



Graduate School of Development Studies

Compromising the environment in Payments for Environmental Services?

An institutional analysis of mechanisms for sharing hydroelectricity revenue in Kulekhani watershed, Nepal

A Research Paper presented by:

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In partial fulfillment of the requirements for obtaining the degree of
MASTERS OF ARTS IN DEVELOPMENT STUDIES

Specialisation:
**Environment and Sustainable Development
(ESD)**

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The Hague, the Netherlands

November, 2009

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List of Acronyms

CFUG	Community Forest User Group
DDC	District Development Committee
ES	Environmental Services
FECOFUN	Federation of Community Forest Users, Nepal
KWCDF	Kulekhani Watershed Conservation and Development Forum
ICRAF	World Agroforestry Centre
MW	Megawatts
PES	Payments for Environmental
RUPES	Rewarding Upland Poor for Environmental Services
VDC	Village Development Committee

Abstract

This study has examined how the scheme of Payments for Environmental Services (PES) has been implemented in collaboration with existing local resource management institutions, particularly community forestry, to try to achieve both environmental and developmental goals. Through a case study approach, this study has analyzed the institutional dynamics of hydroelectricity revenue sharing mechanisms in Kulekhani watershed of Nepal. Results indicate that payments to upstream communities are made in the form of conservation and development projects, most of which are spent on rural electrification and road construction, putting less emphasis on the environment itself. The analysis has found three fundamental design problems of PES institutions. First, construction of road, which is often done using bulldozer, has accelerated soil erosion posing a threat to the environmental services. Second, since the mechanism has excluded the local resource management institutions like Community Forest User Groups (CFUGs), it has failed to provide incentives to resource managers. Finally, the mechanisms have undermined the role of principal beneficiary of environmental services, Nepal Electricity Authority, which has affected the monitoring and compliance of the rules. Analysis of the institutional dynamics of the PES has revealed that such disappointing results are due to three main institutional factors. First, the design process has been heavily influenced by the Makawanpur District Development Committee (DDC), while marginalizing the role of other important actors, particularly CFUGs and the Nepal Electricity Authority. Second, due to lack of a separate policy for PES in Nepal, the rules have drawn heavily from the Local Self Governance Act (1999), which has reinforced the role of the DDC and marginalized that of other resource management institutions. Finally, because of weak monitoring mechanisms, the procedural rules have not been put into practice effectively. Based on this analysis, I argue that, although the PES in Kulekhani has provided a mechanism for transferring hydroelectricity revenue to the local communities to support rural development, it has not transformed existing resource management structures and institutions to demonstrate the effectiveness of enhancing environmental outcomes. The lessons of this research are that politics are driving the design of PES mechanisms, and that its interplay with local institutions can hinder the performance. Moreover, this research suggests that PES schemes do not necessarily result in cooperation among local institutions or the achievement of both ecological and social outcomes.

Relevance to Development Studies

Valuable services provided by natural ecosystems have been dwindling in recent decades, posing a threat to human wellbeing. Different environmental policy instruments have been devised to tackle this issue. PES is one such approach, which aims to provide economic incentives to resource managers to change their behaviour towards conservation. In recent years, this approach has been promoted by development organizations not only for enhancing ecosystem conservation but also for supporting rural development. This study on the institutional dimensions of PES in Kulekhani, Nepal, therefore deepens our understanding of whether PES regimes can collaborate with existing local resource management institutions to foster both conservation and poverty reduction goals.

Keywords

Payments for environmental services, institutions, Kulekhani watershed, community forest management, CFUGs, Nepal

Acknowledgements

The journey of this research and my master's study in the Netherlands would have not been possible without cooperation, support and the company of many others.

First and foremost, I am overwhelmingly thankful to my supervisor, Dr Bram Büscher at ISS; this work would not have been possible without him. I express my sincere gratitude for his incredible guidance and advice, academic excellence and inspiration throughout the process.

I have also benefited from advice, critical feedback, and suggestions from my second reader, Dr Lorenzo Pellegrini.

My sincere gratitude to The Netherlands Government for financial support through the Netherlands Fellowship Program to complete my masters studies at ISS.

I am deeply indebted to the respondents of this study who are a valuable source of information. My special thank goes to Shasi Dhar Subedi for his support for managing my data collection in the community. Similarly, I am thankful to Nabaraj Pudasaini for introducing me to the study area. I also appreciate the support I got from Achut Lamichhane and Rabin Sailung for collecting data from district-level institutions at Hetauda.

My deep appreciation goes to ForestAction for providing me with the opportunity to work together as an intern researcher and offering a platform for sharing my research ideas and preliminary findings. I proudly acknowledge Dr Hemanta Ojha for his encouragement, cooperation and introducing me to the research and professional network of climate change, including PES in Nepal.

I am also grateful to FECOFUN; especially Ghanashyam Pandey and Ganesh Karkee not only for the organizational support they provided by nominating me for NFP fellowship, but also for their cooperation in organizing meetings for discussion.

I should not forget the professional grooming and support I received from the Nepal Swiss Community Forestry Project. I am especially grateful to Dr. Bharat Pokharel for his ever encouraging attitude and professional guidance, from which I have benefited greatly. Similarly, KB Khadka also deserves special thanks for his cooperation, encouragement and inspiration during our rather short professional association.

Thanks to the ESD and whole ISS family: the lectures; convener; course administrator and fellow participants for their support and encouragement. Special thanks go to Deepak Singh and Daniela Barguil Gallardo for reading this paper and providing valuable suggestions; and to Ansu Tumbahanfe and Ramesh Deshar for editing the paper.

I should value friendship and cooperation of my beloved professional colleagues. First, the support of Dinesh Paudel is highly appreciated who has always been my professional guardian. Second, I sincerely appreciate Bryan Bushley for his critical feedback, academic excellence and editing support for this report. Third, I would like to remember the lively discussions and exchange of idea with Dr. Kalpana Giri from the very beginning of this study, and her comments on the paper. Forth, I owe Manohara Khadka for her guidance and cooperation during my stay in the Netherlands. Finally, I am deeply indebted to my best friend, Govinda Paudel for his support throughout my professional and academic career; most importantly, I owe him for the support he provided to my family during the critical moments when I was away from home.

Last but not least, I sincerely appreciate the love and support from my family and I would like to dedicate this work to my late father Bhakta Bahadur Khatri and my mother Binda Maya Khatri for their love, guidance and inspiration for my achievements to date.

1. Introduction

1.1 Background of the Study

Finally, we became successful to get about \$ 60,000.00 additional budget annually for the development of our community after three years of negotiation with District Development Committee, Makawanpur. With this money, we have managed to provide electricity to most of the families of the watershed area and have tried to reach the road to all hamlets. We have also used some of our budget for other community development activities like education, health and watershed management activities.

This is what Payments for Environmental Services (PES) means to a community leader of the Kulekhani watershed, consulted for this study. It is not only the tale of a case of hydroelectricity revenue sharing mechanism in Kulekhani of Nepal but also a representation of what many developing countries are promoting under the banner of PES. The concept of PES relies on the assumption that assigning economic value to ecosystem services and exchanging them under a market system can produce efficient environmental outcomes (Engel et al. 2008, Pagiola et al. 2002, Wunder 2005). Under this logic, the beneficiary of environmental service(s) pays the suppliers in order to provide a direct economic incentive to adopt a more environmentally friendly behaviour. However, these days, the concept of PES is used not only to denote such 'pure' market-based approaches (Wunder et al. 2008). Instead, it has been increasingly used to denote a wide range of schemes for providing direct incentive (both economic and material) to resource managers (Corbera et al 2007, McAfee and Shapiro forthcoming, Swallow et al. 2007). Development organizations are increasingly using such schemes as a tool to promote the twin goals of conservation and development. The concept of PES assumes that it can cooperate with other existing resource management institutions to foster both better resource management and livelihood improvement programs (Matta and Kerr 2006, Neef and Thomas 2009, Smith and Scherr 2002).

Development scholars and professionals have long debated on the use of PES as a development tool. Proponents argue that, development is too focused on objectives like poverty reduction and therefore undermines efficient environmental outcomes (Engel et al. 2008, Pagiola 2008, Wunder 2008). Following this logic, they blame the development agencies, especially the donors organizations as: '...[they] are only interested in PES for their hoped-for-poor pro-poor effects, rather than their environmental impacts' (Wunder 2008:279). On the other side, the critics are cautious about the ability of PES to promote equitable outcomes (Corbera et al. 2007, Proctor et al. 2008). They have pointed out a trade-off between efficiency vis-à-vis equity outcomes and often found evidence of compromise of the later for the sake of the former. Amidst such disagreements, PES has been seen as an alternative source of financing for conservation programs in developing countries.

Reflection on such international trends can also be made in Nepal, which is the geographical focus of this study. In Nepal, the concept of PES was introduced in 2003 as a pilot project of the World Agroforestry Centre (ICRAF) to compensate and reward upstream community of the Kulekhani watershed. It has been perceived as an additional source of money to implement watershed management programs in the area, and to foster both ecosystem conservation and improvement of livelihoods at the local level (Adhikari 2009, Upadhyaya 2005). The Kulekhani watershed became a pioneer in adopting the concept when a revenue-sharing mechanism was devised between the Kulekhani hydroelectricity project and the communities residing in the upstream part of the watershed. The main aim of the scheme is to support the livelihoods of upstream

communities for ensuring forest conservation and reducing sedimentation in the Kulekhani reservoir.

This research, building on the knowledge of PES, aims to understand how the twin objectives of ecosystem conservation and rural development have been translated into practice. Taking the case of the Kulekhani watershed, this research strives to comprehend to what extent the PES can collaborate with existing resource management and other related institutions to foster both objectives. In this process, this introductory chapter presents the main research problem; purpose of the study; the research question; the methodological approach; limitations of the study; and the overall organization of the paper.

1.2 Statement of the Problem

Previous studies on the PES in Kulekhani assert that the mechanisms developed there have been successful in redistributing hydroelectricity revenue to upstream communities for environmental protection and community development (Adhikari, 2009, Hung et al. 2009, Leimona et al 2009, Upadhyaya 2005). These studies take a straightforward logic that the newly introduced mechanisms will simply integrate with the existing resource management institutions, for example community forest and watershed management, and provide financial incentives to the resource managers, mostly the poor people, for better management of the resources. However, such logic has been contested by many scholars who argue that PES are complex mechanisms that do not necessarily accommodate existing resource management institutions (Corbera et al. 2007, McAfee and Shapiro, forthcoming). A review of the institutional literature also reveals that devising resource management institutions like PES involves complex processes that do not always produce the expected outcomes for various reasons, as stated below.

First, the resource management mechanisms are the outcomes of the interaction and interplay among people of different interests in a specific bio-physical and socio-economic context (Ostrom 2005, Poteete and Ostrom 2004). In the negotiation process, inclusion and exclusion of the interest of the actors determines the institutions. Second, such instruments are not designed and implemented in a vacuum; rather they interact with other institutions (Corbera and Brown 2008, Kumar and Muradian 2009, Swallow et al. 2005). Finally, it is also important whether the institutions are enforced and monitored properly. According to the institutional scholars, these institutional factors are responsible for shaping the outcomes of the environmental institutions (Corbera and Brown 2008, Mitchell 2008, Young 2002b).

Like other resource management institutions, Corbera and Brown (2008: 1957) have conceptualized PES as evolving institutions which attempt to enhance or change natural resource managers' behaviour in relation to ecosystem management through the provision of economic incentives. Given the associated complexities with institutions and the use of straightforward assumptions while analysing PES mechanisms in Kulekhani, it is not well analyzed and understood whether PES mechanisms can fit well within the existing community forest and watershed programs to foster synergetic outcomes. In the first place, it is necessary to analyze whether the PES institutions are effective enough to meet the stated goals of environmental conservation and livelihoods upliftment. Such an analysis requires an understanding of the underlying complexities associated with the design and implementation of a PES scheme.

1.3 Purpose of the Study

This study examines different institutional dimensions of the PES mechanisms in the Kulekhani watershed to understand to what extent PES can complement existing resource management institutions in order to foster both ecological and social outcomes. First, the study examines the underlying process of institutional design and the role of different actors in this process. Second, it analyses the specific interactions of the PES scheme with other resource management and community development institutions. Finally, the results obtained from this analysis are used to examine the implications of such institutional dimensions on the overall performance of the PES mechanism in terms of both forest conservation and the provision of social benefits.

