

2.1.1 The Pressure

Land degradation is the single most environmental issue in rural Nepal. Degradation of land is caused by soil erosion, landslide, flood, sedimentation and farm cultivation practices in the marginal land.

Land Fragmentation: Fragmentation of cultivated land is pronounced in Nepal through the sharing of parental land property. The number of landholdings has reached 2.74 million in 1997 as against 2.19 million in 1991. The number of land parcels has increased from 9.51 million in 1991 to 10.83 million in 1997, indicating that about two persons have at least one parcel of land (CBS, 1991 and 1997). However, the average number of parcels is 4 (CBS, 1997). Majority of the landholders have about 4 or 5 parcels and few have over 10 parcels. Even a small area of parcel has been cultivated in the hilly slopes and land tilling causes loss of top fertile soil, which later on accelerates shifting cultivation as the hills agriculture is at subsistence level.

Land Holding: The number of marginalized farmers and small farmers with landholding below 1 ha accounts for 69.4 per cent while these farms are only 30.5 per cent of the total landholding area (Table 2.1). Sharing of parental land and small landholding has increased cultivation in marginal lands and steep slopes, and accelerated soil erosion.

Table 2.1 Numbers and Areas of Landholdings by Size (1992)

Size of holding (ha)	Holdings			Area of Holding		
	Number ('000)	%	Cum %	Area (000 ha)	%	Cum %
<0.1	173.0	6.4	6.4	9.6	0.4	0.4
0.1-0.2	263.8	9.8	16.2	38.0	1.5	1.9
0.2-0.5	729.3	26.9	43.1	244.8	9.4	11.3
0.5-1.0	711.7	26.3	69.4	499.5	19.2	30.5
1.0-2.0	529.5	19.6	89.0	716.5	27.6	58.1
2.0-3.0	168.4	6.2	95.3	400.2	15.4	73.5
3.0-4.0	59.6	2.2	97.5	202.4	7.8	81.3
4.0-5.0	28.6	1.1	98.5	125.7	4.8	86.1
5.0-10.0	32.0	1.2	99.7	209.3	8.1	94.2
>10.0	8.2	0.3	100	151.3	5.8	100
Total	2704.1	100		2597.3	100	

Note: Cum = Cumulative

Source: CBS, 1999.

Crops Growing: Hill farmers grow erosion-inducing crops such as maize in the outward sloping terraces, marginal lands and steep slopes. This accelerates soil erosion, thereby, leading to reduction in soil depth, depletion of plant nutrients and moisture holding capacity. Improper drainage system also compounds sheet and rill erosion in croplands, which may lead to gullies and mass wasting. Soil puddling on small terraces increases the risk of heavy landslides and damage to fertile paddy fields in the plain and valleys.

Livestock Population: Livestock population has increased by about 15 per cent during the last 14 years (14.9 million heads or 9.79 million livestock unit in 1984 to 17.6 million heads or 11.22 LU in 1998, (see Figure 2.1). So the area of pastureland remains constant (1.7 million ha), livestock pressure is increasing in pastures and forests.



