

**Sustainable Agriculture and the Development of
the Amerindians in Guyana:
*The case of the Mabaruma/Hosororo
Organic Cocoa Project***



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**SUSTAINABLE AGRICULTURE AND THE DEVELOPMENT OF THE
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Abstract

This study examines an organic cocoa project in Guyana in order to determine the prospects for development of an indigenous people in the hinterland area of Hosororo. The cultural practices of Amerindian farming communities are examined historically to glean the differences in circumstances and the nature of their agriculture. This approach facilitated an understanding of how the cocoa project can replicate and improve on the early farming systems and thereby foster the development of the Amerindians. The main objectives of the project are to expand cocoa production for export and to use the model to develop other organic agricultural crops. The project has the ability to contribute to the development of the Amerindian community as well as to overall agricultural development, provided the constraints identified in the paper are overcome.

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1. Introduction

This case study is related to a wider study on the development of sustainable agriculture in the Caribbean.¹ It evolved from a field trip to Guyana to gather information on the production of organic cocoa, which was one of the agricultural commodities that were chosen to determine the possibilities for developing a more sustainable agriculture based on organic principles. Projects such as the one on which this study is based have been developed in other developing countries to improve the conditions of poor farmers and native people in remote regions as well as to preserve agro-ecosystems.

Hosororo is a parish in the northwest district of Guyana, close to the border with Venezuela. Mabaruma is the town in the parish, which is served by one main road and a number of rivers that provide the only link to remote Amerindian communities. The Amerindians in this area barely survive on what they earn from mining and from what they are able to produce on their farms [www.jesuitmissions.org.uk]. The success of the organic cocoa project would justify replicating such projects in other areas.

2. Overview of agriculture in Guyana

Agriculture accounts for about one third of Gross Domestic Product (GDP) in Guyana and employs approximately one third of the labour force. Traditional crops, namely sugar and rice, account for most of the agricultural exports. Sugar is produced by a State-owned enterprise, the Guyana Sugar Corporation (GUYSUCO), and production is done mainly in the rich fertile soil of the coastal belt, which is home to 90% of the total population. It contributes 16% to total GDP and 30% to agriculture GDP. Ten per cent of the Guyana labour force is directly employed in the sugar industry. Rice is produced by about 12,000 farmers and is a major source of income and employment in rural Guyana. The rice industry contributes 12% to total GDP and 20% to agricultural GDP.

Non-traditional crops² such as coconut, coffee, cocoa, citrus fruits, corn, manioc (cassava) and other tropical fruits and vegetables are grown primarily for local consumption. The non-traditional agriculture subsector is characterised as labour-intensive, small-scale or subsistence farming with low capital and technological inputs. The subsector suffers from the lack of provision of technical service, which could influence farmers to adopt improved methods of production and, hence, achieve greater productivity and efficiency.

Low productivity is not the only constraint on the development of domestic agriculture. Production is generally unfocused and not linked to marketing, resulting in fluctuations in supply that cause scarcity or glut in the market. The export market for non-traditional agriculture remains relatively untapped. Crops, such as pineapple and plantain, are exported to regional

¹ See study entitled *Free Trade and the Development of Sustainable Agriculture in the Caribbean*.

² Non-traditional is used in Guyana to include all components of the agricultural sector with the exception of rice, sugar, forestry and fishing.

markets (Trinidad and Tobago and Barbados). There is however potential for organic exports, which Guyana is attempting to exploit through production of organic pineapple, cocoa and sugar.

Despite the objective of economic diversification in Guyana's national development strategy, economic and social dependence on agriculture will persist for some time. It is therefore incumbent upon government to ensure that the agriculture sector is developed to its potential and contributes toward sustaining the livelihood of the rural population.

3. The role of the Amerindians in Guyana's agriculture

Overview of Guyana's indigenous people

Guyana's indigenous people, or Amerindians, now live in reservations mainly in the country's hinterland. Their lives are regulated by legislation passed during the colonial period. The Government of Guyana has title to about 90% of the land claimed by the Amerindians. The total land area of the country is about 217,559 square kilometers. Amerindians constitute about 6% of the total population of Guyana, which is about 800,000.

The Amerindians traditionally sustained themselves by fishing, hunting and farming using natural methods. The restriction of access to indigenous land by (colonial) legislation and more recently by the issuance of mining concessions resulted in a move away from farming and toward wage employment in mining and timber operations. This has implications for traditional agricultural activities as well as the structure and culture of Amerindian communities.

Traditional community structure and agriculture

Prior to European settlement, Amerindian communities were centered on the group or on a tribal system, which settled in an area of choice. Community activities and structure (Diagram 1) were governed by the Headman who was a mature (>45years) male usually elected from a generation of such persons (Fox 1996). He was respected as a great warrior and hunter as well as an excellent diplomat, especially in matters of tribal conflicts. The system was a communal one, where members worked together to ensure the development of the community as a whole. Members of the community lived in close-knit structures and depended significantly on the environment for their food, clothing and shelter.

Community development was based on subsistence³ agriculture, which involved mixed cultivation that combined horticulture with small game hunting, fishing and the unspecialized collecting of wild plant foods and shellfish. Farming was labour intensive with labour readily available, on a cooperative basis, for land preparation, cultivation and harvesting.

