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**The Rule of The Jungle in
Pakistan: A Case Study on
Corruption and Forest
Management in Swat**

Lorenzo Pellegrini

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Lorenzo Pellegrini, *Institute of Social Studies (ISS)*

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Fondazione Eni Enrico Mattei
Corso Magenta, 63, 20123 Milano (I), web site: www.feem.it, e-mail: working.papers@feem.it

The Rule of The Jungle in Pakistan: A Case Study on Corruption and Forest Management in Swat

Summary

Corruption in the forest sector of Swat, Pakistan is impairing the sustainable management of forest. We analyze corruption in a case study setting against the backdrop of the reform options that are most often cited as possible solutions. As we highlight in this study, the 'crime and punishment' approach is not feasibly implemented if the overall institutional environment is weak. Since countrywide overhaul of corruption through sweeping reform programs, the other reform approach, is a difficult and lengthy task, there is a need for an alternative kind of reform. In the case of a corruption-ridden centralised forest management regime, institutional reform should move away from enforcement of existing institutions and promote communal management of natural resources by locals.

Keywords: Corruption, Forest Management, Environmental Policy, Institutional Reform

JEL Classification: D73, Q24, Q57

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Address for correspondence:

Lorenzo Pellegrini
Institute of Social Studies (ISS)
Kortenaerkade 12
2518 AX The Hague
The Netherlands
Phone: +31 704260776
Fax: +31 704260507
E-mail: pellegrini@iss.nl

THE RULE OF THE JUNGLE IN PAKISTAN: A CASE STUDY ON CORRUPTION AND FOREST MANAGEMENT IN SWAT

ABSTRACT

Corruption in the forest sector of Swat, Pakistan is impairing the sustainable management of forest. We analyze corruption in a case study setting against the backdrop of the reform options that are most often cited as possible solutions. As we highlight in this study, the ‘crime and punishment’ approach is not feasibly implemented if the overall institutional environment is weak. Since countrywide overhaul of corruption through sweeping reform programs, the other reform approach, is a difficult and lengthy task, there is a need for an alternative kind of reform. In the case of a corruption-ridden centralised forest management regime, institutional reform should move away from enforcement of existing institutions and promote communal management of natural resources by locals.

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1. INTRODUCTION

Developing countries are often characterized by long-standing and severe environmental problems, and lack institutional strength to tackle them effectively. Deforestation in Pakistan is one case in point. The control of logging is fraught with difficulties since formal institutions have little influence on the behaviour of individuals and organizations. In this article, we analyse, in a case study setting, how corruption affects the management of forests in Swat, Pakistan. While examining the factors that are conducive to corruption, we will also highlight the difficulties of applying the standard policy prescriptions for

dealing with corruption. Finally, we outline how strategies based on institutional change at the local level can help improving the management regime and controlling corruption.

Pakistani state and society face challenges associated with the history of the country: political instability, secessionist movements, lack of rule of the law, and shortage of basic public services, just to mention a few. Deforestation is one of these challenges with worrisome environmental, social, and economic consequences. Environmental services provided by the forest include biodiversity, watershed protection, microclimate regulation, amenity and services at the global level (Asian Development Bank, 2000; Brown and Durst, 2003). Furthermore, the services provided by the forest are also important for agricultural activities where the forests, apart from their role in keeping watersheds, also prevent local climate change that can damage crops. The importance of forests for the country was recognised when the extensive floods of 1992 were imputed to deforestation and a commercial timber extraction ban was enacted in the same year (Rao and Marwat, 2003). From the social point of view, another reason for interest in deforestation is that poor communities extract a substantial share of their revenues from the forest (Rafi Khan *et al.*, 2006). The administrative resources available to the forest sector are contended over the pressing needs mentioned above.

In virtually all countries, formal rules have been adopted in order to prevent depletion of renewable natural resources. Where –like in Pakistan– deforestation is taking place, institutional failure is self-evident: the *de facto* management of the forest contradicts the *de jure* setting. In this case study we analyze the causes of institutional failure in the protection of forests in the North West Frontier Province (NWFP) of Pakistan, namely in the Swat district. Statutory law rigorously constrains exploitation activities and the forest department is in charge of enforcement, but idiosyncrasies between formal provisions and actual institutions create open access of forests by loggers.

During the study corruption emerged as a fundamental contributor to the current pattern of forest exploitation. Corruption is crucial in the deforestation process: at every step of illegal logging bribes are disbursed, during the extraction of logs, their transport and their marketing. As we will highlight in this study, the ‘crime and punishment’ approach (Becker, 1968), which prescribes increase of monitoring activities and harsher punishments in order to decrease corruption, is not easily implemented if the overall institutional environment is not supportive. Countrywide overhaul of corruption, based on sweeping reforms, is a difficult and lengthy task, which is seldom accomplished (Kaufmann *et al.*, 2005). Analysing corruption in a case study setting induces to look for institutional reforms that are limited to a specific sector and that do not require far-reaching institutional change. Even though corruption is often cited in reports and articles about illegal logging, we find that there is a lack of case studies on corruption that put it

in the institutional context and use an economic framework for suggesting reform.² In our study, corruption will be analysed in a new institutional economics framework, where the focus will be on transaction costs and enforcement costs of property rights.

Corruption is endemic to many developing countries but Pakistan always features in the highest positions in the rankings that are produced by international organizations (e.g. Kaufmann *et al.*, 2005; Transparency International, 2004). In Pakistani society the phenomenon of corruption is particularly pervasive and affects also the operations of law and enforcement agencies (police and the judiciary) (Transparency International, 2002). Surveys, realized by international organizations with the intent of comparison across countries, indicate that members of law enforcement agencies are among the main offenders in corruption cases. The ‘abuse of power in order to serve private interest’, the common definition of corruption (e.g. Lambsdorff, 2004), is widespread also in the forestry sector of Pakistan. The difficulty of monitoring civil servants operating in remote areas, and the general corruptibility of Pakistani public administration contribute to the prevalence of corruption in the forest sector. Also during our study, through interviews with informed agents, we collected witness evidence about employees of the forest department and of the forest development corporation (that is, the agencies in charge of enforcement in the forest sector) being involved in corruption in the forestry sector (see also Rafi Khan *et al.*, 2006).

