



Reforestation based on the valorization of agroforestry systems in social movements in Haiti

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Haiti is a Caribbean country located in the western part of the island of Hispaniola, which it shares with the Dominican Republic. This island is located between Cuba and Jamaica to the west and the island of Puerto Rico to the east. More than 50% of Haiti's population lives in poverty and without access to basic services[1].

The roots of deforestation in Haiti

The Republic of Haiti, which occupies the western part of the island of Hispaniola, is dominated by 75% mountainous terrain and only 25% flat, i.e., mountains occupy 20,000 square kilometers of the country's 27,560 square kilometers[2]. Throughout its history, the Haitian peasantry has developed farming methods and techniques adapted to mountain agriculture. The plots in direct proximity to houses or 'lakou' gardens are



characterised by a dense agroforestry system where all strata of vegetation are exploited. Originating from the colonial period, the cultivation of coffee and, to a lesser extent, cocoa under tree cover has long allowed the sustainable development of the highlands. But following the decline in coffee prices with the liberalisation of the market at the end of the 1980s and the various economic crises linked to the country's instability, coffee-growing areas have declined considerably in favour of subsistence agriculture[3].

At the same time, population pressure increased from 185 inhabitants per square km in the 1980s to almost 300 inhabitants per square km today, with a population of more than 8 million[4]. With strong demographic pressure, even the steepest land is valued by subsistence agriculture to survive without anti-erosion structures and on very limited areas, often less than 0.5 ha. Cultivated species are strongly heliophilous (beans, maize, yams, sweet potatoes, etc.). The tree has therefore gradually lost its place in Haitian agriculture.

Haiti thus ranks as one of the poorest countries in the American continent (158th out of 193 in the 2022 HDI ranking[5]) and the population, 60% of which is rural, lives overwhelmingly below the poverty line[6]. In rural areas, basic services for the population are very scarce (public schools, health centres, police stations, courts, roads, markets). Limited access to these services often requires travel to the city, which represents significant costs for rural families. In this depressed economic and social context, with the high demand for charcoal throughout the country for domestic use, tree felling is reaching extraordinary proportions. In fact, the tree has become the last resort, and the sale of charcoal allows farmers to cover urgent liquidity needs. Haiti's current forest cover is estimated at less than 2%[7]. This represents the residual natural forest concentrated at the level of the Selle and Pic Macaya massifs in the southern peninsula of the country, a forest dominated by *Pinus occidentalis*, an endangered pine endemic to the island of Hispaniola.

However, the traces of the colonial period, of exploitation of natural and human resources, are strongly reflected in all aspects of environmental issues. At present, it is estimated that there is less than 1% of the territory's native vegetation cover[8].

It is clear that the consequences are alarming. Soils that have been nutrient-poor since their origin are becoming increasingly infertile due to lack of vegetation cover and lack of adequate soil management through effective methods that allow their recovery. Water resources diminish significantly each year. This is why 80% of the Haitian population lives in the countryside, and the agriculture they do is subsistence farming [9], because when there is such an accelerated deforestation, then the soil loses all its fertility due to erosion. This happens automatically and the land loses its productivity. Since the appearance of the first reforestation projects in 1940, there has been a succession of failures and very few experiments have produced satisfactory results.



Large-scale reforestation experiments were implemented in the 1990s. These included the Technical Assistance for the Protection of Parks and Forests (ATTF) project funded by the World Bank and the PLUS (Productive Land Use System) programme funded by USAID and implemented by large US NGOs (CARE and Pan American Development Foundation, PADF).

Despite the millions of dollars spent, few tangible results remain on the ground from these important programmes. Plantations were established without the chosen models taking into account the place of the tree on farms, both the tree products expected by farm families and the use of trees as capital that can be quickly mobilised in the form of charcoal in case of urgent financial need. In addition, the priority was often focused on seedling production in nurseries and distribution to farmers. In both cases, there is a lack of monitoring of the proper development of seedlings or plantations.

