

Fighting Deforestation In Swat Pakistan Through Realigning Property Rights, Education And Community Participation

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ABSTRACT

Swat is part of the high mountain Hindu-Kush Himalayan region of Pakistan, with diverse biophysical and socio-economic characteristics. The region is endowed with many fragile and fragmented ecosystems but land use and land cover changes have accelerated processes with irreversible effects on ecosystems. This paper aims to provide evidences of deforestation in the context of very disparate accounts on the state of forest resources in Pakistan, and suggests realigning property rights, education and community participation.

The temporal analysis of forest cover between 1968 and 2007 showed a drastic change in forest cover. In lowlands forest cover decreased by 36 % and in high elevations by 69%. Annual deforestation rates observed were 1.86% (scrub forest zone), 1.28% (agro-forest zone) and 0.80% (pine forest zone) in the respective areas of district Swat. This change in forest cover leads to destruction of ecosystems and associated livelihoods.

Results of household surveys and expert interviews showed that due to lack of education / environmental awareness, and lack of alternative income sources in district Swat have been mainly linked with the health and status of the overall forest ecosystems. Another important problem is the ambiguity in ownership of forest as well as rangelands and weak enforcement of statutory rules in the district.

A multi-sectoral approach is required which needs to work alternative income sources and enhancing agricultural productivity based on the conservation of traditional crop diversity and value addition to agric-products, education and environmental awareness, efficient and effective implementation of the state rules/laws governing the forest use and protection and to solve the property rights issues in the region.

KEYWORDS: Deforestation, land use change, property rights, Resilience, Institutional response, Swat, Pakistan.

INTRODUCTION

1. Instructions to Authors

The term land cover denotes the natural or artificial objects on the Earth's surface. It is closely related to land use, which refers to why and how people work the land and how vegetation and soils are affected during this process [1], [2]. The high mountain Hindu-Kush Himalaya (HKH) region shown in Map 1 is a region with diverse biophysical, ecological and socioeconomic characteristics [3].

The region is endowed with many fragile and fragmented ecosystems therefore complex land use and land cover changes are accelerated processes with irreversible effects on fragile ecosystem. Furthermore, a good part of the region is evolving from traditional self-subsistence economy to open economy with links to regional and global markets. Due to this change in the economy and due to its physical location the HKH region is described as a "hot spot" for land use and land cover change, where accelerated processes are occurring [4], [5], [6], [7].

Numerous drivers of change have been identified including population pressure, agriculture expansion commodity and timber prices, population growth, wage levels, improvement of accessibility and increase of linkages between high and low lands, tourism, opening to the external economies and global economic integration, change in life style and cultural patterns, external interventions in the form of development initiatives, and governmental policies or lack thereof [6], [7], [8], [9].

Forest depletion is serious environmental issue in HKH region and Pakistan. According to an estimate by the [10] 39 thousand hectares of forest are vanishing annually in Pakistan. Between the years 1981 and 1990 the deforestation rate was 0.6% annually [3, 8], while in the years 1990 to 2000 the deforestation rate in Pakistan was 1.5% annually [8]. A similar finding was provided by other researchers, who found in a field survey that 33% of the respondents observed a severe decrease in the forest cover area of District Swat in the years 2000 to 2005 [11].

Institutional roles are always important in land use and land cover change studies. Forest management, tenure system and rules and regulations and especially their enforcement is different in Swat now, than they were before 1970. Swat was a princely governed state and was merged into Pakistan in early 1970. The change in formal and informal institutions and policies may have had an impact on the land use change in Swat. Little investigation has been done so far and needs further work to reveal the impacts of this institutional change on land use change in Swat valley.

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To analyse causes and impacts of land-use changes especially deforestation is becoming increasingly more important [12], [13], [14], [15], [16], [17]. Keeping in view the importance of the issue, this paper focuses to investigate the relation of environmental education / awareness, socio-economic conditions and property rights of the people with the high rates of deforestation.

