

## **PRODUCE FIRST, CONSERVE LATER ?**

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### **Introduction**

Product of the Agrarian Reform, the farmers seated in the watersheds of the Tunari mountain range (Cochabamba, Bolivia) have looked for to survive, devastating great wooded zones for the extension of the agricultural frontier (Gomez et al., 1995). The deficiency of the forest resources generates a set of shortages for the population farmer (combustible, firewood, forage). In addition, it threatens the precarious stability of the base natural resources (soils and water) and has reduced in a drastic way the soil productivity for agriculture. The work of the Integrated Watersheds Management Program PROMIC is based on an approach of discuted and equitable integral management of the territory, that considered among others a component of natural resources conservation and recovery of the agricultural productivity through the management and soil conservation, developed from a methodology of participative planning of the productive space and supported by a strategy of extension and field training based on a demonstration - action methodology.

### **Objective**

The main objective of management and soil conservation approach is to revert the processes of environmental degradation of the watershed, mainly the soil loss by erosion of the agricultural areas, through integrated practices sustainable of the soil and water resources use, inside a participative frame and socially discussed with the communities farmers.

### **Participative planning of the productive space**

The process of participative planning of the productive space represents the first step coordinated between farmers and technicians for the soil conservation and without putting in risk the productivity, where the farmer assigns different uses according to the land vocation. For that, fotomosaico is used which consists of a fotos extended assembly of the space to be planned on which a transparency is putting and where the set of actions that thinks to execute is designed, accompanied of a form that allows to plan to short or medium term the human resources, material and financial necessities for its implementation.



Foto 1. Participative planning of the productive space

This same instrument represents a very efficient tool to the monitoring and evaluation of the measures behavior of soil conservation in combination with the measures of production and crops diversification.

#### Practices of integral soil management, water and vegetal cover

The productive space management promoted by the PROMIC is based on an integral vision characterized by the combination between conservation and productive actions that result on a sustainable increase of the net income. These different actions are described next:

\* Practices of mechanical and biological soil conservation: Among them, it has been implemented mainly the terraces that, depending on the materials availability, can be of slow formation with stones, the banks terraces on gentle slopes and barriers with grass of the place (*Estipa ichu*) or introduced (*Phalaris tubearundinacea*) sometimes combined with forest shrubs like kishuara (*Polilepis coriacea*), kapa kapa (*Gynoxis glabriuscula*) and retama (*Spartium junceum*) or fruit trees like the apple tree (*Malus sp.*), the peach (*Persian Prunus*), the plum tree (*Prunus domestic*), the damascus (*Prunus armeniaca*) and the sour cherry (*Prunus cerasus*).

In figure 1 where are represented the executed surfaces of the different measures from soil conservation in the last 5 years, it can be observed that the farmers practices preferred is the Phalaris barrier by the fact that are easy to establish and produces additional forage for the cattle. On the other hand, an increase of the surfaces implemented in the course of the 5 years, emanating of an increase of the adoption of these measures can be noticed.

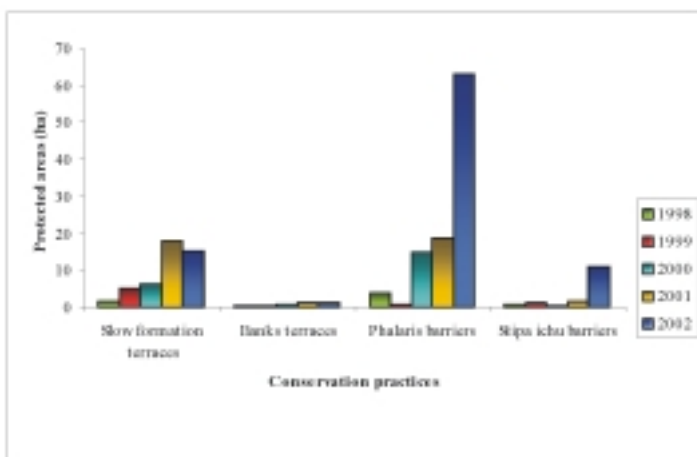


Figure 1. Protected areas evolution with different soil conservation practices

\* Improvement of the soil fertility: The PROMIC promotes ecological practices of soil fertility improvement with the incorporation of organic manure like being dung of animals in their natural or improved state (Bocashi), of green manures and crops strubbles and the use of cover crops like oats (*Avena sativa*), barley (*Hordeum sp.*), pea (*Pisum sativum*), vice (*Vicia sativa*) or tarwi (*Lupinus mutabilis Sweet*), those last ones with the double objective of fertility improvement and soil protection.

\* Rotation and crops diversification: A good crops rotation also implies to diversify the agricultural production, where tubercles, vegetables, leguminouses and cereals take part, allowing to reduce the plagues and diseases incidence as to maintain a certain soil balance nutricional. With this logic, the PROMIC impels the leguminosa incorporation in the traditional rotation and the rotation intensification with the disminution or elimination of the rest period.

\* Irrigation water management: This activity is considered as an indispensable complement in the measures of protection and agricultural productivity, changing the system from traditional irrigation (irrigation by flood) that brings as consequence soil erosion and the nutrients leaching by the sprealking irrigation that allows besides to control the erosion problem, the increase of the irrigation surface.



Foto 2. Sprealking irrigation in diversification cultures and terraces

### Extension – Training

The strategy of communitarian extension developed by the PROMIC consists of a methodologic proposal product of the sum of a process of learning and the synthesis of the results and impacts associated to the applied technological alternatives. It looks for the population participation in the dynamics of the dialogue and the interaction in the work.

The field training, cradle in a methodology of demonstration - action applicable and transferable to zones of Andean ecoregión mountains, articulates the education and communication by means of the

dialogue and the reflection looking for the communities capacities development in the perspective of the familiar and communal autoformation. In the PROMIC extension system, the field training takes several forms, in periodic communal meetings, familiar visits, individual training, interchanges of experiences farmers.

### **Bibliography**

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