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JAMAICA'S HILLSIDE AGRICULTURE: AN ENVIRONMENTAL ENDOWMENT

SEPTEMBER 1994

IICA OFFICE IN JAMAICA

Inter-American Institute for Cooperation on Agriculture

WHAT IS IICA?

The Inter-American Institute for Cooperation on Agriculture (IICA) is the specialized agency for agriculture of the inter-American system. The Institute was founded on October 7, 1942 when the Council of Directors of the Pan American Union Approved the creation of the Inter-American Institute of Agricultural Sciences.

IICA was established as an institution for agricultural research and graduate training in tropical agriculture. In response to changing needs in the hemisphere, the Institute gradually evolved into an agency for technical cooperation and institutional strengthening in the field of agriculture. These changes were officially recognized through the ratification of a new Convention on December 8, 1960. The Institute's purposes under the new Convention are to encourage, facilitate and support cooperation among the 32 Member States, so as to better promote agricultural development and rural well-being.

With its broader and more flexible mandate and a new structure to facilitate direct participation by the Member States in activities of the Inter-American Board of Agriculture and the Executive Committee, the Institute now has a geographic reach that allows it to respond to needs for technical cooperation in all of its Member States.

The 1987-1991 Medium Term Plan, the policy document that sets IICA's priorities, stressed the reactivation of the agricultural sector as the key to economic growth. In support of this policy, the Institute is placing special emphasis on the support and promotion of actions to modernize agricultural technology and strengthen the processes of regional and subregional integration.

In order to attain these goals, the Institute is concentrating its actions on the following five programs:

- Agricultural Policy Analysis and Planning
- Technology Generation and Transfer
- Organization and Management for Rural Development
- Marketing and Agroindustry
- Animal Health and Plant Protection

These fields of action reflect the needs and priorities established by the Member States and delimit the areas in which IICA concentrates its efforts and technical capacity. They are the focus of IICA's human and financial resource allocations and shape its relationship with other international organizations.

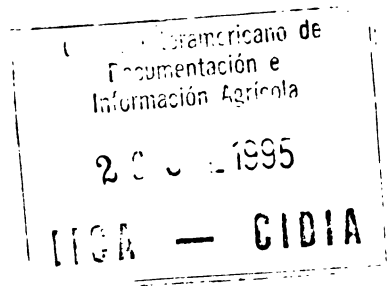
To further reach its objectives of encouraging, promoting and supporting the efforts of the Member States in the area of agricultural and rural development, the Institute renders technical services aimed at strengthening national institutions involved in this sector and serves as a multinational body for cooperation among member countries. IICA also provides direct advisory services and consultancies, implements projects, and acts as a forum and vehicle for the exchange of ideas, experiences and cooperation between the countries, organizations and other entities active in the agricultural arena.

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The Permanent Observer Countries of IICA are: Arab Republic of Egypt, Austria, Belgium, Federal Republic of Germany, France, Israel, Italy, Japan, Netherlands, Portugal, Republic of Korea and Spain.

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**JAMAICA'S HILLSIDE AGRICULTURE:
AN ENVIRONMENTAL ENDOWMENT**

✓
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Jamaica's Hillside Agriculture: An Environmental Endowment

**JAMAICA'S HILLSIDE AGRICULTURE:
AN ENVIRONMENTAL ENDOWMENT. ¹****A. Reyes-Pacheco ²****I. INTRODUCTION**

As a new century beckons, seemingly at a faster rate due to the "Global Village," natural resource conservation, environmental protection and sustainable development are compelling challenges on the world and national agendas. This ample allegation highlights the topics' complex nature and precludes the limited scope of this paper.

The aforesaid is conceivably important to Jamaica, specifically when linked to agriculture and the direct relationship between its frail natural resource base and agricultural activities in the hillsides, and economic development. Indeed, the rational exploitation of the country's natural resources without altering the ecological balance has become an evident need. Soil erosion, degradation, fertility loss, and deforestation, impact on food production capabilities, water shortages, and bio-diversity losses, which cause malnutrition and general poverty. These are some of the intensifying threats that the country withstands.