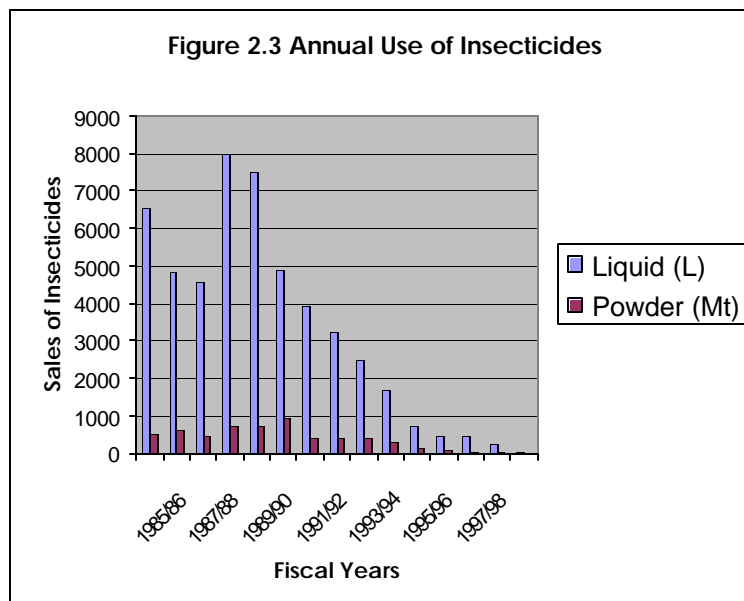
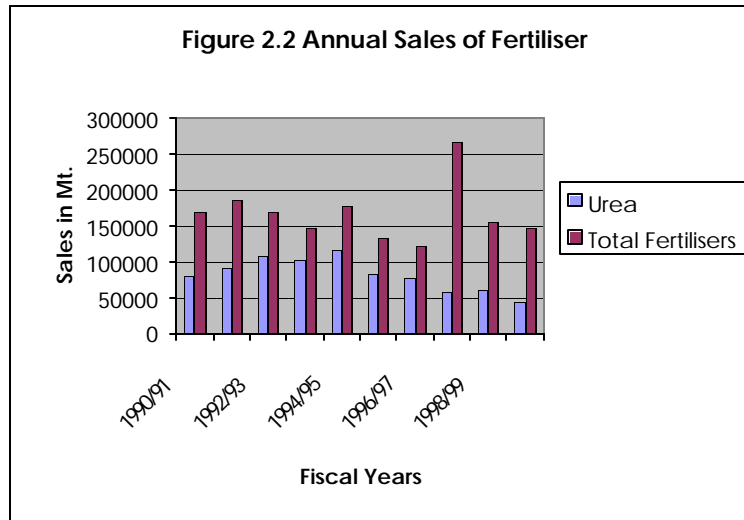
Figure 2.1 Trends of Livestock Units and Pasture Land

Land Degradation: Agricultural land is also affected by infrastructure development, industries and urbanisation. Many urban centres have been developed on fertile farmlands. Hill road construction has increased soil erosion and landslides. Its effect on farmlands is also significant. Laban (1979) estimated that about 5 per cent of the total landslides in Nepal are associated with road construction.

Sedimentation in the Terai and valley floor is also pronounced. It is estimated that Terai rivers experience about 15 – 30 cm rise in riverbeds. The high sedimentation rate in the Terai has resulted in frequent floods and washing of fertile soil each year.

Land degradation also leads to the desertification process. About 10,000 ha of dry and cold land in Dolpa and Mustang districts can be considered as deserts due to scanty vegetation and low regeneration of plants.

Agricultural land is also affected by agro-chemicals such as chemical fertilisers and pesticides. The consumption of chemical fertilizer increased from 2,069 tonnes in 1965/66 to 185,797 tonnes in 1994/95 whereas in 1999/2000 the consumption decreased to 148,187 metric tonnes (Figure 2.2). Although the maximum national average consumption of chemical fertilizer is low, its inappropriate use has increased soil acidity in a number of places, particularly due to high doses of acidic fertilisers.



Use of Agro-Chemicals: Although the use of insecticides has reduced significantly, the croplands may still have some residual effect from persistent chemical usage (Figure 2.3). Studies have indicated the accumulation of DDT in rice, wheat and milk (Joshi, 1988). Out of 527 samples of rice analysed, over 70 per cent were found contaminated by DDT. In case of wheat, DDT residues were higher than in rice and maximum residue encountered was 5 ppm in wheat flour. Similarly, out of the 60 samples analysed for DDT concentration in milk in the early 1980s, 55 samples contained high amount of DDT above MRL, i.e. 0.05 (E) mg/kg and the highest level of DDT detected was 1.2 ppm (Joshi, 1988). DDT residue in pulses, maize, oil and oil seeds, and fruits was also detected as being high. During this period, about 300 Mt of DDT was used for malaria control. As the persistency of DDT is estimated for about 10 years, its concentration should be on the declining trend in foodstuffs.

Introduction of High-yielding Varieties: Genetically-modified varieties of crops and livestock are introduced to produce more foodstuff and livestock products. These varieties have increased pressure on local varieties and wild relatives of cultivated plants, and replaced indigenous genotypes in some areas.

These pressures have also been responsible in reducing the quality of agricultural products.