The traditional Amerindian agriculture system was based on shifting or fallow cultivation in forested areas. Production sites were determined by a number of factors, in addition to soil

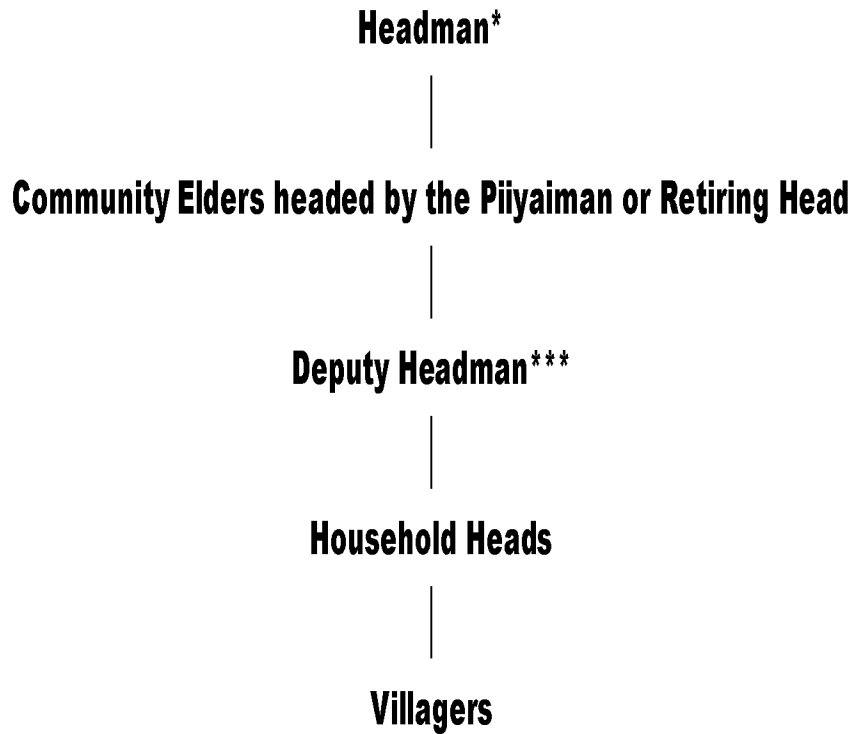
³ Subsistence agriculture refers to a system where families produce the food they need. There is little exchange and consequently crop failure may mean starvation.

conditions, such as potential of the land to flooding; the presence of *acoushi* ants that destroyed crops; security of the area in terms of invasion by animals and other tribes; and the distance of the new field from existing fields and settlements. The distance that the Amerindians had to travel from field to settlement was very critical as it influenced the effective time spent in the field as well as the amount of produce that could be carried from the production site to the point of consumption, especially since the women were the ones who generally carried the produce to the village [Dummett 1968].

Men prepared the land using the “slash and burn” method, that is, by cutting and burning existing vegetation. Women and their daughters then planted and maintained the field. The type of crops grown varied according to the tribes, the topography of the land, the soil type (such as sandy or clay) and the season (rainy or dry). This allowed for crop rotation as well as intercropping, which helped in maintaining the area’s soil and biodiversity. Crops such as sweet potatoes were planted on the slopes; bananas in areas of high ash concentration; and pumpkins, pineapples and watermelons in areas of low ash concentration. Cassava was grown on any type of soil and was considered the most important crop to the Amerindian civilization. This was because the crop produced a high caloric yield per acre, was drought tolerant, grew in relatively any type of soil and could remain in the ground and be reaped over a period of a year when mature. The crop was also an Amerindian staple, whose by-products such as cassava bread and casareep contributed to the main Amerindian dish (pepper pot), which today is one of Guyana’s national dishes.

Amerindians generally cultivated the same plot for a period of 2-3 years not because of exhaustion of soil nutrients but because the weeds become uncontrollable. The plot was then left fallow for about 10-20 years or sometimes longer. When the fallowed area was again ready for cultivation previous cultivators had no prior claim to it. Under the traditional governance system territorial rights for hunting and fishing were not an issue since property was available to all tribes. Conflict over property was avoided by tribes settling at reasonable distances from the farming and hunting areas of other tribes.