¹ Paper presented at the Seminar: " Sustainable Agricultural Development and The Environment: Focus on Watersheds". NRCA/GTS/IICA, Jamaica Conference Center, Kingston Jamaica. June 21-23, 1994

² Representative of the IICA Office in Jamaica

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This paper discusses how Jamaica's "Hillside Agriculture" conceptually interfaces development and sustainability issues. Additionally, this farming system in a fragile ecosystem is an environmental endowment. It is anticipated that the conceptual framework evoked would incite debate to enhance the understanding of this country's "Hillside Agriculture." Maybe a common national policy agenda to deal with this type of agricultural farming system might be envisioned, and ensure a sustainable agricultural hillside farming in Jamaica.

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II. THE CONCEPTUAL CHALLENGE

Since the early 1980's; up to the present, Jamaica has been through a substantial economic structural adjustment program to set the country in a path for growth and development. The economic milieu has evolved towards a liberalized market economy as the government intensified its adjustment program and implemented important policy actions. Principally, those instruments geared to have market-determined interest rates, removal of price controls, and the elimination of subsidies. Thus, the basic strategy can be summarized as one to propel economic stability and growth within an open market, export led, and private sector dominated (Reyes, 1994).

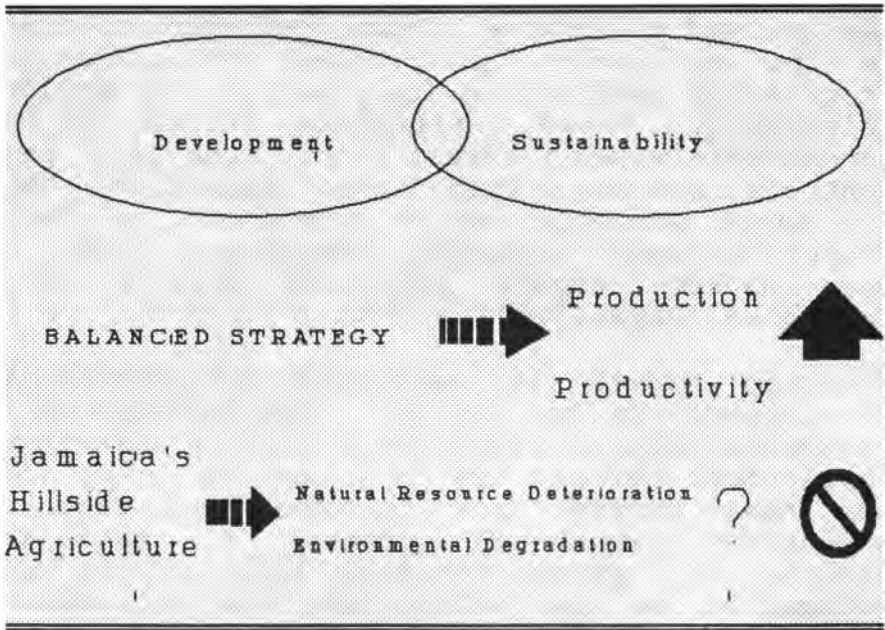
Economic growth is essential if sustainable development is to thrive. The management of renewable natural resources within a sustainable development perspective is a complex issue and a continual thrust; not to mention that the structural adjustment program to facilitate growth, is a process that is increasingly being recognized as one which involves considerable social costs.

The interdependence between development and sustainability in the agricultural sector, enacts a challenge and an obligation, to design strategies to improve the living standard of the population, and also to ensure that survival of future generations are challenged. Surely, development takes place if those strategies can balance natural resource use and sustainability needs. There is a need to increase agricultural

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production and productivity without natural resource deterioration and environmental degradation.