Local associations

Local associations are often mentioned as a third category of actors involved in environmental issues in Haiti. Some of them are not homogeneous, some are a continuum of large international NGOs represented in Haiti. Others are groupings of platforms of organisations that are not specifically environmental groups but which carry out concrete actions in defence or protection of the environment. For the associations that depend on foreign organisations, the use of charcoal as fuel is one of the main causes of environmental degradation in Haiti [10]. They always mention that one of those responsible for deforestation in Haiti is the peasants. This may be true in part, but what really happens is that when you have a country that is not governing, the State does not invest in the country, the population is abandoned, charcoal becomes a source of income for the peasants, they have no choice but to do this because the authorities do not offer them an alternative that can compensate for that. It is clear that what is happening is not spontaneous.

The movements seek to build efficient methods of environmental restoration that promote the recovery of natural resources, but also take into account the social aspect, considering economic issues and cultural practices. Thus, agroforestry systems (AFSs) emerge as a possibility to provide concrete solutions, thinking from environmental, social, economic and political aspects.

There were already practical experiences that began to promote the production of seedlings and the construction of seed banks in four departments of the country through the 4G platform (4 peasant organisations: MPP, Tet Kole Ti Peyizan, MPB and KROS). The species propagated seek to respect the proposals of the Agroforestry



Systems, considering the different functionalities of the plants and their objectives, with priority given to timber, fruit, forage and ornamental plants.

The organisations involved in this experience for the development of food sovereignty are: the MPP (Peasant Movement of Papaye), Tet kole Ti Peyizan (TK) and MPB (Peasant Movement Bayonet) and KROS, i.e. 4 organisations located in 2 different departments of the country (Centre, Artibonite). With the four organisations, the aim is to further promote seedling production and seed banks. When the seedlings reach an ideal size, they are distributed to the communities and in some cases exchanged for seeds.

In this process, important information was gathered, highlighting the interest that families have in working with consortiums in their production units, as this is a practice that allows them to produce a greater quantity of food in small areas of land; it is possible to create a greater diversification of plots; significantly improve soil quality; and promote agroecological practices for the control of insects and diseases. Finally, community and satellite nurseries have strong potentials to foster peasant organisation in their territories. From the farmer-to-farmer method, a method in which farmers can exchange their knowledge and practices, farmers can reaffirm the importance of developing activities with an experimental character, thus showing the potentialities and challenges existing in each territory.

Main causes of deforestation in Haiti

Haiti has not always been a land devastated by rampant logging according to our historians. It was inhabited by the Arawak and the Taino before the arrival of Christopher Columbus in 1492 at the San Nicolas dock. These natives lived off the fruits of the land and were dedicated to hunting and fishing. There were less than a million inhabitants on the whole island. 'Our forests, where fruit trees of all kinds abound, exempted them from the arduous work of agriculture. Rather, they were engaged in fishing and hunting, the products of which, together with potatoes, maize and cassava, provided their food'. In fact, this explains why the felling of trees for agricultural purposes was not their concern. Moreover, they were unaware of the existence of other worlds, so they could trade with them. After the colonial period, many things changed on the island.

According to Paul Moral in 'Le Paysan Haïtien' [11], the colonisation that enriched the flora of Saint-Domingue had also initiated deforestation there, especially after 1770 with the rapid and somewhat disorderly progress of coffee speculation. Authors from the end of the colonial period were already denouncing the harmful effects of the deforestation of the hills. After 1804, deforestation took on a devastating character. Throughout Haitian history, there were two types of deforestation: parasitic deforestation of urban



origin and fundamental deforestation of peasant origin. The former manifested itself mainly in the massive felling of timber and dyes for export (mahogany, Campeche wood, etc.), which continued for about a century until the reserves were almost completely exhausted. According to historical data, in 1896, dyewood exports from Campeche reached one million quintals (approximately 50,000 tons), representing the region's most significant export product in that period[9].

Since the First World War, between 1914 and 1918, the export of wood has practically ceased, but deforestation of urban origin persists for the manufacture of charcoal, for the supply of fuel and planks for the railways of Artibonite and the Northern plains, for the construction needs (wood for shoring and sawmills) of pottery factories and brickworks, and for the supply of guilds.

Unfortunately, in Haiti, some of the above-mentioned functions take priority over others. This is particularly the case for the economic function. In fact, the production of fuelwood is considered the main economic function of trees in Haiti. Wood, either directly or transformed into charcoal, covers 72% of the country's energy needs, estimated at 2 million tonnes of oil equivalent [12]. This energy practice is one of the main causes of mountain deforestation with all the consequences we know.