Due to the fact that environmental problems require active public policies to be eased, it is not a surprise to find that countries that are in institutional disarray are not successful in dealing with environmental issues. Many of the benefits produced by the forest are public goods whose production requires successful coordination of the efforts of several individuals (Ostrom and Gardner, 1993). Nevertheless, institutional failures at the national level do not always lead to environmental disruption and unsustainable resource use. For example, Ostrom (1990) reports a list of cases where natural resources are managed sustainably, as commons, by local communities. Many of these success stories are from developing countries characterized by countrywide institutional disarray. It appears then that institutions managing specific natural resource, when members of local communities coordinate effectively, can be successful even when the national institutional setting is problematic. These findings entail that local institutional

² Existing studies serve, for example, the purpose of highlighting cases of officials and individuals involved in illegal logging in order to push authorities to intervene (e.g. Environmental Investigation Agency and Telapak, 2001). The lack of case studies can be caused by the difficulties of getting information on illegal operations. Already Myrdal (1968) mentioned that corruption is ‘‘almost taboo as a research topic [...], revealing a general bias that we have characterised as diplomacy in research’’. Even though research on corruption has largely expanded in recent years, case studies involving fieldwork can still be affected by diplomacy in research; for instance, Perry (1997) still finds corruption to be taboo in geography.

frameworks could achieve sustainable development even though the country as a whole is characterised by institutional shortfalls.

The paper proceeds as follows: Section 2 presents a literature review of studies of corruption and environmental policies, analysis levels of corruption in Pakistan and highlights the conditions for successful communal management; and introduces the theoretical framework; Section 3 describes geography and institutions in the case study area; Section 4 describes the dynamics producing deforestation; Section 5 summarises the ongoing reform process, underlines its shortfalls and possible improvements of the process. Section 6 concludes.

2. INSTITUTIONS AND THE ENVIRONMENT

In this section we review the literature on corruption and the environment, discuss the incidence of corruption in Pakistan, we highlight the theoretical underpinning of the study, and outline the conditions that enhance communal management of natural resources.

2.1 Corruption and the environment

Environmental degradation requires mechanisms of social coordination to be corrected, but successful involvement of the government is difficult to obtain. Those who have vested interests in the current state of affairs will use their power to arrest institutional change (grand corruption) and enforcement at the lower level by civil servants will be ineffective (petty corruption). In this section, we briefly summarize existing evidence of the role that corruption has on the environment; in the next section we outline corruption incidence in the agencies most directly involved in the implementation and enforcement of forestry policies in Pakistan: the police, the judiciary, and the forest department.

Even though evidence over the spread of corruption is difficult to obtain because of the secrecy surrounding corruption deals, some empirical studies have been produced over the effect of corruption on environmental policies' formulation and implementation. Furthermore, a large number of case studies and reports confirm how corruption compromises the implementation of environmental regulations.

In a cross-country empirical analysis, Pellegrini and Gerlagh (2006) using two indicators of environmental policy stringency and numerous control variables, find that corruption is one of the main determinants of the level of environmental protection across countries. Theoretical papers on corruption and environmental policy include Lopez and Mitra, 2000 and Damania, 2002. Studies focusing on corruption in the forest sector include The World Bank's (Callister, 1999) report on corruption and forestry, reports on

illegal logging in Indonesia (Environmental Investigation Agency and Telapak, 2001; 2003) and Robbins (2000) that uses a theoretical framework for the analysis of corruption and then applies it to a natural reserve in Rajasthan, India. Finally, Rosenbaum (2005), after maintaining that corruption promotes illegal logging and trade, presents a list of lessons for reforming the sector which are drawn from Transparency International's toolbox for fighting corruption. Transparency International promotes national integrity systems that are a series of interventions at the national level for decreasing corruption. Rosenbaum borrows some tools from the national integrity system for the forest sector in order to create a list of interventions for reducing corruption in the forest sector. These interventions include creating a knowledge center, creating a forest sector corruption index, promoting awareness campaigns, encouraging forest certification, etc.

2.2 Evidence on the extent of corruption in Pakistan

The public administration of Pakistan is plagued by corruption. Even though hard evidence of corruption's incidence is difficult to obtain, surveys, news reports, case studies, historical accounts, and information collected during our study all indicate that corruption is pervasive at all levels. Islam, in his study of the Pakistani public service states, "Corruption in Pakistan is a way of life" (2004: 314). It is the National Accountability Bureau, a governmental agency in charge of drafting the National Anti-Corruption Strategy, that states: "Corruption has become a disease infecting every aspect of political, social and economic activity" (Hafiez, 2002: 1). In order to be able to better place the forest sector in its institutional environment, in this sub-section, we will focus on the evidence of corruption in the agencies most directly involved in the implementation and enforcement of forest policy and regulations: the judiciary, the police, and the forest department.

The extent of corruption in Pakistani's enforcement agencies is evident from the results of an extensive household survey conducted by Transparency International (2002). During the survey 3000 households from urban and semi-urban areas of Pakistan have been interviewed. A high share of respondents declared that at least one member of the household had to deal with the police, or the judiciary in the previous year (32%, and 6%, respectively). Most strikingly, all of those interviewed who had had contact with the police reported corruption (that is 960 respondents out of the total sample of 3000). According to the survey results, corruption – while dealing with the police – took several forms, including outright extortion perpetrated by police officers and payments required to be released from arbitrary imprisonment. Among those who dealt with the judiciary, 96% reported corruption. In most cases court employees and judges demanded bribes, but

corruption in the law sector is so widespread that it was not uncommon to bribe also the opponent's lawyer and the public persecutor.

Corruption's incidence, in the police department and in the judiciary, is all the more important to understand the effect of corruption on forest management. In fact, the success of enforcement tasks delegated to the forest department, in cases where there is violence or complaints are taken to the courts, depends also on the collaboration of these enforcement agencies.

As for the forest department itself, anecdotal evidence of corruption abounds. During the fieldwork several interviews (with members of the local communities, with NGOs, but also with members of the forest department) provided evidence of corruption. Steimann (2004), in his detailed analysis of the structure of the forest department, finds that forest guards levy fines in a entirely arbitrary fashion, and in most case they result in a bribe. It appears that the lower ranks of the forest department are completely oblivious of the Forest Ordinance (that should regulate many of their responsibilities, including fining) and they are not aware of the formal regime of fines (let alone being willing or able to properly enforce them).