2. Introduction to Study Area

This study was carried out in district Swat (shown in Figure 1) which is part of the mountainous areas of the Khyber Pakhtunkhwa province and consist of many valleys with scrub and/or coniferous forests on the upper slopes and alpine pastures on the ridges. Swat can be divided into two regions, Swat-Kohistan and Swat Proper. Swat Kohistan is the mountainous area on the upper reaches of the Swat River up to Aien (name of an area). The southern is Swat proper, which can be further divided into: Bar Swat i.e., upper Swat and Kooz Swat i.e., lower Swat. Swat has a predominantly rural population. Pashtuns (mainly Yousafzai tribe), Kohistanis, Gujars and Pirachas inhabit the valley of Swat.

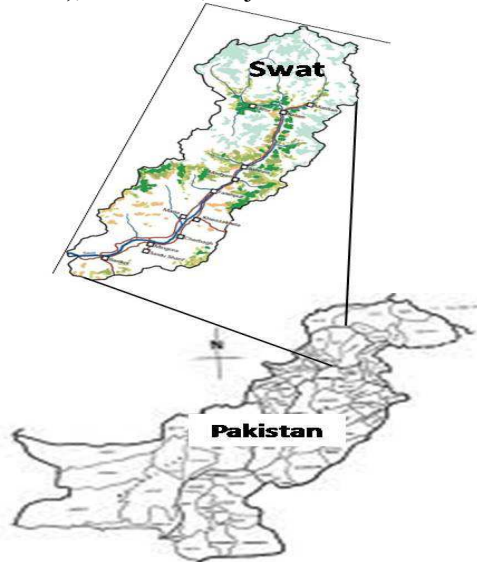


Figure 1. District Swat on Pakistan Map

The very important factor to be noted about study area is the major institutional changes. District Swat used to be a sovereign princely state until 1969, but then it was merged into Pakistan in 1970 [18], so institutional change has created gaps in ownership of the forest and other common land/property, which definitely need to be explored.

3. MATERIAL AND METHODS

For data on land use changes in district Swat, this study depends on the work of [19], where land use maps were developed from old aerial photographs (1968) and satellite images (1990, 2007) using remote sensing and GIS techniques.

A cross sectional and comparative static research design was used for data collection. This design was applied because the data collected was for two different time periods 1970 and 2005 and from different section / parts of the district. Different techniques like surveys, focus groups and workshops were conducted for data collection. Twenty household surveys in each village were conducted aiming at data regarding socioeconomic such as family size, education, land holding, number of farm animals, awareness regarding major environmental issues, total income and income from forest/agriculture, source of fuel wood, and accesses to forests. Qualitative data from expert interviews were analysed using content analysis and were developed into categories, themes and subsections to support the main factors e.g. conflicts in property rights. Open-ended questions from the household survey were categorized and grouped. The groups were then coded and analyzed for distinguishing the differences among zones for each factor.

4. RESULTS AND DISCUSSION

4.1. Major Land Use Changes.

Land use and cover changes in Swat, over forty years, showed drastic changes in all the three zones; namely Kalam, Malamjaba and Barikot areas [19]. In Kalam, and Malamjaba and Barikot region the forest decreased by 30.5 % and 49.7 % respectively, whereas in Barikot, the agro-scrub forest zone, forest cover decreased from 32.7% to 9.5%, between 1968 and 2007

4.2. Fuel Wood Extraction.

Firewood from the natural forest is the only source of energy for cooking and heating in the study area. The weather conditions in the three zones are different from each other and therefore annual firewood consumption for heating and cooking per household is significantly different in the three zones. Due to harsh weather conditions in Kalam region, the majority (49%) of households use up to 20 tons of firewood and another 45% of households burn up to 30 tonnes of

firewood annually, while in 'Barikot' almost all households (88%) consume less than 10 tonnes of firewood per annum. Our results are in line with [12], [14], [20] and [21].

