

# Findings

Africa Region. Number 91. July 1997

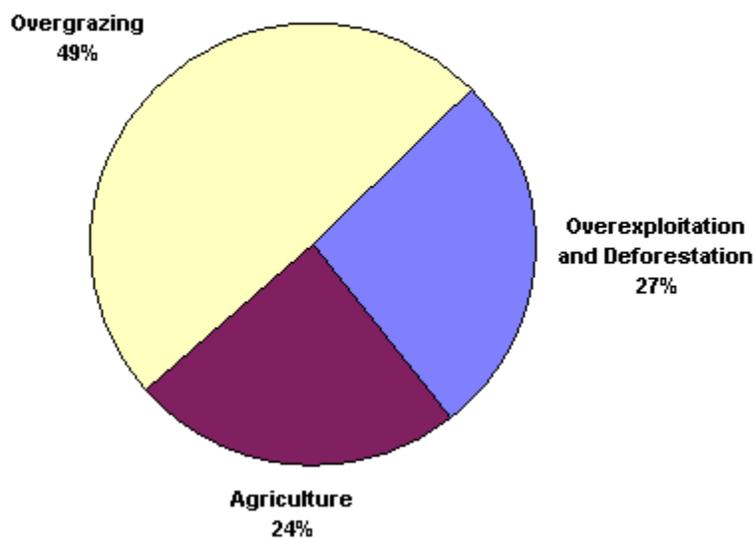


*Findings reports on ongoing operational, economic and sector work carried out by the World Bank and its member governments in the Africa Region. It is published periodically by the Knowledge Networks, Information and Technology Center on behalf of the Region.*

## LAND DEGRADATION IN TANZANIA: VILLAGE VIEWS

Declining soil fertility due to inadequate farming practices, deforestation and overgrazing are among the primary impediments to increased agricultural productivity in Sub-Saharan Africa. These causal factors, driven by social, economic and political forces, manifest themselves in market, policy and institutional failures, inappropriate technologies and practices. This is also the case in Tanzania where over 90 percent of the population is rural and depends on land resources for its livelihood.

**Major Causes of Land Degradation in Sub-Saharan Africa (Dryland)**



Source: Oldeman, Hakkeling, and Sombroek, 1991.

Official and local land users often have quite different perceptions and responses to land degradation problems (Table 1). This situation impedes the successful implementation of policies and projects to address land degradation. Land degradation is also influenced by local ecological and socio-economic forces, and understanding the dynamics of these interactions at the local level would contribute to remedy the problem. Hence, this study, *Land Degradation in Tanzania: Perception from the Village* examines the most significant issues affecting levels of productivity and land quality at the community and village level, where local land users take decisions on cropping and livestock management.

The specific objectives of the study were to examine farmers' perceptions, particularly their understanding and interpretation of factors and indicators which they link to soil erosion and fertility decline, the level of degradation of crop and pastureland, and the institutional capacity to implement soil conservation and fertility measures -- with particular regard to land tenure policies, local organizations and extension service. The investigators also sought to identify the technologies, best practices and indigenous knowledge used by households to control erosion, enhance soil fertility, and increase crop and livestock productivity among smallholders.

**Table 1: Perception and response gap to major land degradation problems**

<i>Problem</i>	<i>Government Solutions</i>	<i>Results</i>	<i>Villagers' Responses</i>
Overgrazing	<ul style="list-style-type: none"> <li>• Livestock removal</li> </ul>	<ul style="list-style-type: none"> <li>• Malnutrition</li> <li>• Lack of farmyard manure</li> <li>• Regeneration of hilly areas</li> </ul>	<ul style="list-style-type: none"> <li>• Livestock removed to other areas</li> <li>• Non-compliance with destocking regulations</li> <li>• Resentment of local extension agents</li> </ul>
	<ul style="list-style-type: none"> <li>• Zero-Grazing Initiative</li> </ul> (improved dairy cows and stall feeding)	<ul style="list-style-type: none"> <li>• Too expensive</li> <li>• Limited market for milk</li> <li>• High demand on women's</li> </ul>	<ul style="list-style-type: none"> <li>• Limited adoption</li> <li>• More interested in farmyard manure than milk production</li> </ul>

		time	
Soil Erosion	<ul style="list-style-type: none"> <li>• Labor-intensive conservation (e.g. terracing)</li> </ul>	<ul style="list-style-type: none"> <li>• Recommendations not followed</li> </ul>	<ul style="list-style-type: none"> <li>• Contour ploughing</li> <li>• Putting crop residue and grass along contour</li> </ul>
Soil Fertility Decline	<ul style="list-style-type: none"> <li>• No coordinated strategy</li> <li>• Removal of subsidy</li> </ul>	<ul style="list-style-type: none"> <li>• Decreased demand for fertilizer use</li> <li>• Agricultural expansion on forest land and marginal areas</li> </ul>	<ul style="list-style-type: none"> <li>• Intercropping, composting, farmyard manure</li> <li>• Ploughing crop residue</li> <li>• Agroforestry</li> <li>• Extensification and clearing of new land</li> </ul>
Deforestation	<ul style="list-style-type: none"> <li>• No coordinated national policy</li> <li>• Village woodlots</li> </ul>	<ul style="list-style-type: none"> <li>• Shortage of fuelwood</li> <li>• Encroachment and conflict on pastoral and communal lands</li> </ul>	<ul style="list-style-type: none"> <li>• Individual tree planting</li> <li>• Use of fire and environmentally damaging practices to clear new land</li> </ul>

Source: Dejene, Shishira, Yanda and Johnsen, 1997.

