

Chapter 15

Land Tenure and Poverty: Status and Trends Land Systems in the Hills and Mountains of Nepal

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15.1 Introduction

Land and land-based resources are inextricably linked with the livelihood of the Nepalese people. Nearly 90% of them still pursue agriculture and related land-based activities and reside in rural areas. Thus, ownership and access to these resources have an overwhelming influence on the well-being of the vast majority of the population. Historically, they also determine the economic and social status of the people.

The present paper attempts to:

- describe the prevalent land systems, their distribution, and tenure-related issues;
- discuss the extent of linkage between access to land and the people's livelihood in the present context of Nepal; and
- draw implications from the existing land system and entitlement structure about poverty, sustainable economic growth, and natural resource management.

The paper begins with a description of land systems and land-use patterns. In Section 2 it discusses land tenure related issues. Section 3 attempts to relate the land system

and land use with the issues of poverty and environment and reviews past policies in this respect. The last Section outlines a strategy for reforms in the land system with the purpose of improvement in land use for poverty alleviation and environmental conservation.

Land systems

The land system of Nepal is probably unique because of its extreme variability with respect to topography, soils, and climate. The altitudinal and agro-ecological diversities across narrow stretches of geographical territory pose a challenge to attempts to identify and adopt an adequate system of classifying land units. Yet, attempts have been made in the past to develop a scientific system of land classification based on altitude, landscape, soils, and climate (e.g., Nelson 1980; Chapagain 1984; LRMP 1986; Carson 1991; and Carson and Sharma 1992; Chapagain et al. 1998). By and large these classifications are either in terms of physiography, in terms of land capability, or in terms of current uses.

Physiographically, the land area of Nepal is divided into five major regions: the 'Terai', Siwaliks, Middle Mountains, High Mountains, and High Himal. They represent well-defined geographic areas with distinct bedrock geology, geomorphology, and climatic and hydrological characteristics. Soils and land units within these regions are significantly different from each other. Table 15.1 lists the areas occupied by the different physiographic regions within each Development Region¹. The major characteristics of these physiographic regions are provided in Annex Table 15.1.

The most common land classification is the division of the country into the Terai, hill, and mountain regions. Because of its simplicity, this system is widely adopted to classify districts with similar characteristics. But, in many instances, the demarcations are not very clear, and regional units are not homogeneous, particularly in the hills and mountains. Within a given hill or mountain district, one can observe the occurrence of deep, incised, and low altitude valleys together with steep side slopes and high altitude pastures. For instance, districts like Gorkha and Dhading are commonly grouped as hill districts, whereas considerable proportions of these districts actually lie in the High Himal physiographic region. Similarly, Chitwan and Dang districts are classified as Terai although they belong to the Siwalik physiographic region.

These physiographic regions are further divided into relatively homogeneous land systems on the basis of landforms, geology, slope, and arable areas. Each land system may have several land units. Altogether 17 land systems have been identified that are broken down further into 46 different land units. They are summarised in Annex Table 15.2.

¹ For the purpose of development planning and administration the country is divided into five development regions from east to west.

Table 15.1: Distribution of the total land area of Nepal by physiographic region ('000 ha)

Physiographic Regions	Development Regions					
	Eastern	Central	Western	Mid-Western	Far-Western	Nepal
High Himal	470.5 (16.5)	224.3 (8.2)	882.9 (30.0)	1502.5 (35.1)	269.0 (13.8)	3349.2 (22.7)
High Mountain	531.1 (18.6)	366.9 (13.4)	489.8 (16.7)	1147.5 (26.8)	424.0 (21.8)	2959.3 (20.1)
Middle Mountain	980.9 (34.4)	931.2 (34.1)	1011.8 (34.5)	803.3 (18.8)	716.4 (36.8)	4443.6 (30.1)
Siwalik	251.2 (8.8)	629.6 (23.0)	237.2 (8.1)	570.2 (13.3)	197.5 (10.2)	1885.7 (12.8)
Terai	620.4 (21.7)	582.1 (21.3)	313.8 (10.7)	256.7 (6.0)	337.4 (17.4)	2110.4 (14.3)
Total	2854.1 (100.0)	2734.1 (100.0)	2935.5 (100.0)	4280.2 (100.0)	1944.3 (100.0)	14748.2 (100.0)

Note: Figures in parentheses represent percentages.

Source: LRMP 1986

Table 15.2: Major land uses of Nepal

Area in '000 ha

Physiographic Regions	Land Uses						
	Agriculture			Grazing	Forest	Others	Total
	Cultivated	Non-Cultivated*	Total				
High Himal	8 (0.2)	2 (0.06)	10 (0.3)	884 (26.0)	221 (6.6)	2234 (67.0)	3349
High Mountains	245 (8.1)	147 (5.0)	392 (13.2)	510 (17.2)	1813 (61.2)	245 (8.3)	2960
Middle Mountains	1222 (27.5)	665 (15.0)	1887 (42.5)	293 (6.6)	2202 (49.6)	61 (1.4)	4443
Siwaliks	259 (13.7)	55 (2.9)	314 (16.6)	21 (1.1)	1477 (78.3)	74 (3.9)	1886
Terai	1234 (58.5)	117 (5.5)	1351 (64.0)	50 (2.4)	593 (28.1)	116 (5.5)	2110
Total	2968 (20.1)	986 (6.7)	3854 (26.8)	1758 (11.9)	6306 (42.8)	2730 (18.5)	14748

Note: * These are non-cultivated inclusions within the mapped agricultural land.

Figures in parentheses represent percentages.

Source: LRMP 1986

In terms of capability, six different land classes (I through VI) are defined. The landscape and climate under Classes I, II and III are suited to agricultural cropping and are separated from each other on the basis of slope. Due to the limitations imposed by slope, Class III land can be cultivated only by means of terracing. The upper limit of cultivation with terracing is considered to be 30 degrees. Class IV land is too steep or too cold to support agricultural cropping, but supports productive forest suited for exploitation. Class V land is either too cold for natural forest or is geomorphologically unstable, but it supports vegetation suited for grazing. Class VI land is too steep and too unstable to support normal forest use and is very sensitive and liable to degrade rapidly even with very slight disturbances (Sharma 1995).

