

The History of Agroforestry in Dominica

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Introduction

Agroforestry involves a wide range of disciplines and land use practices, but in its most basic form it is just multiple cropping: combining woody and non-woody plants to produce various products and services (Huxley, Tropical Agroforestry). This alternative land use system provides the opportunity for conservation of resources and improves yields of production (Manley, Investing the Agroforestry).

Upon arriving in Dominica and observing their current farming methods, I saw minimal signs of agroforestry. Increasing the food production is a natural necessary response as the human population continues to grow and life spans lengthen (Ulzen-Appiah, Tropical Ecology). Agroforestry is important to increase the productivity of food and the overall sustainability of the land.

The adverse environmental impacts of intensive agriculture in Dominica could possibly be mitigated through implementing a system of agroforestry. The reintroduction of this resource management practice could also improve productivity at the farm level. The specific objectives of the study were to: (1) examine the origin of agroforestry in Dominica (2) identify past and current agroforestry practices (3) identify the problems associated with these practices that lead to failure (4) suggest future agroforestry practices that will address the inhibiting factors to the progress of agroforestry in Dominica.

Methods

I used several published report sources and conducted an interview with Albert Gallion, who is currently working for the Forestry, Wildlife and National Parks Division as an assistant Forest Officer, to collect and analyze the information on the history of agroforestry and its

current role in Dominica. The information collected describes the origin, development, constraints, and management mechanisms associated with the awareness of agroforestry.

Results

In the late 1970's scientific researchers observed agroforestry practices and identified it as what we know it as today. Agroforestry is not a new idea, it has been used in some form for centuries, but was often overlooked. For years, farmers have pursued a wide range of tree planting with crops prior to defining it as we do today. There are numerous studies and biological hypothesis that support the benefits of agroforestry. Yet, it is also important that we remember that agroforestry is not an exact science but consists of management decisions which consider several factors including environment, economic, and crop-oriented needs (Huxley, Tropical Agroforestry).

Dominica's interest in agroforestry stemmed from the declining monoculture production of bananas and a need for a new way to increase income. Dominica adopted agroforestry practices to satisfy the demands of the farmers and to maintain their family's wellbeing. Loss in fertility of land and land availability leads to a more efficient system of cropping. Agroforestry creates more output from the same input of labor on less land.

Various agroforestry methods allow farmers to grow crops on poorly degraded lands. When the farmers combine woody and non-woody crops on the same land unit they increase the crop intensity. Providing multiple products leads to an increase in income as well (Ulzen-Appiah, Tropical Ecology).

One central hypothesis stands out from the rest, "that benefits of growing trees with crops will occur only when the trees are able to acquire environmental resources that the crops would not." This truth is the foundation of all other benefits of agroforestry (Huxley, Tropical

Agroforestry). Benefits from agroforestry in Dominica include: improvement of soil fertility and conservation, increase in timber production and various crop species, improving the water supply which has been degraded by pesticide and herbicide use (Geuder, Dominica: Report on agroforestry). Agroforestry is a general term that encompasses many practices that are classified by their spatial structure and function.

Agroforestry systems may be classified into:

1. Agrisilvicultural systems including crops and trees
2. Silvopastoral systems including animals and trees
3. Agrisilvopastoral systems including crops animal and trees (Ulzen-Appiah, Tropical Ecology).

Past

Farmers in the 1960's used more agroforestry practices than today, such as intercropping, fodder, and live fences. Currently, farms are mainly banana monocultures but display some minimal agroforestry uses such as windbreaks. The banana farms observed at Syndicate Trail used mangos and other species as windbreaks (Albert Gallion, Personal Communication).

Most of the farmland in Dominica is a 4-5 acre plot area in a very large farming sector that is broken up into many smaller sections. Past agroforestry practices included intercropping bananas with coconuts, dasheen, tannia, cassava, cocoa, and breadfruit. Some silvopastoral systems integrated goat and cattle into the forest to eat the weeds instead of using herbicides. Agrosilvopastoral systems were used in home gardens and continue to be practiced in some areas (Manley, Investing the Agroforestry Potential).

During the 80's population pressure and a lack of suitable farmlands forced some people to adopt agricultural practices on steep slopes (Manley, Investing the Agroforestry Potential). All

the benefits of agroforestry can only result from a proper working system. When your enthusiasm outruns your understanding of agroforestry it leads to destructive effects (Ulzen-Appiah, Tropical Ecology).

