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THE RATIONALE FOR THE USAID/GOVERNMENT OF JAMAICA HILLSIDE AGRICULTURE PROJECT

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ABSTRACT

Jamaica has over 30 years experience with agricultural development programs focused on small farmers cultivating the steep slopes of the rugged interior watershed areas. Some of these programs have focused on soil conservation treatments under the rationale that the hillsides could be stabilized within present cropping patterns. These programs, have for the most part, not succeeded in slowing soil erosion.

The USAID/Government of Jamaica Hillside Agriculture Project was designed to fund sub-projects focused on the production and productivity of economic tree crops in two of Jamaica's largest, and most densely populated watershed areas. The rationale for designing the project with this focus and structure was to identify mechanisms to make perennial tree crops a positive economic alternative to annual cropping of steep hillside slopes. Specifically, the focus is on perennial tree crops for two reasons: 1) the potential for increased economic returns to farmers with proper management, and 2) perennial tree crops provide a more permanent and stable cropping system, and are therefore a more sustainable land use.

INTRODUCTION:

The broader goal of the USAID/Government of Jamaica Hillside Agriculture Project is to increase the socio-economic well being of the residents of the hillside lands in a manner that promotes rational land patterns. The specific purpose of the project is to increase the productivity, and increase the acreage of perennial crops, with good market potential, in two of Jamaica's most critical watersheds; the Rio Minho and the Rio Cobre (Project Paper). The goal and purpose of this project conform to both Government of Jamaica and USAID programs and strategies for the future of the agricultural sector in Jamaica. The mechanism for project implementation is to fund self-managing, community-level, sub-projects that support this goal and purpose through a small centralized implementation unit.

This paper lays out the rationale for the Hillside Agriculture Project. This rationale is important because of the strategic significance of the project to the future of Jamaican agriculture. This rationale is important to Jamaican agricultural professionals and government policy makers in that it provides an analysis of past development programs, and asserts a framework for the development of future programs. The rationale is important to donor agencies and agricultural professionals in the developed countries because it is the justification for decisions relative to the investment of capital and professional resources in future targeted development activities.. And, most importantly the rationale is important to the small farmers on the steep hillside slopes of Jamaica because the cultivation of perennial tree crops are not only their "old age pension", but are the best hope for achieving a profitable, and in the long term, sustainable, form of agriculture.

DISCUSSION

The Historical Perspective

The cultivation of perennial tree crops in Jamaica is neither new or innovative. In 1988, Jamaica celebrated its 350th year of the continuous cultivation of cocoa (Theobroma cacao). The highest annual production achieved was 3,830 tons of dried beans in 1922, but annual production for the past four years averaged 2,600 tones (Alvim). Annual production of dried coffee beans has been as high as 36,000 tons in 1814 (before the abolition of slavery), but has fluctuated over time (Fiester). Recently annual production levels of coffee have been increasing, and are currently in the neighborhood of 2,500 tons per year.

The idea of promoting perennial tree crops has been around ever since the advent of public sector sponsored development programs beginning in the 1950's. In 1962, the chairman of the Provisional Watershed Protection Commission wrote

> "...the most important single factor to be stressed in the establishment of a stable and permanent agriculture in the Upper Rio Minho Watershed is the establishment of orchards of permanent tree crops. This we regard as a matter of paramount priority ... emphasis will have to be laid on establishment of permanent tree crops as the major form of agricultural land-use for every one of the major watersheds in the country. (Field)"

However, public sector agricultural development programs since that time have had little impact on overall annual production levels of permanent tree crops, or on soil erosion levels.

The farmers cultivating the more than 80% of Jamaica classified as hillside lands live in a complex social, cultural and economic environment. They typically farm small disaggregated plots of land on steep hillsides, with total acreage seldom totaling more than 10

acres. The land may be "owned" in a variety of forms of land tenure ranging from registered titles to "family land". Farmers are typically older (average age is 48), have a fear of agricultural credit, experience a low level of esteem for farming, and usually lack basic agronomic information on which to base sound production decisions (Le Franc).

Since the 1950's, there has been a succession of development projects which have attempted to overcome barriers to agricultural growth for the hillside farmers. These programs have addressed a variety of perceived constraints and have included land improvement schemes, land lease schemes, the provision of agricultural credit and low cost inputs, and the construction of soil conservation treatments. While it is beyond the scope of this paper to provide a comprehensive evaluation of these programs, it is accurate to say that the effect of any single program, or the combined effect of all of them has not created any noticeable or sustained change in the way that the small hillside farmers cultivate their land (Project Paper).