According to the third criterion of land classification based on current use, the common land use types are agriculture, forest, grazing, and others (Neild 1986). The extent of these land uses juxtaposed with the physiographic regions is summarised in Table 15.2. It shows that nearly 27% of the total land area of the country is under agriculture, of which about 7% is non-cultivated; about 12% under grazing; 43% under forest; and about 19% under other land uses such as snow, ice, and rock outcrops.

Agriculture

It is evident from Table 15.2 that, of the total agricultural land in the country, the Terai possesses the largest proportion (64%). It is closely followed by the Middle Mountains with nearly 43% of its land under agriculture. The Siwalik is geomorphologically the most fragile physiographic region with 17% of its land under agriculture.

About 13% of the land area of the High Mountains is under agriculture. Cropping patterns, cropping intensity, and productivity in this physiographic region is limited by temperature, particularly at higher altitudes. A very insignificant part (0.2%) of the High Himal physiographic region is under agriculture.

The existing production systems, as summarised in Annex I, consist of irrigated rice cultivation on lowlands ('khet'), rainfed cultivation on uplands ('pakho' or 'bari'), livestock raising, and forestry. All these production systems are found all across the country with varying degrees of intensity. In the hills and mountains, rainfed agriculture and livestock raising predominate.

Agriculture is by far the largest sector of the Nepalese economy and contributes 40.5% to the total GDP (1995/96) (MOF 1998) and 81.2% to the employment of the 'economically active' population (CBS 1994). About twenty years ago, these proportions were 71.6% to the GDP (1974/75), 94.4% to employment (1971), and 82.5% to export earnings (1974/75).

In the early 1960s, the per hectare yields of Nepal's major crops, such as paddy, wheat and sugar cane, were significantly higher than those of other South Asian countries. Presently, Nepal's yield rates from these crops fall far short of those realised by other countries (APROSC and JMA 1995). In other words, with the successful

introduction of the green revolution technologies beginning in the late 1960s, Nepal's neighbouring countries have made long strides in raising their agricultural productivity while Nepal has largely been bypassed by these changes. Consequently, with the initial impetus provided by rapid agricultural growth, those countries have been able to sustain respectable overall economic growth.

In recent years (1984/85-1996/97), Nepal's GDP in real terms has grown at an annual rate of slightly above five per cent (Chapagain 1999). In contrast, agricultural GDP during the same period grew only by three per cent. These growth rates were still lower during the period from 1974/75-1983/84. These trends, when compared to the annual population growth of about 2.5%, present quite a disturbing picture.

The production of the two principal food crops (paddy and maize) over the period from 1974/75-1996/97 grew nationally by less than 0.5% per year, with negative to near zero growth in the mountains and hills. These alarming trends for paddy and maize were to some extent compensated for by the rather encouraging growths in wheat and potatoes (Chapagain 1999).

The rather insignificant three per cent growth in the country's predominant economic sector employing more than 80% of the economically active population and contributing more than two-fifths (42%) to the gross domestic product is quite inadequate to meet the country's growing food demands and to trigger a process of overall economic transformation.

It is also noteworthy that the proportion of the economically active population depending on agriculture has fallen by about 13% in the past two decades, from 94% in 1971 to 81% in 1991. On the other hand, the share of this sector in the GDP has dropped more sharply, from around 72% in 1974/75 to 41% in 1995/96. These disproportionate drops in the sector's share in the total employment and income indicate declining productivity within the sector.

Forests

Historically, the policy adopted by the rulers with respect to forestry, particularly in the Terai, was to export more timber to British India and to supply wood and wealth to the ruling families and their supporters. The Rana regime (1846-1951) distributed almost one third of the forests to various Rana families and others in the form of 'birta' and 'jagir' tenure².

² According to Regmi (1978), 'birta' was a grant of land given to a noble as a reward for service rendered to the state. This led to the emergence of birta land tenure. It was usually both tax free and inheritable, and had no set time limit. It was valid until it was recalled or confiscated. Jagir was also a grant of land given to government employees (civil or military) in lieu of salary. This led to the emergence of jagir land tenure. The jagir land grant was also tax free but remained valid only as long as the person concerned served the government. Rakam was a compulsory labour obligation which a farmer rendered to the government and later also to the birta owners on a regular and inheritable basis.

No specific policies were followed. In the case of the hills and mountains, forests did not offer similar economic attractions to those in the Terai. Throughout most of the hills and mountains, indigenous forest management systems prevailed.

In 1957, all privately owned forests under the 'birta'³ and 'jagir' systems were nationalised through the Private Forest Nationalisation Act. This act was intended to revert much of the Terai forests to state control and in the process weaken the power of the landed gentry established before 1951: it is also blamed for the massive deforestation in the hills and mountains, as the owners swiftly converted the privately-owned forest patches into agricultural land.

The Sixth Plan (1981-85) introduced the principle of people's participation in the management, conservation, and use of forest resources (NPC 1985,1992). The Decentralisation Act of 1987 introduced the concept of 'user groups' for local control and administration of policies. The preparation of the Master Plan for the Forestry Sector Nepal (MPFS), which started in 1986 and finished in 1988 and was later revised in 1990, provided the policy context for community forestry, declaring that all accessible forests in the hills should be handed over to community control (HMG/N 1988). Unlike the past policies, which concentrated forestry activities in the Terai and urban areas, the new policy document emphasised the basic needs of forest users and production of forest products in the hills. In 1989, a proposal for forestry legislation reform in Nepal was prepared and this was enacted in 1993. The Forest Act 1993 recognises the Forest User Group as an independent and autonomous non-government institution. The subsequent Forest Regulations 1995 give clear guidelines about how to create and recognise user groups' rights and responsibilities to manage the forest and use forest products (HMG/N 1995).