The incentive structure faced by the employees of the forest department determines their likelihood to collude. We must mention, among the factors that determine forest guards' behaviour, that wages of the lower rank employees of the forest department are around or below the survival line for those who have to support a large family. Under these economic circumstances, turning a blind eye on illegal logging and collecting bribes looks like a necessary addition to a meagre salary (for a study of wages levels and corruption see Van Rijckeghem and Weder, 2001).³ Another factor influencing the behaviour of enforcement agents is that conflicts in the area turn easily to violence and these conflicts have involved forest guards in the past. Duty-related incidents have resulted in serious injuries and, in a few cases, also in the death of forest officials (Steimann, 2004). Conflict makes the cooperation of the police and the judiciary even more essential, because the lack of cooperation weakens the position of the forest department in relation to timber smugglers. The fact that, as mentioned above, cooperation from other enforcement agencies is absent contributes to the prevalence of corruption in the forest department.⁴

³ Forest guards need wood for heating purposes, but they are not given allowances to purchase it legally. This makes them dependent on, at least part of, the wood that is being logged illegally.

⁴ Reportedly the forest department has been asked in several occasions to allow smuggling of timber directed to judges and prosecutors in order to obtain cooperation by the judiciary.

2.3 Methodological framework

The theoretical framework utilized in this study of corruption and forest management is based on the new institutional economics approach. We will look at the way institutions constrain choices of economic agents (North, 1990). In the context of formal institutions, corruption represents a weakening of constraints: disbursing bribes facilitates operations that are inconsistent with legal institutions. Institutions, apart from constraining behaviour, define also opportunities. In some circumstances, however, to exploit the prospects offered by the legal system bribes need to be paid (e.g. when locals have to pay inducements in order to extract logs for self-consumption). In order to understand the failure of formal institutions to influence economic agents' behaviour, we will focus on transaction costs and more specifically on enforcement costs of property rights.^{5,6}

A relevant category of costs is transaction costs: the costs that occur when a bundle of rights (related to a good or service) is transferred across economic agents (Coase, 1960). One stage of activity ends and another begins (Williamson, 1985). When, as in Swat, *de facto* property regimes do not coincide with legal provisions, also illegal costs – such as bribing – are part of the costs of the transaction. Enforcement costs are a sub-category of transaction costs and pertain to the expenses occurred in order to put into effect property rights.

Enforcement costs of *de jure* institutional settings are a key for understanding the evolution of natural resources management and its likelihood to fail. In the case of the forest, the enforcement of property rights entails guarding it and monitoring extractive activities. The legislator in Pakistan opted for a forest management regime characterised by pervasive control by state agents. The state and its agencies should effectively monitor all forestry operations. Enforcement costs of the regime are prohibitive and the system has proven unattainable.

Different property regimes entail different rights (and duties) for economic agents and have implications for the management of the resource.⁷ The formal property regime of most of the forest in Swat is state property, with some rights given to local communities and former owners and the enforcement is based on state agencies (primarily the forest department).

In the rest of the article we assess the working of existent management regime to diagnose the reasons of the failures. However, focusing only on the failures of the current

⁵ For a detailed account of the theoretical framework adopted during the research see Pellegrini and Kruseman, 2005.

⁶ Transaction costs can be imputed in a variety of ways to different agents. Bromley (1989) has shown that the distribution of transaction costs influences distributional and environmental outcomes.

⁷ For a comprehensive overview of bundles of rights associated with property right regimes see Schlager and Ostrom, 1992.

regime would not be very useful. Hence, in this section we also summarize theoretical and empirical underpinnings of an alternative management system that we suggest to explore: common property management.

While reviewing the findings of studies completed over the last few decades, Ostrom (2000) summarizes the conditions that increase the probability of successful communal management. These conditions relate both to characteristics of the resource and of the appropriators. With respect to the resource, the likelihood of successful management as a common is enhanced if improvement is feasible, reliable indicators of the condition of the resource are available, the flow of resources is predictable, and forest boundaries are clear. Parts of the forest of Swat are so degraded that improvements to its stock are feasible only over a medium to long period of time, but most of the other conditions are met: the state of the forest is directly observable, the regenerative potential is predictable and communities' boundaries are mostly undisputed. With respect to the appropriators, the conditions are: resource saliency for the users, common understanding, low discount rate for the agents, trust and reciprocity in the community, autonomy (e.g. the appropriators are able to rule themselves), and prior organizational experience. These conditions are the ones that are the most difficult to meet in Swat. Adherence to these conditions is heterogeneous: some communities meet most of the conditions, while others are more deficient. Generally, saliency and shared understanding are the conditions that will be met more easily: income in rural communities is very low and resources extracted from the forest make up a large share of income (Rafi Khan *et al.*, 2006), the forest standing has a predictable evolution and communities' members are aware of its functioning. Discount rates are not particularly low because incomes are meagre and there is migration. Trust and reciprocity and previous organizational experience are contingent on each community, on its social cohesion and its history. Autonomy is absent in the present situation, but that is the condition to achieve in case of institutional change towards communal management.

Overall, the conditions mentioned above affect the individual agents' cost benefit calculations of engaging in communal management (Ostrom, 2000). Policy interventions that promote communal management should include instruments to promote these conditions in order to enhance the likelihood of success. It is worth reminding the reader that these conditions are not a list of necessary and sufficient conditions. There is also an important role for individuals in the setting up of commons' management mechanisms. The uncoordinated activities of individual members of local communities are partially unpredictable and make it impossible to be entirely certain of the outcome of their interaction. Furthermore, once we consider self-organization in a longer temporal framework, it is important to emphasize that social systems are dynamic and evolve over time, therefore though the local community is not self organizing at one point in time it

can develop in that direction at a later stage. Learning can make a community able to copy other communities' solutions, or to adapt them to their own socio-environmental conditions. Summing up, the list of conditions mentioned above can be considered as a benchmark for estimating the likelihood to achieve successful coordination in a common over the short period, or objectives to be achieved as an intermediate step toward effective communal management.

Finally, as mentioned above, the transition to communal management can also be problematic and give way to a situation where the poorest members of the community continue being marginalized. It is important to note that local communities are not homogeneous. Individuals, within the community, can try to extract as much resources as possible, depending on their power (Garcia-Frapolli, 2004) and initiatives encouraging self-organization can easily be hijacked by commanding agents (Rola and Coxhead, 2005). Hence, the end results of policies promoting communal management should be carefully monitored (especially at the implementation stage) and they cannot be assumed a success.

3. A PROFILE OF SWAT, PAKISTAN

For the understanding of dynamics of deforestation in Swat, it is important to describe the physical and human geography of the study area, and the institutional settings characterizing it.