There has been a decrease in agroforestry practices as a result of promoting intensive monoculture banana production and improper farming techniques. This transition has created a snowball effect in the degradation of the environment (Geuder, Dominica: Report on agroforestry). The repercussion of the actions caused; “soil deterioration, excessive leaching of soil nutrients, reduction of water quality, pollution of streams, and an increase in landslides” (Huxley, Tropical Agroforestry). Lack of feeder roads to farmland makes it difficult for farmers to access their crops. Also, if the farmer decided to extract timber from their land the cost of timber extraction would outweigh the production revenue. There are also problems that come with the local climate such as steep terrain mixed with heavy rainfall. In addition, unstable soil provides a very difficult foundation for the construction and maintenance of roads. (Manley, Investing the Agroforestry Potential). After some time farmers realized the increase in pollution and landslides and began to change their practices (Albert Gallion, Personal Communication).

As environmental problems increased the forestry division constructed an agroforestry unit through the funding of Organization of American States (OAS). This agroforestry unit conducted research and extensive work from April 1987 to January 1989. (Manley, Investing the Agroforestry Potential). They observed the current farming system and formalized many recommendations to their farming practices (Albert Gallion, Personal Communication). Areas where they conducted research include Castle Bruce, Bagatelle, and Petite Savanna. The unit was demolished in 1991 when they ran out of funding because of the government’s decision to cut wages and refusal to rehire existing staff. The previous problems associated with the adoption of

agroforestry are currently the same problems, including the lack of financial resources and materials (Manley, Investing the Agroforestry Potential).

Since 1991 when research was disbanded, there has been no progress in agroforestry. The recommendation was made to establish an agroforestry unit within the Division of Agriculture, Forestry department; however, because of lack of funding this has not been created. If there was an agroforestry unit recognized as a separate discipline it would have its own allocated budget. This would provide an income for staff to teach the farmers agroforestry practices. Some farmers were willing to adopt agroforestry practices, but in the absence of having agroforestry as a former discipline within the public sector there is no prior knowledge of it. When farmers question the resources provided of adopting agroforestry practices, the extension workers can not provide an adequate response because due to the lack of funding (Albert Gallion, Personal Communication).

At this time farmers are in need of financial, technical, and moral support of some sort. The transition to agroforestry requires the purchase of seedlings, fruit trees, and understory crops. The farmers understand the present negative impact of monoculture on the environment but they lack the funding to change their current practices. If possible, an extension worker should stay and show them how to develop the land and construct the proper environment for the agroforestry practice. There has been a trend, in the past, of people relaying the information and facts and not taking the time to teach farmers how to properly implement their new knowledge. It is obvious that there is a need for extension workers in a distinct agroforestry unit (Albert Gallion, Personal Communication).

Current

Currently Dominica is under a transformation in the farming system. This change in agriculture is due to the older farmers retiring and younger, more knowledgeable farmers beginning to farm. The goal is to change the mindset of the farmers and landowners. An attempt is being made to convince farmers that profit lies not in the amount of acres you own, but in maximizing your production with the number of acres available. Increasing acreage does not necessarily mean an increased production (Albert Gallion, Personal Communication).

While I was sea turtle watching on Rosalie beach I met Dexter George who patrols the beach for RoSTI. Dexter is also a young farmer who practices agroforestry techniques such as intercropping and using goats to eat the weeds. His parents used chemicals and some of the soil is completely infertile. He is attempting to turn the farm around and is currently farming completely organically. This confirms my initial statement of the older farmers retiring and the need for younger farmers to carry on farming the land, but it is only one, circumstantial case.

Currently, steps are being made to interest young farmers in participating in agroforestry practices and performing farming through the mindset of a businessman. The purpose of this is to recruit young farmers who have a scientific background along with some business education to practice farming as their main economic income. There should be a desire within the younger generation for agriculture practices and to pursue this career with the same energy as the previous generations. The older farmers made money, but they did not invest the money back into the farm, therefore, following their generation there will be nothing left for future farmers. Farmers need to consider their livelihood as an agribusiness and industry. Providing for their family is important, but so is economy (Albert Gallion, Personal Communication).