The MPFS attracted considerable donor assistance in the sector. Despite this, over a 10-year period only 450,523 ha of national forest, which is only 8.1% of the total forest area, have been handed over to 6,730 Forest User Groups (Table 15.3). Similarly, 1,936 ha of national forest are placed under active management representing 0.3% of the potential state-managed forest. A negligible area (299 ha) has been handed over as leasehold forest (CPFD 1998). With this pace of progress, it will take about 20-30 years to hand over all the potential community forests in the country (Pokharel 1998).

Grazing

Grazing is the dominant land-use type (next to the 'other' category which includes rock and ice) of the High Himal physiographic region. A significant proportion (17%) of the High Mountains and some seven per cent of the Middle Mountains is occupied by grazing land. At the country level, 1,758,000 ha, or about 12% of the land area of Nepal, are used as grazing land. Purely grazing lands occur in quite insignificant proportions in the Terai and Siwalik regions.

³ Birta is a land grant made by the state to individuals, usually on a tax free and inheritable basis.

Table 15.3: Forests handed over to CFUGs up to May 1996

Year	Number of Forests	Area (Ha)	Number of CF User Households
1987/88	3	79.80	398
1988/89	34	518.84	2,732
1989/90	29	1,916.48	5,356
1990/91	54	1,949.99	5,189
1991/92	354	1991.89	37,506
1992/93	634	3,592.14	73,303
1993/94	950	63,308.43	99,249
1994/95	1,390	98,530.91	141,159
1995/1996	325	26,983.28	39,255
Not mentioned	1,583	116,446.99	181,531
Total	5,356	362,551.50	585,658

Total Forest Area of Nepal: 5.5 million ha

Potential CF area: 3.355 million ha (61% of the total forest area)

Per cent of potential CF already handed over: 11 (362,551.5 ha)

Source: DOF 1997

Most of the grazing lands, particularly those in the Middle Mountains, are suffering from different degrees of degradation. Many studies report that, as a result of poor management and high livestock population pressure, the grazing lands are susceptible to degradation. Productivity of open grasslands and forests in the mid-hills is observed to be quite low, whereas the stocking rate is several times higher than the carrying capacity (Wyatt-Smith 1982). Livestock population per unit area in the hills and mountains of Nepal is reported to be the highest in the world, with 10 livestock per family in the mid-hills and 15 in the high hills (Chitrakar 1990).

15.2 Land Tenure

Historical background

Land and land-based resources have been the principal source of the economic surplus generated by the ruling classes. Concentration of land in the hands of a few elite and severe exploitation of the peasantry through the excessive expropriation of labour and land revenue have been the principal policies of the rulers through much of the nation's history (See Regmi 1971, 1978 for further details).

Following the overthrow of the Rana Regime in 1951, a number of interventions were initiated by the state to reform land tenure. Significant among them were:

- formation of the Land Reform Commission in 1953,
- promulgation of the thirteen-point programme in 1956,
- preparation of a Land and Cultivators' Records' Act 1954,
- the Lands' Act 1955,

- abolition of Birta Land Act 1957, and
- the Agriculture (New Provisions) Act 1960.

All of these measures were ineffective for the most part since the government was not serious about genuine reform. The overwhelming concern was to perpetuate the status quo that safeguarded the interests of the privileged classes.

The Lands' Act of 1964 was the most comprehensive of all the past measures.

- It fixed ceilings on landholdings of 25 'bigha' (16.93 ha) in the Terai and inner Terai, 80 'ropani' (4.07 ha) in the hills and mountains, and 50 'ropani' (2.54 ha) in the Kathmandu Valley.
- It protected the rights of the tenant.
- It fixed rents at 50% of the principal crop grown in a year.
- It abolished the 'birta' system.
- It introduced a compulsory savings' scheme to generate capital for investment in the rural areas.

The Act, initially implemented in 16 districts, covered the entire country by 1966. Landowners were informed well ahead of time when the Act would be effective. The prior information and phase-wise implementation of the Act allowed ample time for big landowners to redistribute surplus land above the ceiling among their near and distant relatives, or otherwise conceal their actual possessions. In retrospect, it could be said that the state allowed this in order to protect the interests of the landed gentry, while at the same time trying to project a populist image of a regime concerned about the welfare of the majority of poor landless households, small holders, and tenants who depended on big landowners.

The objective of redistributing land among the landless and smallholder peasant farmers appeared noble on the surface. Yet, because of the the above-mentioned reasons, the state was able to identify and redistribute only 1.5% (29,124 hectares) of the total agricultural land. This appears to be an insignificant achievement in view of the fact that about one-fourth of the farmers at that time were pure or mixed tenants.

Safeguarding the rights of the tenant was ensured through provisions for protection against eviction, entitlement to one-fourth of the rented land area or the equivalent value in money to the legally registered tenant and redressal of grievances in a court of law. Fixation of rent at 50% of the principal crop was also established for this very purpose. On the other hand, the Act created a situation of 'dual ownership' of land, in that both the land owner and the tenant could now lay claim to the same piece of land, albeit in different proportions.

One of the distinguishing characteristics of the Lands' Act 1964 was the compulsory savings' scheme. The scheme required all farmers to deposit a portion of their produce

in kind⁴ as savings with the local ward committee. Later, they were allowed to deposit cash equivalents instead of in-kind payment. The resources thus generated were to be used for loans to the members participating to undertake various income-generating activities. The scheme was to mature in five years, after which the farmers were promised full return for their deposits along with an annual five per cent interest. However, massive irregularities and misappropriations soon began to emerge in the scheme. Thus, a scheme that could have gone a long way towards transforming the traditional rural economy of Nepal through internal resource mobilisation was abused, and it collapsed prematurely.

Current status of land tenure in Nepal

The currently prevailing tenure types are 'raikar' and 'guthi', and the government has begun to convert 'guthi' lands into 'raikar', except for certain types of 'guthi' such as 'raj guthi'.

Ownership and distribution

In Nepal, more than two-thirds of the total holdings have less than one hectare of land, and they account for only 30% of the total farm area. On the other hand, 1.5% of the holdings in the more than five -hectare holding class cover 14% of the total farm area (Table 15.4).