3.1 Geography and ecology

Pakistani forest endowment is dwindling. In the decade 1990-2000, the deforestation rate for the whole country was 1.5% per year (Brown and Durst, 2003). Once we consider that only a minute part of Pakistan is forested (around 3% of the total area), the trend is even more compelling. The North West Frontier Province (one of four that compose Pakistan) contains the largest amount of forest (around 40% of the total, Government of Pakistan, 1992). Our case study focused on an area that traditionally was mostly covered by forest and still contains significant tracts of forest, but is also marked by deforestation: the Swat district.⁸

The Swat valley is named after the river that runs through it and it includes several sub valleys. At the lower end of the valley, there is the district capital, Mingora, which is also

⁸ The North West Frontier Province has a set up that was instituted during the British colonial rule. The Province is divided in divisions, themselves divided into districts. The Malakand division contains the Malakand, Swat, Dir, and Citral districts. Apart from the districts, The North West Frontier Province also contains Federally Administered Tribal Areas, where federal and provincial government have very limited powers (mostly limited to military incursions related to terrorism and drug activities).

the most important urban agglomerate. From there, moving northwards along the valley, lower plains with agriculture and fruit orchards are the dominant land use. Moving higher up in the valley, with the increasing altitude, forests, alpine pastures, and perennial glaciers take the place of agricultural activities. The settlements decrease in size going up the valley. Transport infrastructures become scarcer and most of the transport to the villages nearest to the glaciers is on foot.

The forest standing in this district is of special interest because it is one of the most dense of Pakistan, because of the ecological diversity within its boundaries, because the area is very poor and the poor are dependent on resources and income coming from the forest, and because the watershed is large and influences the water basin of various hydropower stations.

3.2 History and institutions

History is at the root of the *status quo* and it shapes expectations (claims and rights). The history of Swat has a bearing on current land tenure and forest management, because historical developments are at the origin of the right holding of heirs of the most important families allied to the local dictator. In this section we will outline the historical evolution leading to the modern management regime.

Swat has a distinct history in relation to Pakistan and the rest of the Indian sub-continent. While the rest of the area was colonised by the British crown, Swat succeeded in conserving its autonomy and, once Pakistan became independent in 1947, it did not fully accede to Pakistan until 1969.⁹

3.2.1 Pre accession

The earlier history of Swat (from the end of the 19th century) was marked by the emergence of a political structure characterised by the extensive powers of the autocrat. The dictator, called *Wali*, was leading a rebellious country and needed the support of allies from the powerful families of Swat in order to defend the Princely State of Swat (as the state was officially called before the accession to Pakistan). Challenges to the state came from external powers (the British and the neighbouring Kalam state) and from internal ones (other local leaders trying to seize power) (Sultan-i-Rome, 2005). As a result, the rulers were under continuous threat and they were used to build alliances with wealthy local lords.

The history of the *Wali* is especially important for the management of the forest, because natural resources were valuable assets used for building and keeping alliances,

⁹ For an account of Swat's resistance to outsiders occupation and interference see Lindholm, 1990.

thus their exploitation was crucial to the survival of the regime. The management system compounded harsh punishments to those who illegally encroached on the forest, while allowing favouritism and smuggling when such was in the *Wali*'s – or his allies' – benefit. The decision power, with respect to logging and forest exploitation, was centralised and rested in the hands of the *Wali*.¹⁰

3.2.2 Post accession

The accession to Pakistan of the Princely State of Swat swiftly changed the institutional setting. The national state took under its control the management and exploitation of forests. The law provided only for a minute disbursement of royalties (10% of the total net revenues) to be paid to the legal right holders and established some extraction rights for local communities to meet consumption needs of the residents.

Pakistani state's forest management was, from the very beginning, characterized by a command and control approach but the effective enforcement was beyond the state's capability.¹¹ The post-accession regime implied that most of the forests were declared reserved or protected, i.e. the management regimes strictly constrained exploitation rights.¹² Ownership and management rested in the hands of the state, through the forest department. In the reserve forest, no cutting is allowed and members of the local community have limited rights for extracting dry wood and non-timber forest products. In protected forest, the forest department is in charge of the management plan and at times when there are cuttings, the forest development corporation is in charge of the cutting of marked timber, but shares of the net sales revenues are given to right holders (Steimann, 2004). Moreover, a "local quota" of timber is reserved to local residents for their needs and there is an "emergency quota" that can be used under special circumstances, e.g. to rebuild a house after a fire.¹³

The shares of revenues from wood sales directed to right holders have been increasing over time, from 10% at the time of accession, to 60% nowadays. Those entitled to shares

¹⁰ For a detailed historical account of the autocratic rule of the *Wali* of Swat, the strictness of the application of the law to the commoners, the importance that forestry had under his rule, and the illegal cutting and favours for his allies (the *Khans*) see Sultan-i-Rome, 2005. For an altogether different version of the *Wali*'s rule see his autobiography (Barth, 1985).

¹¹ Pakistan was not the only state that tried to control the forest sector without the necessary resources to implement its own rules on the face of high transaction costs. For comparison see Ostrom (1990) on Nepal.

¹² A third category of forests are the *guzara* forests. They are those whose property was left to the communities, even though relevant management responsibilities were taken over by the forest department. *Guzara* forest is an institutional setup that characterized almost no forest in our study area.

¹³ For a detailed description of legal status and management provisions in the forest of the whole of the North West Frontier Province see Steimann, 2004.

of the royalties of the forest are the land owners (mostly *Khans* families – the former allies of the *Wali*) that reside far away from the forest, or local communities, depending on the property situation of the forest at the time it was taken over by the state.¹⁴

The state has been incapable to implement the management regime outlined above, and together with the dismantlement of the previous regime of property rights, this has led to an open access regime.¹⁵ Additionally, the gap between *de jure* and *de facto* management of the forest created multiple bases for claiming rights on the forest: the statutory law, custom, and the *de facto* regime.¹⁶ Agents can then refer to competing bases to justify their claims according to their interests (i.e. there is forum shopping) (Meinzen-Dick and Pradhan, 2002).

The open access regime on the forest implies that landowners and local residents exploiting the forest are only restrained by local power relations. An unabridged gap persists between the regulatory framework and the actual management practices. Encroachments and illegal cuttings continue. Furthermore, legal disputes over the cuttings' royalties abound and court decisions settling them are delayed (at times for decades), and, in many cases, court decisions are still pending.

The operations of the forest department have not become more functional to date.¹⁷ Corruption is widespread and it affects all the operations of the forest department. Forest guards are paid salaries that cannot satisfy the needs of families (Steimann, 2004) and they are lacking the support of the other enforcement agencies (which, as we saw above, are themselves inefficient and plagued by corruption). The overall enforcement system seems more geared to make ends meet for forest officials, than to protect the forest. There are numerous check-posts along the roads going down the Swat Valley, but these serve little purpose apart from extracting bribes in exchange for turning a blind eye on timber smugglers.¹⁸

¹⁴ Property rights over the forest are contested and contention over property rights is a source of endless litigations that are dealt by Pakistan's corrupt and inefficient judiciary system.