Diagram # 1



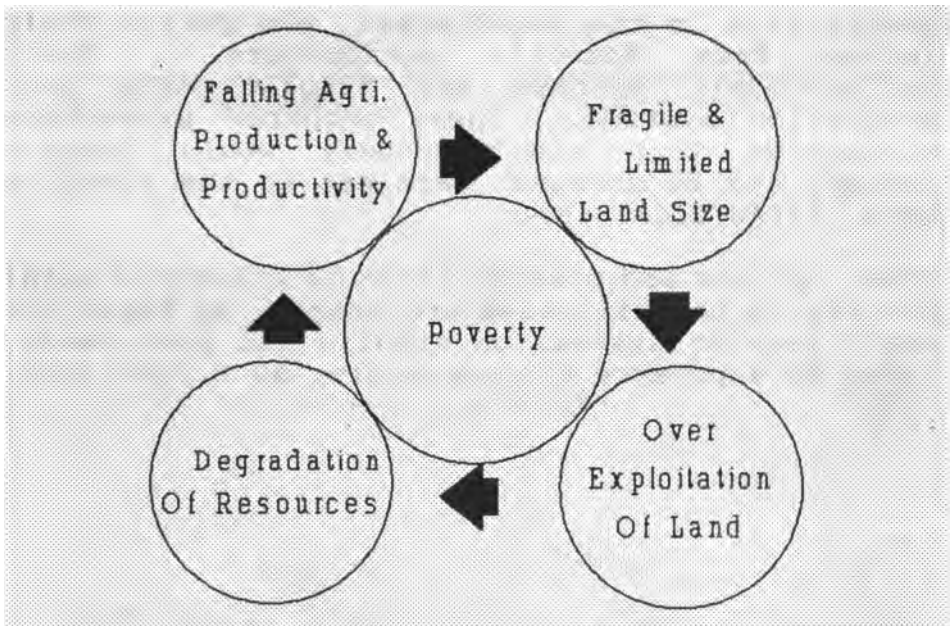
The above diagram illustrates the issues raised; and in Jamaica economic development would append agricultural growth and in itself on the productive use of the natural resources. In this process, the agricultural sector plays a strategic role; e.g., a sector supplier of food stuffs, raw materials, generator of employment and foreign exchange; and within it, "Hillside Agriculture."

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Rural poverty in Jamaica is a growing problem that merits urgent attention. The widening impoverishment of the rural population is intensified on the hillsides. Many low income groups live in the rural areas, and derive their income from domestic agriculture. Their socioeconomic systems are fragile with poor production systems. These encumber production strategies that simultaneously would improve income, and be somewhat harmless to the resource base. (IFAD/IICA. 1994).

Thus, options and possibilities to alleviate rural poverty in the hillsides are meager, as these are small farming systems on fragile and poor lands, laced to a poverty vicious cycle, as illustrated:

Diagram # 2

The Vicious Cycle of Agricultural Poverty.

The heightening inability of the rural population to cope and change their socioeconomic status; due to the level of poverty itself, is a major structural element of rural poverty in Jamaica as well as, the increasing degradation of the natural resources.

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Whether poverty moves parallel with land and forests degradation, scarcity of water, declining productivity levels and thus shortages of food, malnutrition and quality of life (Sachs, 1989); evidently the conceptual challenge is to achieve development that would encompass: alleviation of rural poverty, rational resource management, and an environmental balance to ensure well being of present and future generations.

III. JAMAICA'S HILLSIDE AGRICULTURE A SUSTAINABLE STRATEGY.

Sustainable agricultural development requires a multidimensional framework that combines ecological, technological, socioeconomic and institutional aspects. The ideal is to attest a farming system or a technological pattern that would consider this framework. Jamaica's Hillside Agriculture farming system resembles a sustainable agricultural system with environmental merits, that ought to be scrutinized.

In this vein, "Sustainable agriculture can provide opportunities to address productivity and environmental goals simultaneously. By adopting alternative land use practices that can reduce the need to abandon established farmland and that can restore degraded land to economic and biological productivity, farmers can meet their food needs and make an adequate living without contributing to the further depletion of forests and other natural resources."³

3

National Research Council. 1993 Sustainable Agriculture and the Environment in the Humid Tropics. Washington, D.C.: National Academy of Sciences. page 52.