Table 15.4: Land distribution by farm size in Nepal, 1991

Size of Holdings	Holdings		Total Area	
	Number	%	Hectares	%
No Land	32,109	1.2	1,571	0.1
Holdings with Land	2,703,941	98.8	2,597,400	99.9
Below 1 Ha	1,877,702	68.6	791,883	30.5
1-2 Ha	529,467	19.4	716,533	27.6
2-3 Ha	168,449	6.2	400,227	15.4
3-5 Ha	88,165	3.2	328,089	12.6
5 Ha and Above	40,158	1.5	360,669	13.9

Source: CBS 1994.

A regional analysis of land distribution indicates that the proportion of landless holdings is higher in the Terai than in the hills and mountains. Three-fifths of the holdings in the hills and mountains own less than half of the total land, whereas 41% of the holdings in the Terai own a little more than half of the total land (Table 15.5).

⁴ The amounts are 1.5 maunds (55.99 kg) per owner cultivator, 1 maund (37.32 kg) per land owner renting out land, and 0.5 of a maund (18.66 kg) per tenant in the case of the Terai; and 6 mana (1.83 kg of paddy and 2.55 kg of maize), 4 mana (1.22 kg of paddy and 1.70 kg of maize), and 2 mana (0.61 kg of paddy and 0.85 kg of maize), respectively, in the hills.

Table 15.5: Per cent distribution of farm holdings and area by ecological region, 1991

Size of Holdings	Ecological Regions					
	Mountains		Hills		Terai	
	Holdings	Area	Holdings	Area	Holdings	Area
Landless	0.30	-	0.2	0.04	0.9	-
Below 1 ha	7.80	3.5	37.8	17.00	23.0	10.0
1-2 ha	1.30	1.8	8.6	12.20	9.4	13.5
2-3 ha	0.20	0.6	1.9	4.80	4.0	10.0
3-5 ha	0.10	0.4	0.8	3.10	2.3	9.1
5 ha and above	0.05	0.5	0.3	3.10	1.2	10.3
TOTAL	9.75	6.8	49.6	40.24	40.8	52.9

Number of total holdings: 2,736,056

Total area of holdings (hectares): 2,598,971

Source: CBS 1994

Interventions to facilitate access to land are among the options available for addressing the equity issue. Indeed, land redistribution and regulation of tenancy contracts are favoured on both equity and efficiency grounds. Analysis of the 1991 Sample Census of Agriculture data reveals that cropping intensity, a proxy for agricultural productivity, decreases with increase in the size of holding per household (Chapagain 1999). Thus redistribution of land has the potential to increase output and equity, hence the case for more equal distribution of land.

Tenancy

Table 15.6 presents information about the land tenancy situation in Nepal. Details are provided for three holding categories: (a) holdings of cultivated, rented land only; (b) holdings engaged in more than one tenure arrangement (mixed tenure); and (c) rented area as a percentage of the total area of holding. About two per cent of the total farm holdings are those of pure tenants who do not have their own land. The proportion of such holdings varies across the ecological belts. It is 1.1 and 1.2%, respectively, in the mountains and hills, while 2.7% of the holdings in the Terai are of this type.

The bulk of the holdings operate under mixed tenurial arrangements supplementing their own holdings with land obtained through tenancy arrangements (Table 15.6). About 15% of the total holdings are of the mixed tenancy type. Again, the incidence is much higher in the Terai where almost one-fifth of the total landholders are mixed tenants. In terms of area, land under tenancy (both pure and mixed) constitutes about 10% of the total farmland in Nepal. Across the ecological belts, 13% of the land in the Terai and about 5% of land in the hills and mountains is under tenancy.

However, the actual incidence of tenancy is widely believed to be much higher when the presence of informal and non-registered tenants is considered. Because of the

Table 15.6: Structure of tenancy, 1991

Regions	Pure Tenants as % of Total Holdings	Mixed Tenants as % of Total Holdings	Area Rented as % of Total Land
Nepal	1.9	14.9	9.3
Mountains	1.1	12.0	5.8
Hills	1.2	11.8	4.6
Terai	2.7	18.8	12.9

Source: CBS 1994

slackness in implementation of existing legal provisions, landowners have managed to continue engaging tenants on an informal basis in order to maintain their full claim on the land owned by them. The situation is made more complex with the easy access to cultivators from across the country's southern border. Since land can not be legally owned nor rented by non-citizens, landowners, particularly in the Terai, find it more convenient to engage the easily available, Indian wage labourers and cultivators.

Fragmentation

Land fragmentation is considered to be one of the structural problems inhibiting agricultural modernisation. Because of the scattered nature of farm parcels and, in many instances, as a result of their economically non-viable size, farmers are hindered from adopting productivity enhancing technologies that are otherwise readily available for them. The case of shallow tubewells is one example. If a farmer has a piece of land just enough to irrigate with a shallow tubewell, he/she will consider installing such a tubewell. However, if that land is fragmented into four parcels and situated in four different places, the prospect will not be so attractive. This is exactly the situation at present. Land fragmentation has its roots in the traditional Hindu law of succession whereby all male offspring are entitled to parental property, including land.

Information on the extent of fragmentation by ecological region is presented in Table 15.7. It is interesting to note that the average number of parcels into which a hectare of land is divided is the highest in the mountains, followed by the hills. In the mountains, it is more than twice (6.8) and significantly higher (5.1) in the hills than in the Terai (3.1).

The combination of the existing legal provisions for inheritance and the present land ceilings imply increasing fragmentation and subdivision of landholdings as the society moves from one generation to the other.

Table 15.7: Land fragmentation, 1991

Regions	Average Parcels per Farm	Number of Parcels per Hectare
Nepal	3.96	4.2
Mountains	4.63	6.8
Hills	3.92	5.1
Terai	3.85	3.1

Source: CBS 1994

In 1995, the government formed a 'High Level Land Reform Commission' in order to study thoroughly the land issues and suggest corrective measures to the government. However, no follow-up action was taken by successive governments.

