



AGROFORESTRY TECHNIQUES TO RELIEF FOOD INSUFFICIENCY IN HAITI

TÉCNICAS AGROFORESTALES PARA AYUDAR A LA INSUFICIENCIA ALIMENTARIA EN HAÍTÍ

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ABSTRACT

The territory of Haiti was once fully covered of forests, now cleared for subsistence agriculture or pastoralism and the remaining trees are treated for fuel. Soil erosion is very strong. Agriculture is the main activity, nonetheless people give 64% of their incomes to buy foods and 48% of the population has food insecurity. Differently from the other Latin American or Caribbean Countries that were able to keep their traditional land management, the disruptive colonization has caused the lost of most of the knowledge of the natives. Research has been done in the Carrefour, to identify the main reasons of the difficult conditions, and the possible solutions, within a development project funded by EU (B 7-201 Sécurité alimentaire). The reasons found are related to the physical environment (climate, bare soil eroded), to the rural management (deforestation, lack of plants for reforestation, irrational livestock rearing, poor knowledges of farmers) and to the social organization (difficult access to capitals, lack of organization and legal recognition of farmer's associations). The solutions proposed are related to crop diversification, small livestock, agroforestry and agro-silvo-pastoral systems, reforestation, social organization.

Keywords: deforestation, problem solving, fruit trees, agroforestry systems

RESUMEN

El territorio de Haití estuvo cubierto en su totalidad por bosques, que ahora se han talado para la agricultura de subsistencia o el pastoreo, y los árboles que quedan se utilizan como combustible. La erosión del suelo es muy fuerte. La agricultura es la actividad principal, sin embargo, la gente destina el 64% de sus ingresos a la compra de alimentos y el 48% de la población padece inseguridad alimentaria. A diferencia de otros países de América Latina o el Caribe, que lograron mantener su gestión tradicional de la tierra, la colonización disruptiva provocó la pérdida de la mayor parte de los conocimientos de los nativos. Se realizó una investigación en Carrefour para identificar las principales razones de las difíciles condiciones y las posibles soluciones en el marco de un proyecto de desarrollo financiado por la UE (B 7-201 Sécurité alimentaire). Entre las razones encontradas están relacionadas con el medio físico (clima, suelo desnudo erosionado), con la gestión rural (deforestación, falta de plantas para reforestación, ganadería irracional, escasos conocimientos de los agricultores) y con la organización social (dificultad de acceso a capitales, falta de organización y reconocimiento legal de las asociaciones de agricultores). Las soluciones propuestas están relacionadas con la diversificación de cultivos, la ganadería menor, los sistemas agroforestales y agrosilvopastoriles, la reforestación, la organización social.

Palabras clave: deforestación, solución de problemas, frutales, sistemas agroforestales

INTRODUCTION

Haiti forest area has been reduced to 3.2% of the territory to get arable land and pastures and to get fuelwood. Soil erosion is a main problem. Agriculture is the dominant activity commonly for self-subsistence. Small tree plantations

include coffee, bananas, cocoa and sone coconut. Food crops are cereals (maize, sorghum and rice), legumes (in particular Cayanus cayan), root plants (manioc, yam, sweet potato) and fruit (banana, mango, annona, citrus) and sugarcane (FAO/PAM, 2004).

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Differently from other Latin American and Caribbean Countries, Haiti does not have has not agricultural "traditions" properly linked to the territory, because the indigenous population was almost exterminated already in the 1600s. Mixed homeyards are agroforestry systems as a matter of fact, in the study area three kinds are easily recognized: "*devant porte kaye*" (500-1000 m², dense planted vegetation including trees around the house); the "*pre kaye*" (1000-5000 m², an area without trees, fenced with live hedges, and the "*loin kaye*" (> 5000 m², usually further from the house). These areas contribute much to the overall food production and supply to urban markets (Temple et al., 2014).

Currently, food represents 64.3% of expenses of rural families (2.7% is for education and 3.2% for health). Food insecurity and poverty affect about 48% of the population (3.8 million people). The cost of fixed-price food has doubled from 1980 to 1990 and quintupled from 1991 to 2000 (FAO/PAM, 2004). The earthquake of 2010 has enhanced the low food production and heavily stressed the internal trade. Food security can be improved also by increasing urban and periurban food production (Pardini & Massolino, 2019), crops diversification and intercropping with multipurpose trees is considered a priority (Murray & Bannister, 2004).

Our research was part of a development project funded by EU as part of the *B 7-201 Sécurité alimentaire* sector, and was aimed at improving food security in the municipality of Carrefour.

MATERIALS AND METHODS

The research was done in the Departement de l'Ouest (Province of Carrefour). The climate has 1500 mm of annual rainfall, a very dry season (December-March) and a very rainy one (April-November) with strong erosion. The area has no access roads, the communities are therefore extremely isolated and there is only subsistence agriculture.

The research was divided into three phases:

1. Preliminary investigations to identify the counterparts (institutional building) and evaluation of the physical and agricultural environment.
2. Discussion of the present conditions of agriculture and territory management and the related problems, with local farmers, technicians and authorities.
3. Discussion of the results and formulation of intervention proposals to improve food safety, still with participatory approach with local farmers, technicians and authorities,

Two local NGOs, a cooperative of producers, local institutions and technicians, community facilitators and representatives of the rural population have been chosen as counterparts. The problems about agriculture and territory were identified by joint discussions, later a set of proposals for action were decided still with participatory approach.