4.3. Timber Extraction.

Forest in Malamjaba and Barikot has already been almost finished and the very little forest left has been categorized as protected forests. Thus the locals are not allowed to use this forest for timber extraction. But interviews with experts and households revealed that many trees are cut down illegally both for timber and firewood. The proximity of these forests to big urban centres makes them more vulnerable and the 'Timber Mafia' is comparatively more active in Malamjab as per the expert's information. Similar results were reported by [12] and [22]

4.4. Literacy and School Enrolment.

For the purpose of this study literacy has been defined as the ability to read and write. Here, Pukhtun law and the absence of girls' schools might be the reasons for a surprisingly low literacy rate among women in all the three regions. The highest literacy ratio was observed in Barikot region but even in this area women are far behind in regard to. Our data about education seconds the official national average, which is 55% for men and 32% for women. Regional differences in school enrolment of children between 5 and 18 years are less obvious, yet again reflecting the huge gap between male and female education: whereas boys' enrolment rate is above 80% in all three villages, the girls' rate is above 50%. In the three regions, eighty percent of the respondents said that local school facilities have been improved in many ways. Other researchers who have worked in similar research areas have reported a gradual increase in literacy ratio [23] and [24].

4.5. Natural Assess and Access Right to the Land

As most of the households in the study area are involved in agriculture, therefore this section focuses first on land access. Subsequently, access to forest resources will be discussed.

4.5.1. Land Access and Tenure.

Our data shows that, more than 80% households in Kalam are involved in farming, which basically is the dense forest zone of the district. Similarly adjacent to it is Malamjaba region where 95% household interviewed were engaged in Agriculture. In both the zones, the majorities of farming households were having very little land and were actually cultivating land on lease (i.e., owner cum tenants). Tenancy is very common; in Kalam and Malamjaba zone, however there were very few pure tenant farmers. An important thing to note here is that many people do call themselves landowners but do not have an official proof for it, and it is very true especially about land adjacent to forests. Some experts in their interview mentioned that in both the regions such agricultural lands and farming is providing an access to forest land and encroachment as well. In Barikot zone, however, things are different. Only 61% of all households have access to land, out of which 94% are involved in farming. 42% of all households are not farming at all, thus indicating the importance of other occupations and sources of income in the lowland. In terms of farming households, Kalam and Malamjaba are quite close to the provincial average, which lies at 83% owners, 6% owner cum tenants, and 11% tenant farms. Access rights have been one of the major cause for deforestation and land use changes, which has been repeatedly reported by many authors in Hindu Kush Himalayas, e.g., [25], [26], [27], [28] and [29].

5. Conclusion and Recommendations

It is Based on data collected and interviews conducted we recommend that small credit schemes may be introduced for farmers of mountain areas. Alternative energy resources like electricity, kerosene oil and liquid petroleum gas may be subsidized for people living in remote valleys for minimizing use of expensive wood for fuel purposes. The government may also promote coordination among the institutions involved in conservation of biodiversity at federal and provincial levels and integrate sustainable mountains development into the Perspective Plans, Five Year Plans and Annual Development Programmes, and into relevant sectoral plans, particularly those for wildlife, forestry, fisheries and agriculture. There is also a need to establish Sustainable Mountain Planning wing. Professionals including engineers, town planners, professors and consultants should be inducted as members and participation of participation from government bureaucrats. We also recommend that local government laws should be amended to provide for greater community level participation in activities supporting sustainable mountain development. The laws relating to communal ownership and access to sensitive ecosystems like water towers and water sheds should be reviewed and revised so as to protect and encourage customary natural resource management systems. Apart from that improve the effectiveness of existing legal mechanisms by creating greater awareness of regulations and enhancing the capacity of law enforcement agencies. This will only work if environmental awareness and environmental education is provided at all levels. The communities living in the region must be educated about the importance of forest cover for sustainable ecosystem.

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