Diagram 1
Hierarchy of Village Government in Early Amerindian Communities



* Elected from among the household heads

*** Usually the eldest son of the Headman

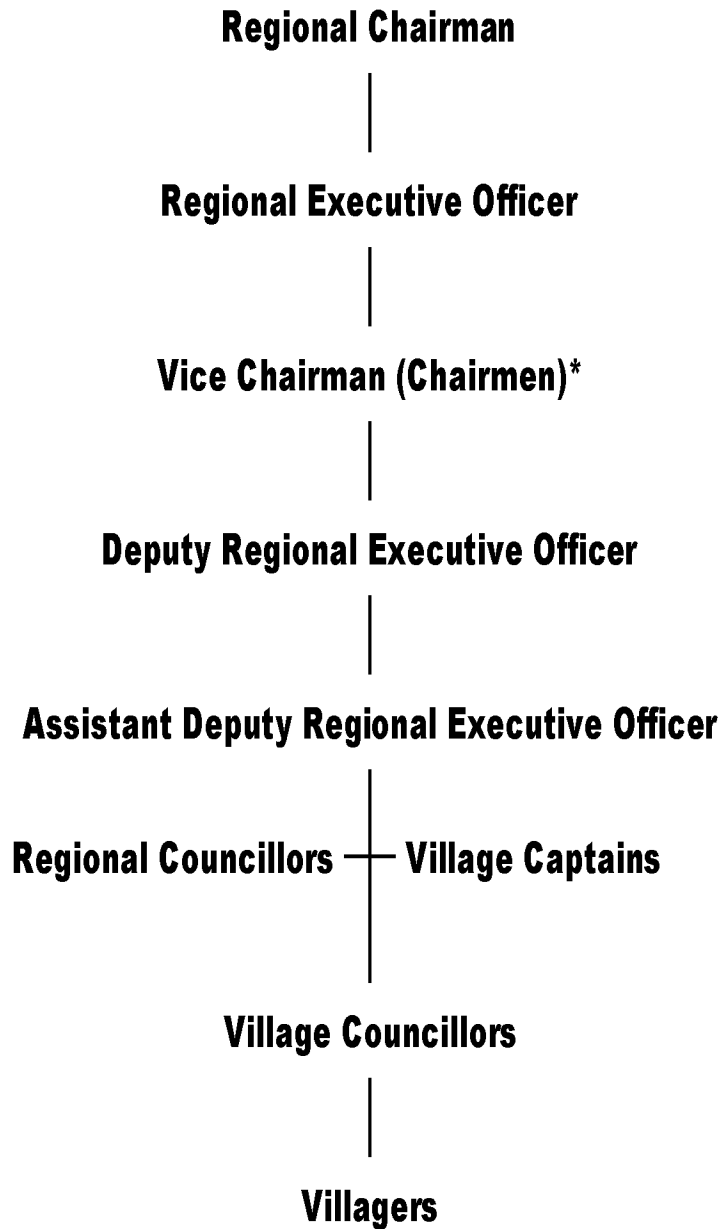
Source: Fox, D. "Continuity and Change among the Amerindians of Guyana" in Reddock, R. (ed.) *Ethnic Minorities in Caribbean Society*. University of the West Indies, St. Augustine, Trinidad and Tobago, 1996.

The regional system and agriculture

There was change in the Amerindian community system after the settlement of the Europeans (planters) and later the Africans and East Indians (Coastlanders). The traditional village government was replaced with a regional system of administration (Diagram 2). The new system was initiated with the passing of the Aboriginal Protection Ordinance No. 28 in 1910, which served to restrict the Amerindian population to reservations. Ten Amerindian reservations were established, divided into three main districts: the Mazaruni District (Region 7); the North-West District (Regions 1 and 2); and the Rupununi District (Regions 8 and 9). Today many of the Amerindians live in Regions 1, 2, 7, 8 and 9. Regions 1 and 9 have the largest population.

To improve the welfare of Amerindians, the West Indian Royal (Moyne) Commission in 1939 recommended that officers be appointed to the Amerindian communities for a period of two years. These officers would act on behalf of the government working with the village captain (former Headman) to maintain law and order in their communities. Medical officers were also assigned to communities. This was seen as a way to establish stable communities and help in the integration of Amerindians into the social and economic activities of the new Guyana. Education was one of the primary tools used in the integration of Amerindians, a strategy that had been used by missionaries for decades.

Diagram 2
The Regional System of Administering Amerindian Communities 1980 to Present



*Depending on the size of the area, selection of more than one vice-chairman could be done

Source: Fox, D. "Continuity and Change among the Amerindians of Guyana" in Reddock, R. (ed.) *Ethnic Minorities in Caribbean Society*. University of the West Indies, St. Augustine, Trinidad and Tobago, 1996.

With the new system came changes in the hierarchy system of Amerindian communities. The Headman was replaced by the Regional Chairman and was given the position of captain who reported to the Assistant Deputy Regional Executive Officer who, in turn, reported to the Deputy Regional Executive Officer and, ultimately, to the Regional Chairman through the other positions in the hierarchy. Although captains should be elected by villagers, this seldom occurred. Captains could be either male or female, who many times were chosen based on their affiliation to the central government of the day or their educational status rather than on heredity, respect earned, warrior and hunter skills or diplomatic capability. This method of selection often results in captains not getting full respect from their villagers.

Changes in the community system, such as the restriction of Amerindians to reservations, have limited their access to arable land, which was a major determinant of the method of production. Land limitation has led to shortened cycles of shift cultivation from 10-20 years to less than 10 years. The result is exhaustion of soil nutrients since a natural method of production is the general practice of Amerindian cultivators based on crop rotation, intercropping and a lengthy fallow period.

There was also change regarding type of crops grown brought about mainly through an agricultural campaign by government in the 1960s to influence Amerindians to switch from subsistence to economic production. This was viewed as part of government's (integration) strategy to ensure economical survival of the Amerindian population. Farmers were taught how to cultivate crops such as peanuts (especially in savannah), red beans, pigeon peas, cabbages and tomatoes. These crops were generally sold to government trade stores and the Marketing Corporation in Georgetown (Fox 1996). Though the venture was profitable it did not succeed because the interest of Amerindian farmers declined due to problems such as inadequate transportation facilities, inefficient storage facilities for harvested vegetables and a poor payment system.