### Restoration of soil fertility

Farmers are aware that soil degradation, in various forms, is taking place on their farms as well as in the surrounding areas. This is based on their perception and interpretation of indicators that reveal certain conditions regarding crop and pastureland. The major indicators that farmers cited included rill and gully erosion, water absorption capacity (level of run-off), exposure of roots, crop yield, change in color of crop leaves, stunted crops, emergence of weeds and unpalatable species, appearance of termite mounds, and the disappearance of grass. Most plant species indicators are local and site-specific.

One approach to mitigate land degradation involves the intensification of farming using sustainable production systems (such as intercropping, composting, farmyard manure, strip cropping, ploughing crop residue, and agroforestry), and increasing productivity on the same unit of land. The proper use of chemical fertilizer is important for the restoration of soil fertility as

well as in the intensification of smallholder farms. Macroeconomic factors, particularly pricing policy, have eliminated fertilizer subsidies, and drastically reduced the demand for and use of fertilizer. There is a linkage between high population density and greater incentives to improve soil productivity since investment in soil fertility and measures to maintain productivity becomes more rewarding and profitable as the scarcity value of land increases with respect to labor. Another approach involves extensification of agriculture by clearing new land, often in an unsustainable way. Extensification is also a means of gaining ownership to new land. Poverty can be a disincentive to undertaking improved land management practices and intensification. Poor farmers living in villages are often engaged in cash labor at the time of field preparation and the land tend to suffer most from soil erosion and fertility decline.

### **Farming practices**

Several important aspects of farmer behavior were revealed through the examination of farming practices. For example, deforestation was primarily a result of increasing the area under cultivation, not fuelwood gathering. The use of fire is widespread as it is the best means of reducing the incidence of livestock disease, encourages regeneration of grass and pasture for livestock, and is also used in clearing new land. Its use was widespread. But it has negative effects -- the destruction of vegetation cover and soil organic matter, lowering the diversity of soil fauna, and increasing erosion. The government's efforts to initiate communal tree planting were not widely accepted, and farmers indicated their preference for individual tree planting on their farms.

### **Overgrazing**

Officials view large herd size and overgrazing as major causes of land degradation. Villagers see livestock as a sign of wealth, and would like to maximize their herd size for their own social, cultural, and economic reasons. This perception tends to encourage overgrazing and land degradation. Officials and extension agents have attempted to solve this problem by enforcing destocking policies. This policy has been unpopular among farmers and difficult to implement. Livestock were temporarily moved into another area, thereby merely transferring the problem. Another unintended outcome of the removal of livestock was the substantial increase in the incidence of malnutrition, the introduction of the zero-grazing method which focused on improved dairy cows for milk production, and a stall-feeding system. However, this alternative has not been well received since it does not take into account the multiple roles and value of livestock in the farming system.

### **Land tenure**

The majority of farmers feel secure about the land they cultivate. Customary land tenure authority is vested in local leaders. It is not subject to regulation and can be held in perpetuity by farmers, and thus has not been an impediment to investing in land. Indeed, most farmers have invested in, or improved their land in terms of tree planting, buying fertilizer, using farmyard manure, constructing terraces and waterways, etc. The lack of investment has been more influenced by poverty rather than an unwillingness to invest because of any insecurity of tenure. A more pertinent issue seems to be conflict over grazing rights involving predominantly crop

producers and pastoralists. This conflict is more acute where large-scale operators are expanding into traditional pastoral and grazing areas. In areas where there is a large tract of common property resources, the current laissez-faire approach is enhancing conflict and the degradative process.

### **Extension and Local Organizations**

Farmers are reluctant to participate in local associations mainly due to their negative experiences with government-initiated, top-down conservation efforts (such as destocking and labor-intensive conservation measures) and the belief that such an association could be used as a rubber stamp to promote unpopular measures. Furthermore, there are few extension agents at the village level and visits from the extension service are infrequent. Farmers are suspicious of extension agents as they often see their objectives as being the conversion of communal lands into government-managed protected areas, which they will not be able to use.

The crucial challenges facing extension services are (a) developing a technical package in improved crop and livestock practices tailored and fine-tuned to a specific farming system and agro-ecological conditions; (b) incorporating tested indigenous knowledge and land management practices into the technical packages; (c) increasing nutrient uptake efficiency by developing the best combination of organic and inorganic fertilization methods; (d) involving civic society and the appropriate local organizations before launching conservation measures; and (e) working closely with research institutions in developing and introducing early maturing and drought-resistant crops.

### **Conclusions**

The sustainable use of land resources and the successful implementation of policies and programs to address the land degradation problem would require enabling policies and institutional arrangements to encourage intensification of the smallholder farming systems. This would include such means as increasing the proper use of inorganic and organic soil amendments, provision of permanent watering points, development of low-cost soil cover and water harvesting techniques, expanding draft power, and strengthening local organization and extension services. At the same time, there is also a need for policies that discourage environmentally damaging land use practices, such as uncontrolled

An improved system will require taking into account land users' perspectives, local variations in ecology and socio-cultural conditions, incorporating proven indigenous practices and knowledge into technical approaches, and ensuring local participation in decision-making.

---

Alemneh Dejene, Elieho Shishira, Pius Yanda, Fred H. Johnsen. 1997. *Land Degradation in Tanzania: Perception from the Village*, Technical Paper No. 370, World Bank, Washington D.C. For more information, please contact P.C. Mohan, Rm. J5-171, World Bank, 1818 H Street NW, Washington, D.C. 20433. Tel. no.: (202) 473-4114; e-mail address: pmohan@worldbank.org