

## Preface

### A Special Issue : Recent Counter-measures for Desertification

As desertification studies and surveys go forward, it would be better to use the expression 'land degradation' rather than 'desertification,' because the most fundamental aspects of desertification are in relation to and connection with human activities. Without people there would be no desertification. Nevertheless it is useful to keep the word desertification with its double meaning of : ( 1 ) a desert-like landscape replacing productive lands, and ( 2 ) irreversible soil degradation, without following the widespread trend, which is to include under desertification all types of resource degradation, even in humid ecosystems. Even if restricted to the meaning of conversion to desert irreversibly, the word desertification does not lose its equivocalness. The question is not just a theoretical one ; there is also a sense of drawing conclusions only after analysis of existing cases and components of the problem. I want to cite the following three detailed exemplifications which puzzled me and motivated me to weave this special issue.

1) Under our present terms of reference, replacement of productive lands by desert-like landscapes can be confirmed only in seasonally or continually dry areas, for example, the dry-lands of the American West, Australia, China and NIS countries including Uzbekistan, Kazakhstan and Turkmenistan. Land degradation, on the other hand, occurs in all ecosystems, for example, between 1961 and 1980 many developed countries such as Japan, Germany and Canada lost about 2.5% of farmland. But these lands did not become deserts and do not look like them.

The degradation of land resources, for instance, in the Mato Grosso Do Sul (Brazil) has been a matter of great concern in recent years : overgrazing, deforestation, soil erosion, siltation, flooding, and droughts. Nevertheless, the landscape has an entirely different aspect from the hill slopes of the Sahara massifs.

2) Desert margins can seem to have turned into desert but the oscillations can be natural and even seasonal and may be reversible. Analyses of degradation in semi-arid and sub-humid ecosystems in the midst of the Loess Plateau, China, present us the observation that the most severe degree of destruction of biological potential is in the domain of 700 mm annual precipitation. In this sub-humid ecosystem the land is severely degraded, denuded patches exist with increased wind and water erosion. Still the landscape has not become a desert, but only degraded land.

Is land degradation irreversible or not ? At present, we cannot find the answer with confidence. Many researchers have reported how in 1988 good precipitation in the ecosystem of the Sahelian region brought a good recovery. In contrast, the land in the more humid Sahelo-Sudanian ecosystem is intensively populated and utilized 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 apt to be greater in dry lands than in humid ecosystems because of high climatic variability (precipitation, temperature, higher wind and water erosion potentialities, larger extensiveness of poor fertility of soils, poor water retention of soils). All planning has to adjust to these natural risks. A consequence of these high risks is slow rate of recovery. Dry-lands recover more slowly from degradation than humid ones.

Sustainability and resilience are now the two leading concepts for the utilization of and counter-measures to protect dry-lands. Sustainability of dry-land agriculture means an agricultural system which functions

indefinitely without degradation of the ecosystem. Resilience of dry-land soil means the capacity for maintenance and natural restoration of the soil. They remain only theoretical concepts 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.

As mentioned above, because dry-lands 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 as demographic factors increase, marginal lands have to be looked after carefully. Moreover, in times of drought, the better-armed and organized pastoral people often moved on to conquer areas with higher precipitation.

Dry-lands differ in terms of climate, physical potential, and culture. The remediation methodologies, therefore, have to differ from one area to another. Every remediation technique or solution, however, should be comprehensive. I have tried to coordinate the special issue titled "Recent counter-measures for desertification" from different aspects and standpoints, though it may lack in unification as a whole.

Finally, I want to express my sincere thanks to all contributors to this special issue, who made an effort to help, in spite of their busy schedules.

Satoshi Matsumoto  
Graduate School of Agriculture and Life Sciences,  
University of Tokyo