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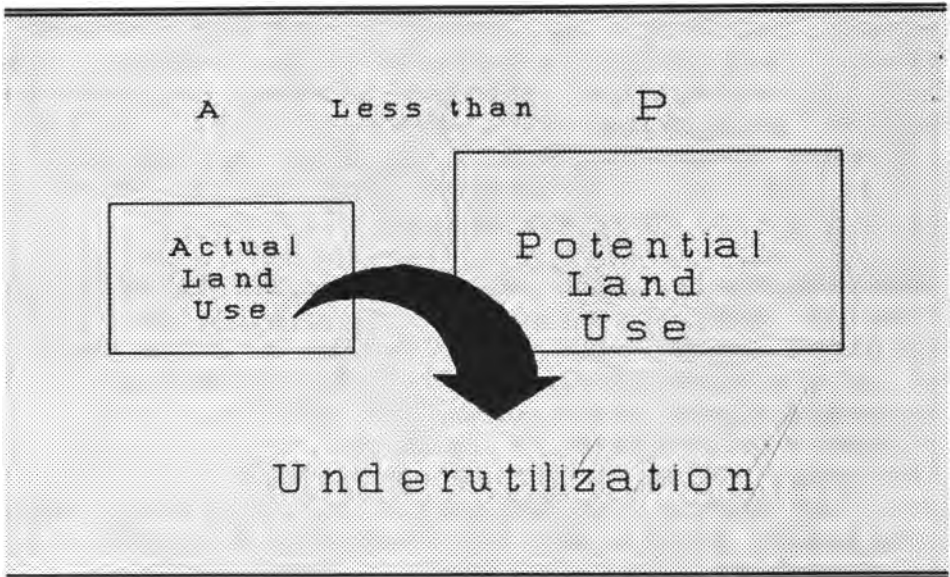
Similar to any other agricultural systems, "Hillside Agriculture" abdicate to natural and non natural factors; e.g., climate, pest and diseases, prices, and praedial larceny.⁴ In Jamaica, its multi-cropping and farming system evolved to spread production and economic risks. Thus, contrary to general assertion, this farming system in itself, is a calculated low and/or somewhat economic risk free activity.

Understandably, the small hillside farmers in Jamaica exhibit a system of mix cropping in marginal lands --characterized by a large degree of plant diversity, to minimize production and economic risks associated with farming, and thus ensure availability of food and cash throughout the year. Thus, contrary to general belief land use in some watersheds is under-utilized (Mulleady, 1994). See the following diagram #3 as an illustration of the idea.

⁴

For a detailed description of different land use options &/or farming systems see Idea. Part One Chapt. 2.

Diagram # 3



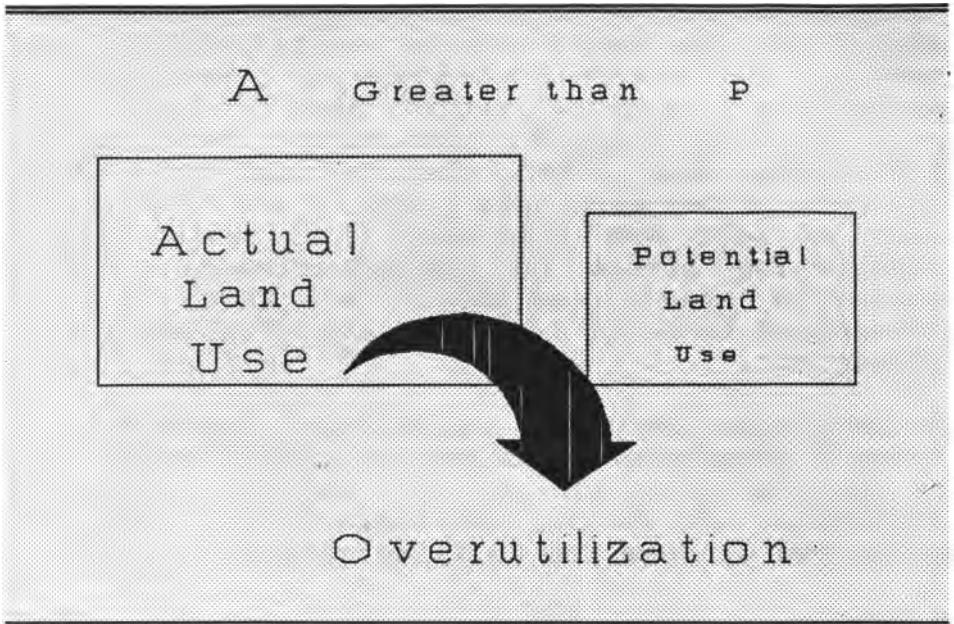
Jamaica's "Hillside Agriculture" far from being modern, has unfolded into a highly diverse multi-crop mix system that reduces the effects of adverse climatic conditions, pest and diseases, prices, and market variability. Minimizing risk is the prevailing economic denominator to ensure a continuous flow of subsistence foodstuffs and income, rather than a profit maximizing function. One could suggest that its under-utilization could reflect a reasonable sustainability, given its relative environmental amicability.