¹⁵ Dismantling existing institutions for the management of natural resources without succeeding in creating new ones has been a common procedure in many developed and developing countries over the last few decades.

¹⁶ Customs and *de facto* regimes can differ because the former borrows legitimacy from the tradition, while the former is simply the current state of affairs.

¹⁷ We collected information through focus group discussions and interviews during the fieldwork. Different sources, including employees of the forest department itself, confirmed the dismal state of the forest department operations.

¹⁸ This was confirmed by numerous interviews and by our own witnessing the ease of movement of truckloads of illegal logs in thorough the valley.

4. 4 DEFORESTATION IN SWAT, PAKISTAN

Deforestation in Swat is taking place because of institutional failure. Formal rules, if applied, could protect the forests, but *de facto* alternative institutions and lack of effective monitoring and implementations forbade them to be effective.¹⁹ At the level of economic agents, deforestation is caused by the desire to convert land for agriculture and/or for the extraction of the valuable logs (Bromley, 1999). In this section we analyse how the most important incentives interact with the institutional framework determining the *status quo*.

The process of deforestation is different in different sites according to differences in socio-economic and ecological conditions, and also local institutional settings are diverse in the case study area. The same formal institutions produce different environmental outcomes and causes different social agreements to arise depending on local conditions. Under current conditions sustainable management of the forest is achieved only rarely. It is worth stressing that, as we will see, not only logging, but also those cases of effective forest protection operations contradict the formal regulatory framework.

4.1 Incentives and institutions over the forests of Swat

The occurrence of deforestation depends on local physical and social conditions. Incentives and institutions interact with geography because of geography's effects on transaction costs. Below we provide a classification of institutional regimes that are in place in Swat.

At the bottom of the valley, in the most fertile area, land conversion for agriculture has historically been the main cause of deforestation. Over time forested areas have been cleared to make space for agricultural production and fruit orchards. Deforestation in the area, which is historically important, has lost significance. At the bottom of the valley land conversion is almost complete and there are no large stretches of standing forest left. Property rights in this part of the valley are well established, especially since easy access diminishes enforcement costs. Historical patterns determined land ownership to be concentrated in the hands of the *Khans* families (see section 3.2 above).

Agricultural activities at the bottom of the valley are the most valuable of the area and they are the most damaged by the ongoing deforestation taking place uphill. During our interviews several stakeholders noted microclimatic change (especially increases of hail precipitation) and problems from the watershed of the Swat River (floods and erosion) that damage agricultural activities. These problems were linked to the deforestation process.

¹⁹ In our study we do not investigate the issue of underlying and proximate causes of deforestation. For an in depth discussion see Bromley, 1999 and Contreras-Hermosilla, 2000.

In the mid and upper valley, a lack of enforcement of property rights on forested areas determined a *de facto* open access situation in most of the forest. The state and the right holders – the former landowners²⁰ (mostly the *Khans* residing at the bottom of the valley) – are formally entitled to the ownership and to shares of revenues arising from forest cuttings, but lack of enforcement allows members of local communities and timber smugglers to consider the forest as an open access resource and to exploit it accordingly. Formally, the forest department (representing the provincial government) and the landowners (that reside at the bottom of the valley) have control over the forest. Under the formal management scheme a quota of wood is reserved for the local community for its needs, and the net revenues that accrue when there are cuttings are shared among the right holders (i.e. the former owners of the forest) and the forest department. The formal institutional setting, which remains unenforced, is not substituted by an alternative regime restricting access to the forest.

The forest department and the forest development corporation, at times when markings and cuttings are allowed, collude with loggers and allow more wood to be extracted than the amount planned. This illegal extraction damages right holders and the local community, depriving of royalties the former, of self-consumption opportunities the latter, and of environmental services both.²¹

Illegal logging takes place also when there is no marking and organized logging: locals log more than they are allowed because their quota are insufficient, or because of the lengthy process involved in obtaining their share of the local quota, or they extract logs for commercial purposes (mostly in connection with the timber mafia, whose members are reported to be the hard-to-trace). When timber is logged and transported, chances of running into a control from forest officials is high and the unauthorized logging is punished with a fine or a bribe.²²

In summary, the area is characterised by a failure to organize forms of control by the state or by the local community. In the mid-valley, the local community is not involved in

²⁰ The rightholders are the formal landowners, because with the accession of Sat to Pakistan the formal property of forests passed to the state and the former owner enjoyed the right to a share of the revenues from logs extraction.

²¹ Sources of information on illegal operations are: cross-checked confidential interviews with people belonging to different stakeholders groups (i.e. forest department, law scholars, members of elders' council), group discussions, and household surveys.

²² The regulatory framework that should guide the operations of forest officials is so confused that different officials interpret their duties differently. As a result, often the difference between a fine and a bribe becomes fuzzy. For example, when interviewed, different forest officials answer differently on whether fines should be paid on the spot, or fines should be reported first, and then paid at the office of the range officer; also the amount of the fine to be levied varies markedly depending on the respondent and it is unclear what should be done with confiscated timber (reportedly some forest officers keep it in order to smuggle it, or for their own benefit). For a detailed exposition, see Steimann, 2004.

monitoring and regulation of the exploitation activities. One of the factors contributing to this situation is the lack of trust and of social capital in the communities²³. Competing stakeholders exploit the forest in an unsustainable manner. Every agent would benefit from a collective management of the forest, but cannot reap the benefits of its restraint. Without a credible coordination mechanism and a fair property regime, they would not appropriate any value of the natural resource in any case. The dominant strategy is thus to harvest as much as possible resulting in a logging race typical of the so-called tragedy of the commons (Hardin, 1968). Thus, neither the management practices of the Forest Department, nor the management practices of the local community point towards sustainable extraction. The elimination of trees from the steep slopes causes soil erosion and slides. As a result, problems of land degradation are evident in the whole area.

