

### 2.1.3 The Impact

As mentioned before, agriculture is the predominant economic activity of over 80 per cent of the total population. Population growth rate of 2.37 per cent and additional pressure on marginal land has direct impact on steep slopes. Fragmentation of cultivable land into smaller pieces has limited mechanisation in farm production, and over use of acidic fertilisers has increased the use of lime to improve and/or maintain soil fertility. This has increased the cost for crop production.

Haphazard use of agro-chemicals to improve soil fertility and reduce the menace of pests, insects and weeds may have increased the concentration of persistent compounds such as chlorinated and mercury containing chemicals in foodstuffs. Pesticides are also used for food storage and minimising post harvest loss. Sporadic studies indicate possible bio-magnification effects of chemicals.

Irrigation-induced sedimentation is an emerging issue in the plain areas. Many farmlands in the Terai and valley floors are affected by irrigation system. For example, about 22,580 m<sup>3</sup> of silt may be accumulated annually in the Fattepur irrigation canal, based on the amount of sediment load in west Rapti River. If intake gates are not closed during the rainy season, in case of over 5000 ppm silt in the river water, the whole irrigation scheme will be deposited by silt will affect the farmlands (DOI, 2000).

There is an increasing trend of depleting organic matter and plant nutrients along with the loss of topsoil. It is estimated that the annual loss of about 5 tonnes/ha of soil would result in the equivalent loss of about 75 kg/ha of organic matter, 3.8 kg/ha of nitrogen, 10 kg/ha of potassium, and 5 kg/ha of phosphorus (Carson, 1992). The effect of landslide, soil erosion and floods has also impacted the land system. Although the area of degraded land from these events is decreasing, yield rate of major crops has not been increased in comparison to the increased area of irrigation facility, inputs of improved seeds, and other agricultural inputs (Table 2.7; Figure 2.4).

Various studies, including the Ninth Plan have documented that crop productivity has declined due to land degradation. This may increase desertification process and its impact will be severe, particularly in poor farmers who depend on subsistence agriculture, and also cultivate marginal land on steep slopes.

Year	Degraded Land (ha)
1987	18,860
1990	1,130
1991	280
1992	140
1993	5,580
1994	390
1998	326
1999	69.5

Source: MOHA, 1999; DPTC, 1997

Soil loss has resulted in fodder deficit and less manure, which has a direct bearing on soil fertility. Fodder deficit has also affected the forests which have been over used in order to bridge the fodder deficit for the increased number of cattle. This impact is pronounced in the Hills and Terai. Furthermore, increasing number of unproductive cattle has also exerted additional pressure on forests, and farmland. High number of cattle in limited area and its trampling effect has increased soil loss and surface run-off.

Discharge of industrial effluents in natural water bodies and the high rate of sedimentation in the rivers, lakes, and reservoirs have negatively impacted the fish population. Similarly, there exists the possibility of agro-chemicals contamination on fish

both in ponds, reservoirs, and natural water bodies. Although, fish production is increasing, water pollution will likely pose a threat for quality production of fish and its sustainable development.

Several agricultural species are considered threatened. Introduction of high-yielding varieties has replaced local crop species. It has been considered that, *Oryza nivara* and *O. rufipogon* (parents of cultivated paddy) are on the verge of extinction from Ajigara swampy area of Kapilvastu district (Upadhyay, 1995). Local strains of paddy such as *Taulia*, *Thapa Chinia*, *Marshi*, *Mansara*, *Siramlā* and *Masino* are also considered threatened in Nepal (Bastola, 1998). Genetic erosion has also been noticed in few of the fruit and fibre crops, rice and wheat species due to increasing use of high yielding varieties.

In a nutshell, the yield rate of the most of major cereal crops is not encouraging, primarily because of the loss of nutrient rich topsoil. Soil fertility has also been affected due to the disproportionate use of agri-inputs, and the high sedimentation rate.