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Diverging from this system, agricultural modernization lessens production risks, is very productive, but is increasingly questionable with regard to its environmental sustainability and safety. Modern agriculture incorporates production practices within high technological packages (for example, irrigation, fertilizers, pesticides and other chemical inputs) which diminish if not eliminate climatic and other risks such as pest and diseases, that could have a devastating effect on the environment. This vis-a-vis traditional practice, which may be determined to be of low input and environmentally consequent.

An unbalanced growth of agriculture, especially in fragile ecosystems; like the hillsides, could lead to over-utilization of the natural resources available, and hence, its degradation. See the following diagram for an illustration.

Diagram # 4



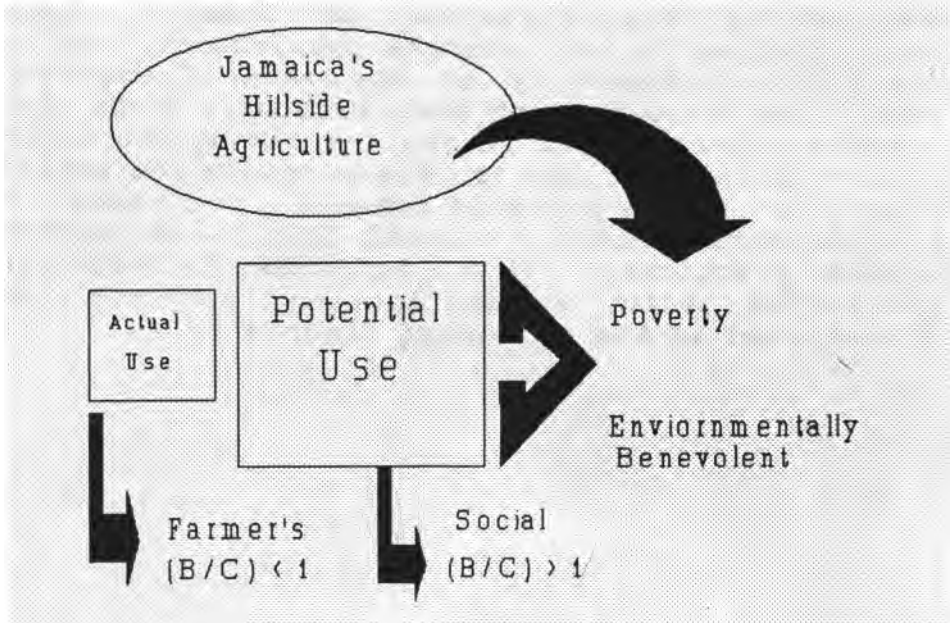
The mixed cropping pattern developed by the small hillside farmers involved in traditional agriculture has diffused the production farming risks, if not livelihood. In Jamaica the "Hillside Agriculture" system, not only incorporates a cropping pattern that includes several different crops at various stages of growth, which spread production risks and minimizes adverse effects of market price variability, but also an array of other non-agricultural activities that stabilize cash flow and minimize economic risks.

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The agricultural practices and social structures evolved in the hillsides of Jamaica, have guaranteed up to now farmer's subsistence, not to mention sustainability of the natural resource base. But this has not been without a high cost --their poverty. Low income and living standards below the poverty line are the economic and social indicators of the hillside farmers. Yet there are environmental benefits accrued from their farming system practices. Thus, hillside farmers are confronted with a conflicting scenario as illustrated in the following diagram #5.

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Diagram # 5



The "Hillside Farming" system in Jamaica guarantees some degree of food and income security --made possible by their intricate agricultural crop-mix --and other non-farm activities, and thus diminishes natural and economic vulnerability. The economic rationale of Jamaica's "Hillside Agriculture" implies that the farming units show on one hand a private Benefit/Cost relationship to be less than one which is neither economically nor socially sustainable and on the other, a social Benefit/Cost ratio greater than one which is environmentally sustainable.