Landlessness and forest encroachment

There is an ongoing argument between the Departments of Agriculture and Forestry regarding what constitutes forest and agricultural areas. Encroachment of forests for crop production was in fact encouraged in the past in order to raise land revenue. This encouraged hill dwellers for whom land is scarce to migrate to the Terai and settle there by clearing patches of forest land. Thus, the Terai forest acted as a new frontier for the hill people. However, this frontier closed some time around the 1970s, but the problem of the landless encroaching on the forest continues to this day, albeit on a reduced scale. The policy on illegal encroachment is not strong. Quite often, the squatters are moved and driven away by the government authorities. But at other times they are encouraged by the politicians in that particular area to break the law and stay in the forest area. They are also promised land-ownership rights. This has long lasting socioeconomic and political implications. Such illegal settlements encourage other local residents to occupy such land illegally and register it later. If these families are provided with some assistance from the government on humanitarian grounds, the neighbours become dissatisfied with the government, as they would also claim for all their unmet demands. There may be inter-ethnic/community conflict and clashes. Politicians were found to be motivated to lure such settlers and increase deforestation. This has been found to be the case, particularly during election periods. Needless to say, such practices have serious environmental consequences.

15.3 Poverty

Available estimates put poverty incidence anywhere between 42 and 70% (World Bank 1991). The incidence of poverty is most severe in the mountains, with 56% of this region's population categorised as poor and ultra poor (Table 15.8). The ultra poor comprise more than a quarter (26.7%) of this region's population, and this proportion is nearly twice as high as in the Terai. It is also noteworthy that the incidence of poverty is nearly twice as high in the rural areas as in the urban areas. In view of the fact that nearly 90% of the population is rural, the poverty scenario in the country is grim.

The deteriorating environmental situation in the country is often associated with the massive poverty. The poor are regarded as the main users of the country's

Table 15.8: Poverty incidence in Nepal

Geographic Regions	Poverty Incidence in Per Cent		
	Total	Poor	Ultra Poor
Himal	56.0	29.3	26.7
Hills	41.0	21.3	19.7
Terai	42.0	28.7	13.3
Urban areas	23.0	13.2	9.8
Rural areas	44.0	26.4	17.6
National average	42.0	24.9	17.1

Source: NPC 1998

depleting natural resources, mainly land and forests, beyond the regenerating capacity of these resources, thus contributing to their rapid depletion and deterioration. As more than 90% of the energy consumption is met by fuelwood, this is regarded as the principal cause of deforestation.

Current policies

The current Ninth (five-year) Plan (NPC 1998) focuses on poverty alleviation as its principal goal. The plan proposes the following strategy for poverty alleviation: (i) realisation of a high growth rate in the economy and orientation of all sectoral programmes towards achieving the poverty alleviation objective, with agriculture playing the lead role; (ii) provision of essential social services such as primary health care, education, and drinking water for the deprived, remotely located, and weaker sections of the population; (iii) special focus on equitable distribution of the fruits of development; (iv) of the two categories of the poor, the 'poor' will be benefited through their integration in the open market system by raising their employment opportunities and incomes, while the 'ultra poor' will be assisted by local-level banking services, emphasising the deprived sections and poor women; (v) programmes to directly benefit the rural poor will be comprised of agriculture, agro-industries, agricultural marketing, rural tourism, and development of rural infrastructure; and (vi) expansion of employment and income opportunities through extended provision of skill training and micro-credit.

The Plan proposes to launch targeted programmes for the following target groups: inaccessible remote areas that have no road access; neglected ethnic communities and deprived people; other sections of the population that are socially and otherwise vulnerable; landless rural families; small landholders; special target groups such as the 'kamaiyas'; and the poor and unemployed people in urban areas.

Poverty and the environment

Nepal's environmental problems basically originate from stagnant agriculture over a protracted period of about three decades, accompanied by a high population growth rate. The recently prepared Agricultural Perspective Plan (APP) (APROSC and JMA 1995) shows that, in recent years, the country's agriculture has been growing at around 3%, while the population has grown by 2.5%. This rather insignificant growth in the country's predominant economic sector is quite inadequate to absorb the nearly 250,000 new entrants to the labour force each year and to meet the country's growing food demands.

The failure to achieve a reasonable and sustained growth rate in the agricultural sector has meant that farmers and landless labourers in the rural areas have to continuously expand cultivation on to the economically less productive and environmentally fragile lands that otherwise would remain under some kind of permanent vegetation. It has also meant that farm sizes have continuously been fragmented, and there is less food available per household and this has adversely affected their food security.

Expansion of cultivation on to ecologically sensitive uplands has led to accelerated erosion of productive soils, undermining the productivity of farm land, and increased sedimentation in downstream areas.

In view of the fact that around 90% of the population reside in the rural areas where the primary occupation is agriculture and related activities and, since practically no growth is occurring in those areas, it is not surprising that the problem of growing poverty and worsening environmental health have become mutually reinforcing.

In the absence of broad-based rural economic transformation, a few urban enclaves provide the only alternative economic opportunities outside the rural areas. Such opportunities are extremely limited to some industrial establishments and the service sector. Such a one-way pull of the urban centres grossly exacerbates the already overstretched capacity of the cities to provide the basic physical facilities (space, dwellings, drinking water, sewerage, power, communication, and other basic utilities). What is more, increased scarcity of such facilities and amenities raises their prices, and this hurts the poor and low income groups the most.

Food production and the environment

As stated earlier, the major environmental concerns in the context of Nepal arise from the increasing pressure exerted on the country's natural resource base as a consequence of the largely subsistence-based agriculture and the growing need for cereals. Food production is the largest user of renewable natural resources in South Asia today (Gill 1995), and it is definitely so in the case of Nepal. Land, forests, pasture, fresh water, and genetic materials prevalent among these resources constitute the principal means of producing, in the traditional mode, food and other basic minimum requirements to ensure human survival. It is these resources that constitute the most prominent components of the environment.