It is worth mentioning here that the existing body of literature about PES in Kulekhani and similar models adopted in different parts of the world mostly represents the perspectives of proponents (Leimona et al. 2009, Huang et al. 2009, Upadhyaya 2005). These studies either lack in-depth analysis or just provide a snap-shot of positive outcomes of PES regimes, instead of attempting to analyse them critically. Generally, the existing PES focuses either on the technical aspect of providing the environmental services or on the associated process of marketing them. Relatively little effort has been made to understand the institutional dynamics and its impact on the PES mechanisms as a whole. This study provides an explicit analysis of the interplay of institutional dynamics and its implications for a PES regime. The findings of this study are thus expected to fill the gap of in-depth institutional analysis in the PES scholarship. Such an analysis can also support policy-makers and development professionals to make informed decisions while formulating policies and programs for PES in developing countries. Moreover, the findings are also expected to inform the debate on using PES to meet the twin goals of conservation and poverty reduction, while accommodating other existing resource management institutions, particularly community based institutions and initiatives.

1.4 Research Question

The main question this study seeks to answer is: *How have Payments for Environmental Services mechanisms been designed and implemented in Kulekhani, Nepal and how has it transformed existing resource management structures and institutions?* The following sub-questions were used to analyze the main research question.

- What are the historical and institutional contexts of introducing the PES in Kulekhani?
- How have the PES mechanisms been designed and what were the roles of different actors involved in the process?
- How are the PES mechanisms interacting with other existing institutions, especially community forestry, watershed management and community development ones?
- How effectively are the rules of the PES mechanism enforced?
- What are the implications of these institutional dynamics on performance of the PES mechanisms in terms of generating the desired environmental services and supporting community development?

1.5 Methodological Approach

This is primarily a qualitative study based on both primary and secondary data. It has adopted a case study approach where Kulekhani as a case was used to analyse the institutional dynamics of PES in Nepal.

1.5.1 Study site and rationale for choice

The Kulekhani watershed was purposively chosen for this case study for a variety of reasons.

Firstly, Kulekhani is the site where PES was introduced in Nepal for the first time. It is one of seven sites globally for the pilot program of Rewarding Upland Poor for Environmental Services (RUPES), which aims to introduce payment mechanisms for watershed services with the objective of conserving the environment and supporting poverty reduction.

Secondly, though there are a number of other initiatives in Nepal that have been recently implemented, the Kulekhani case now has been in existence for over three years. The mechanisms and process used and consolidated during these three years allows for a more in-depth institutional analysis.

Finally, there exists considerable literature about the PES arrangement in Kulekhani, including research on institutional aspects, to help understand how PES can accommodate other resource management mechanisms to enhance both ecological and social goals. This facilitated an explicit focus on the institutional dynamics of PES and made this study feasible within the given time frame and resources.

1.5.2 Source of data

Primary data

Primary data was collected between mid-July and early August 2009 in two phases. The first visit to the Kulekhani was used to consult the key informants to get an overview of the study area, to identify major actors involved in the PES process and to identify the respondents to be interviewed during the second phase. The second visit was used to collect data at three levels. First, at the community (watershed) level, five interviews and one focus group discussion were conducted. Interviewees at this level were selected from different actors like the general public, community leaders, CFUGs and political parties, whereas the participants of the focus group discussion were selected from Chuliparan CFUG. This CFUG was selected based on its activeness in the forest and community development activities. Leaders from this group have also participated in the PES process in their capacity as political leaders. Second, at the district level, five interviews were conducted with representatives from district level actors, such as the DDC, the District Forest Office, the District Soil Conservation Office and the District Federation of Community Forest User, Nepal. Finally, at the national level, one key person interview was conducted with an expert involved in the RUPES-Kulekhani program and one focus group discussion was held with the national secretariat of the Federation of Community Forest Users, Nepal. A total of 11 interviews and two focused group discussion were conducted.

Secondary data

Secondary information was collected from various sources. One of the main sources was documents prepared by the RUPES-Kulekhani program, including the project profile, newsletters, workshop proceedings, and field notes. Another source was the Makawanpur DDC, which provided records of the expenditure under PES scheme, procedural rules and

meeting minutes. Previous studies on Kulekhani and existing literature on PES were also consulted.

1.5.3 Data collection techniques

Among the various qualitative data-gathering techniques for institutional dimensions of environmental governance discussed by (Biermann 2007), in-depth qualitative interviews and focus group discussions were used in this study.

In-depth interview

In total, 11 semi-structured in-depth interviews were conducted with respondents representing various actors involved in the PES mechanisms. These interviews were carried out to understand the processes used during design of the PES institutions; the interest and role of different actors in this process; interactions of the PES mechanisms with existing resource management and community development mechanisms and finally perceptions of the actors about the effectiveness of the PES.

Focus group discussion

Similarly two focus group discussions were conducted. Discussion with CFUGs was intended to understand the roles of CFUGs in the PES design and implementation process and changes in the behaviour or forest management practices due to the PES mechanisms. Similarly, discussion at the central level was focused on possible implications of existing policies and institutions on the exclusion of CFUGs in the PES mechanisms.

1.5.4 Data analysis

As this research is qualitative in nature, qualitative data analysis techniques were used. The field notes, including transcriptions of the focus group discussions and interviews and essences of the documents were coded and analyzed using ATLAS-Ti, software for qualitative data analysis. The final output has been presented in this paper primarily in the form of rich and thick texts including direct quotes from the respondents. The texts and descriptions are supplemented with relevant figures, maps and pictures.

1.6 Limitations of the Study

During the process of this study a number of limitations were encountered. First, since the findings of this research are drawn based on a one particular case dealing only with watershed services, it has limitations for wider scale generalizations. Nevertheless, the research findings could have wider policy and conceptual implications for other environmental services like carbon sequestration and biodiversity conservation, provided the context of the research is taken into consideration. Furthermore, since PES has been looked at from an institutional perspective, this study has an analytical bias towards an institutional approach. Second, it was difficult to manage the fieldwork and literature review within a limited timeframe, which has implications for both the conceptual and empirical depth of the research. The researcher's prior knowledge about the community forestry in Nepal and the study area helped to overcome these limitations to some extent. Finally, the time for field work (July and August) was not ideal due to the Monsoon season in Nepal, the peak season for agricultural work, and the end of fiscal year. The heavy monsoon rains also hampered mobility thereby affecting fieldwork efficiency. Similarly, it was very difficult to organize focus group discussions with communities, which made me abandon one discussion and rely more on individual interviews. Moreover, as many government officials were on leave or out of duty station for financial settlement, it often took time to track them down.

1.7 Organization of the Paper

This paper is organized into six chapters including this introduction. Chapter Two sets out the theoretical background and analytical framework for this study. It first outlines the concept and debates about PES and then discusses the institutional framework for analysis. Chapter Three presents the historical and contextual background of the PES in Kulekhani. This chapter covers the evolution and status of community forest and integrated watershed management in Nepal and their contribution to the generation of watershed services. Then it provides an overview of the Kulekhani watershed and an introduction of the PES system. Chapter Four includes the main findings of this study related to the institutional design and interplay of PES. In doing so, it examines actions and actors involved in the design process, the rules crafted through negotiation among the actors, and the interactions of PES institutions with other existing institutional arrangements. Building on Chapter Four, Chapter Five consolidates the findings by presenting an analysis of the performance of the PES. Finally, the paper concludes by drawing policy implications and exploring the scope for further research in the field.

2. Theoretical Background and Analytical Framework

2.1 Introduction

This chapter presents the theoretical background and analytical framework for this study. The first section provides an overview of the concept of and current debate surrounding PES. The second section outlines the analytical framework of the study. It first conceptualizes the PES as a resource management institution and then presents the institutional analytical framework. The chapter concludes by consolidating the theoretical debate and analytical approach.

2.2 Definition and Conceptualization

2.2.1 *Environmental Services*

Environmental Services, also known as Ecosystem Services—henceforth ES in this paper—are ‘the benefits people obtain from the ecosystems’ (Millennium Ecosystem Assessment 2005:v). As forests are the focus of this study, only ecosystem services from forests are considered here. Forests generate a range of services in addition to useful commodities like timber, fuel-wood, food and medicine. The common ES from forests are clean and sufficient water for human consumption, sequestration of carbon, maintaining biological diversity and maintaining natural beauty (Millennium Ecosystem Assessment 2005, Patterson and Coelho 2009). As this study only deals with watershed services, this section explains how forest and land management contributes to these services.

Forest conservation can have a positive impact on watershed functions (Brauman et al. 2007, Landell-Mills and Porras 2002, Poras et al. 2008). The major watershed functions of the forest include the regulation of the quantity and quality of water. However, there is not a straightforward relationship between forest conservation and these watershed functions. Such functions are determined not only by forests, but also by various other site factors like the terrain, soil composition, tree species and vegetation composition (Bishop and Landell-Mills 2002, Poras et al. 2008). First, there is a general perception that improvements in the condition of forests positively contributes to increases in water discharge. However, forests might have controversial impacts on water flow. In one way, the forest contributes to the maintenance of water flows because of its ‘sponge effect’. This means that vegetation cover decreases runoff by providing coverage to soil and increasing infiltration, which in turn contributes to groundwater recharge. On the other hand, groundwater is lost due to the evapo-transpiration function of plants. Therefore, it is necessary to understand whether a particular vegetation type contributes to an increase in water flow.

Second, water quality is determined by the hydrological functions in a watershed. In this case as well, the general perception is that the forest has positive causal relations for controlling soil erosion. The common logic is that forests reduce runoff and provide an anchoring effect to the soil (Bishop and Landell-Mills 2002). However, the phenomenon of soil erosion is not only determined by forest cover but also by other site-specific factors like soil type, terrain and weather characteristics; land use practices like agriculture; and infrastructure development. Still, there is quite well-documented evidence that forests play a positive role in controlling soil erosion (Bishop and Landell-Mills 2002, Brauman et al. 2007), thereby decreasing sedimentation and improving water quality downstream. Understanding such hydrological functions is a prerequisite for determining the value of environmental services. Various methods have been developed for assessment of such services that range from scientific methods using hydrological data and modelling (de

Groot and Hermans 2009) to more pragmatic, cost effective, participatory one like Rapid Hydrological Appraisal (van Noordwijk et al. 2008).

Like watershed services, forest management generates other services, like, carbon sequestration, biodiversity conservation and natural beauty. Various approaches have been developed to understand and define such services with the aim of conserving them. In recent years, direct economic incentive approaches are being used under the PES. The basic concept and current debates surrounding this new policy instrument are discussed in the following section.

2.2.2 Payments for Environmental Services: Definition and Debates

PES has become an increasingly popular policy instrument for environmental conservation in recent years in both developed and developing countries. The concept is founded on the assumption that conservation outcomes would be enhanced if the current situation of 'market failure' is solved (Engel et al. 2008, Landell-Mills and Porras 2002, Pagiola 2002). Proponents of PES argue that markets typically fail to provide for ecosystem services because the conventional policy instruments including 'command and control', and community based natural resource management fail to internalize the positive externalities¹, or the benefits of the ES generated due to conservation. Therefore, the concept of PES relies on the idea of assigning property rights and monetary value to the ES so as to internalize these positive externalities (*ibid*). This concept operates according to the logic of the 'free market' (Engel et al. 2008, Wunder 2005) which says that if environmental services are given economic values and assigned property rights, the rational behaviour of buyers and sellers in the market environment will produce efficient environmental outcomes. Following this logic, Wunder (2005:3) defined a PES mechanism as '(1) a voluntary transaction; (2) in which a well defined environmental service or land use likely to secure that service; (3) is bought by at least one buyer; (4) from at least one provider; (5) if and only if the service provider secures service provision (conditionality)'.

These five criteria constituting the definition have been used to qualify a program as a market-based mechanism often called 'true PES' to produce efficient environmental outcomes (Engel et al. 2008, Wunder 2005). Therefore, proponents praise the PES as an innovative policy instrument (Engel et al. 2008, Engel and Palmer 2008, Pagiola et al. 2005, Wunder and Albán 2008, Wunder et al. 2008) and do not want to compromise efficiency for social goals. In this connection, Wunder (2008:295) argues:

...[to] the extent that multiple side objectives (e.g. concerns for poverty, human rights gender, and indigenous people) are increasingly squeezed into the PES equation, the schemes will lose efficiency in achieving their main target, to deliver an improved environmental service. If schemes become over-regulated and efficiency is lost, the outreach to the private sector globally a prime target for PES schemes so far would be reduced. PES would increasingly become "old wine in new bottles" subsumed into the generic family of altruistic development projects to which they were actually meant to be an alternative.

Scholars supporting such argument put emphasis that: 'PES was conceptualized and undertaken as a mechanism to improve the efficiency of natural resource management, and not as a mechanism for poverty reduction' (Engel et al. 2008: 671-72).