The only examples of sustainable forest management and effective enforcement of restraints of extraction activities are those that arose from spontaneous initiatives of local citizens, or centered on locals' activities, but in cooperation with the forest department. Local groups of citizens at various times have been organizing themselves in order to defend some stretches of forest from exploitation. The most effective way that has been found to enforce extraction restrictions was with limits on the transport of logs: community-manned check posts have been set-up and timber loads have been blocked along the roads (Killeen and Khan, 2001; Khan *et al.*, 2004). Other efforts to protect the forest involved local communities in concert with the forest department. The ones that were initiated under the donor-sponsored initiatives include community manned check posts, patrols from the local community guarding the forests, joint patrols of community and forest department members and have been associated with improvements in forest cover (Steimann, 2004; Suleri, 2002).

In summary, in the Swat district, the inconsistency between different regulatory frameworks create a situation of legal pluralism: there is a plethora of different rules that are contending the governance of transactions. Each agent turns to the regulatory framework that is more convenient for her and neglect others' claims (Meinzen-Dick and Pradhan, 2002). In most of the area rather than the official management regime, centred on the control of the forest department, a open access situation is in place.

5. STRATEGIES FOR INSTITUTIONAL CHANGE

²³ During our meetings members of the community repeatedly asserted that they were not interested in the management of the forest, that they wanted these tasks to be supplied by the forest department and that all they want are shares of the revenues when marking and extraction takes place.

Considering institutional arrangements as fixed and simply working from a ‘crime and punishment’ perspective (Becker, 1968) the most obvious solution to the enforcement problem would be to alter the cost-benefit outcomes for forest officials of entering into corruption deals, and of loggers harvesting illegally. When applied to corruption in the forest department, this would imply increasing the penalties for employees of the forest service caught for being involved in corruption and augmenting monitoring in order to identify more corruption cases. With respect to illegal loggers, this approach requires higher fines and increasing monitoring in the collection and transport of logs.

The successful application of the crime and punishment approach relies on the existence of enforcement agencies that operate efficiently and honestly. Recommendations based on this approach must take into account the institutional settings where they would be applied. However, in Pakistan the highly corrupted police and judiciary cannot patrol effectively the forest department. In turn the corrupt employees of the forest department cannot effectively monitor the behaviour of other agents.

Furthermore, examples of sustainable management of the forest exist in the area, but they are not based on the state’s control of the forest, nor on better enforcement (or harsher rule) by the forest department. On the contrary, the only successful cases of sustainable management are based on collective action of local people and do not rely on the official enforcement agency (i.e. the forest department). In light of these findings, in this section we will outline the ongoing reform process, underlining its idiosyncrasies and setbacks. Finally, we will suggest how the reform process could take a new spurt reinforcing collective action where it is already in place, and facilitating it where it is not happening.

5.1 The ongoing reform process

The unsustainability of *de facto* management practices and the environmental, social, and economic shortcomings of current deforestation rates in most of the North West Frontier Province are apparent and cause discontent voiced in numerous manners (e.g. the press often laments the management regime and its effects). The social and environmental failures associated with the current management practices have motivated some reform attempts of the forestry sector. For the Swat district the most relevant reform effort was the Forest Sector Strategy, whose inception was supported by a loan of the Asian Development Bank and by technical assistance to the program provided by the Dutch Royal Embassy.

The main task of this donor-driven program was to move the management of the forest from a state of command and control towards co-management. The donors hoped to strengthen the local capabilities and to move the emphasis of the forest department from punishment towards partnership with local communities.

The program was not successful. Local committees were established in several villages, so that they could be an interlocutor of the forest department and, most importantly, contribute to the village land use plan.²⁴ However at the local level the most influential members of the community controlled the process as the committees over-represent the wealthy. Moreover, the forest department has been unwilling to give up part of its powers and enter in a real partnership with the locals. Eventually, due to implementation slowness and especially because of the resistance at the provincial level to undertake the necessary steps to support the reform in due time, the support of donor agencies has been withdrawn in 2004. This was a mayor setback, especially in the few places where the reform started to yield benefits. Now, trust is lost in this type of interventions (see Suleri, 2002).

The Forest Ordinance of 2002 confirmed that the reform process was not proceeding smoothly. The inception of the ordinance was admirable. It was geared towards co-management and partnership in a stable regulatory framework. However, under the insistence of more conservative powers in the forest department and the provincial government, the final result was only a compromise. Even Sungi, a Pakistani grass root NGO working for the empowerment of the most marginal members of the society, which from the beginning was supportive of the reform process, eventually rejected the Forest Ordinance. Of special importance in determining Sungi's stance were the punitive powers that the ordinance gave to the forest department and that could be used against local communities.

Since the donors' support to the reform process was stopped, the whole process halted and is reversed. The latest initiatives strengthen the forest department control of the forest and, in accordance to the 2002 Forest Ordinance, the Forest Force has been instituted.²⁵ Now a 500 men-strong armed force will patrol the forest of the North West Frontier Province, including Swat. The forest department itself estimates that at least 3000 would be required in order to patrol effectively the forest of the province.²⁶ The insufficient number of men involved in the force will be the likely excuse for another failure of the 'crime and punishment' approach applied to illegal logging.

It is also worth noting that if the existing force would be effective much less than 500 armed men would be necessary in order to control extraction activities in the area. Few roads run along the valley and functioning check-posts should be sufficient to stop a large part of the smuggling. Nevertheless, the guards manning the check posts are colluding with the smugglers, and arming the very same guards will not change their incentive

²⁴ The committees are the Village Development Committee (composed by men) and the Women Organization (composed by women).

²⁵ See <http://www.ttjonline.com/story.asp?sc=35057>.

²⁶ The expected cost of equipping such a force would be of 60m Pakistani Rupees (or around 825,000 euros). See <http://www.dawn.com/2004/06/16/local23.htm>

structure. Similarly, armed guards patrolling the forest, even more removed from detection possibilities, will easily become involved in illegal deals. Arming forest officials may not yield any environmental, economic or social dividends.

5.2 Institutional reforms

The other mainstream approach to reform, the “holistic approach”, is a countrywide program of institutional change. For example, Transparency International asks for a holistic approach based on national integrity systems (see Rosenbaum, 2005 for an application to the forestry sector). Its implementation remains blocked because of opposing powerful interests. In the case of Pakistan, completing the checklist of the national integrity system (including independent judiciary, free press, establishing an effective watchdog authority, etc.), would imply altering deeply the institutional framework of the country (e.g. Yusuf, 2002). While the objective of decreasing corruption occurrence in the whole of Pakistan remains valid, the ecological and social problems caused by deforestation require viable initiatives to be adopted at a quick pace in the forestry sector.²⁷ Moreover, obtaining improvements and reducing corruption in some spearhead sectors – such as the forestry – can help to create a momentum for wider initiatives against corruption.²⁸

Since, as discussed above, corruption is widespread in Pakistan, the officials from the forest department operates within a system where effective collaboration of complementary enforcement agencies is infeasible. Therefore, institutional change should focus on a management regime that can be implemented mostly within the forestry sector.