Structural change and the opportunity to earn money wages were among the pull factors influencing the migration of young Amerindians from many traditional activities such as farming, fishing and hunting. The development of Guyana's interior areas provided opportunity for many (male) Amerindians to leave subsistence agriculture in order to earn money for self-development in the mining and timber industries or on large commercial farms (cattle ranches). Ironically, the same economic activities (mining and timber) that provide the younger generation with money wages are also the ones responsible for destruction of the forests and pollution of the watercourse, which sustained the Amerindian civilization for centuries. Amerindians, based on their level of education, are able to obtain jobs in government services such as nursing, teaching and local government.

Migration of the able-bodied males and females has significantly reduced the labour force in Amerindian communities, with the result that most agricultural activities have to be performed by older men and women. Further decline threatens the sustainability of Amerindian villages and increases poverty, resulting in dependence on external agents such as government, churches and other social and charitable groups. Sustainability of Amerindian villages is also affected by pressure placed on limited land resources and population growth of both Amerindians and other ethnic groups. Many Amerindian communities have been seeking government assistance in

getting access to additional lands. Only about 15,540 square kilometers of land titles have been granted to Amerindians. On the other hand, most of the land surrounding Amerindian reservations (thousands of hectares) was leased to mining and forestry operations to increase export earnings.

Changes in the Amerindian community structures as well as integration of Amerindians into the wider Guyanese community have influenced many Amerindians to move away from traditional cultural practices especially in respect of agriculture. Organic methods of agricultural production offer a viable option for developing a sustainable agriculture that could contribute toward improving the living standard of Amerindian communities as well as toward the overall development of the agriculture sector in Guyana. The Mabaruma/Hosororo organic cocoa project is an experiment in adopting organic methods. At the same time there are companies in Guyana that are currently involved in the production and marketing of other organic products such as sugar, beef and heart of palm.

4. The Mabaruma/Hosororo Organic Cocoa Project



Background

The Guyana Mabaruma/Hosororo Organic Cocoa Project was implemented based on a recommendation to the President of Guyana from Britain's Prince of Wales on his visit to Guyana in 2000. During his visit to Region 1 (Mabaruma/Hosororo), the Prince was informed that cocoa used to be a major cash crop for the region and the country, but the cocoa industry had been unproductive for 30 years. The Prince suggested that the industry could be revitalized if old cocoa plantations were rehabilitated to a standard that would allow them to obtain organic certification. He indicated his willingness to buy all the organic cocoa beans for use in making his Duchy Originals chocolate. Duchy Originals is a food company formed by the Prince of Wales (Prince Charles) in 1991 to create a source of income for his Charitable Foundation. The company also helps in maintaining a sustainable environment as it markets and sells products that use wholly organic ingredients.

Guyana had never exported cocoa beans since local production was unable to satisfy domestic demand. Early cocoa plantations in Guyana were mainly of the Forestero type. In 1942, the area under cocoa production was estimated at 202 hectares. In 1950, new cocoa areas were developed particularly in the northwest district. Four regional vegetative propagation stations were established, with the main station, Atkinson Field, producing an estimated 50,000 plants annually. Plantations were mainly planted with the Trinitario variety, Imperial College Selection clone (ICS), especially ICS 95. This clone was used because it showed some resistance to black pod disease (*Phytophthora palmivora*) although it was somewhat susceptible to witches broom disease (*Marasmius perniciosus*). It has good flavour characteristics, low pod intensity (19 pods produce 1 kg of beans), is high yielding and adapts well to the environment. The plantation was established in a lightly forested area to provide shade for young cocoa trees and maintain a suitable microclimate for sustainable cocoa production.

Objectives

Implementation of the Mabruma/Hosororo project began in 2000. The main objectives of the project were:

- (a) To revitalize and expand cocoa production in Region 1 by rehabilitation of old cocoa plantations using organic production practices;
- (b) To achieve organic certification for farms involved in the project so that cocoa beans could be exported to the Duchy Originals chocolate factory in Holland and thus provide a means of increasing farm revenue;
- (c) To produce 25 metric tonnes of marketable organic cocoa within five to seven years; and
- (d) To use the project as a model for government to develop an organic agriculture policy initiative.

Organic production and guidelines

Organic agriculture refers to a holistic production management system geared towards maintaining balance in the ecosystem (soil-ecosystem and agro-ecosystem) by avoiding the use of artificial inputs and relying instead on farm-produced natural materials. Organic farming methods, such as crop rotation, mixed cropping and composting, promote soil biological activities and nutrient cycling. Although several agricultural systems use such techniques, organic agriculture is unique because regulation and certification programmes prohibit the use of all synthetic inputs and mandate the use of soil building crop rotation⁴.

The organic rules and regulations are the same for any organic cocoa production and processing system. The general guidelines that farmers in the project must follow are:

- Farmers can only burn densely forested land once;
- The use of synthetic chemicals (pesticide, herbicide and fertilizer) is prohibited;
- Fields should not be contaminated with human waste;
- Farmers should practice intercropping cocoa with other crops to maintain ecosystem balance;
- Planting material for field must come from an organic field (such as NARI field at Hosororo).