¹ Positive externality as mentioned by Landell-Mills and Porras (2002:8) '... is any uncompensated benefit' for example erosion control, decreased sedimentation and increase in dry season flow of water because of improved forest conditions'.

However, there is ongoing debate regarding such pro-market arguments. The idealized notion of a 'pure' market-based approach has been contested by various scholars and development professionals arguing that too much focus on efficiency can compromise equity outcomes (Corbera et al. 2007, Corbera et al 2007). Various empirical studies have also revealed that equity outcomes have often been compromised for the sake of economic and/or environmental efficiency goals (Corbera et al. 2007, Corbera et al. 2007, Kosoy et al. 2007). Based on three case studies in Central America, Corbera et al. (2007:446) argue that: '... trade-offs between different environmental and social goals are likely to emerge in PES schemes, posing some doubt as to their ability to be multipurpose instruments for environmental improvement and rural development'.

On the other side, a few scholars have positioning themselves opposite to the market-based approach, arguing that the 'commodification of nature' and marketing under neo-liberal logic does not necessarily benefit poor people (Proctor et al. 2008, McAfee and Shapiro forthcoming). This group of scholars argues that: '[...] equity outcomes have rarely been considered in the implementation of [PES]. Neoliberal economic analysis does not explicitly take such equity considerations into account with efficiency concerns being the overriding goal' (Proctor et al., 2008:1). Even more idealistically, McAfee and Shapiro (Forthcoming: 23) argue: '... conservation policies in the global South, if imposed from the North and framed by neoliberal logic, are likely to clash with state agendas and indigenous development goals'.

Such discrepancies have also been translated into practice. There are a variety of PES schemes being practiced in developing countries which ranges from a pro-efficient 'pure' market-based mechanism to a redistribution of the benefits to poor people. McAfee and Shapiro (Forthcoming: 7-8) have summarized such diversified PES schemes into three major categories: pro-efficiency PES; pro-market and pro-poor PES; and compensation for environmental services. The first category comprises the projects having efficiency as primary outcomes. The second category represents projects that aim to balance environmental conservation and poverty reduction goals. The third category covers projects which are implemented with more focus on social outcomes assuming that conservation and poverty reduction are inseparable.

Amidst such debate and discrepancies, in recent years, there has been a growing tendency to use PES as a development tool to achieve both conservation and poverty reduction goals. It has often been used for the redistribution of resources to the local level, especially to rural areas in the form of financial transfers (Gutman 2007, Kumar and Managi 2009). The project at Kulekhani, one of the pilot sites of the RUPES project of the ICRAF, follows a similar concept. It has used the concept of rewarding contributions and compensating foregone benefits of upland poor for resource management. In this context, the concept of PES in this paper denotes a compensation and reward mechanism as discussed in Swallow et al. (2007: 34). This suggests that PES in Kulekhani departs conceptually from Wunder's definition in that it involves complex interactions among actors and institutions to balance conflicting interests over community development vis-à-vis environmental conservation. An institutional approach would be a useful tool for studying such dynamics.

2.3 Institutional Approach for Studying PES

PES is conceptualized here as institutions designed to enhance environmental conservation and foster community development. The concept of institution used in this study indicates rules which determine dos and don'ts in a given situation. This is different from the concept often used to denote an organization. In the environmental context, '[i]nstitutions play more or less significant causal roles with regard to most environmental

change involving human actions' (Young 2002b:4). In doing so they shape the way in which humans interact with the environment (Corbera and Brown 2008). In short, the institutions shape outcomes in terms of environmental change by affecting behaviour of actors (Dietz et al. 2003, Gibson et al. 2000). Following this concept, Young (2002b: 30) defined institutions as '... sets of rules, decision-making procedures, and programs that give rise to recognized practices, assign roles to participants in these practices, and govern interactions among occupants of specific roles'. Such rules might be both formal (rules in paper) and informal (customary rules or rules in practice) (Leach et al. 1999, Young 2002b).

As discussed earlier, the concept of PES relies on the principle of self-regulated market mechanisms (Landell-Mills and Porras 2002, Pagiola et al. 2002), where consumers pays the provider of the ES (Corbera and Brown 2008). However, in practice, various form of interaction between actors and institutions exist which are beyond the remit of the market (Corbera and Brown 2008, de Groot and Hermans 2009, Kosoy et al. 2008, Lebel and Daniel 2009). On the one hand, PES constitutes some market elements which provide direct economic incentives to the resource managers. On the other hand, it consists of rules directing the behaviour of people—for example, agreement mechanisms between providers and beneficiaries of the environmental services, conditions to be followed by the resource managers, and decision making procedures. Therefore, PES can be conceptualized as institutions to shape the behaviour of resource managers for desired environmental outcomes. Understanding such institutional mechanisms needs to go beyond the market remit to include institutional dynamics, which are discussed in the following section.

2.4 Institutional Framework for Analysis: Design, Interplay and Performance

Frameworks for analyzing PES institutions, which is used in this study, was developed by Corbera et al. (2009) and Corbera and Brown (2008) borrowing basic conceptual elements from different institutional scholars. The framework consists of the concept of institutional design drawn from the Institutional Analysis and Development Framework of Ostrom (2005); the concept of institutional interplay of Young (2002b); and the concept of institutional performance of Mitchell (2008).

2.4.1 Institutional design

The concept of institutional design helps to explain why and how PES have been designed in a particular socio-economic context. First, it tries to uncover what drives the institutional design (Ostrom 2005, Young 2002a). Second, it helps to explain the process and outcome of the design, which includes the actions and steps involved, as well as actors and their interactions and procedural rules (Corbera and Brown 2008). As explained by Dolsak and Ostrom (2003) the design consists of rules for resource use, monitoring and enforcement which guide the behaviour of actors. The rules as defined by Ostrom (2005:18) are '... shared understanding by participants about *enforced* prescriptions concerning what actions (or outcomes) are *required, prohibited or permitted*' (emphasis in original text).

The design process involves negotiation among actors (Corbera and Brown 2008, Corbera et al. 2009, Lebel and Daniel). Such negotiation takes place among actors having differential interests and power who tend to reflect their interests in the institutions. Therefore, it is likely that the interests of less powerful actors are marginalized. Very often there are roles of external actors to facilitate the negotiation process (Swallow et al. 2007,

Tiwari and Amezaga 2009). These might be both governmental and non-governmental actors who can facilitate the negotiation process and also help the less powerful actors to voice their concerns at the negotiation table.

Ultimately, the analysis of institutional design provides opportunities to understand issues like whether design rules are conducive to meet goals of the institutions and whether the interests of various actors are reflected in the rules (Corbera et al. 2009, Lebel and Daniel). Institutional scholars have suggested different design principles so as to increase the effectiveness of the institutional design (Dolsak and Ostrom 2003, Ostrom 1990). The design principles summarized by Dolsak and Ostrom (2003) include: 1) rules are devised and managed by resource users; 2) compliance with rules is easy to monitor; 3) rules are enforceable; 4) sanctions are graduated; 5) adjudication is available at low cost; 6) monitors and other officials are accountable to users; 7) institutions are devised at multiple levels; and 8) procedures exist for revising rules. These design principles are often used to examine the effectiveness of the institutions.

2.4.2 Institutional interplay

The resource management institutions do not operate in a vacuum; rather they interact with other existing institutional arrangements (Young 2002a, Young 2002b) which impinge on the effectiveness of the institutions in question. These interactions have been conceptualized as ‘institutional interplay’ (Young 2002b). The assumption behind the idea of interplay is that ‘... the interaction between two or more institutions can influence their respective outcomes’ (Corbera et al. 2009: 746). The outcomes might be positive or negative depending on the nature of the interplay: coordination or conflict. The coordination of PES with existing institutions may enhance the outcomes whereas conflicting relations may inhibit them. Such interactions mostly take place among similar types of institutional mechanisms. According to Young (2002a, 2002b) there are two different categories of institutional interplay: symmetrical versus unidirectional, and vertical versus horizontal. In symmetrical interactions, both institutions affect each other in a similar manner, whereas in unidirectional interactions one institution affects the other more. Similarly, in vertical interplay, institutions at different scales interact with each other, for example, an international regime like the Kyoto Protocol may affect national or local carbon-related programs. However, such cross-scale interplay is not the focus of this study.

Considering the case of Kulekhani watershed, community forest management and watershed management program have been practiced for a long time. These programs are reported to have been successful for ensuring both effective forest management and erosion control. Similarly, DDC and Village Development Committees (VDCs)² are executing local development activities to promote community development. PES, which have been introduced to support both environmental conservation and community development, is thus likely to interact with these three institutional arrangements. In this context, the concept of interplay is used in this study to understand interactions of PES institutions with those three existing institutions. Analysis using this concept helps to examine to what extent PES institutions cooperate with other institutions as claimed in the literature (Adhikari 2009, Matta and Kerr 2006, Smith and Scherr 2002) to foster conservation as well as development.

² VDCs are the lowest administrative bodies in Nepal. Makawanpur DDC has 43 VDCs and one municipality.

2.4.3 Institutional performance

The concept of institutional performance (Mitchell 2008) analyzes whether institutional mechanisms meet the stated goals. In other words, it is an assessment of the extent to which PES institutions are effective in meeting both environmental and social goals. Therefore, this is a tool to evaluate the collective benefits and negative outcomes of the mechanisms (Corbera et al. 2009). Such evaluation needs comparison between the states of the world due to PES institutions against what would happen if there were no such mechanisms in place (Mitchell 2008).

Mitchell (2008) discussed three different ways of examining the effectiveness of environmental institutions. First, as institutions are expected to change behaviour of the resource managers, assessment of change in behaviour can be used as proxy of outcomes. However, the change in behaviour does not necessarily affect performance because there might be other non-institutional factors at play. Still, it is the preferred way of assessing performance. The second method is assessing compliance with the rules. Relying on compliance also may not give a complete assessment of the performance because it is difficult to determine the level of compliance and it does not consider informal institutions. Finally, measuring outcomes like environmental quality with respect to a counter-factual reference point is a very reliable and credible method. However, it requires reliable baseline information and measurements of the current state of the world against pre-determined standards.

The overall performance of the institutional mechanisms is determined by a number of factors like the strength of the institutional design, and the effect of interplay and compliance of rules in practice. Therefore, in this study, these three factors are considered to examine the performance of the institutional design. Since, PES mechanisms in Kulekhani do not have a very long history, and there is no base line data available to examine the outcomes, only compliance with the rules and behavioural change is considered for assessing institutional performance.

2.5 Conclusion

Over the past few decades, various conservation approaches have been adopted to solve the problem of degradation of natural ecosystems. PES, one of the most recent of them, provides direct economic incentives to the resource managers. However, there are debates and discrepancies regarding the use of this approach as a tool for conservation and development. Proponents praise it for its efficient outcomes, whereas opponents argue that the neoliberal logic of PES cannot benefit the poor. Amidst such debates, a variety of PES projects have been implemented in different parts of the world. Promoters argue that the PES can be customized with existing institutional mechanisms to enhance environmental goals along with supporting livelihoods of poor people. Whereas the sceptics contest such arguments, asserting that the neo-liberal form of the PES cannot cooperate with existing resource management and other development institutions (McAfee and Shapiro forthcoming). This paper, based on a case of PES in Kulekhani watershed of Nepal, attempts to understand how institutional dimensions play a role in the effectiveness of the PES to meet both conservation and development goals. The following chapter provides a brief overview of the resource management context of Nepal in general, and of Kulekhani in particular.

3. Introduction of PES in Kulekhani: Historical and Contextual Background

3.1 Introduction

This chapter outlines the historical and contextual background of the PES scheme in Kulekhani. It first gives an historical overview and the current status of forest and watershed management in Nepal. Then, it provides an overview of the Kulekhani watershed which includes bio-physical and socio-economic information, past efforts for forest and watershed management and their role in the generation of ES. It also discusses the context in which PES have been introduced in the area. Finally, it provides brief overview of the policies and institutional infrastructure supporting PES.

3.2 Evolution of Forest and Watershed Management in Nepal

After nationalization of private forests in 1957, forest resources were governed by government mechanisms in Nepal (Gilmour and Fisher 1992). The western media and academia pointed to an environmental crisis in the Himalayas in late 1970s claiming degradation of the mountain ecosystem due to heavy deforestation and soil erosion (Ojha 2006, Ojha et al. 2009). These claims put moral pressure on western development agencies and the Government of Nepal (then His Majesty's Government of Nepal) to address the crisis. The government, with financial and technical assistance from donor agencies, initiated resource management and conservation programs including establishment of plantations on degraded lands and watershed management initiatives. Yet, such programs overlooked peoples' participation, which affected their overall success.