Consequences

Deforestation has led to soil erosion, which has reduced agricultural yields and caused deadly landslides due to torrential rains that overflow and increase because they have not been absorbed or at least slowed down by the surrounding nature.

The cities' natural environment is overwhelmed by human presence and suffers from a lack of sanitation. Large slums, particularly around the capital Port-au-Prince, are populated by people living in poverty and unsanitary conditions.

Deforestation also leads to the emergence and appearance of arid zones, whereas recently these zones, located in tropical climatic zones, were heavily irrigated by regular rainfall. On the coast, the land is retreating even more rapidly towards the sea, a victim of this strong soil erosion.

Materials and methods

The reforestation project is an activity developed through farmers' organisations, implemented through participatory approaches in the different project intervention sites in the various farmers' organisations.



Produce and protect , an alternative to fight deforestation



Seedling nurseries. Photos: Wallens Onesias.

The establishment of satellite nurseries offers an alternative way to get closer to reforestation areas. These nurseries also facilitate the distribution of seedlings to farmers in their communities.

In all social movements in Haiti, one of the main axes in which social movements intervene is the protection of the environment, which is why reforestation based on agroforestry systems is an alternative that generates sources of income for farmers.

One of the major projects of the farmers' organisations is to produce 50 million trees to help reforest the country. It is necessary not only to plant energy forests, but also to value areas based on agroforestry systems (SAFs). The optimisation of areas planted in trees provides shade, protects soils (combats erosion) and fertilises soils.

In the cases of valorised agroforestry systems areas, they conserve soil fertility, provide supplementary income (in non-timber products) and food production such as sweet potato, cassava, sugar cane and other agricultural crops.

Strengthening and sustaining; a reforestation approach

In the social movements that are part of the reforestation project, activities to establish energy forests have already begun. For example, in the Mouvement Paysan Papaye (MPP), one of the strategies developed for the successful growth of seedlings is to use our clusters, associating the trees with agricultural crops (SAFs). With this method, not only the maintenance of the trees is ensured but also the clusters gather and take advantage of the seedlings to produce their necessary food.



For this activity, different groups are trained in soil and water conservation techniques and tree management techniques in plantations. The groups have received materials such as cable reels to ensure the safety of the planted areas.

Creating opportunities for tomorrow

The activity of seedling production and seed banks, initiated in 2020, pursues ambitious objectives: reforestation, seed banks, the valorisation of resilient and sustainable agroforestry systems, an increase in the agricultural margin per hectare on average, and an active participation of women and young people in all these activities.



SAF local. Photo: Wallens Onesias.

While the Haitian rural environment is facing a significant degradation of ecosystems and a major phenomenon of exodus of young people to the cities and other countries that deprives the rural environment of lively and dynamic forces, the establishment of energy forests and the valorisation of agroforestry systems contribute to new relations with young rural farmers in the agricultural sector, vital for the economy of peasant communities, and will allow the emergence of a new class of farmers capable of introducing technical and technological innovations for better development and preservation of local potential.



Successes achieved from 2020 until today with nurseries and SAFs

From the beginning of the project until the present day, a series of actions were undertaken based on the production of forest and fruit seedlings. These were one of the central axes of the project's activities. In only four years, the 4G platform (MPP, MPB, Tk and MPA) are farmers' organisations, actors in the implementation of the project, and managed to produce 315,000 forest and fruit seedlings. These productions were destined for distribution in the nearest municipalities of the production departments. They also managed to establish 12.9 hectares of forests, based on agroforestry systems.

Agroforestry systems are an alternative implemented in social movements with the aim of returning to ancestral practices; nowadays these practices are almost disappearing in rural and peasant communities. And it is an opportunity for the peasant organisations that were members of the AIP project (AIP stands for Asamblea Internacional de los Pueblos) to continue strengthening the groupings in the dynamics of reforestation of deforested areas.

The peasant and social organisations are the ones promoting the paradigm of food sovereignty through agroecology in Haiti, as an integral approach that seeks social, economic and environmental sustainability of production systems.

Sooner or later, the actions undertaken by peasant movements eradicate the problems of the environmental crises that affect us. Reforestation based on agroforestry systems proposed by peasant organisations seems to be one of the best and most comprehensive long-term responses to the environmental crisis facing the country.

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