The forestry sector, as it stands now, is characterised by pervasive powers given to state’s agents and chronic corruption. Since, as delineated above, corruption is endemic to the Pakistani public sector, institutional reform should reduce state’s involvement in planning, management, and enforcement of forest policies. As mentioned above, institutional arrangements that rely on local communities can halt deforestation.

Where property rights are well established the reform process should be very careful with altering the existing situation as it could lead to open access conditions. Where private property is undisputed a system of market-based incentives would be supportive for the internalization of the positive externalities arising from the forest. As we explained

²⁷ For an analysis of how social action coalitions can produce and sustain anti corruption efforts see Johnston and Kpundeh, 2005.

²⁸ The National Integrity System (NIS) has also been applied specifically to the forest sector (Rosenbaum, 2005), but its application in Pakistan seems doubtful. Some of the most important tools of NIS involve the partnership of commercial forest interests and the public sector (e.g. forest integrity pacts and business principles for the forest sector). In Pakistan commercial logging is formally inexistent (because of the ban), therefore there is no legal basis for a partnership between the commercial sector and the state.

above, at the bottom of the valley, the avoidance of deforestation is not an issue as those areas have been already entirely cleared from the forest.

Where communal efforts to protect the forest are in place – and deforestation is not occurring – a strengthening of the current institutional settings should take place, aligning the *de jure* to the existing situation. In this way the long-term management perspective of communities can be improved through stability.

Where institutions are not well defined the task of reform is more difficult. The impediments to the self-organization of the collective must be removed and social learning must take place, which can be a lengthy process. The broader institutional environment, especially the forest department, should operate as a facilitator in the process (Ostrom *et al.*, 1999).

At the same time, it is important to recognize that local communities can also fail to manage in an equitable and sustainable manner the natural resource. Differentiation within communities, because of wealth, power and/or of ethnicity, can mean that the most influential members of the community can hijack the devolution process and the collective action process, turning it into their favour (Suleri, 2002; Rola and Coxhead, 2005). Social trust and self-organization capability are required and, if they are not present, time and good examples will be required to build them. Hence, special attention should be devoted to monitoring and implementation.

Summing up, when it is needed to think about institutional change for the management of the forest, to overcome failures of a present system, it is important to accommodate local ecological conditions and social capabilities. Thus, institutional set ups cannot be uniform, but need built-in flexibility and accurate monitoring of achievements and failures.

5.3 Paths of change

In the context of institutional change, a particular emphasis should be given to the building of coalitions that can support change. After highlighting the needed steps for change, in this section we outline possible patterns to achieve change, through an analysis of the incentives of the most important stakeholders. Finally, we will outline some of the auxiliary reforms and federal level initiatives that could facilitate the reform process and the achievement of the final objective of sustainable forest management.

5.3.1 Actors and incentives

The main actors with stakes in the forestry sector are the federal and provincial governments, the forest department, the forest development corporation, local communities (differentiated among themselves mostly because of right-holding issues),

NGOs, and international donors. All these actors have some qualified interest in forest conservation. Additionally, there are the interests of those involved in illegal logging, the smugglers, the wood processing industry, and the economic agents involved in economic activities induced by timber trade. Thanks to corruption, they are able to influence some of the other actors as well.

If change is offered as a package the main losers could get a compensation for their losses. This compensation would ease opposition and the actual change would be more likely to happen. We identify as the main losers from the achievement of sustainable management the local notables who are right-holders and would lose part of their rights if management would be moved to the local community. Another potential loser is the forest department which would suffer in terms of power, routines and, for certain officials, relevant shares of their income (now provided by kickbacks). Last, we will look at those directly involved in the illegal timber trade.

Federal and Provincial Government have important stakes in forestry. The federal government is ultimately in the position to decide the overall legal framework and it should be in the position to allow for the internalization of positive externalities created by the forest. The provincial government can also influence the legal framework (within the boundaries set by the federal government) and is the recipient of a share of the royalties produced when legal logging takes place. The situation is further complicated because there are discrepancies between the government's mandate and the interest of agents acting in the name of the government. From the perspective of the government as a whole, the conservation of forest resources would have the advantage of increasing welfare levels, ease the pressure on the issue exercised by mass medias and political discontent, and attract donors. Nevertheless, from confidential interviews with high-rank members of the forest department and of NGOs, it was revealed that important figures in the government (mostly at the provincial level) have stakes in illegal logging.

Forest department and the forest development corporation have as stated main objectives the management and protection of the forest cover, and sustainable extraction and fair repartition of royalties. Apart from their official missions it is apparent that employees of these organizations have developed routines that are not oriented towards conservation of the forest, but towards appropriation of shares of revenues that are derived from illegal logging. Increasing the meagre salaries — as a substitute of actual kickbacks — and training of the lower ranks of the forest department are preconditions for having the forest department and the forest development corporation playing a positive role in the forestry sector. Moreover, the forest department as a whole should be more involved in the reform process.²⁹

²⁹ At least the forest guards should be aware of it, on the contrary of what happened with previous efforts (as we have seen above). Going a step further, and actually involving the forest department in

Formal arrangements give landowners rights to part of the royalties from the net sale proceeds from log extraction operations. *De facto*, they obtain only a marginal share of what they are entitled to. Still, a move of the institutional framework towards co-management would further limit their ability to appropriate royalties from logs extraction. If the opposition of such influential members of the community would stop the reform process, as it seems likely, a scheme for compensation should be crafted. For example, incentives for the conservation and the re-forestation in the lower part of the valley (where, as mentioned above, private property rights are well established) could also be included as a compensation for these losses. The fact that landowners are not getting much from their formal rights and the fact that their agricultural operations would benefit of local positive externalities from increased forest cover, should contribute to their acceptance of reform.

NGOs are willing to and should be partners in the whole reform process. Because of their interest in forest resources' conservation and the information and experience that they have available, they are valuable partners of any reform process. For many NGOs, this type of activity is functional to the achievements of their goals and their involvement can increase transparency and checks on the implementation of reform programmes.³⁰

International donors have already shown their interest and willingness to assist and facilitate the reform process in the forestry sector in Pakistan. Unfortunately, the lack of success in previous reform efforts may undermine future engagement. Still, international donors are active in Pakistan and projects involving the management of natural resources offer them the opportunity of ripping benefits with respect to environmental and poverty reduction objectives. Furthermore, donors' could exploit their experience of regulatory and implementation obstacles to reform that they met in the past. They could, for example, make their support conditional on *ex-ante* legal reforms and focus on their implementation (see also Suleri, 2002). The additional funds that derive from donors' involvement could be used for the activities to reduce resistance to reform and to guarantee equitable outcomes.