Then, a more participatory approach in the forestry sector was introduced in the mid-1970s. As a result, the Nepalese forestry sector got a long-term policy framework called the Master Plan for Forestry Sector in 1989. The Master Plan, emphasizing a participatory approach, identified Community Forestry and Watershed Management as priority programs (Hobley et al. 1996, Ojha 2006, Pandit et al. 2007). Since these two programs were implemented in Kulekhani and were responsible for generating ES, it is worth introducing them here.

The community forestry program, though initiated in the mid-1970s to respond to the Himalayan crisis, gained momentum only after their incorporation in the Master Plan and the enactment of the Forest Act (1993) and Forest Regulations (1995). These policies made provisions to transfer the management and use rights of forests to local communities as Community Forests. The Community Forests are government owned forests which are handed over to CFUGs for protection, management and utilization of forest resources. As of 2007, about 25% (1.2 million hectare) of the national forests have been handed over to more than 14,000 CFUGs which cover about 40 % of the country population (MoFSC 2008). In recent years, activities of the CFUGs are not only limited to forest management but also extend to various community development activities, including the exercise of participatory democracy at the grassroots level (Ojha et al. 2009, Pokharel et al. 2009). The Community Forestry program in Nepal, particularly in the mid-hills has made remarkable achievements in terms of improving forest conditions, meeting basic forest products' need of people, and representing a robust grassroots level organization (Byrne et al. 2009, MoFSC 2008, Pokharel et al. 2006, Thoms 2008). Yet, there are still challenges, particularly on equity outcomes (Iversen et al. 2006, Rai Paudyal 2008). An important point to note here is that the improved forest conditions have

contributed to the generation of important ES like improved quantity and quality of water resources.

Similarly, the watershed management program was also initiated in the 1970s under similar circumstances (Acharya 2000, Pandit et al. 2007). Later, in late 1980s, the government, with support from different donor agencies, introduced the concept of integrated watershed management, adopting a participatory approach as manifested in the master plan (Acharya 2000, Pandit et al. 2007). This approach includes different programs like community forestry, conservation farming, agro-forestry and conservation engineering, which are implemented in selected watersheds or sub-watersheds. These programs basically include a range of activities like establishment and support for CFUGs, conservation friendly agricultural activities, income-generating activities including savings and credit schemes, small-scale conservation structures like bio-engineering works, conservation ponds, and check-dams. They were implemented through various community based organizations including CFUGs, community development committees, savings and credit groups and so on. From the government side, the District Soil Conservation Office is responsible for coordination of such activities in the district.

The integrated watershed management programs have been reported to be beneficial in terms of improving both bio-physical and socio-economic conditions of watersheds like Kulekhani (Acharya 2000, Ojha et al. 2007, Pandit et al. 2007). As discussed elsewhere, the community forestry program, praised for its success in restoration of degraded forests, especially in the mid-hills, is the most important component of the integrated watershed management activities. The following section presents an overview of forest and watershed management activities in the Kulekhani watershed and its contribution to the generation of ES.

3.3 Forest and Watershed Management in Kulekhani

3.3.1 Overview of Kulekhani Watershed

The Kulekhani watershed is a catchment area of the Indrasarobar reservoir of the Kulekhani hydroelectricity project. The reservoir was constructed in the early 1980s with 114-meter high rock-filled dam on the Kulekhani River and its tributaries (Sim, Pakhel and Chitlang) (See Map 2 and picture next to it) (Sthapit 1996). The 2.2 square kilometre reservoir provides water to the Kulekhani hydropower project of 92 Megawatt (MW) capacity (Schreier and Shah 1996). The project comprises two sub-projects: Kulekhani I with 60 MW and Kulekhani II with 32 MW capacities. Kulekhani III is also under construction and will have a capacity of 40 MW. Being the only reservoir-based hydropower project in Nepal to date, this project has strategic importance. It supplies electricity during scarcity: peak time of the day, and in the dry season when other powerhouses cannot run in full capacity due to their decreased water flow.

The Kulekhani watershed, located in the northern part of Makawanpur district of Nepal, is about 30 Kilometres south-west of Kathmandu, the capital city of Nepal (see map 1). It is distributed over 12,492 hectares and encompasses a portion of 8 VDCs of Makawanpur district, namely Dama, Palung, Tistung, Deurali, Bajrabarahi, Markhu, Kulekhani and Fakhel. The total watershed area is comprised of about 53 percent forests and shrub-land, 42 percent agricultural land, 2 percent grazing land and 3 percent wasteland, like landslides (Sthapit 1996). The watershed area, most of which is sloped land, falls under a fragile physiographical region and experiences intense monsoon rainfall (Ghimire 2004). Such biophysical conditions along with human pressure have created a threat of land degradation and soil erosion.

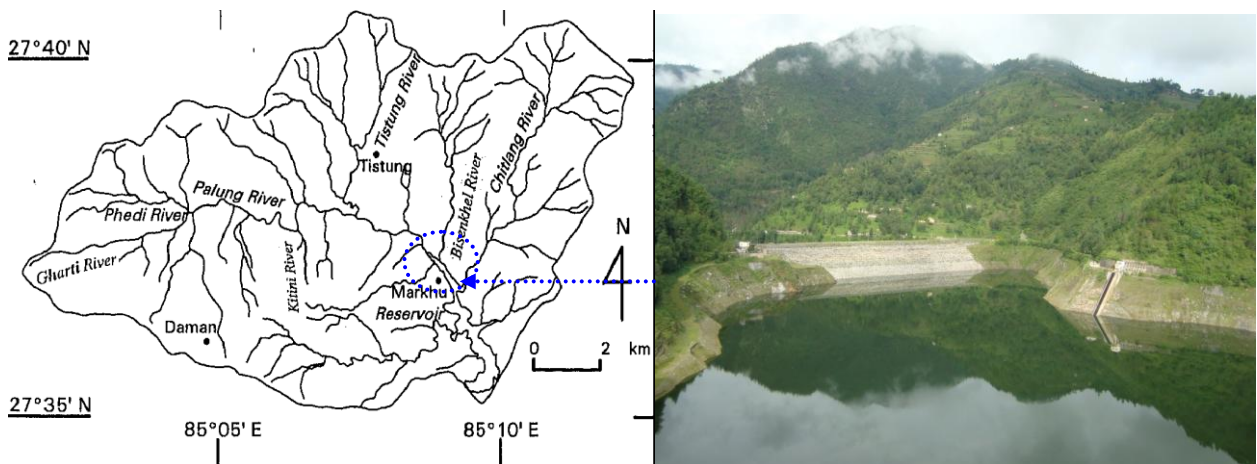
Map 1: Kulekhani Watershed on the Map of Nepal



Source: Upadhyaya 2005

This watershed is home to about 46,000 people, including 8,600 households of diverse ethnic groups (Upadhyaya 2007). The majority of the population consists of small farmers with subsistence farming as their main source of livelihoods, of which forests form an integral part. They collect a variety of forest products including fuel-wood, fodder, and timber as construction materials. In recent years, the subsistence farming is being gradually switched to commercial vegetable cultivation. Nevertheless, the forest is still a major source of livelihoods.

Map 2: Kulekhani Watershed and Indrasarobar (Reservoir)



Source: (Dhakal et al. 2000)

Picture: Kulekhani Reservoir (Source: Author)

3.3.2 Forest and Watershed Management

The Watershed is not only a source of water but also a source of sedimentation affecting the reservoir's operation and longevity. Though the designed life span of the reservoir was 50 years, it was expected to function for 100 years with the anticipated annual sedimentation rate of 7 m³ per hectare (Sthapit 1996). However, the observed annual

sedimentation rate to the reservoir was much higher than anticipated (*ibid*). This was due to an alarming rate of sedimentation right after the construction of reservoir as a consequence of heavy deforestation and degradation of the watershed area in the 1970s and early 1980s (Schreier and Shah 1996, Sthapit 1996). As argued by Upadhyaya (2005), besides satisfying the forest product needs of the local community, the construction of the reservoir has also contributed to such environmental consequences. On the one hand, the reservoir construction project excavated construction material from the watershed area and, on the other hand, it put pressure on the forests to satisfy the need of a heavy influx of construction labour. These phenomena contributed to forest degradation and destruction of the watershed area.

To tackle such devastating effects, the government selected the Kulekhani as a watershed of strategic importance and initiated watershed management activities with the help from donor agencies in the early 1980s. Resource Conservation and Utilization Project (RCUP) funded by United States Agency for International Development (USAID) and Food and Agriculture Organization (FAO) ran until 1986. From the subsequent year, the Finnish Department for International Development and Cooperation (FINIDA) and the European Union (EU) launched the Bagmati Integrated Watershed Management Project which has gone till 2003. As explained in the previous section, the project had promoted an integrated watershed management program comprised of different conservation and development activities.

Among the different programs under the integrated watershed management initiative, the community forestry program was the most important one. As a result, more than 95% of the forests have been handed over to about 75 CFUGs. These efforts were said to be beneficial for improving the conditions of the forests and reducing sedimentation in the reservoir. A study of the land use status of the Kulekhani watershed shows that the forest area has increased from 5210.67 hectare to 6370 hectare from 1992 to 2001, which was 5884.30 hectare in 1978 (*ibid*). Though, there is no well-documented information to prove improved forest condition, Upadhyaya (*ibid*), comparing conditions in photographs over different time intervals, suggests that the condition of the forests have improved significantly (see picture below).



Biruwa Ban of Chitlang in 1985



Biruwa Ban Community Forest in 2004

Picture: Impact of community forestry program on improved forest conditions (Source: Upadhyaya 2005)

3.4 Generation of Environmental Services

The improvement in forest conditions combined with other conservation efforts under integrated watershed management programs are argued to have positive consequences on reducing sedimentation in the reservoir. A sedimentation survey conducted in Kulekhani watershed by the Department of Soil Conservation and Watershed Management and the Nepal Electricity Authority (NEA) at different points in time shows that the sedimentation rate has declined significantly since 1996 (Sthapit 1996, Upadhyaya 2005). Similarly, evidence also shows that dry season water flow has also increased over the years. 'Between 1991 to 1995 and 1999 to 2003, the average annual water inflow to the reservoir increased by 31 percent and the dry season water inflow increased by 55 percent (Upadhyaya 2005: 16).'



Picture: Indrasarobar (Kulekhani reservoir), water source of Kulekhani Hydropower projects (Source: Author)

These two positive impacts of forest conservation and watershed management—decreases in the sedimentation rate and an improvement in dry season water flow—are considered to be valuable environmental services. Decreased sedimentation has twofold benefits: first, it increases the life of the reservoir and second, it reduces the cost of powerhouse maintenance. Similarly, the increased water flow directly contributes to increased hydroelectricity production. Therefore, these two environmental services provide direct economic benefits to the NEA, the owner of the Kulekhani hydropower projects. Principally, it shows that the NEA is the main beneficiary of the ES, and therefore should pay for the maintenance of these services.

3.5 Introduction of PES in Kulekhani

The Nepal Electricity Authority has been paying a certain portion of revenue generated from hydroelectricity to the central government since 1992 as required by Nepal Hydroelectricity Act (1992). The central government was also allocating 12% of the revenue to the local government, Makawanpur DDC³, according to the provisions of the Local Self Governance Act (1999). However, the DDC was using this money on its own without any consideration for the watershed area (Upadhyaya 2005, 2006).

As discussed in the preceding section, local communities have been contributing to the generation of valuable ES. Such efforts presented costs to local communities as resource managers. According to Upadhyaya (2005, 2006) and local communities, such costs include displacement during the reservoir construction; conversion of agriculture land to forest; a decrease in available grazing land; forced reduction of livestock; livestock and crop damage by wild animals; and labour contribution for watershed management in the name of participation. Such costs, combined with high level of poverty, contributed to deforestation in the past.

³ For administrative purposes, Nepal is divided into 75 districts. DDCs are the district level local governance body; responsible for the overall development of the district.

The sustainability of local conservation efforts would not have been possible without an appropriate mechanism to compensate local communities for the (opportunity) costs they bear and to support their conservation efforts. However, the integrated watershed management project was terminated in 2003. Neither the government nor the donors were willing to continue financing such projects. As a consequence, the capacity of local institutional mechanisms created for forest and watershed management like CFUGs and farmers groups gradually deteriorated. This created a threat to the ES.

Winrock-Nepal, under the RUPES Program, played an important role to fill this gap. It facilitated a mechanism to transfer a portion of the hydroelectricity revenue being received by Makawanpur DDC to the upstream communities as a compensation and reward. It was conceptualized to provide economic incentives to the upstream communities to foster the conservation for sustainable generation of ES following the concept of PES (Upadhyaya 2005). Since the mechanism was a pioneer in Nepal and implemented in the area where community-based approaches were perceived to be successful for conservation, the PES was seen by various development professionals and community forestry promoters as an alternative source of funding for community forestry (Matta and Kerr 2006, Pokharel et al. 2009). Still, there is no specific policy dealing with PES in Nepal and the current mechanism is rooted in the existing policy and institutional infrastructure which is discussed in the flowing section.