Implementation

Stakeholders

To ensure the success of the project the Prince of Wales, through the Department for International Development (DfID) of the British Government, donated US\$67,797 (G\$13 million) in 2002 and US\$24,041 (G\$4.7 million) in 2003 to the project, for training farmers in organic cultivation techniques and processing as well as to establish infrastructure for the processing of cocoa beans, such as fermentation unit, solar dryer, mechanical dryers and storage facility. The Government of Guyana's contribution was in the form of technical support and planting material through the Ministry of Fisheries, Crops and Livestock. Assistance was also given to the project by the Cocoa Research Unit (CRU) of the University of West Indies (UWI), St. Augustine Campus and the Inter-American Institute for Cooperation on Agriculture (IICA). To further ensure the success of the project the Mabaruma/Hosororo Organic Cocoa Growers Association (MHOCGA) was formed to organize farmers for processing and marketing of the cocoa beans.

In 2000, 26 farmers and their families were involved in the project in conjunction with the National Agricultural Research Institute (NARI). Farmers' involvement grew significantly in 2004 when the number of farmers in the project more than doubled to 62 with a total farm size of 249.6 hectares. Not all areas are planted in cocoa. Many more farmers are waiting to enter the

⁴ Crop rotation is the practice of alternating crops grown on a specific area in a planned pattern or sequence in successive crop years. It helps improve soil physical structure and fertility while reducing weed, pest and disease problems. Under limited cropping conditions (perennials) crop rotation may not be applicable. Certification programmes suggest other methods that would preserve the soil-ecosystem.

programme. All farms are located in Region 1⁵. Eighteen of the 62 farms have received International Organic certification from the Dutch certifying body, Skal. The farms are characterized by the length of time registered in the program and the level of adaptation of organic principles (Table 1).

Table 1
Category of Farms in the Project

Farm type	Length of time in programme	Organic certification stage	Total farm size in hectares
Certified organic (18 farms)	3 and more years	Dutch certified body SKAL	140.9
Organic, not certified	3 and more years	For certification by 2004	
Non-organic/ under conversion	2 years	Transition stage	45.5
Conventional	Less than 2 years	New farm	63.2

Source: Based on information supplied by MHOCGA.

Cocoa rehabilitation

Rehabilitation is the transformation of old, abandoned or semi-abandoned estates into productive and economically viable enterprises. Unproductive cocoa trees are generally replaced with high-yielding, disease-resistant clones. In order to rehabilitate abandoned estates, farmers had to manually remove unwanted weeds from between the cocoa trees and reduce the permanent shade trees that shade the cocoa. Some farmers found the task tedious given the small labour force and the size of the trees with the result that over shading of the cocoa trees has persisted. This has contributed to fields being infested with black pod disease especially during the rainy season when humidity is high. After clearing the field the cocoa trees are cleaned and then pruned⁶, which helps to stimulate fruiting.

New fields are established from planting material provided by the Hosororo Agriculture Station (NARI nursery). Planting materials (seedlings) are produced from buds of selected ICS clones at the NARI cocoa plantation at Hosororo (organically certified field). The clone was chosen because an analytic test done by Duchy Originals Company in Holland indicated that it had the best flavour characteristic for premium chocolate. In newer fields, cocoa was

⁵Region 1: Mabaruma settlement, Mabaruma proper, Waini, Bumury, Wauna and Kobrimo areas.

⁶Farmers have been taught the proper pruning method by a Voluntary Service Officer (VSO) from the Philippines who was given responsibility for most of the pruning operation.

intercropped with other crops such as banana, avocado, pigeon pea and cedar trees and leguminous plants.

Processing cocoa beans

Farmers were assisted in improving their post-harvest and processing techniques (harvesting, pulping, collecting and storage) by a team from CRU, as this is a critical stage in producing premium beans. Farmers generally harvest and de-husk their own beans. The MHOCGA buys the farmers' wet beans and processes them – fermenting, drying, polishing, cleaning and grading, bagging and storing. The processing stage of cocoa beans is very important in maintaining bean quality. The project has a processing unit comprising small sweatboxes, cascade fermentation facility, dryer facility (solar and artificial/mechanical) and storage facility.

Fermentation

The small sweatbox is presently used on account of the small volume of beans being processed. This is an insulated wooden box with a slotted bottom. The box is insulated at the side by using sawdust packing between double walls. To improve insulation, the fermenting bean is covered with banana leaves and jute bags. The box is then covered with a wooden lid. Neither the side nor bottom of the box is lined with banana leaves, as this would greatly reduce the accumulation of inoculum of microflora, which is needed for successive fermentation build up. Lining the bottom of the box would restrict aeration and drainage.

Drying

After successful fermentation, the bean is dried. Both solar and artificial dryers are used. The solar dryer comprises:

- (a) A simple wooden drying bed used to dry the bean;
- (b) The drying bed is covered with a galvanize gable roof which allows the processing operator to work below the roof. It also allows free run off of rainwater. The top of the roof is vented allowing hot air to escape when the roof is closed. The roof is so designed as to allow the drying bed to be rolled out;
- (c) A wooden shovel and paddle (lightweight and strong) are used instead of metal to minimize damage to beans and to prevent contamination from the reaction of acid to metal.