Past policies and their impacts

Nepal's agricultural development strategy has historically emphasised the promotion of the so-called improved farming practices, dominated by the promotion of high-yielding varieties of crops, cross-bred livestock, chemical fertiliser, and irrigation. The seed-fertiliser technology suitable for irrigated flat lands has also been pushed to the hills and mountains where the fragile ecological conditions and resource endowments are quite different. Crop-dominated farming systems have not proven effective in these areas in terms of both increased food production and soil fertility maintenance. Crop yields have declined consistently over time, threatening the food security of small landholders and marginalised farmers particularly. These trends have a direct relationship to the deteriorating fertility of soil (Shrestha and Katwal 1992, EPC 1993). Intensive cultivation and insufficient application of nutrients to the soil have led to situations in which farmers are forced to completely abandon their land because of the extremely low yields.

On the other hand, work carried out at the British-supported Lumle Agricultural Centre (LAC) in the western hills demonstrates that significant progress was possible with respect to vegetable seed production, rice production, and cattle and buffalo rearing on a sustainable basis when the research and extension system properly integrated five key elements, namely, a strong institutional foundation, a comprehensive understanding of farmers' conditions, the participation of farmers in all stages of research and dissemination, the interdisciplinary interaction of all sections of LAC, and the synergistic effect of having research, extension, and training in one organisation (Pound et al. 1992). Similar experiences are reported from the Pakhribas Agricultural Centre in the Eastern Hills (Chand and Thapa 1992).

All periodic plans, strategic documents, and action plans invariably emphasised the need for giving high priority to soil fertility maintenance, particularly in the hills and mountains. However, the continuously declining crop yields and ever-worsening process of land degradation indicate that these policies have failed.

Major indicators of unsustainability and declining trends in Nepal's hill and mountain agriculture are summarised in Table 15.9.

Partap and Watson (1994) elaborate upon the important contributing factors and issues among the range of causes and symptoms of decline. The two critical problems commonly faced by the mountain farmers, in general, and Nepalese farmers in particular are degradation of land and the extent of land degradation. The area of degraded lands in Nepal is estimated to be 1.8 million hectares. Similarly, estimates of the magnitude of soil erosion from the hill and mountain areas of Nepal are compiled from various sources and presented in Table 15.10.

A study conducted by Banskota (in Jodha et al. 1992), cited in Partap and Watson (1994) indicates that the total amount of nitrogen lost from level terraces (365,000ha) and sloping farmlands (816,00ha) is about 27,000 metric tonnes, whereas the total amount of nitrogen fertiliser used in 1987/88 was only 24,320 metric tonnes. The total loss of combined nutrients exceeded the level of inputs used in 1987/88.

The value of nutrient loss has been estimated at over six million rupees for paddy and over 54 million rupees for maize at 1987/88 market prices. The implications in terms of equivalent cereal losses are even more significant. Overall the losses were equivalent to about 75,000 tonnes of paddy and 747,000 tonnes of maize. These big losses indicate the difficulties experienced in sustaining food production when soil fertility is deteriorating rapidly.

Declining crop yields

Farmland productivity in upland areas measured in crop yields has either remained steady or declined (Partap and Watson 1994). For instance, average crop yields declined in the range of from 5 to 30% during the past few decades in a number of mountain watersheds in Nepal, along with the Indian Himalayas, and the Tibetan Autonomous Region of China.

**Table 15.9: Indicators of unsustainability/decline in hill and mountain agriculture
(Time frame: approximately four decades spanning the period from 1954-91)**

Indicators		Rates of Change		Indicators	Rates of Change
S.N.	I. RESOURCE BASE		S.N.	II. PRODUCTIVE FLOW	
1.	Landslides	100-300%	18.	Fall in average crop yields on sloping lands: (a) maize and wheat, (b) millet	(a) 9-15% (b) 10-72%
2.	Gully formation on sloping lands	High-Medium	19.	New land under cultivation	5-15%
3.	Soil erosion rates on sloping lands	20-30%	20.	Human population	60-65%
4.	Abandonment of agricultural land due to decline in fertility	3-11%	21.	Decline in the application of compost (organic manure)	25-35%
5.	Appearance of stones/rocks on cultivated land	130-200%	22.	Additional labour demands due to falling land productivity	35-40%
6.	Decline in the size of livestock holding per family (LSU)	20-55%	23.	Forestry-farming linkages	Weak
7.	Decline in the area of farmland per household	30-10%	24.	Purchase of cereals from shops	3-50%
8.	Decline in forest area	15-85%	25.	Need for external inputs for crop production	High-Medium
9.	Decline in pasture/grazing area	25-90%	26.	Fuelwood and fodder scarcity in terms of time spent in collection	45-200%
10.	Decline in good vegetative cover on common property lands	25-30%	27.	Fodder supply: (a) decline from common land, (b) increase from private land	(a) 60-85% (b) 130-150%
11.	Fragmentation of household farmland (in number of parcels)	20-30%		III. RESOURCE MANAGEMENT	
12.	Decline in the size of land parcels of families	20-30%	28.	Emphasis on monocropping	High
13.	Distance between farmland parcel and home	25-60%	29.	Cultivation expansion on steep slopes (above 30%)	10-15%
14.	Decline in cereal production and self-sufficiency	30-60%	30.	Use of weeds and herbaceous crop products as fuelwood	200-230%
15.	Permanent out-migration of families	None-5%	31.	Conversion of marginal lands into cultivation	15-40%
16.	Seasonal migration	High	32.	Decline in fallow periods	From 6 to 3 months
17.	Conversion of irrigated land into dry farming because of water scarcity	7-15%			

Source: Shrestha 1992, cited in Partap and Watson 1994

Table 15.10: Soil erosion from different land use types

Types of Land Use	Soil Erosion (MT/ha/Yr)
Grazing lands (support lands)	100
Rainfed terraces (sloping terraces)	5
Irrigated terraces (level terraces)	0
Sloping farmlands under farmers' practice	38

Source: Partap and Watson 1994

Increasing food insecurity

An ICIMOD study in the mid-hills of Nepal (Panday 1992) highlights the increasing food insecurity among mountain farmers in resource poor areas. The study revealed that 86% of the households in Bhardeo village were experiencing food deficits to varying degrees. Among them, over 50% suffered food deficits for at least six months each year. It concluded that the production of adequate amounts of food from small landholdings, with ever-declining farm productivity, is almost impossible. Bhardeo depicts the worsening trend of food insecurity in poor, heavily populated mountain areas where resources are scarce (Partap and Watson 1994).