3.6 Policies and Institutional Infrastructure Supporting PES

Amid controversies, development professionals involved in PES promotion in Kulekhani and some scholars assert that the basic policies and minimum institutional infrastructure necessary for PES already exist. It has been argued that provisions for sharing benefits of environment conservation have been initiated since the early 1990s with the provision of sharing revenue of protected areas with local communities (Upadhyaya 2005). He points out that the fourth amendment of the National Parks and Wildlife Conservation Act in 1993 made a provision to provide 35-50 percent of revenue generated by protected areas to local communities through buffer zone support programs. Similarly, the Nepal Electricity Act (1992) requires the Nepal Electricity Authority to pay certain royalties to the central government. Yet, sharing of such revenue at the local level has only been ensured by provisions of the Local Self Governance Act and Local Self Governance Regulations in 1999. The Local Self Governance Act requires that the central government provide 12 percent of its total electricity royalty to the DDC housing hydroelectricity project and 38 percent to all districts of the respective development region. Upadhyaya (Adhikari 2009, Upadhyaya 2005) further argues that the Forest Act (1993) and the Forest Regulations (1995) supporting the community forestry program have created a conducive environment for PES.

A different institutional setup under these policies could be useful for PES in Kulekhani. However, while designing the PES scheme, the Local Governance Program of DDC, followed the provisions of the Local Self Governance Act with only slight modifications. Other institutional alternatives, most importantly, CFUGs and other conservation-based local organizations have been overlooked. Since the CFUGs have made a significant contribution to generation of ES, it is worth discussing how they could provide an alternative institutional set up. CFUGs are well-established grassroots organizations which could serve as a platform for community development and livelihood improvements under PES schemes (Ojha et al. 2009, Pokharel et al. 2006, Pokharel et al. 2009). The community forestry guidelines (CFD 2009) require the CFUGs to spend 25 percent of their total income on forest management and environmental conservation and 35 percent on pro-poor activities. Similarly, there are various other community-based

organizations that have been established in the past for watershed management like farmers groups and savings and credit groups, which could also be incorporated into a PES regime.

However, negotiation of PES in Kulekhani was shaped by various actors and existing policies, particularly the Local Self Governance Act, undermined other institutional arrangements and unilaterally favoured the Local Governance Program. This is not only due to a lack of specific policies dealing with PES, but also to outcomes of politics of negotiation while designing and implementing the PES. This issue is highlighted throughout the analysis of this report in the following two chapters.

3.7 Conclusion

Participatory approaches to environmental management, including community forest and integrated watershed management, have been deemed successful due to their positive impact on improved forest conditions and decreased soil erosion in the mid-hills of Nepal. In the case of Kulekhani, these positive effects have been considered to be responsible for the provision of two valuable ES: reduced sedimentation and improved dry season water flow to the reservoir. However, sustainable generation of these valuable services have been challenged due to the lack of a sustainable source of financing for the conservation and livelihood support of people. On the other hand, the Makawanpur DDC was receiving a percentage of the hydroelectricity revenue generated from Kulekhani projects paid by the Nepal Electricity Authority to the central government. Local communities who were also bearing the cost of conservation were not aware of this fact and were not receiving any incentive. The RUPES Kulekhani program bridged this gap by introducing the concept of PES to provide compensation to upstream communities. The design and implementation of the PES scheme has been mediated by interactions among actors and current policies, particularly the Local Self Governance Act and its administrative structures. This process of mediation of institutions and practice forms the main findings of this report, which are discussed in the following two chapters.

4. Institutional Design and Interplay

4.1 Introduction

This chapter examines institutional dimensions of PES in Kulekhani in light of the design and interplay of institutions as discussed in Chapter Two. The first section focuses on institutional design, which includes three main aspects: actions involved; actors and their role in shaping the institutions; and finally procedural rules crafted through negotiation among the actors. The second section presents institutional interplay which includes an analysis of how the politics of negotiation and the lack of a separate policy for PES has affected the design of PES institutions on one hand and the implementation of the PES program on the other.

4.2 Institutional Design: Actions, Actors and Procedural Rules

As discussed in chapter three, the introduction of PES in Kulekhani was basically driven by the intention of reducing possible threats to reservoir and increasing revenue from Kulekhani hydroelectricity project. However, initiations were not taken by the Nepal Electricity Authority, the principal beneficiary of environmental services realizing immediate ‘credible threats’ to the reservoir as discussed in the PES literatures (Engel et al. 2008, Wunder 2007). Rather, the PES mechanism resulted after lobbying of local communities to receive a stake of the hydroelectricity revenue provided by the central government to Makawanpur DDC. Negotiations took place among different actors, including local communities and DDC Makawanpur, with the support from intermediary organization, the RUPES-Kulekhani program. The logic behind such negotiation was to compensate and reward upstream communities according to the principles of PES. This section discusses different aspects of the design of the PES mechanism.

4.2.1 Steps and action involved

The Process of designing the PES mechanism involved different activities conducted by RUPES-Kulekhani project with active involvement of local communities. The process started with identifying and defining watershed services, providers of those services and the ultimate beneficiaries. Winrock-Nepal has compiled information on changes in forest conditions over 20 years and the trends of sedimentation inflow into the reservoir. These studies showed that the conditions of the forest have improved dramatically which contributed to the reduction of sedimentation (Upadhyaya 2005, 2006). The economic value of the sedimentation reduction was determined using a ‘production function approach’ (Upadhyaya 2005: 18) which shows increases in revenue of hydroelectricity by \$39,933 annually. Even more revenue is expected due to increases in the dry season water flow; however exact valuation was not done for this component. The two ES determined based on such tentative valuation became the basis for negotiation (Resp. 2)⁴.

Similarly, RUPES Kulekhani also conducted a social study to understand socio-economic conditions of the catchment area and thus define the providers of the ES. The study showed that all residents of the watershed area were contributing to forest and watershed management, eventually contributing to generation of the ES. Therefore, all residents of Kulekhani watershed were identified as providers of the ES.

⁴ Respondent 2 was the team leader of the RUPES-Kulekhani program who had involved throughout the PES design process.

Realizing gaps in knowledge and the capacity of the local communities, the RUPES Kulekhani program adopted the strategy of ‘mobilizing upland communities to see themselves as seller of environmental services and enhancing their capacity to negotiate with buyers’ (ICRAF 2009:3). Raising awareness was thus the main strategy for capacity building which included disseminating information through community level newsletters, radio programs and workshops at different levels (interview with resp. 2). In addition, local leaders and representatives from Makawanpur DDC also participated in different training and exposure visits which helped them to understand how PES mechanisms work.

Having developed the capacity of local communities and other actors, the RUPES Program facilitated a process of negotiation among actors to craft procedural rules. One of the respondents summarized the negotiations between the DDC and local communities as follows:

A series of meetings were conducted at the district level to develop the PES mechanism. Though there were different proposals, the negotiation ended up with using the compensation in the form of conservation and development programs under a separate fund called the Environmental Management Special Fund. The rules are documented in by DDC Makawanpur in the form of ‘guidelines’ and ‘procedural rules’ of using hydroelectricity revenue (Resp. 8)⁵.

Detail about the negotiation and its outcomes are discussed in the following section.

4.2.2 Actors and their interaction

Although the RUPES-Kulekhani program played significant role as an intermediary organization, the PES institutions are merely outcomes of the interaction and negotiation among the broader set of actors directly associated with it. In this institutional design process, the interests of powerful actors are reflected in the rules, marginalizing the interests of less powerful ones.

The major actors involved in the process were: local communities represented by Kulekhani Watershed Conservation and Development Forum and local leaders, local government representatives, including DDC and VDCs, political parties, Kulekhani hydropower project management and other district-level line agencies. Despite involvement by this range of actors, the principal actors of the negotiation were DDC Makawanpur and the local communities. This section discusses how negotiations between these two major actors have resulted in specific procedural rules.

The DDC, which also includes 8 VDCs of the watershed area, was the most important and powerful actor in the negotiation process. Firstly, the Local Self Governance Act provided authority to the DDC for collecting taxes and revenues of natural resources. According to such provisions, the DDC receives revenue from the electricity generated from the Kulekhani projects. Moreover, the act also authorizes the DDC to coordinate all development activities in the district. Secondly, since there are no separate policies to deal with the PES process, the Local Self Governance Act and its subsidiary regulations provided the policy framework for the development of the PES mechanism.

However, the local government, including the DDC and VDCs, have been falling short of politically elected local representatives. Local elections have not been held since 2002 due to the effect of more than 10 years of civil war in Nepal. Therefore, the DDC and VDCs have been governed by government officials with involvement of political parties in major decision-making processes to seek political consensus. As a result, the

⁵ Respond 8 is representative from the DDC Makawanpur, who is responsible for PES program.

decisions made by the DDC mainly represent the interests of government officials and local political parties.

On the other hand, the local communities were represented by two principal actors: the Kulekhani Watershed Conservation and Development Forum (KWCDF) and local leaders, including political leaders. The KWCDF was originally formed with support from the RUPES-Kulekhani Program to federate all local community based organizations and representatives as providers of the environmental services. However, during the negotiation, its roles were limited to representing the voices of local communities at the negotiation table. In some cases, the KWCDF also collaborated with RUPES-Kulekhani to implement capacity building programs at the local level. One of the respondents reported:

The idea behind formation of the Kulekhani Watershed Conservation and Development Forum was to organize different local community-based organizations to represent the providers of the environmental services. We facilitated the process of registration in the district administration office. However, the actors, particularly the DDC, rejected that idea and pushed for a different mechanism (Resp. 2).

The negotiation basically took place between the local communities and the Makawanpur DDC. In this process, political parties represented both the DDC and local communities. The roles of other actors—including managers of Kulekhani hydroelectricity projects, district level government organizations like District Forest Office and District Soil Conservation Office, representatives of the private sector and few others—were very negligible. More importantly, contrary to the PES principles, the Nepal Electricity Authority has no direct involvement in the mechanism.

During the negotiation, the actors easily decided on the amount and form of payments. The tentative valuation of two major ES by RUPES-Kulekhani program and socio-economic information of the watershed area helped the actors to come to this conclusion. Considering the possible transaction costs, it was decided to provide compensation in the form of conservation and development projects. Similarly, it was also agreed to provide 20% of the electricity revenue received by the DDC to the upstream communities.

However, an agreement about the mechanisms of implementing such projects was not easily reached. The KWCDF, representing local communities and backed by RUPES-Kulekhani program, presented itself as a provider of the ES. The idea was to provide compensation to the forum which was then expected to coordinate all other community-based organizations including CFUGs for executing the projects. The negotiation table, dominated by government officials especially from the DDC, rejected the proposal. One of the respondents described the negotiation process as follows:

Though various stakeholders participated in the negotiation meetings and workshops organized at the district level, the compensation mechanisms have been finalized according to the interests of the DDC. Referring to the Local Self Governance Act, the proposal to provide funds to local community-based organizations was denied and DDC and VDCs were given a central role in implementation. The government officials wanted to keep exercising their authority for executing the projects (Resp. 1)⁶.

Eventually, the negotiation ended up with the establishment of a separate fund to manage PES called the Environmental Management Special Fund. Due to the lack of a separate policy guiding such mechanisms and the influence of government officials in the

⁶ The respondent 1 is secretary of the KWCDF and was also local facilitator for RUPES-Kulekhani program.

negotiation process, a decision was made to follow the Local Self Governance Act and its subsidiary regulations to implement the fund. These policies require following specific planning and implementation procedures practiced by the DDC to conduct other local development projects. They require mandatory involvement of the DDC and its subsidiary bodies in planning and implementation of the projects. As argued by most of the respondents, the officials had some hidden interests. One of the respondents indicated that:

The DDC does not want to devolve authority below VDCs, its own subsidiary bodies. Because of rent seeking behaviour, government officials strongly resisted the proposals to include the community-based organizations for the implementation of projects under PES. They argue that involving such local organizations will be against the spirit of the Local Self Governance Act (Resp. 3)⁷.

These politics of negotiation have heavily influenced the procedural rules and thereby marginalized the existing community-based organizations like CFUGs. This has undermined the role and ability of such organizations in promoting environmental management and rural development. The issue of exclusion and its implication for the effectiveness of the mechanisms are discussed in Chapter Five.