The solar dryer is orientated in a north-south direction to maximize the use of sunlight (east to west travel of the sun). The artificial dryer is necessary to allow timely processing to continue in the peak harvest period, which is generally around the rainy season in Region 1.

Sorting and storing

The storage house is used for sorting and grading and the storage of processed and bagged cocoa beans. It is made pest proof by screening the window and ventilation blocks with fine rust resistant mesh. The high ceiling of the house serves to allow hot air to escape preventing

the development of a hot and humid microclimate favorable to mould growth and re-humidification of stored cocoa beans.

Project constraints

Even though the project started in 2000, it is still in the implementation stage. It was estimated that by 2005-2007 the project would have been producing 25 tons of marketable organic cocoa beans. In 2003 the project exported one metric tonne of organic cocoa beans produced from organically certified rehabilitated cocoa fields. The project is expected to increase this quantity for 2004. However, the project suffers from a number of constraints.

1. **Inadequate supply of planting material.** The NARI nursery began distributing planting material in 2002. The amount of seedlings supplied to farmers in 2002 and 2003 was 2,975 and 6,400, respectively. It takes an average of between five to seven years for cocoa trees (ICS clones) to meet full production potential. Therefore, the project would not be self-sustainable until after 2007. Farmers are of the view that the method of supplying them with seedling is slow. Demand exceeds supply, which is constrained by limited space for producing seedlings. In addition, the survival rate for budded cocoa is only 50%. The inability to receive adequate supplies can result in loss of income to the farmers as land is left idle until planting material is available⁷.
2. **Limited labour supply.** In addition to limited planting material, farmers are faced with unavailability of family labour as young family members migrate to other areas or neighbouring countries (Venezuela and Brazil) in search of higher wages. Most farmers cannot afford hired labour. The average cost of farm labour is US\$10 (G\$2000) per man-day. Farmers have to further provide other incentives, such as lunch, cigarettes and alcohol (high wine), which were some of the strategies used by Europeans to encourage Amerindians to work. Instead, each farmer works his/her own plot with assistance from other members of his/her household.
3. **Age of farmer.** The general age of farmers is another issue, given limited manual labour. The average age of the farming population is above 45 years. Young people are generally not involved in agriculture because they do not have title to land. Land is generally leased or owned. Most of the land in the hinterland (Amerindian villages) is Crown land, which is usually leased for a period of 99 years. Most of the flat and gently undulating land is already occupied. Available lands are located in areas where land is either waterlogged because of its proximity to rivers/swamps or is mountainous.
4. **Plant disease.** Cocoa production in the region especially with rehabilitated trees is also affected by black pod disease. This can result from over shading of cocoa trees, which increases the humidity to a level that favours the growth of the fungus. Annual losses due to black pod disease can range from 30-90% of the

⁷ This is because land designated for organic production should only use planting material from organic sources.

crop. The species present in Guyana and the wider tropics also attacks crops such as rubber, pineapple, coconuts, citrus, avocado and papaya ([www. aspnet.org](http://www.aspnet.org)). Farmers, given the limited manpower and lack of equipment, such as chain saws and tractors, are unable to clear areas of large vegetation, leaving trees that over shade the cocoa. Most farmers are equipped with a simple cutlass for felling trees and controlling weed.

5. **Cost of certification.** It costs the project US\$5,000 for the annual certification inspection audit. The Association pays the certification costs, as the project is still in its implementation stage and farmers are therefore unable to assume those costs. The Association is in the process of changing certification organization from SKAL to Euro Soil Association to reduce certification cost. The change is also influenced by the higher organic standards required by the chocolate manufacturers.

5. Sustainable agriculture and Amerindian development

Amerindian communities in Guyana survived in the past practicing extensive agriculture based on traditional community structures and culture. The farming system generally involved slash-and-burn shifting cultivation with a short cropping period and long fallow. This type of cultivation helped to restore soil fertility. The availability of land coupled with the traditional governance system based on cooperative relations sustained the lifestyle of Amerindian communities.

The change in the Amerindian community structure resulted from change in the traditional access of Amerindians to land. Free access became limited access through legislation passed under British rule within the first decade of the twentieth century, creating reservations for Amerindian communities. However, Amerindians have since then received only limited rights or official titles to the land. In addition, the titles do not include rights to subsoil minerals and government has, therefore, been able to issue mining concessions on land contiguous to or overlapping with Amerindian land, with adverse consequences for Amerindian communities.

The restriction of Amerindians to reservations has limited their access to arable land for shift cultivation and extensive farming. Pressure from population growth as well as from mining and logging concessions further limited agriculture activities. The result has been migration of Amerindians from agricultural activities to wage paying jobs in mining, logging, plantation agriculture and other areas, as well as to neighbouring countries. Money was not a factor in traditional Amerindian economies as goods were bartered and Amerindians generally produced all their food and other requirements. Contemporary Amerindian economies are not closed and hence money is required to purchase food, clothing and other essentials that are no longer produced within communities.