In addition, worsening trends of soil acidification, siltation, flooding, and landslides have been reported (NPC 1992).

15.4 Conclusions and Main Issues

Ownership and access to land and land-based resources are still principal determinants of the survival and economic status of the vast majority of the people of Nepal. Their livelihood is inextricably linked to whether they own land, how much of it, and of what quality. Given the mostly subsistence-based production system and skewed land distribution, the imperative is that access to this basic resource be made more equitable.

Mere access to land would not, of course, ensure that land productivity would increase and poverty be reduced. As stipulated in the Agricultural Perspective Plan, dynamic, commercially-oriented agriculture has the potential to increase farm incomes significantly and reduce poverty, while at the same time contributing positively to sustainable natural resource management. This is possible in three ways. First, a productive and competitive agriculture implies intensification of cropping systems and input use in order to make best and most economical use of the existing resource endowments at the household and community levels. Such attempts would make it less attractive economically for the farmers to continue cultivating unproductive marginal lands. In fact, experience from successful areas in Punjab, Haryana, and Himachal Pradesh in India have shown that, in the process of modernising their agriculture, farmers have not only intensified their farming practices, they have confined their farming operations to the most productive lands also; invariably such

lands are the relatively more fertile fields in the lowlands, plains, alluvial fans, and valley bottoms that are less vulnerable to nutrient loss through erosion and loss of topsoil. Farmers have actually withdrawn from cultivation of lands more prone to environmental hazards such as marginal hill slopes. Once farmers start applying expensive purchased inputs to their fields, the returns expected from poor quality lands become unattractive.

Agriculture that is commercially viable and has a high growth rate would be able to generate enough employment and income opportunities within the sector itself to absorb the growing number of hitherto unemployed or underemployed in the rural labour force. More intensive; in terms of both cropping intensity and application of purchased inputs, farming operations will require not only increased supplies of better quality inputs and ancillary services, such as extension and equipment repair, it will also need more labour.

A vibrant and growing agriculture would mean rising rural household incomes which could be spent on goods and services provided from outside the agricultural sector. There would be more demand for manufactured products and processed agricultural goods, triggering and augmenting a multiplier effect in the rest of the economy. The APP states that, when agriculture grows at a respectable rate, the value of such a multiplier has been empirically established to be 1.5. This means that, with every percentage of growth in agriculture, the non-agricultural sector should grow at a rate of 1.5%. Hence, the strong case for agriculture to play the lead role in the overall transformation of the economy.

Government policy with regard to land reform has been lukewarm, if not outright inimical. For instance, the Eighth Plan (1992-97) argued that a land reform programme could not be self-contained in itself, and that experience across the globe made it doubtful whether imposition of a land ceiling through land reform and the automatic guarantee of tenancy rights to the tillers would support the deprived sections (NPC 1992, p. 255). The current Ninth Plan (1997-2002) essentially reiterates this view (NPC 1998, Chapter 9, Section 9.2.2), while emphasising the elimination of dual ownership of land. All periodic plans since the Seventh Plan (1985-90) have emphasised increased production and productivity through discouraging the tendency towards absentee landholding and diverting investment to the non-agricultural sectors.

It has been demonstrated by the experiences of other countries that land reform, with the objective of providing access to land, the most important productive resource, for the majority of poor households (landless, near landless, and smallholders), and improvement in tenure relationships can act as engines of growth in the initial stages of economic transformation. Because of the predominant feudal influence on governance, Nepal has been unable to introduce genuine steps in this direction for a long time, even after it did away with the autocratic regime of the Ranas in 1951, and until now, after nearly a decade of multi-party democracy. True, measures started by the Lands' Act of 1964 bore promise of genuine reform, but those promises were

thwarted almost immediately by the ruling elite. It is ironical that democratic governments that came to power after the people's movement of 1990 have also tended to embrace the status quo and avoid any serious action on this front.

The Constitution of the Kingdom of Nepal 1990 clearly enshrines the philosophy of a welfare state and seeks to "transform the national economy into an independent and self-reliant system by preventing the available resources and means of the country from being concentrated within a limited section of society"; and it advocates equitable distribution of economic gains on the basis of social justice (Part 4, Clause 25). It specifically prescribes land reform. All major political parties have also supported land reform measures in their respective manifestos. Yet, ironically, these considerations have not been reflected in the two periodic development plans since the political change of 1990, nor have the successive governments taken this issue seriously. On the other hand, it can be concluded that favourable conditions exist to carry out carefully designed land reforms in the country with the objective of realising widespread and equitable economic growth.

Indications are that redistribution of land could help increase agricultural productivity, although this issue needs to be investigated more thoroughly (Zaman 1972 and 1973, Blaikie and Sadeque 1999). We know that smaller farms are more productive in terms of cropping intensity, but they are not necessarily so in terms of yields. The latter situation could be because of the lack of access of smaller farms to inputs and technology that help raise productivity. This is an empirical issue that needs to be evaluated. We know that smaller farms are endowed with poorer quality land than biggest ones, and lack of capital and credit that because of they cannot purchase inputs to increase their yields.

Issues of tenure are very important, and these need to be analysed and implications of various options clearly understood. The tendency thus far has been to avoid these issues altogether. This has only contributed to perpetuating the uncertainty, discouraging investment in land, and hampering adoption of wide-scale measures to raise productivity. Donors can play a role here by promoting analytical work and healthy debate. The main issues related to land ownership and tenancy are ceilings on landholdings, dual ownership of land, fragmentation of holdings, and landlessness among rural households.