For example, an analysis of the Second Integrated Rural Development Project funded by USAID, and implemented by the Jamaican Ministry of Agriculture from 1978 to 1983 reveals a variety of reasons for lack of project success. These reasons can be summarized as follows: 1) a too complicated project design with conflicting goals of production, conservation and social welfare, 2) no economically attractive production technologies to advocate, 3) too large of an emphasis on the construction of expensive soil conservation treatments, 4) the reliance on subsidies to induce farmer involvement, 5) political interference in the implementation process, and 6) an ill-advised strategy of attempting to reach 100 % of the farmers within its geographic boundaries (Nolan).

In particular, the emphasis on soil conservation treatments within the confines of existing farming systems has been a waste of valuable development resources. Jamaican small farmers have no historical tradition of soil conservation (as in some Asian countries), and cultivate fragmented plots under often insecure forms of tenure. They work tropical soils that tend to be highly erodible, and operate in a tropical environment characterized by high and often intense rainfall. The expense involved in the construction and maintenance of soil conservation treatments in such a social and physical environment are greater than other areas, and seldom make economic sense within the framework of an individual farmers' productive lifetime.

The development of the Hillside Agriculture Project

The concensus of a workshop held in 1984 that brought together representatives from within the Ministry of Agriculture, and other GOJ agencies, is summarized in a document entitled "Hillside Development Strategy for Jamaica" (Babb). This document describes a scenario in which there is a gradual shift away from intensive

production of annual crops on the hillsides because of increasing competition and better technologies used by lowland farmers. Instead, there will be a gradual shifting towards the increased production and intercropping of permanent crops. The document also provides an analysis of the requirements to achieve the scenario, identifies some investment priorities, and key programs, and makes some suggestions for planning and implementing the strategy.

For all the work and effort put into the "Hillsides Development Strategy for Jamaica", it remained a workshop consensus until active planning began on the Hillside Agriculture Project. The first step, was the undertaking of a series of studies in order to identify and overcome specific constraints to agricultural production on the hillsides. These studies included a comprehensive assessment of hillside conditions, as well as technical studies of cocoa and coffee production and the agro-processing sector. Two of these studies produced some startling and eye-opening results.

In a study of Cocoa production by Alvim, it was pointed out that the average annual productivity of cocoa in Jamaica is about 130 lbs dried beans per acre. This figure is about 1/3 of average yields in West Africa, 1/5 of average yields in Brazil, and 1/10 of average yields on well-managed cocoa plantations throughout the world. The author argues that poor crop management is the principle cause of the average low productivity in Jamaica. In particular, excessive shade, low plant density, poor canopy architecture, inadequate disease control, the lack of insect control, and inadequate weeding, are identified as the cause of low productivity. The author also points out that in the absence of good agronomic practices, the application of fertilizers and fungicide sprays probably does not yield economic returns.

Similarly, in the case of coffee, it was found that the national average annual yield of coffee in Jamaica was 244 lbs per acre (22-25 boxes) (Fiester). The author points out that this figure varies with the type of farm (ranging form 6-8 boxes on small farms to 60 to 80 boxes on larger farms), but that even on well managed 5 year old plantations, yields of 150 boxes per acre are exceptional. This is contrasted with Costa Rica where national average are usually in the range of 140-160 boxes/acre, and in good years have been considerably higher. The author argues that a number of inexpensive changes in production methods and processing could triple average national yields. In particular, higher plant populations, greater attention to cultural practices such as shade control, pruning, and weed control, improved plant nutrition, and the use of higher yielding varieties will have significant effects on production levels.

It was further found that in general, sound principles of orchard management are seldom practiced by the vast majority of small hillside farmers. A social soundness survey (Le Franc) found that in general there was a virtual lack of sound agronomic information reaching farmers, and further that less than 5% of the farmers had

seen their extension agent in the past two years. Although, and perhaps because, permanent trees are thought of as an "old age pension", they rarely get any care beyond minimal weeding, fertilizing and reaping. Farmers, in general do not like to prune trees because of a fear that to do so will destroy some fruits of the tree. This partly explains the excessive overshading seen in orchards, the "intense agro-forestry" or "food forests" common to hillside farming, and why overgrown and straggly coffee trees are commonly seen in Jamaica despite the fact that coffee only bears on new wood.