4.2.3 Procedural rules

The procedural rules crafted through the negotiation process were passed by the DDC council⁸ in 2006 (see box 1). These documents provide formal rules to guide behaviour of the actors to implement the PES mechanism. These rules are discussed in this section.

As discussed above, all residents of the watershed area were considered providers of the ES. However, there is confusion regarding the beneficiaries of the ES. The DDC Makawanpur is understood as the main beneficiary in the current mechanism. However, as discussed already, it is the Nepal Electricity Authority that receives direct benefits from the ES. This confusion has created complexities in the mechanism which have also affected the monitoring and compliance of the rules. This section discusses major procedural rules crafted under the PES mechanism which include the mechanism of payments, conditionality and monitoring mechanisms.

Payment mechanism

These two documents containing guidelines and rules for using hydroelectricity revenue suggest that 20% of the total revenue being received by Makawanpur DDC should go to Kulekhani watershed for conservation and development programs. As shown in figure 2, such money is managed under a separate fund Environmental Management Special Fund which has been created specially for this purpose. The fund is governed by a subcommittee under the DDC which comprises representatives from all actors involved in the negotiation process. This sub-committee, which has very little representation from the local communities, is responsible for making final decisions for selection of the projects, coordinating the other actors for implementation, and the monitoring and evaluation of the projects.

⁷ Respondent 3 is one of the local leaders who have been involved in the design of PES mechanisms as local political representative. He had also served for more than ten years as a chairperson of the Chuliparan CFUG.

⁸ DDC council is an apex body of DDC.

Box 1: Guidelines and procedural rules for distribution and use of hydroelectricity revenue

Guidelines for Distribution and Use of Hydroelectricity Revenue

The guidelines prepared through the negotiation among actors and endorsed in DDC council aiming at distribution and use of the hydroelectricity royalty being received by DDC include the following guidelines.

- *Local Self Governance Act will be the principal guiding policy. The planning and implementation of the activities will be according to the provisions made in these policies. The financial matters will be handled according to the Local Government Fiscal Administration Regulations (2001).*
- *50% of the electricity revenue will be allocated to the hydropower affected communities. Out of this, 20% will go to upstream communities, 15% to downstream and 15% to VDCs hosting hydropower infrastructures including powerhouse and reservoir.*
- *Such revenue will be used for environmental and development activities under five major headings: social mobilization and poverty reduction; environment conservation; rural electrification; local infrastructure development and human resources and institutional development.*
- *The money will not be used for DDC's administrative purpose.*
- *The revenue allocated for the upstream communities will be managed under the Environmental Management Special Fund created for this purpose which will be coordinated by a sub-committee under the DDC comprising major actors.*
- *Local level organizations like CFUGs, village level units of other line agencies, and other community based organizations can be involved in planning and monitoring of the projects.*

Source: Extract from DDC 2006a

Operational Procedure for Mobilizing Environment Management Special Fund

The operational procedure to use the Environment Management Special Fund agreed among the actors and endorsed by DDC councils includes the following rules.

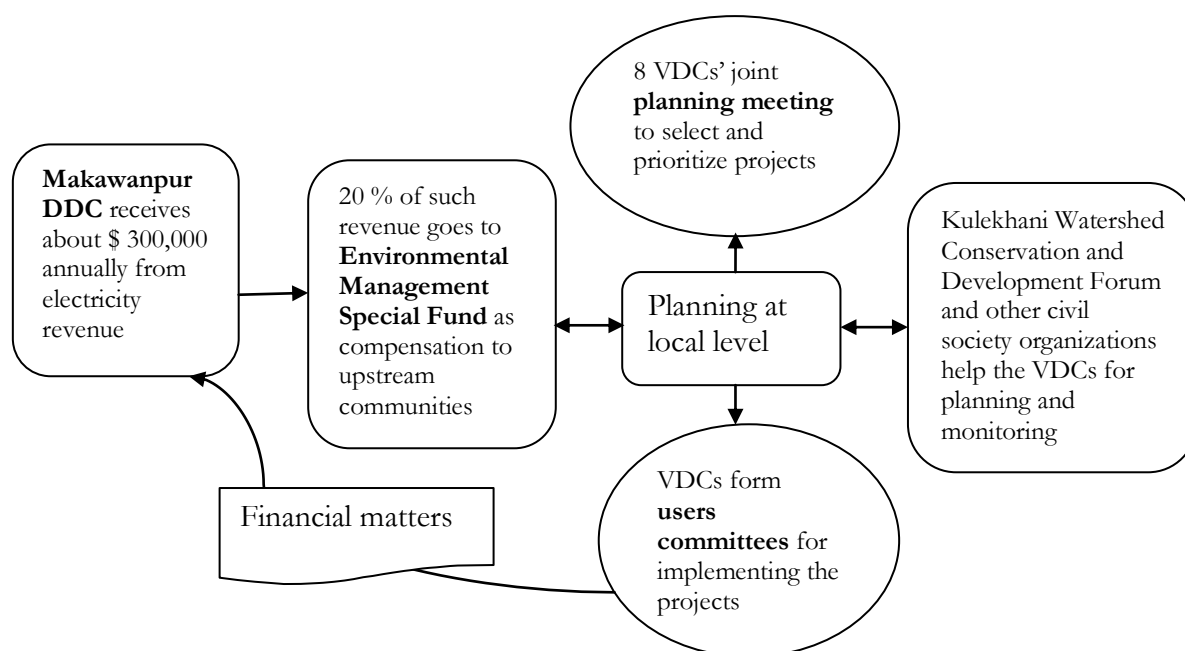
- *The fund will be used for: a) improving livelihoods of the local communities and b) improving forest conditions and reducing soil erosion.*
- *Various conservation and development activities will be implemented under the five headings identified by hydroelectricity revenue use guidelines.*
- *The DDC planning and fiscal administrative procedure will be followed when implementing the projects under this fund.*
- *Local level organizations like CFUGs and other, community based can also propose projects under this fund.*

Source: Extract from DDC 2006b

As shown in figure 1, the 8 VDCs of Kulekhani watershed hold an annual meeting of VDC secretaries⁹ and representatives of local political parties to select and prioritize projects. Local level civil society organizations like the KWCDF are also invited in such meetings as facilitators. The projects selected and prioritized by such meeting are submitted to steering committee of the Environmental Management Special Fund for final approval. Once the programs are agreed upon, the VDCs formulate users' committees for the implementation of the plans. The financial administration of these projects is done through the DDC administration as in the case of other development projects.

⁹ VDC secretaries are government staff responsible for VDC administration.

Figure 1: Mechanisms for planning and implementation of projects under PES



Source: Developed by author for this report based on field information

This suggests that the procedure for planning and implementation of such projects are heavily drawn from the Local Self Governance Act and its subsidiary regulations. Though it has made a provision to involve other actors including local communities, the central role lies with the DDC and its subsidiary bodies. This has direct implications for what projects gets priority and how they are implemented. The implications of such interplay are discussed in next section under the interplay heading.

Conditionality and monitoring mechanism

Seemingly, the mechanism has two major conditions to ensure generation of the ES. First, it is expected to support the livelihoods of the local communities aimed at reducing the dependency on forests. Second, local communities are expected to improve, or at least maintain, the current level of forest conditions and soil erosion which are directly linked to the ES. However, these conditions are not clearly defined as conceptualized in the PES literature (Huang et al. 2009, Wunder 2005). Therefore, there are a number of issues about compliance with such conditions that are discussed in the next section.

Regarding the monitoring mechanisms, the procedural rules (DDC 2006b) say that ‘the sub-committee responsible for steering the Environmental Management Special Fund will develop procedure for monitoring and evaluation of the projects in consultation with local community representatives’. However, a detail mechanism and criteria for monitoring are yet to be developed. In principle, the Nepal Electricity Authority should be concerned with the monitoring to ensure whether the ES are being generated. However, since the Nepal Electricity Authority has no direct connection to PES mechanism and simply pays a fixed fee to the government, it has no incentive for this. This has serious implications for PES institutions and its effective implementation which are discussed in Chapter Five.

The analysis in this section shows that PES institutions in Kulekhani are the outcomes of both interaction among actors and the politics behind it, and the influence of existing policies and institutional mechanisms. While this section has focused on the process and politics of institutional formation, the following section analyses how current policies and institutional mechanisms have shaped the PES institutions.

4.3 Institutional Interplay

Referring back to Chapter Two, the environmental institutions are not implemented in a vacuum; rather they interact with existing resource management and other related institutions (Arifin 2005, Corbera et al. 2007, Corbera et al. 2009). Such interactions create synergetic outcomes if complimented with local institutions, whereas the conflicting relations deteriorate the overall performance of PES. As discussed in chapter three, there are three important existing institutional arrangements that have direct interactions with the PES mechanism. This section analyses how PES is interacting with three institutions: the Local Governance Program, community forest management and integrated watershed management programs.

4.3.1 Influence of the Local Governance Program

Since the Local Self Governance Act and its subsidiary regulations are the main policy framework guiding PES in Kulekhani, the Local Governance Program of DDC has a huge influence on PES institutions. As discussed in the preceding section, the procedural rules of PES institutions are heavily drawn from these policies. The rules are crafted in such a way that the programs under PES are planned and implemented through the DDC and its subsidiary bodies. According to Young's concept of institutional interplay (Corbera et al. 2009, Young 2002b), this is unilateral asymmetric interplay. It means that the PES institutions are affected by the Local Governance Program of DDC. It has undermined the role of local resource management institutions, including about 75 CFUGs and farmers groups for maintaining the ES and fostering community development. The following two sections illustrate how these local institutions have been marginalized, though a detailed discussion about the implication of such interplay on the overall performance of the PES is given in Chapter Five.

4.3.2 Lack of interaction with Community Forest management

Conceptually, PES provides economic incentives to the resource managers to adopt conservation friendly behaviours to ensure the generation of the ES (Engel et al. 2008). However, these conceptual underpinnings have not yet been realized in Kulekhani because of poor coordination of the PES institutions with community forest management institutions. Despite the fact that more than 95% of the forests of Kulekhani watershed have been handed over to over 75 CFUGs and they have made a huge contribution in generating the ES (Adhikari 2009, Upadhyaya 2005), the CFUGs have been excluded from the mechanism. The chairperson of one of the CFUGs during focus group discussion reported that:

We have been making an painstaking efforts to improve the conditions of the forest. We have also sacrificed a lot by giving up grazing and reducing our number of cattle. We work hard to protect the forest by regular patrolling and fighting against illicit use of forest products. If it was not the case, the condition of the forest would be much worse and there would be severe problems for the reservoir too.

Most of the actors, including the DDC, recognize the important role played by CFUGs. Yet, they have not been rewarded for their contribution and compensated for their sacrifices for forest management.

This exclusion has not only raised the question of motivation of CFUGs for forest management but also limited the effectiveness of community development activities carried out under the PES. As discussed in chapter three, the CFUGs are also contributing to community development activities. The CFUG leaders claim that they could implement

the conservation and development program better than what has been done to date. One of the CFUG leaders argues: ‘the plantation program carried out last year under PES scheme failed because the user committee formed for that purpose was temporary and thus was not responsible for taking care of it. It would have been far better if that money had been provided to the CFUGs’ (Resp. 3). The exclusion of the resource managers has huge implication on the overall performance of PES institutions, which is discussed in Chapter Five.

4.3.3 Insufficient coordination with watershed management programs

Like community forestry, PES have also poor coordination with integrated watershed management programs. As discussed in chapter three, the adoption of conservation friendly farming systems, promoted by integrated watershed management programs has made a significant contribution to the reduction of sedimentation in the reservoir. However, the PES scheme has not involved local organizations carrying out such activities. The procedural rules have a provision to spend part of their PES funds for environmental activities, including watershed management. However, evidence shows that only 7% of the PES money has gone for watershed management activities so far. Unfortunately, such projects have neither supported the efforts of organizations nor had coordination with the District Soil Conservation Office, which is responsible for the overall watershed management program in the district.

The District Soil Conservation Office made a significant contribution for watershed management in the Kulekhani watershed in the past. It even had a district-level office in the watershed area until 2003. However, its roles have been squeezed these days due to lack of sufficient financial and human resources. As argued by one representative of this office, they could provide technical support to implement the watershed management activities being funded under the PES schemes. It could also help to minimize the negative consequences of construction projects under the PES schemes. He expresses his frustration as follows:

The current PES mechanisms are not supporting the watershed conservation activities properly. Past efforts for integrated watershed management have not been recognized and the farmers’ groups are not included in the mechanisms. Rather, the road construction has accelerated soil erosion. Attention has not been paid to minimize the negative environmental impacts of such projects. We have some idea about environmental friendly technologies for road construction. The soil exposed after road construction can also be stabilized to reduce the erosion (Resp. 11).

