Chapter 5  Prevention and Remedies

“Science tells us what we can know, but what we know is little, and if we forget how much we cannot know we become insensitive to many things of very great importance.” Russel (1947)

“And he gave it for his opinion that who so ever could make two ears of corn and two blades of grass to grow upon a spot of ground where only one grew before would deserve better on mankind and do more essential to his country than the whole race of politicians put together.” Swift (Gullivers travels)

5.1 Introduction

It will be noted that, in this book, I have chosen to use the expression land degradation rather than desertification. Nevertheless it is useful to keep the word desertification with its double meaning: (a) of a desert-like landscape replacing productive land, and (b) of irreversible degradation, without following the widespread trend which includes under desertification all types of degraded resources even in humid ecosystems. Even if restricted to these meanings: conversion to a desert and irreversibility, the word desertification does not eliminate ambiguity. The question is not just a theoretical one; there is also a practical problem, which is to consider the realities as they appear to our common sense and to draw conclusions only after analysis of existing cases and components of the problem:

1. Under our present terms of reference desert-like landscapes replacing productive lands can be observed only in seasonally or occasionally dry areas: e.g., the drylands of the American West, Australia, China, and the USSR. Land degradation occurs in all ecosystems: between 1961 and 1976 Canada lost more than 3.5 million ha of farmland (Standing Senate Committee on Agriculture, Fisheries and Forestry 1986). But this land did not become a desert and does not look like one.

The degradation of land resources in the Himalayas (India) has been a matter of great concern in recent years: overgrazing, deforestation, soil loss, siltation, flooding, and droughts occur. Nevertheless, the landscape has an aspect very different from the mountainous slopes of the Sahara massifs.

2. The desert margins can seem to have been turned into desert but the oscillations can be natural and even seasonal without irreversibility. Analysis of degradation in semi-arid and sub-humid ecosystems south of the Sahara leads to
the observation that the most severe degree of destruction of biological potential is in the domain of 800 mm annual rainfall. In this subhumid ecosystem the land is severely degraded, denuded patches exist with increased wind and water erosion, but still the landscape has not become a desert, but only degraded land.

Is degradation irreversible? Nobody knows. We have seen in 1988 how good rainfall in a semi-arid ecosystem (the Saharo-Sahelian) brought a good recovery of the grassland and high crop yields; but this area of the desert is sparsely populated. In contrast, the land in the more humid Sahelian and Sahelo-Sudanian ecosystems is intensively populated and used and it is there that we have to concentrate our attention and to try to apply solutions.

3. Risks of land degradation or desertification are greater in drylands than in humid ecosystems because of high climatic variability (rainfall, temperature, higher wind and water erosion potentialities, larger extension of poor soils, poor water reserves). All planning has to adjust to these natural risks. A consequence of these high risks is slow rate of recovery. Drylands recover more slowly from degradation than humid ones.

Sustainability and resilience are now the two leading concepts for the utilization and conservation of drylands. Sustainability of dryland agriculture means an agricultural system which functions indefinitely without degradation of the ecosystem. Resilience of dryland soil means the capacity for the maintenance and natural restoration of the soil. They remain only theoretical words if they are not linked to the physical and human local potential, the physical characteristics of the soil, the land use system, and the density of the human and animal population.

The Californian economist Douglass (1984) points out that “sustainability” has different meanings for different schools of thought:

— The food-sufficiency or productivity viewpoint, which “thinks of sustainability as supplying enough food to meet everyone’s demand”;
— The stewardship school, which “regards sustainability primarily as an ecological phenomenon,” with a concern for maintaining an “average level of output over an indefinitely long period... without depleting the renewable resources on which it depends”; and
— The community perspective, which “pays most attention to the effects of different agricultural systems on the vitality, social organization, and culture of rural life.” (Dover and Talbot 1987).

Because drylands are high-risk ecosystems, they cannot stand high human and animal pressure. It is obvious that the scale of damage increases with the increasing densities of populations. Traditionally, conservation was less necessary when there was lower density of populations and greater relative demographic stability. More and more with demographic increase marginal lands have to be looked after carefully. Moreover, in time of drought, the better-armed and organized pastoral people often moved on to conquer areas with higher rainfall.

Drylands differ in terms of climate, physical potential, and culture. The set of solutions has to be different from one area to another. I shall try in Chapter Five