RESULTS AND DISCUSSION

The emerged problems can be categorized in agronomical and social (Table 1), the problems of the first kind are perceived as more important by farmers, however also the second type is extremely important.

Table 1. Identified problems and percentage of farmers that are concerned.

Identified problem	% of people concerned
Agronomic	
Seasonality of rainfall and soil erosion	100
Poor and irregular yields	100
Further deforestation	80
Lack of tree nurseries	75
Irrational livestock rearing and missing veterinary system	50
Poor agronomic skills and training	60
Social	
Lack of access to capitals	90
Lack of legal recognition of farmers associations	100

Some of the problems are actually complex and require a multidisciplinary approach with several improvements to be done contemporarily.

Seasonality of rainfall and soil erosion: notable weather events are common in the area, creating an excess of water in some periods of the year and insufficiency in other, obviously they increase erosion. Water will be collected in small ponds, starting water conservation and reducing erosion (progressive terraces, living barriers, mulching, tree planting). Regularization of the microclimate planting trees with large canopies.

Poor and irregular yields: the soil fertility has been reduced over years of deforestation and erosion; industrial fertilizers are too expensive for local farmers. A new increase in soil fertility is seek through organic fertilization (legumes) and mulching. Intercropping with fruit forage timber and multi-purpose trees in agroforestry systems. Crop diversification and rotations (cereals + grain legumes).

Further deforestation: unfortunately, deforestation is not finished yet. Farmers seek the reintroduction of multipurpose trees, but this is obstacle by the needs of energy and building materials. Reduction of fuelwood use can be achieved by spreading the use of solar ovens built locally, and the use of stones and clay bricks can be alternatives to wooden houses.

Lack of tree nurseries: tree plants are now sown directly, often with disappointing results. Five small irrigated nurseries were done. Seedlings of Avocado, Mango, Papaya was given for free to the farmers of the project. These community nurseries will be managed by existing agricultural cooperatives and rural associations.

Irrational livestock breeding and lack of veterinary system: uncontrolled livestock grazing is common use. Live fences have been built to start controlled grazing. Live hedges were done also with *Opuntia ficus-indica* that can be forage during drought, herbal medicine for rural families and food in the most extreme cases. At the moment there are no veterinary checks, 33 veterinarians were trained and 5 rural veterinary pharmacies has been started, a campaign of cattle vaccination has been started in all the municipal districts of Carrefour.

Poor agronomic skills and training: forty “promoter” farmers have been trained for the training and dissemination of skills two methods have been used: *Campesino-campesino* and *Aprender haciendo*. Every farmer trained by the project is committed to teach the learned skills to other farmers. Also starting agroforestry techniques on their land which become demonstrative plots.

Lack of access to capitals: an initial help to selected farmers was given delaying tree seedlings in plastic pots to be planted in their lands. The beneficiaries agreed to return them in a larger number within 5 years. This approach will be extended to eventual cases of weather damages, and allow the restart of activities that would otherwise be permanently lost.

Lack of legal recognition of farmers associations: most degraded land is found where land security is unstable. Rental contracts are not written or however they are given for just a few years. These two conditions make farmers not interested in reintroducing trees or making any improvement to the land. Furthermore, farmers organizations have no legal recognition and cannot support the requests, the legal support of farmers for the regularisation of medium-term leases (10-12 years) and sales contracts was therefore initiated.

Several agronomic solutions have been proposed (Table 2). Nonetheless of the technical interest of the agronomic solutions, the possible changes to social organization were more appreciated because of more rapid effects on farmers wealth than agronomic changes. The introduction of agroforestry techniques and all the agronomic practices related were very appreciated, but farmers referred the necessity to make the social changes before to favour its introduction, in particular they pointed out the necessity of written contracts of land tenure and the diffusion of agricultural knowledge farmer-to-farmer.

Table 2. Agronomic solutions proposed and percentage of appreciation by the farmers

Proposed solutions	% of appreciation
Artificial lakes to harvest and conserve rainwater	60
Land terraces on slopes	70
Legume's diffusion and introduction of rotations legumes-cereals	65
Diversification of Cash Crops	70
Planting of multiuse trees	75
Introduction of agroforestry systems	80
Diffusion of solar ovens to save fuel wood	70
Starting of tree nurseries	80
Green fences	75
Veterinary training and set of periodical veterinary controls	70
Opening of veterinary pharmacies on rural territory	70
Training of promoter farmers	95
Knowledge spreading farmer to farmer	100
Example plots in pilot farms	95
Availability of tree seedling given for free initially	95
Written medium-long term contracts of land rental	100

CONCLUSIONS

The research identified a number of basic problems, either agronomic or related to social organization. The local population has been actively integrated in the conduction of the initial surveys, thus reaching widely agreed assessments. Later on, farmers were involved also in the identification of possible solutions and in the actual start of interventions. Some of the problems resulted to be affordable with very low monetary input and therefore actually available to the local farmers.

In this way, the results of the research were guaranteed the possibility of actually spreading among the population.

In many cases changes to social organization were considered more important than agronomic aspects.

The identified social problems have been linked to land uncertainty that must be overcome in order to entice farmers to re-bring down tree plants that require long periods to become productive.

Concerning agronomic tools, many aspects considered are related to trees reintroduction and their intercropping in agroforestry or complex agro-silvo-pastoral systems.

Generally talking, local farmers are interested in any intervention that is affordable with little money and little knowledge, thus refusing as a matter of fact high input interventions. Under this point of view agroforestry looks a good set of practices to start gradual changes either social or related to the land.

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