Nevertheless, very little attention has been paid to such coordination. This suggests that the current PES schemes ignored the potential for synergetic outcomes in watershed management.

This analysis reveals that the influence of the Local Governance Program of the DDC and exclusion of the local institutions responsible for community forest and watershed management is not only because the DDC had a stronger position during the PES design, but is also due to the lack of a separate policy for PES. The deficiencies in PES institutions due to interplay among actors and institutions, which gave the DDC the central role in PES implementation, have affected the overall performance of PES.

4.4 Conclusion

As de Groot and Hermans (2009) argued based on a study of water based environmental services in the Netherlands, negotiation among actors plays a more important role than the scientific study of hydrological functions to determine ES and economic valuations of such services. Analysis of the institutional design in Kulekhani has also revealed similar findings. Similar to the argument of various institutional scholars (Corbera et al. 2009, Ostrom 2005, Tiwari and Amezaga 2009), interaction and negotiation among the actors shaped the PES institutions in Kulekhani too. During such negotiations, the interests of the most powerful actors, government officials and political parties representing the DDC Makawanpur, have prevailed in the procedural rules. In this politics of negotiation, the interest of less powerful actors, most importantly the local communities have been marginalized. Such power asymmetry during the negotiation process was reinforced by the lack of separate policies guiding the PES and thus dependence on the Local Self Governance Act and its subsidiary policies. This has resulted in undue influence of the Local Governance Program of the DDC on the PES rules, which has marginalized the local resource management institutions. The analysis also reveals that the PES mechanism has not provided economic incentives to the CFUGs and other local organizations looking after watershed management activities. Eventually such design deficiencies and institutional interplay have affected overall performance of the PES. The following chapter consolidates the analysis of this chapter by relating these issues to the overall effectiveness of PES in meeting environmental and rural development outcomes.

5. Institutional Performance

5.1 Introduction

Assessing the institutional performance means understanding to what extent PES institutions are achieving the stated goals (Mitchell 2008). In this case, effectiveness of PES institutions is examined against two major goals: supporting community development and generating ES. Going back to Chapter Two, the performance of institutions depends not only on how the institutions are designed and how they interact with existing institutions but also on to what extent they are put into practice. The analysis in the preceding chapters has shown that PES institutions in Kulekhani have fundamental deficiencies in terms of providing incentives to the resource managers and direct involvement of the main beneficiary of the ES. Taking these findings as a point of departure, this chapter analyses how PES institutions have been put into practice and how effective they are in terms of meeting the stated goals. In doing so, it first presents the current state of PES in Kulekhani and examines preliminary outcomes. Then it analyses the implications of the institutional design, interplay and compliance of the rules on the overall institutional performance.

5.2 PES in Practice

Though the process of setting up PES mechanisms in Kulekhani began in 2003 with the initiation of the RUPES Kulekhani project, it took almost three years to come into practice. Upstream communities received \$ 2,712.00¹⁰ for the first time in 2006. The amount was provided to the KWCDF to carry out income-generation and conservation awareness-building programs. The negotiation of the PES institutions in the same year finalized the mechanisms as discussed in the preceding chapter. From the following year (fiscal year 2006/07), the DDC began providing money to the Environmental Management Special Fund to implement conservation and development projects.

Under the Special Fund, the local communities received \$ 52,130 and \$63,963 in fiscal year 2007/08 and 2008/09 respectively. In total, \$ 118, 802 (including initial budget provided to the KWCDF) has been provided to the local communities under the PES scheme. The planning for fiscal year 2009/10 has already been submitted to the DDC and the fund is expected to be released very soon. The breakdown of expenditures (see figure 2) suggests that they have gone to rural infrastructure projects like electrification, construction and maintenance of roads and structures to protect the settlements. Very little money has been spent on environmental activities. Figure 2 shows, that only 7% of the total expense has gone to watershed management activities and not a single rupee has been allocated for forest

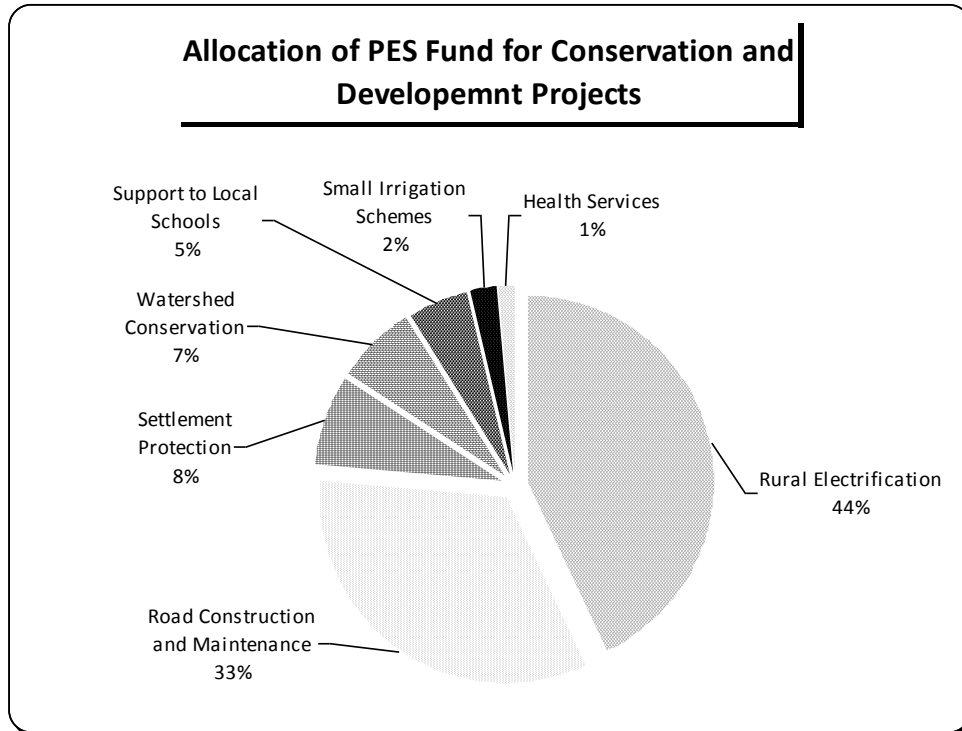
5.3 Preliminary Outcomes

As implementation of the PES is still in its initial stages, it is too early to assess outcomes in terms of maintaining environmental conditions and improving the livelihoods of the people. Therefore, this study is not intended to draw outcomes in depth. However, a general assessment has been made to understand to what extent the institutions are heading towards meeting these outcomes. As discussed in chapter two, behaviour of the resource managers and the level of compliance with the rules are used to examine the

¹⁰ Here 1 \$ is equivalent to 78.15 Nepalese Rupees.

outcomes. In doing so, use of the PES funds, incentives to resource managers and negative consequences are the main indicators. This section presents these preliminary outcomes of the PES scheme in Kulekhani. More rigorous analysis would be required to evaluate such outcomes after several years.

Figure 2: Use of PES funds for conservation and development projects



Source: Records from DDC Makawanpur

5.3.1 Contribution to rural development: raising hopes

As discussed in preceding section, local communities are receiving about \$63,963.00 annually, which is an additional budget for community development. As shown in Figure 2, this money has been used for different community development activities. Local communities are quite happy with this initiative. One of the local leaders reported that:

We are receiving additional money for our development through this compensation scheme. Though we had a hard time before, now we are more privileged than other VDCs of the district. We have electricity facilities and road access to almost all villages which would have been impossible without the PES. We are grateful to the RUPES-Kulekhani and our local leaders who have contributed for this (Resp.4).

Most of the respondents from the watershed area share this opinion. Nevertheless, they are still not satisfied with the way the PES mechanism has been developed. They are looking forward to improving the current mechanisms to ensure a better role for local communities. This indicates that the PES mechanism has at least some signs of positive impact on community development and arguably in improving the livelihoods of the local people. Yet, there is no specific program targeting the poor and marginalized communities. Thus, poor and marginalized people may not have equal access to development benefits delivered by the current mechanisms. There is a need for further research to understand to what extent the poor and marginalized people have benefited from the PES.

5.3.2 Environmental performance: sustainability of the environmental services in question

The analysis reveals that the current mechanism is not sufficient to ensure the generation of the ES—reduction of sedimentation and increase dry season water flow to the Indrasarobar. First, very little investment has been made in environment-related projects. One respondent said that ‘road and electrification are the top priority projects for local communities. However, the environmental projects hardly come to their mind’ (Resp. 9)¹¹. The expenditure pattern as shown in figure 2 also proves such preferences of local communities.

The investments in infrastructure projects, particularly rural road construction, often have negative environmental consequences. As shown in figure 2, about 33 percent of total money received under PES mechanisms has been invested in the construction and maintenance of the road. Moreover, there is a general trend in recent years to put a huge portion of the local development budget (budget of VDCs and DDCs) into this sector. One of the respondents reported that:

Regardless of the sources of the local development budget, priority goes for road construction. For cost effectiveness and time reasons, using a bulldozer has been the preferred method of construction. They could use other environmentally friendly technologies or do soil stabilization works after construction, but, proper attention is lacking. It is obvious that such activities accelerate soil erosion and increase sedimentation to the reservoir... (Resp. 11).

The pictures taken during field visit also depict such situations (see picture below) which have created serious threat to the ES.



Road constructed using bulldozer in the watershed area (Picture: Author)

Current PES mechanisms do not provide any incentives to existing local resource management organizations including CFUGs and other groups. This has affected the motivation of these institutions towards better resource management. Even more so, as discussed in chapter three, these institutions are falling short in their financial and technical capacities to maintain the spirit of conservation.

This evidence reveals that the current institutional mechanism in Kulekhani falls short of meeting environmental outcomes despite some positive outcomes for rural development. The analysis reveals three striking results: a) negative consequences of development projects particularly road construction using bulldozer; b) exclusion of the main resource management institutions from the PES mechanism and c) undermining of

¹¹ Respondent 9 is Local Development Officer, in charge of the DDC.

the role of the principal beneficiary of the ES. The following section substantiates such results shaped by the institutional factors.

5.4 Institutional Performance in Question: Implications of Design, Interplay and Compliance

As discussed in the preceding section, PES institutions in Kulekhani are not performing well in terms of generating the desired ES. This section consolidates the findings of this study by drawing on the analysis in the previous sections. Thus the analysis in this section substantiates how politics of negotiation of institutions, institutional interplay and poor compliance of the rules have shaped the poor performance of PES institutions in Kulekhani. In doing so, first it analyses how design deficiencies and institutional interplay affect the institutional outcomes. Then it examines how such outcomes are further deteriorated by poor compliance of rules and poor monitoring mechanisms.

5.4.1 Design deficiencies and the effect of interplay

Politics surrounding the design of the PES mechanism and its interplay with other existing institutions have huge implications for three striking but rather disappointing outcomes. First and foremost the negative consequences of road construction using bulldozers are alarming. As discussed in previous section, 33% of total expenditure under the PES scheme has been spent on the road. In addition, VDCs have their own budget and they also receive development budget from the DDC. As discussed in the preceding section, road construction is one of the priority programs of local communities. Due to cost and time considerations, the bulldozer is the preferred means of road construction in recent years. This is not only contradictory to the PES principle but also against the objective of PES mechanisms in Kulekhani. The basic objectives of the PES in Kulekhani are to improve livelihoods of local communities as well as to conserve the watershed. However, this study found quite the opposite results; use of PES money for road construction has negative consequences in terms of soil erosion.

Analysis shows that such negative consequences are outcomes of different institutional factors including design and interplay. Going back to the institutional design, the negotiation among the actors opted for using PES money for conservation and development programs. For this, they have agreed on five broader themes as discussed in chapter four (see box 1). Rural infrastructure development is one of them. However, the mechanism lacks clear guidelines and comprehensive long-term planning which would guide the implementation of projects by maintaining a balance among those themes. Such weaknesses in the institutional design and weak monitoring mechanisms have allowed the local leaders to manipulate the rules and allocate more funds for community development activities, including road construction, as shown in figure 2. Similarly, mechanisms have not been developed to safeguard against such negative consequences.

Second, referring back to the design principles in Chapter Two (Dolsak and Ostrom 2003), PES in Kulekhani has fundamental flaws in terms of involving principal actors. The CFUGs and other local community based organizations were excluded from the design process. One of the respondents pointed out that:

The current PES has sidelined the local organizations from decision making as well as from benefit sharing. Now, these organizations, especially the CFUGs, which have made a huge contribution in forest management, are running short of financial resources. More than 50% of CFUGs in the watershed are not able to renew their plans. The District Forest Office cannot provide support because they lack their own financial resources. Therefore, users are not motivated; they are not interested in leading groups and

conducting forest management activities. Therefore, I am afraid that the condition of the forest will deteriorate (Resp. 3).