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Annex Table 15.1: Main characteristics of the physiographic regions of Nepal

Features	Physiographic Regions				
	Terai	Siwaliks	Middle Mountain	High Mountain	High Himal
Geology	Quaternary	Tertiary sandstone, siltstone, shale and conglomerates	Phyllite, quartzite limestone and islands of granites	Gneiss, quartzite and mica schists	Gneiss, schist, limestone and Tethys sediments
Elevation	60-330 m	200 - 1,000 m	800-2,400 m. Relief 1,500 m with isolated peaks to 2,700 m	1,000-4,000 m. High relief 3,000 m from valley floor to ridges	2,000 to 5,000 m
Climate	Tropical	Tropical, subtropical	Subtropical, warm temperate (but tropical in lower river valleys; cool temperate on high ridges)	Warm to cool temperate, alpine	Alpine to Arctic (snow 6-12 months)
Moisture regime	Sub-humid in FW+MWDR: humid in W+C and EDR	Sub-humid in most of the area: humid in N-aspect of W+C+EDR and Dun Valleys	Humid: per humid above 2000 m	Sub-humid to per humid	Semi arid behind Himal
Rainfall intensity	High	High	Medium	Low	Low
Vegetation	Sal + mixed hardwoods	Sal + mixed hardwoods + pine forest	Pine forest + mixed hardwood and oak forest	Fir, pine, birch and rhododendron	Open meadows + tundra vegetation
Soils	Ustochrepts, Haplustolls, Haplaquepts, Haplustalfs, Ustifluvents and Ustorthents	Ustochrepts, Haplustolls, Rbodustalfs, Ustorthents, Dystrochrepts, Haplaquepts and Ustifluvents	Ustochrepts, Haplustalf, Rbodustalfs, Haplumbrepts, Ustorthents and Ustifluvents	Eutrochrepts, Dystrochrepts, Cryumbrepts, Cryorthents and Ustorthents	Cryumbrepts, Cryorthents and Rock
Crops	Rice, maize, wheat, mustard, sugar cane	Rice, maize, wheat, millet, radish, potato, ginger	Rice, maize, wheat, millet, barley, pulses, sugar cane, radish, potato, ginger, cardamom	Oat, barley, wheat, potato, buckwheat, yams, amaranths, medicinal herbs	Grazing (June-September)

Annex Table 15.1 Cont.....

Horticulture	Mango, litchi, pineapple, jackfruit, potato, tomato	Mango, papaya, banana, potato	Mango, papaya, banana, orange, lime, lemon, peach, plum, potato, cauliflower	Chestnut, walnut, apple, peach, plum, apricot, potato	Apple, walnut, vegetable seed, potato
People	Tharu, Brahmin	Tharu (Dun Valley), presently all hill tribes displaced/immigrated from the Middle Mountains	Gurung, Magar, Tamang, Newar, Brahmin, Chhetri, Damai, Sarki, Sunar, Kumal, Rai, Limbu	Khas Chhetri, Tibetan related groups Thakali, Bhotiya, Sherpa, Tamang, Ghale	Temporary herders, Sherpa and Bhotiya
Industry	Match factory, jute factory, cigarettes factory, sugar factory, <i>katha(?Author givemeaning)</i> factory, saw-mills, rice and flour mills, soaps, condiment and food processing furniture, industrial estates	Sawmills, rice, flour and oil mills. Industrial estates, cotton factory, cement factory, wildlife camps	Rice, flour and oil mills, cement factory, industrial estates. Cottage industry handicraft, curios, hosiery, metallurgy, furniture, plastics, hotels and lodges.	Cottage industry, carpets, blankets, hand woven cloth, trekking	Mountaineering and trekking
Transport	Good road linkages	Good road linkages within dun valleys	Road linkages around major centres	Very few road linkages	No road Linkages

Source: Sharma 1995

Annex Table 15.2: Main characteristics of land systems and land units

Physiographic Regions	Land Systems	Land Form		Land Unit
Terai	1	Active alluvial plain (depositional)	1a. 1b. 1c. 1d.	Present river channel Sand and gravel bars Low terrace Higher terrace
	2	Recent alluvial plain 'lower piedmont' (depositional and erosional)	2a. 2b. 2c. 2d.	Depressional Intermediate position, level Intermediate position, undulating High position
	3	Alluvial fan, apron complex 'upper piedmont' (erosional)	3a. 3b. 3c. 3d.	Very gentle slopes Gentle slopes Undulating Highly dissected
Siwaliks	4	Active and recent alluvial plains	4a. 4b. 4c.	Sand and gravel bars Low terrace Higher terrace, undulating
	5	Fans, aprons, and ancient river terraces	5a. 5b. 5c. 5d.	Very gentle slopes Gentle slopes Undulating topography Rolling topography
	6	Depositional basins (Duns)	6a. 6b. 6c. 6d.	Depressional Non-dissected high position Gently rolling topography Highly dissected
	7	Moderately to steeply sloping hilly and mountainous terrain	7	-
	8	Steeply to very steeply sloping hilly and mountainous terrain	8	-
Middle Mountains	9	Alluvial plains and fans (depositional)	9a. 9b. 9c.	River channel Alluvial plains Alluvial fans
	10	Ancient lakes and river terraces (<i>tars</i>) (erosional)	10a. 10b.	Non-dissected Dissected
	11	Moderately to steeply sloping mountainous terrain	11.	-
	12	Steeply to very steeply sloping mountainous terrain	12.	-
High Mountains	13	Alluvial plains and fans	13a. 13b. 13c. 13d.	Active alluvial plain Recent alluvial plain Fans Ancient alluvial terraces

Annex Table 15.2 Cont.....

	14	Past glaciated mountainous terrain below upper altitudinal limit of arable agriculture	14a. 14b.	Moderate to steep slopes Steep to very steep slopes
	15	Past glaciated mountainous terrain above upper altitudinal limit of arable agriculture	15a. 15b.	Moderate to steep slopes-steep to very steep slopes
High Himal	16	Alluvial, colluvial and morainal depositional surfaces	16a. 16b. 16c. 16d.	Glacio-alluvial plains Morainal deposits Alluvial colluvial fans Colluvial slopes (talus)
	17	Steeply to very steeply sloping mountainous terrain	17a. 1 7b.	Shallow till or colluvium over bedrock Rock headwalls

Source: Sharma 1995