The forestry department continues to advocate agroforestry practices by teaching new farmers techniques they should try to adhere to, however they can only do so much with the labor they have. Farmers respond willingly to agroforestry practices, but since there is no financial support they are unable to follow through with the practices. The forestry department workers taught the farmers to apply specific practices to meet their desired needs such as planting forestry tree species for shade and planting fruit trees or other quick cash crops (Albert Gallion, Personal Communication).

One of the current problems is the high cost of labor in Dominica. The labor constraint and having no support are two limitations farmers face as they seek to adopt agroforestry (Albert Gallion, Personal Communication). The scarcity of farm labor is solved by the use of herbicides, intercropping, and shifting to low labor demanding vegetable crops (Ulzen-Appiah, Tropical Ecology). There have been some marketing problems on the island, so farmers should identify the specific wants and needs of the target consumers. Market buyers must have a guaranteed quality and quantity of the specific product. This problem can be resolved, but it is a matter of better networking within the industry as well as the private and public sector. Farmers also need to adjust their production to meet the specific demands because currently there are periods of over supply and low demand. The farmers should forecast their production so that there is a continued supply of the crops (Albert Gallion, Personal Communication).

Future

Future agroforestry practices that could be implemented by farmers include multi-storied cropping, live fences, **and alley cropping**. Multi-storied cropping would consist of using mahogany as the top story, cocoa and fruit trees as the middle story, and cassava or dasheen as the under story crop. Using live trees for fences can provide protection from strong winds and

yield fodder for livestock. The alley cropping system consists of alternate strips of food and trees. For example, use of leguminous trees along the contour and against the slope with a variety of crop species is an efficient nutrient cycling process. Another future practice is the taungya system. This includes combining annual crops with permanent woody trees (Manley, Investing the Agroforestry Potential).

Dominica is viewed as a country with a flourishing agricultural industry. If farmers do not begin to change their practices they will soon lose their ability to compete with other countries. Banana monocultures may begin to diversify their production by intercropping. Their acceptance of diversifying their crops and taking new risk will yield great profits. However odd it may seem, there is also the need for Dominicans to eat more bananas and consume the ripe bananas that are unable to be exported. For example, there is a restaurant named The Banana Café where every dish on the menu contains Dominican bananas. More agroprocessing plants on the island are necessary to accept the fruit that is just left in the field to rot. These crops could be sold locally in Dominica to tourists. Often, because farmers do not receive the desired price for their crops, they leave them in the field to rot on the trees instead of accepting less money for their goods (Albert Gallion, Personal Communication).

The banana industry will and should remain strong in Dominica because of the long-term relationships between Europe and Dominica. Despite the negative impact to the environment the local farmers will continue to grow bananas because they are assured of an income. However, Europe has recently enforced certain quality and quantity requirements for bananas that many Dominican farmers are unable to meet. Because they can not produce bananas at this standard their crops become worthless. Within the next month alone, 710 farmers must be certified or lose their banana market (Albert Gallion, Personal Communication).

Conclusion

Agroforestry in Dominica should be reintroduced and reinstated. Due to population pressures and the lack of suitable land for agriculture there is a need for sustainable practices that protect and conserve the environment. Current environmental problems in Dominica have led to great concern and possible progression towards agroforestry. Agroforestry's success in Dominica relies heavily on the financial support and an earnest commitment from the land managers. The environmental problems in Dominica cannot be solved by agroforestry practices alone. The land managers, agribusiness, politicians and government divisions must come together and cooperate to achieve technological advances in Dominican agriculture (Manley, Investing the Agroforestry Potential). Future objectives for agroforestry include controlling soil erosion, protecting watersheds, diversifying production, and improving environmental awareness of farmers and extension workers. Solutions to achieve these goals include windbreaks, shelterbelts, and roadside and streamside plantations and must begin with the coordinated efforts within the agriculture and forestry divisions (Geuder, Dominica: Report on Agroforestry). The future of Dominica lies within pursuing an organic production using agroforestry practices. Dominica should pursue the niche market of organic agriculture if it wants to continue to compete in the world crop production realm. This is an area of tremendous growth globally. This new system of agriculture delivers a consistent image to the ecotourist and the natural island aspect. This new dimension is crucial for the stability of agriculture.

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