All respondents agree on these facts. However, they differ regarding the reasons behind such exclusion. The DDC argues that, the Local Self Governance Act and its subsidiary policies did not allow them to include existing local resource management institutions. Community leaders and CFUG representatives contest such arguments saying that it was due to the hidden interests of the government officials to keep control of the development budget for their own personal benefit.

The analysis in Chapter Four has revealed that such exclusion has to do with both the politics of negotiation of PES institutions and the interplay of PES with existing local institutions. The Makawanpur DDC represented by government officials has resisted the devolution of authority below their own subsidiary body. Therefore, they denied the proposal of providing PES money to local organizations like CFUGs. Instead, they made a weak provision that these organizations can be involved in planning and implementation of the projects. However, this provision has never been complied with. Such power asymmetry in the negotiation process was reinforced by the lack of separate policy for PES mechanisms. As a consequence, the Local Self Governance Act and its subsidiary regulations became the guiding policy for PES.

Such exclusion has serious implications in terms of providing incentives to the resource managers, which is the most important aspect of PES mechanisms. Thus the current PES mechanism is not likely to motivate the resource managers to change their behaviour. This has serious implications for the performance of the PES institution.

Finally, the current mechanism has undermined the role of the Nepal Electricity Authority, the direct beneficiary of the ES. This has serious implication for the incentive to monitor compliance. Neither the Makawanpur DDC nor the Nepal Electricity Authority is motivated for effective monitoring of PES projects. On the one hand, as the DDC is not direct ES beneficiary, it has no incentive for monitoring the ES. On the other hand, since the Nepal Electricity Authority pays a lump sum of money, as required by current policy, and it has not been given proper role for monitoring, it also has no incentive. One respondent reported:

I think it should be the Nepal Electricity Authority's interest and responsibility to do monitoring so as to ensure that the PES activities are contributing at least to maintain the current level of environmental services. But, I doubt the role of the authority because being a government body, it is not proactive and the officials do not have willingness to do so. (Resp.2)

As a consequence, the monitoring mechanisms and level of compliances have been seriously affected.

5.4.2 Weak compliance and monitoring mechanisms

Besides design deficiencies and institutional interplay, the PES mechanism in Kulekhani has also fallen short in terms of putting its rules into practice. First, one of the main reasons behind negative environmental consequences of road construction in the watershed area is poor compliance with the rules. Local communities see road construction as the core of rural development and want cost-effective way carrying it out. Though the use of bulldozers for road construction is not allowed, there is no compliance mechanism to stop such destructive works.

Second, the current PES rules have mentioned that local-level, community-based organizations can be involved in planning and implementation of projects. However, this has not been considered at all. One of the respondents pointed out that:

Though the procedural rules have made provisions to involve local organizations including CFUGs in the planning and implementation of the projects under PES, it has not been followed in practice. The political parties and local leaders, who are more powerful actors at local level decision making, have a tendency to distribute the money based on political negotiation. On the other hand, the local organizations are also not capable of putting pressure to be involved in the process (Resp. 8).

Other respondent agreeing with this statement added that ‘VDCs form users’ committees for implementation of the projects instead of recognizing existing ones like CFUGs’ (Resp. 8). This suggests that the power asymmetry has also played a role in implementation of the projects.

These weaknesses in compliance of the rules are also due to weak monitoring mechanisms. The role of the monitoring has been given to the sub-committee of the DDC which looks after the Environmental Management Special Fund (DDC, 2006b). However, it has not put enough efforts in this respect. There is no single evidence of monitoring of the PES projects conducted during the past three years. Such poor monitoring and compliance with the rules have further impacted the overall performance of the PES mechanism in Kulekhani.

5.5 Conclusion

The above analysis has revealed that the PES mechanism in Kulekhani has raised the hopes of upstream communities by offering additional budget for community development, which is expected to contribute to the livelihoods of the people. However, effectiveness of the mechanisms for meeting environmental outcomes has been seriously questioned. An analysis of institutional dimensions has shown three striking results: negative consequences of road construction in the watershed area; exclusion of resource managers from PES mechanism and the undermining of the role of direct beneficiary of the ES. Such disappointing outcomes are due to the combined effect of institutional factors: the politics behind negotiation of the institutions; and the institutional interplay and poor compliance with the rules. First, the PES design falls short of providing enforceable and pragmatic rules. Weak definition of the project themes under PES and lack of a comprehensive plan for execution has allowed actors to manipulate the rules and hence allocate exceptionally big portions of the fund to rural infrastructure, thereby undermining the environmental aspects. Second, the PES has failed to include the resource managers as key institutional partners, including the CFUGs and other local organizations. This exclusion has affected their motivation for resource management. This has happened not only because of the influence of the DDC in PES rule-making, but also because of the use of the Local Self Governance Act as a guiding policy. Finally, the role of the Nepal Electricity Authority, the direct beneficiary of the ES, has not been properly recognized. This has affected the compliance with the rules and the monitoring of PES projects. Such findings not only raised questions about the effectiveness of the PES mechanisms to ensure sustainable generation of the ES in Kulekhani, but have also challenged the argument of some scholars and development professionals that PES can cooperate with local institutions and contribute to both environmental conservation and poverty reduction.

6. Conclusion

My argument in this paper was that, although the PES in Kulekhani has provided a mechanism for transferring hydroelectricity revenue to the local communities to support rural development, it has not transformed existing resource management structures and institutions to demonstrate the effectiveness of enhancing environmental outcomes. The work of Corbera et al. (2009) and Corbera and Brown (2008) provides a framework for analyzing institutional dynamics of PES, which allowed me to understand how PES institutions are: (a) shaped by interaction and interplay among actors through the process of negotiation; (b) interacting with other related institutions; and (c) performing in practice. The empirical findings of this analysis are combined with wider debates surrounding PES to substantiate my argument. In doing so, this concluding chapter first outlines the main empirical findings of the study and then links them with the contemporary PES debate. At the end, it draws some policy and conceptual implications and explores area for further research.

The PES in Kulekhani was designed to enhance or at least maintain two main environmental services: reduction in sedimentation so as to prolong the life of Kulekhani reservoir and increased dry season water flow. The design process supported by RUPES Kulekhani, involved negotiation among actors, most importantly the local communities and the DDC Makawanpur. From this study, I found three striking but rather disappointing results: negative environmental consequences of PES projects; exclusion of resource managers from the PES mechanism and undermining the role of direct beneficiary of the ES. First, not only a big portion of the PES fund but also other local development funds have gone for road construction, which has often been associated with the use of bulldozers. Arguably this contributes to soil erosion and hence increases sedimentation in the reservoir. Second, the PES mechanism has excluded the local resource management institutions like CFUGs and others that have made a huge contribution to the generation of the ES. Hence, the mechanism has failed to provide direct incentives to the resource managers. Finally, the mechanism has also undermined the role of the Nepal Electricity Authority, the direct beneficiary of the ES. This has affected incentive to the monitoring and hence the compliance with the rules. These findings support my main argument that the PES mechanism in Kulekhani falls short of generating the desired ES.

Analysis of the institutional dynamics has revealed that the poor performance of PES institutions in Kulekhani is the outcome of three major institutional factors: design deficiency, institutional interplay and ineffective compliance with the rules. First, the PES institutions have been shaped by interactions and interplay among major actors where power played a significant role. The interests of the DDC have prevailed in PES rules, marginalizing the interests of others. Therefore, the mechanism has not only excluded the important actors in the mechanism but also overlooked critical environmental aspects. Second, such design deficiencies in the PES institutions are also a result of the influence of the Local Self Governance Act. Due to lack of separate policies guiding PES mechanisms, the Local Self Governance Act and its subsidiary regulations became the guiding policies. This has reinforced the influence of the DDC in the implementation of the projects. Finally, weak compliance with the rules has affected the performance of the institutions and resulted in negative environmental consequences. Hence, the design deficiency, institutional interplay and poor compliance with the rules have affected the performance of the PES in Kulekhani.

Such empirical findings suggest that the PES mechanisms designed and implemented in Kulekhani, although given the typology of 'PES', cannot be compared against five

criteria of a 'true PES' mechanism given by Wunder (2005:3). Since the ecosystem management was not a primary goal, it has not followed the basic premises of the PES as advocated by its proponents (Engel et al. 2008, Pagiola et al. 2002, Wunder 2007). The mechanism has tried to define the ES, but faced limitations in terms of clearly identifying buyers and sellers. Similarly, since the mechanism has been devised through negotiation of multiple actors, the criterion of voluntary participation is also not applicable. This supports the prevailing argument of many scholars that there are diversified schemes of PES and it is very hard to find ones that fulfil all of these five institutional requirements (Shallow et al. 2007, Wunder 200 et al. 2008). However, since this paper took the institutional approach of analysis, it is worth examining the PES from an institutional standpoint. This analysis has revealed that the PES mechanism in Kulekhani is plagued by design deficiencies and the effects of interplay. As a result, it could not provide an incentive to the resource managers; and thus was not likely to change their behaviour toward the environment (Dolsak and Ostrom 2003, Mitchell 2008, Young 2008). Similarly, instead of bringing new policies to support the PES, it relied on an existing policy and bureaucracy which has hampered the performance of the mechanism itself.

Based on such arguments, one lesson for policy makers is that improvement in institutional dimensions can enhance the overall effectiveness of a PES regime. The institutional design can be reviewed considering institutional requirements for PES as discussed by Wunder (2005) and design principles as discussed in Dolsak et al. (2003) (see chapter two). For this, attention needs to be paid to include the most important actors in the design process and institutional arrangements, crafting pragmatic rules and developing systems for effective enforcement and monitoring. For this, as found in this study, a separate policy for PES might overcome the influence of the Local Self Governance Act and the dominance of the DDC and its officials. As argued by institutional scholars, careful design and minimization of influence of institutional interplay can enhance the effectiveness of the institutional mechanisms to meet the stated goals. If so, the PES would be an alternative source of financing the community based forest management as argued by some of scholars (Matta and Kerr 2006) and expected by many development professionals (Pokharel et al. 2009).

However, returning to the debate surrounding PES, there are discrepancies on primacy of the PES goals: efficiency vis-à-vis improving livelihoods. Pro-market PES advocates, referring to the efficient environmental outcomes advocate for strict market principles (Wunder 2007, Wunder 2008) putting aside the poverty reduction objective. Opponents of such a strict market-based approach assert that 'commodification of nature' and marketing them under neoliberal logic (McAfee and Shapiro forthcoming, McCarthy 2004, Robertson 2004) cannot address equity outcomes (Corbera et al. 2007, Proctor et al. 2008). Some authors have equated the PES projects as a process of hybrid-neoliberalism and assert that they clash with other local resource management and poverty reduction programs (see McAfee and Shapiro, forthcoming). Moreover, various empirical studies have also pointed to trade-offs between equity and efficiency goals of the PES projects (Corbera et al. 2007, Kosoy et al. 2007, Proctor et al. 2008).

Amid such debate and discrepancies, it would be naive to draw straightforward conclusions that improvements in the current institutional design can enhance both poverty reduction and environmental conservation goals. It has been revealed from this study that there is no equitable participation of actors in institutional design process and consequently in benefit sharing. Yet, as it is too early to examine the equity outcomes of the project in Kulekhani, in-depth assessment of PES against equity outcomes will be needed.

On the other hand, the PES has been seen as an alternative source of financing for conservation (Wunder et al. 2008), especially the community-based forest management (Matta and Kerr 2006, Pokharel et al. 2009). The burgeoning literature in this field suggests that there are diversified forms of PES schemes being implemented in different parts of the world. In recent years, there are tendencies to combine such schemes with existing resource management instruments, particularly community-based initiatives. Yet, there is no firm theory to explain how PES can collaborate with other approaches for fostering environmental conservation along with ensuring equity outcomes. The community based approaches are based on the logic that social fabric and collective action motivate community for conservation (Kosoy et al 2008). Whereas the market based approaches use the direct economic incentives to pursue the resource manager to adopt conservation friendly behaviour. Therefore it would be worth understanding whether such different incentive systems can cooperate to enhance both conservation and livelihood improvement outcomes.

Finally, it is hoped that this paper will help policy makers and development professionals to reflect and ultimately make more informed decisions when formulating policies and programs for PES. The institutional analysis framework used in this study proved useful for understanding the effectiveness of PES institutions which will not only help the policy-makers and development professionals but also researchers in the field. Moreover, this study has opened up new debates in the PES discourse. It has provoked the need for understanding incentive systems of different policy instruments and assessing their interaction for synergetic outcomes.

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