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The dilemma presented is:

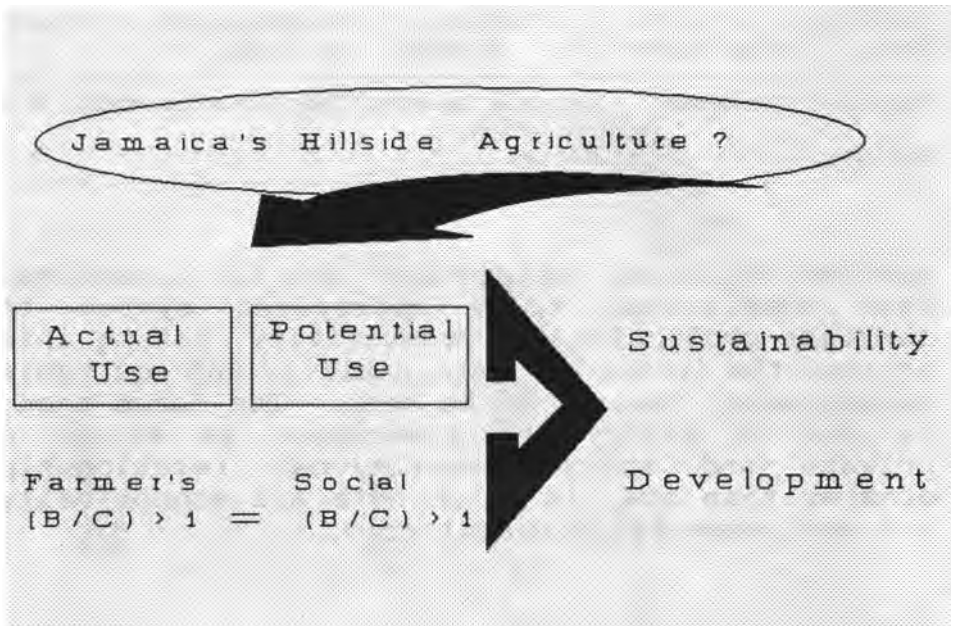
Group	Time Frame	Economic Indicator				
Farmers	Present	Private Benefit/Cost Relationship < 1				
Society	"	Social	"	"	"	> 1

Whether "Hillside Agriculture" can be transformed from traditional to a modernized system to increase production and productivity, taking into account the issues of sustainability and equitable development, remains to be seen. The issue then, is one of policy and investment to attain a private and social benefit/cost relationship greater than one, in which both are economically and environmentally sustainable.

Group	Time Frame	Economic Indicator				
Farmers	Future	Private Benefit/Cost Relationship > 1				
Society	"	Social	"	"	"	> 1

As illustrated in the following diagram # 6, this is possible if social benefits and costs are valued and allotted accordingly, for the "Hillside Agriculture" farming system to be sustainable.

Diagram # 6



Traditional farmers reveal their understanding for the agricultural environment in several ways. There are aspirations, cultural practices, economic and physical considerations, that contribute to the comprehension of the deterrents and stimuli to affect their farming system. Only with this knowledge may agricultural changes be feasible and compatible with the hillside farming community and the environment. Now, the same understanding is required from the rest of the society.

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IV. FINAL COMMENTS

Small hillside farmers operate under a social, economic and natural complex milieu characterized by diverse risk-prone conditions, usually located on fragile or marginal lands. The resource base upon which these farmers depend could rapidly diminish through environmental degradation, nutrient depletion and erosion. Thus, increasing concerns with sustainability and resource conservation call upon hillside farmers for changes in land use patterns and watershed management. This suggest that their agricultural production systems currently in use, may not be sustainable because they deplete the natural resource base and impose unacceptable high environmental costs. However, until now, their farming system seems relatively benevolent as is evident by its persistence.

Assessing the sustainability of "Hillside Agriculture" as a farming system is not an easy task. Quantification of sustainability is complicated by the sheer number of elements involved --environmental factors such as climate, land and water resources, and economic and social considerations-- and the often, difficult to predict interactions among the various elements. Yet, poverty alleviation responses ought to be expected, and one could speculate that agricultural production would have to increase to keep up with increasing demand for food and fiber.

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As hillside farmers strive to increase their agricultural production and income, hopefully, these increases will be sustainable; but with minimum exposure to additional risk. The question and the appropriate answers to be addressed is how to do this without higher risks involved, than those already prevailing. For example, an erroneous technological recommendation might endangered the livelihood if not survival of farmers. After all, "Hillside Farming" as a system has endured; by incorporating technological practices through calculated risks to deal with socioeconomic production and climatic conditions.

Whether "Hillside Farming" in Jamaica is sustainable and the subsistence level of the hillside farming communities can be improved, given the new external and economic thrust require some issues to be addressed. For this system to be improved, it warrants a broader perspective beyond technological considerations, for the dominant objective is more often to ensure survival and income security, than to maximize profits.

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24/9/00

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