A typical response to restricted land access was for Amerindians to adopt the practice of intensive agriculture using synthetic chemical inputs. This was however not feasible as most, if

not all, Amerindians were unable to purchase chemicals given the high cost of inputs as well as transport from Georgetown to Region 1. Moreover, Amerindian cultivators were not producing traditional export commodities, which would have entitled them to subsidised inputs under government-sponsored incentive schemes. Amerindian agricultural activities therefore declined as a result of the land restrictions, the export promotion strategy of the government based on mining and forestry and the migration of Amerindians to other areas of economic activity.

The move towards the development of organic agriculture in Guyana has been determined largely by the need to resuscitate traditional export agriculture and develop non-traditional agricultural products for export markets. The use of organic methods of production encourages agricultural genetic diversity that guards against pests and diseases. It would also contribute towards the preservation of forest resources in the Guyana hinterland. For Amerindian communities, organic agricultural methods would enhance their traditional agricultural systems and community structures (www.fao.org) by providing them with the opportunity to practice intensive agriculture on limited land without the use of synthetic chemicals while maintaining crop growth.

The Amerindian traditional method of shifting agriculture was environmentally sustainable⁸ once access to land was not restricted. However, given land limitation in the present era the only way agriculture can be truly sustainable is through the use of organic techniques of production. The shift to organic methods of production would be a challenge for Amerindian communities despite their unique ability to use the resources of the natural environment to support their lifestyles without damaging that environment at the same time. But it could result in significant improvement to the lives of Amerindians providing the shift is towards commercial organic production. Although farmers would have to abandon the slash-and-burn method, they could practise a variation of their traditional shifting method of cultivation, as in the case of Indonesian farmers (see Box 1). This approach is suitable for farmers with a limited amount of land (see Fig. 1).

The major benefit would be increased farm income as a result of premium prices paid for organic agricultural exports. Farm income could also be augmented by intercropping and crop rotation of supplemental produce to be sold in domestic markets. Earnings from domestic sales would have to be based on increased productivity and output since local consumers are less likely to pay premium prices for organic produce. Increase in net earnings would depend on improving yields and keeping costs low. Studies conducted in Europe show that crop yield on organic farms is lower than on conventional farms. However, this depends on the type of farm and the efficiency of management. Nevertheless, since Amerindian farms are traditional – based on natural methods – rather than conventional, farms crop yields could only increase from the use of organic methods.

The cost for organic seeds and plants is generally high but is offset by the reduction in cost of fertilisers and pesticides. The most significant cost could be that of labour especially since farmers would be competing with mining and logging companies in attracting young

⁸ This is in spite of the fact that the slash-and-burn technique of production can lead to deforestation. In Guyana forest areas have increased rather than decreased over the years, especially prior to the resuscitation of logging in the hinterland during the 1990s.

Amerindians back into agriculture. Labour costs tend to be relatively high for organic farming but varies with farm size and structure. However, the potential for development of viable export industries could be the pull factor influencing the return of migrant Amerindians to their communities.

Producing for export markets could have a beneficial effect on farming communities, as farmers would have to develop good management practices, including record keeping, in order to ensure that their products meet international standards. This could be done during the period of conversion to full organic production, which would be relatively short given that a natural method of production was previously employed.

Amerindian success in organic farming would depend on a number of factors, such as the ability to attract young skilled workers in agriculture, the ability to manage the farm effectively and efficiently and adequate support from government. Government support would be beneficial in the area of training in organic management practices and in the provision of appropriate extension services.

6. Conclusion

The Mabaruma/Hosororo organic cocoa project in the northwest of Guyana was geared towards improving the livelihood of the Amerindian community and, by extension, communities dependent on agricultural activities. The project is concerned mainly with the production and export of organic cocoa beans, which is suitable for farms of a certain size, that is two hectares and greater. Since cocoa is not a short-term crop, farmers with small farms need to intercrop with short-term crops to provide quick returns.

The project has the potential to resuscitate Amerindian communities and community-based agriculture. However, instead of returning to the traditional methods of production farmers have the opportunity to improve on those methods while learning new skills and management practices. The constraints of the project identified in this study would have to be addressed in order to ensure its success.

Although the project is oriented toward the production of cocoa beans for export, a second phase could be geared towards the production of traditional chocolate, which would enhance the role of women in cocoa production. It is mostly men in farming communities that have titles to land. Women tend to provide the labour required for specific functions. They could, therefore, add value to the cocoa by processing it into chocolate for sale in domestic as well as tourist markets. Women in the Tabasco region of Mexico are processing cocoa beans grown by their husbands to make traditional chocolate for sale in hotels and airports [www.fao.org].

The association of growers in the Hosororo area has already indicated its desire to move into value-added industries, such as chocolate, in another phase of the project. Growers are also interested in diversifying production into other areas, such as pineapple, which has good prospects in export markets. The organic pineapple would not necessarily be exported as a

primary commodity, but supplied to a processing company in the area. Processed pineapple is in greater demand than raw pineapple, which requires additional labour to prepare the pineapple for use in other industries.

