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Helping Farmers Reclaim Eroded Land and Increase Productivity and Income in the Same Project

Bolivia • Perú • Guatemala

Strategies for International Development (SID), www.sidworld.org

There is a direct relationship between the problem of soil erosion and the problem of rural poverty. Each problem is partially caused by the other, and neither can be solved without also solving the other. It is efficient for all parties -- the farmer, the Non-Governmental Organization (NGO), and the donor -- to address and solve both problems in the same project.

An Example from Bolivia

The pictures on the cover are from two sides of the same road. On one side of the road, just before you reach Patarani, the pastures are patches of greenish brown stubble, hardly higher than the dirt itself. On the other side, the knee-high, thick grass stretches for nearly a kilometer. Dairy farmers in Patarani, a rural community in Bolivia's Central Altiplano, put the grassy side into a pasture reserve several years ago. They started with 70 hectares and since then they have added another 100.

The reserves are a very successful way of reclaiming eroded land. Farmers in a community agree to stop grazing their cows and sheep on a portion of severely eroded communal pasture. They place stone markers along the boundaries of the land and leave it alone for at least three or four years. The grasses are free to flower and re-seed themselves naturally. As a result, grass cover in the reserve increased from less than 100 kilos per hectare to an average of 526 kilos per hectare. After three or four years, farmers open the reserve to grazing, but only for three or four months of the year during the dry season. Only cows are allowed to graze and the number of cows is controlled. Farmers who exceed their quota are fined.

Farmer Filomena Mamani's opinion of the reserves is typical of many farmers. She said: "When we started with our reserve, I didn't think it would help me very much. But there is little grass during the dry season, and the cows are hungry. So we all decided to try it. We marked off the reserve area, let it rest, and now it serves me well. We graze our cattle in the reserve in the dry season. Cows eat better and they give more milk."

Strategies for International Development (SID) began working on Bolivia's Central Altiplano in 1996, helping 1,630 dairy farmers in 50 communities adopt the farming practices that reclaim eroded land and increase productivity and income. In three and a half years, farmers reclaimed 1,593 hectares of land by digging water retention ditches, damming gullies, and re-seeding pastures, and another 70 hectares by constructing terraces. They also reclaimed 14,307 hectares by creating reserves in which the land was not grazed for four to five years. They put 27,341 hectares of pastures under strict rotation.

They also immunized their cattle, dug 727 farm ponds, constructed 202 cowsheds, and sowed 1,553 hectares of alfalfa. And they increased their productivity from 5.3 to 10.7 liters of milk per cow per day and their income by 64%. Now, years later, they continue to reclaim and conserve their land, and they have maintained their increases in income.

The Problem

Soil erosion is quietly but dramatically reducing the amount and productivity of arable land in developing countries. In 1990, the United Nations estimated that 2 of the 13 billion hectares of the earth's surface covered by land, including most of the arable land, were eroded as a result of human activity. The principal causes of the erosion are overgrazing of livestock, deforestation, and poor agricultural practices. More than three-quarters of the eroded land is in Africa, Asia, and Latin America, where erosion has grown dramatically given steady increases in population, the demand for food and fuel, and other pressure on the land. (UNEP, 1990)

CAUSES OF SOIL DEGRADATION (millions of hectares)

	Over-grazing	De-forestation	Poor Agricultural Practices	Over Exploitation	Industrial Pollution	Totals
Africa	243	67	121	68	---	499
Asia	197	298	204	46	1	746
South America	68	100	64	12	---	244
North America	38	18	91	11	1	159
Europe	50	94	64	1	1	210
Australia	83	12	8	---	21	124
World	679	589	552	138	24	1,982

Source: United Nations Environment Programme, 1992

The increase in population and pressure on the land, the farming and grazing of marginal land, and the emphasis on production without conservation have combined to dramatically increase the erosion of arable land. All the good land and most of the marginal land is now under cultivation. Farmers can no longer move to new land once their current land loses its fertility, and traditional methods for maintaining soil fertility such as shifting cultivation, fallowing, and crop rotation are no longer sufficient. For example, in Bolivia, farmers who once worked their land in 10 or 15-year cycles -- sowing and harvesting crops in the first two or three years, fallowing the land for the remainder of the cycle -- have reduced their cycles to 7 or 8 or even 5 years.

The Solution

Projects that seek to reclaim eroded land in rural communities meet with limited success because they do not address the primary concern of poor farmers: making a living. And projects that seek to increase rural income are meeting with less and less success because the natural resources on which the increases in income are based are eroding away. Poverty and soil degradation are intertwined and the only way to solve these problems is to address them in the same project.

Strategies for International Development (SID) and farmers we assist use three levels of results for project planning: a goal, objectives, and the practices that farmers adopt to achieve the objectives. Increasing income and sustaining the increases is the

goal; reclaiming eroded land and increasing productivity are the objectives, and the farming practices that reclaim land and increase productivity are the third level.

Reclaiming eroded land is as important as increasing productivity, and the practices that achieve the reclamation are given as much attention as those that increase productivity. The table below illustrates this structure for dairy farmers on Bolivia's Altiplano. The farmers have limited amounts of land, and they have to increase the productivity of their dairy cows in order to sell more milk. They must also reclaim their eroded pastures and harvest rainwater, their principal assets as well as their "productive infrastructure", in order sustain any increases in productivity.

Goal: Increasing income from milk and sustaining the increases.

Dry Season (June- November)	Rainy Season (December- May)
Objective 1: Reclaim eroded pastures.	
• Dig farm ponds that hold rainwater throughout the dry season • Dig shallow water infiltration ditches in compacted soils and pastures • Put eroded pastures into reserve • Improve demarcation of grazing areas • Establish stricter pasture rotation	• Collect grass seed for re-seeding pastures the following season • Re-seed eroded pastures • Put eroded pastures into reserve • Improve demarcation of grazing areas • Establish stricter pasture rotation
Objective 2: Increase productivity.	
• Improve animal selection • Improve male-female ratios • Vaccinate cattle, dose against internal parasites, give cattle vitamins • Construct cowsheds and shelter cows at night • Dig farm-ponds for better year-round watering	• Improve animal selection • Improve male-female ratios • Vaccinate cattle, dose against internal parasites, give cattle vitamins • Sow higher-yielding fodder crops such as alfalfa • Cut, store fodder for good year-round feeding • Shelter cows at night

The project is now designed to reclaim eroded land and increase productivity, and increases in income result from the achievement of both objectives. The scheduling of the technical assistance in the various practices is by agricultural season. For example, the technical assistance in cutting water infiltration ditches and damming gullies is carried out in the dry season. The technical assistance in harvesting grass seed and seeding fallowed land is carried out in the rainy season. The practices that reclaim eroded land are combined with those that increase productivity, and they gradually become part of standard agricultural practice and calendar

Sustainability

Poor farmers caused most of the erosion by overworking their pastures and farmland. They are the only labor force that can reclaim this land, and they need to do so in order to increase their income and sustain the increases. Helping them reclaim eroded land and increase productivity and income in the same project is the best way to solve both of these problems.