If the management regime were successfully reformed, members of the local community that, to a different degree, are involved in illegal logging will suffer a setback in their economic opportunities. Very often these members of the community are disadvantaged and in dire economic conditions, hence the reform package should be complemented with measures supportive of alternative forms of sustainable livelihoods (see below). In other words, the intervention towards the protection of the natural resource should contain a social package to prevent its social outcome to be regressive. It

the reform process would give to its members a sense of ownership and the necessary information to increase compliance.

³⁰ Such NGOs are, for example, IUCN, Sungi, or the WWF.

can be argued that the previous interventions to reform the forestry sector were incomplete from this point of view.

The “Timber mafia” bases its operations on the high rents that can be captured because of the high profitability of illegal trading in wood. A strategy for reducing the potential rents from illegal extraction would be to liberalise timber trade (see below), i.e. reducing tariffs and red tape for imported wood, undercutting substantially the size of rents to be appropriated via illegal logging. Consequently, the level of resources available locally to facilitate illegal logging will be reduced.

5.3.2 Auxiliary initiatives and federal level reforms

Finally, there are some initiatives that would facilitate the achievement of environmental and social targets, and some reforms that are necessary conditions for instituting sustainable management practices for the forest. In this sub-section we provide an overview of the most important interventions that would facilitate the achievement of sustainable logging, but many other interventions related to institutional quality and environmental management in general could be mentioned (e.g. reforms to improve governance such as the ones proposed by Transparency International, population planning, land reform, etc).

A key reform and a test for the will of the federal government for protecting the Pakistani forest is the abolition of all trade barriers on imported wood.³¹ The domestic demand for wood cannot be met by the modest forest stands as it was recognised already in the Forestry Sector Master Plan (Government of Pakistan, 1992). Allowing imports would simply be the logical consequence of government’s efforts to protect the forest.

Interventions oriented towards the provision of sustainable livelihoods of local communities should focus both on those who use wood for self-consumption and those who extract it for commercial purposes. For the locals involved in logging, alternative social programs providing alternative sources of income should be set up. For all the households, their timber use could be reduced with the use of more efficient stoves and similar technical solutions (e.g. promoting the construction of micro-hydel).³²

Payments for environmental services can be another way of financing the conservation of forests. Since Swat’s forests provide economic benefits (e.g. watershed protection of

³¹ Opening the Pakistani borders to timber trade would imply increasing pressure on international markets and, possibly, also increasing illegally harvested timber in neighbouring countries. While we recognise issues related to unsustainable and illegal logging in world markets, reforms and interventions at the global level (which we strongly support) are beyond the scope of this study.

³² Pakistani and International NGOs operating in Pakistan have experiences with such programs and could be instrumental in implementing them within the forestry sector reform (e.g. see World Health Organization, 2005).

agricultural activities and hydropower generation), a quantification of the major benefits could lead to the implementation of a scheme where members of upstream local communities are paid in order to preserve the forest. In economic terms, the positive externality will be internalised (for an overview see Landell-Mills and Porras, 2002).

Some room could be available for the crime and punishment approach, when the state agencies in charge of enforcement are reliable and they are not likely to get involved in corruption. The one body of Pakistan's security forces that has been praised for its honesty is the motorway police (Transparency International, 2003). This force could enforce restrictions on the movement of logs on the main roads of Pakistan. Even though the motorway police can be considered a reliable enforcement agency, it is worth noticing that the courts that would judge complaints arising from the operations of this force do not share such a remarkable score on corruption.

6. CONCLUSIONS

Our analysis shows that corruption is contributing to the failure of the management regime of Pakistani forest and highlights the shortcomings of the standard reform approaches to corruption. The most invoked reform options with respect to corruption are the 'crime and punishment approach' and the 'holistic approach'. The 'crime and punishment' approach requires sound enforcement institutions, which are not available in Pakistan. In our study, we saw that the insistence of Pakistani legislators on the former approach is at the root of present failures. Furthermore, the sweeping reforms required to introduce transparency in the Pakistan administration, the 'holistic approach', are at odds with embedded routines and vested interests. These comprehensive reforms remain a valuable social objective, but cannot provide timely solutions for the issues analyzed here.

Corruption problems, when the overall institutional environment is weak, are best addressed by local institutional change. In a sector and in a region that are marked by low administrative capabilities to enforce state regulations, reforms should be aiming at reducing the coercive role of state agencies. Therefore, options where responsibilities in forest management are (at least partially) devolved to local communities should be at the centre stage of reform efforts.

In contrast with what suggested here, the latest developments in the management of forest in Pakistan are increasing the enforcement effort and powers of state agencies. We find that the emphasis on state enforcement agencies is misplaced and is reproducing the conditions of present failures. A carefully crafted reform program should include the strengthening of property rights, provisions for communal management and market based incentives, depending on the social, economic, and ecological characteristics of the different areas under consideration. These objectives should be endorsed by coalitions of

actors empowered as to be able to enforce these propositions. State agencies should act as facilitators of the process rather than attempt to exert complete control over the forest.

Ultimately, the relevant question is whether it is possible to save the remaining forest of Swat through reforms in the forest sector. The arguments presented in this article provide support for the existence of viable alternatives to unsustainable logging, but significant changes in the way the problem is dealt with by Pakistani authorities have to take place in order to achieve them.

APPENDIX: SOURCES OF INFORMATION IN THE STUDY

This study is a part of the Poverty Reduction and Environmental Management (PREM) research program (<http://www.prem-online.org/>). During our study we collected information from secondary sources, from individual interviews, from group discussions and from a household survey, we held during the fieldwork. The interviewees were informed agents: forest officials, a conservator, international donors, national and international NGOs, lawyers, students of history, councils of the elders, and landowners. Interviews were in some cases individual and in some other in the form of focused group discussions. Further information was collected from 400 household surveys in the Swat district and from meetings in villages. Households' information on economic and social conditions, and income dependence on natural resources. Village socio-economic profiles were drawn after the visits. The fieldwork took place between January and August 2005. A summary of the findings and the methodology applied in the project is available in Rafi Khan *et al.*, 2006 and an outline of the conceptual framework used in the analysis is available in Pellegrini and Kruseman, 2005.

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