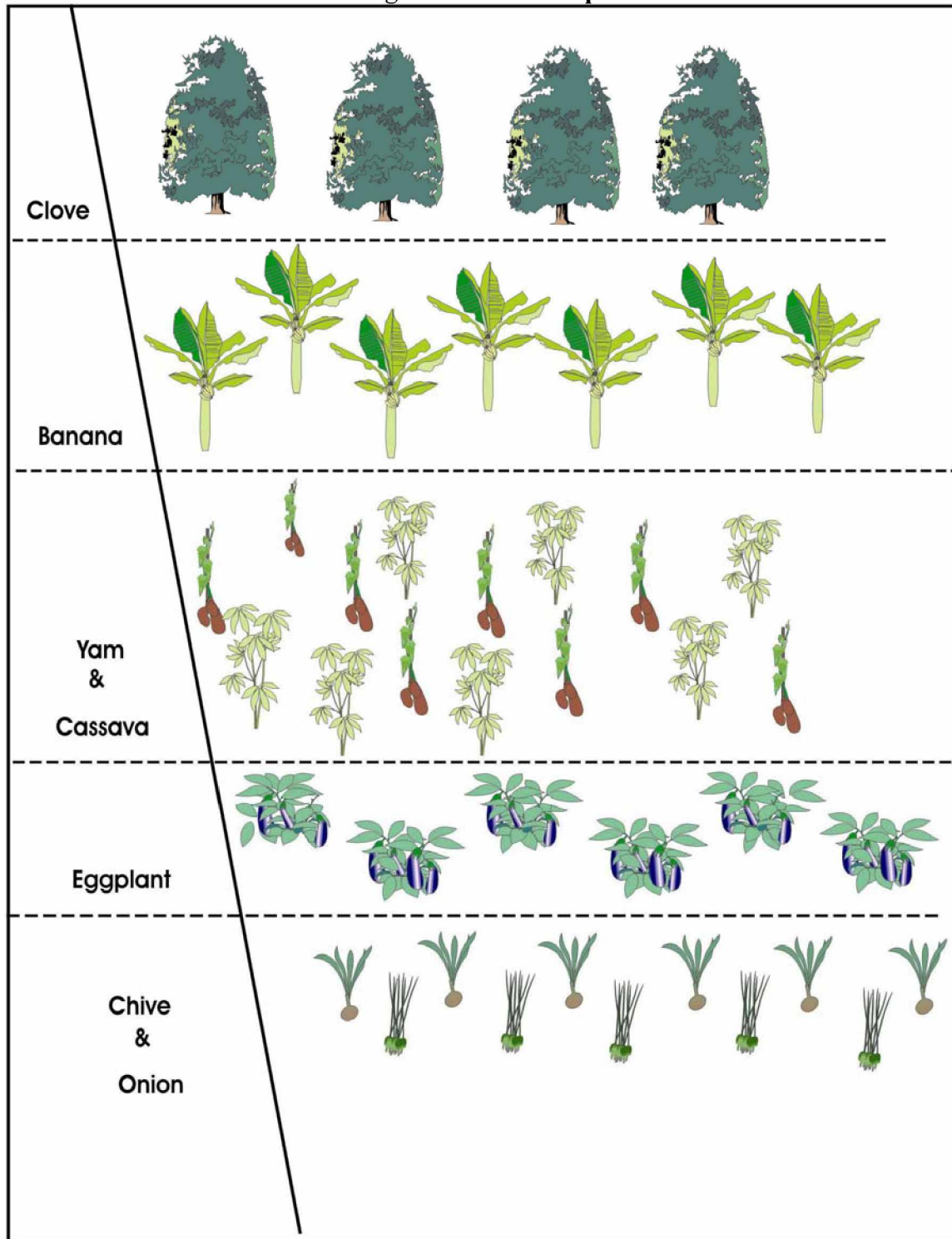
Box 1
Lessons from Indonesia

The native people of Indonesia have practised traditional agriculture in the forest areas on the island of Sumatra, using the slash-and-burn technique. That method of cultivation threatened the forest areas and national parks, which were contiguous to the areas that were farmed. On the initiative of a United Nations Advisor, the Indonesian Cassia Cinnamon Project was set up. The project created groups of producers of organic spices that were to be exported to the EU and US markets. The farmers in the area adopted organic methods of production, relying on crop rotation, composting and biological methods for the control of pests and diseases. Slashing and weed control is done by hand, using simple tools such as machetes, knives and axes, and the slashed matter is then used for mulching. Burning is not permitted.

Crops are produced in a sort of shifting cultivation mode. Each producer operates a traditional field planted in a variety of crops of different harvesting durations. For example, annual plants such as onion and melongene (aubergine) are intercropped with perennial crops such as cloves and cinnamon and short-term crops such as banana and yams. The perennial crops function as shade trees for the under-storey crops.

Growers are certified by the National Association for Sustainable Agriculture (Australia) and by the Dutch certification organisation of SKAL. They produce a variety of spices such as chilli, tumeric, ginger, vanilla, cloves, allspice, cardamom, nutmeg, black and white pepper and cassia (cinnamon). A number of growers (3000) have been producing organic spices for world markets. This has led to improvement in the socio-economic conditions of Indonesian, specifically Sumatra, farmers and at the same time preservation of biodiversity [www.fao.org].

Figure 1
Shifting Cultivation Crop Plan



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