The rationale for the Hillside Agriculture Project

The case for a strategic program emphasis on promoting the production and productivity of permanent tree crops lies in two basic areas; the economic, and the agro-ecological.

The economic rationale is based on the application of basic principles of orchard management. It has already been pointed out that yields of cocoa and coffee are so low principally because of the lack of attention to the agronomic requirements for improved yield. In the case of cocoa, the control of excessive shading in mature fields, prompt removal of Phytophthora diseased pods, and greater attention to field sanitation will significantly improve yields. In the case of coffee, improved shade control, an organized system of pruning, and higher plant populations will significantly impact on yields. These increases in yield are not overly dependant on the purchase of outside inputs, nor are they overly labor intensive for the small size plots found in Jamaica.

This is not to argue that increases in the use of purchased inputs are not required for increased yields, but rather that the application of sound agronomic management is a prerequisite for improved yields. In many cases, it makes neither economic sense to small farmers, nor agronomic sense to agricultural professionals, to finance the cost of purchased inputs for low-yielding orchards. In Jamaica, the situation is that while the agricultural know-how for these improved agronomic management exists in some circles, it has not been disseminated to the vast majority of small farmers cultivating the interior hillsides of the island. These farmers then, taken as a whole, have not had the opportunity to apply basic orchard management principles because the option afforded by this knowledge has largely not been available to them.

The agro-ecological rationale lies in the nature of permanent crops, and their long term effect on the eco-system. Permanent crops have a stabilizing effect on hillside slopes by simple virtue of the binding effect of tree roots on the soil, and the physical obstruction of the overland flow of water. Tree canopies provide a buffer from the intensity of rainfall, fallen leaves provide a physical protection to

the soil surface and organic matter, and roots provide channels for the downward percolation of water. The physical ground cover provided by permanent crops is probably the most important factor in the long term soil conservation.

The long-term importance of stabilized hillsides can not be over-emphasized in Jamaica. In 1986, and 1987, heavy rains caused severe incidence of flooding and landslides in the Rio Minho and Rio Cobre watersheds. In agro-ecological terms, the less ground cover and less percolation mean greater runoff and greater erosion. While there is a lack of specific research to show direct co-relations, the principles of the system are sound. Indeed, Jamaicans need only look to the island of Hispaniola, where the denudation of the hillsides is contributing to an ever worsening situation of environmental havoc.

Future Directions

In the course of designing, implementing, managing and evaluating development projects over the past 30 years, much has been learned about what works and what does not work. One of the most pervasive lessons running across a range of development projects is that it is critical to involve local people and organizations in how projects operate. This is especially important because local people and organizations: adapt development activities to local conditions; mobilize local resources; coordinate and spread the benefits of outside assistance; manage the natural resource base; exercise influence over local administrators; and in the long term sustain project benefits (Gow).

The rationale described herein has led to the development of a project strategy that focuses on three elements. 1). Promote the production and productivity of permanent tree crops with good markets, 2). Concentrate on the identification, adaptation, and dissemination of production technologies for these crops, and 3). At all times, and in all ways, strive to involve the small hillside farmers in the design and implementation of project activities. The transition to a cropping system based more on perennial crops is expected to be a slow and gradual one, and in the final analysis, will only take place if makes economic sense to small farmers on the hillsides. The challenge of the project is to define and disseminate those technologies that make economic sense.

The Hillside Agriculture Project represents a significant opportunity to transform the agriculture of the interior watershed areas to a more stable and sustainable form of agriculture. To agricultural professionals, the project affords the opportunity to provide operational budget to try innovative ideas and technologies for incorporating trees into present farming systems, such as use as wind breaks, use of nitrogen fixing trees, alley cropping, box planting systems, and in general a more judicious use of trees. To Jamaican organizations, the project affords the opportunity to expand

and grow with sub-projects designed to build on their particular interests and strengths, To donor agencies the project affords the opportunity to incorporate lessons learned into realistic expectations for achievement. And most of all to the hillside farmers, the project affords the opportunity to access sound agronomic advice and obtain key agricultural inputs, so as to incorporate information, and build on their own knowledge so that they may increase their own production potential.

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