CARIBBEAN NATURAL RESOURCES INSTITUTE (CANARI)

THE POTENTIAL OF NON TIMBER FOREST PRODUCTS TO CONTRIBUTE TO RURAL LIVELIHOODS IN THE WINDWARD ISLANDS OF THE CARIBBEAN

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This report is an output under the three year project "Developing and disseminating methods for effective biodiversity conservation in the insular Caribbean" implemented by the Caribbean Natural Resources Institute (CANARI) and funded by the John D. and Catherine T. MacArthur Foundation. The project sought to address two critical regional needs which are (i) enhance the participation of all stakeholders in conservation initiatives, leading to the development of participatory conservation institutions that have popular legitimacy and political support and (ii) the need to strengthen the linkages between conservation and social and economic development. The analysis of the Non Timber Forest Product (NTFP) sector in the region sought to establish this linkage particularly since the sector has remained marginalised to mainstream economic activity for most of the Caribbean.

CANARI's approach to the analysis of the Non-Timber Forest Product (NTFP) regional use led to the establishment of an NTFP Learning Group comprised of state and civil society representatives (Appendix 2). The representatives came from the Windward Islands and provided reports and data covering their territories of Dominica, St. Vincent and the Grenadines, Grenada, St. Lucia, Trinidad and Tobago. The Group contributed its NTFP experiences, and sought to analyse the issues, policy constraints and identify areas for further research.

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Executive Summary

This study is the result of a regional research initiative by the Caribbean Natural Resources Institute (CANARI) that comprised a literature review and culminated in a meeting on Non Timber Forest Products (NTFPs) entitled *"The potential of the Non Timber Forest Products sector to contribute to rural livelihoods in the Windward Islands of the Caribbean"* (14-15 July 2004) held in St. Lucia. The study also drew on the country reports and presentations made by 18 participants at the meeting. The countries represented were St. Lucia, Trinidad and Tobago, St. Vincent and the Grenadines, Grenada and the Commonwealth of Dominica. The workshop participants came from diverse backgrounds which served to enrich the discourse through their firsthand experiences and analysis. Participants included representatives from the forestry administration sector, NTFP producers, representatives of development agencies, a representative from a blind welfare association and a representative from a community-based organization.

The regional discourse on NTFPs has remained mainly within the domain of forest resource managers who are charged with ensuring protection of biodiversity resources. This has resulted in most of the regional studies produced to date focussing on conservation related issues and very little attention paid to the socio-economic aspects of the NTFP sector. NTFPs are not only a conservation issue but are essentially a sustainable livelihoods issue particularly for rural populations. Given the level of uncertainty the region faces in its traditional earning sectors (i.e. agriculture, tourism), the ecological risks and increasing unacceptability associated with traditional timber forestry on small islands and the promotion of the policy of diversification in the agricultural sector, NTFPs may offer a valid avenue for revenue generation. However, the policy environment for NTFPs requires support since it has demonstrated its capacity to generate livelihoods particularly in rural communities for generations.

The report sets out an analysis of the constraints and challenges confronting the NTFP sector which are distilled into the following categories; livelihoods, resource sustainability, finance, marketing, policy and institutions, public awareness and information, and training. It identifies the gaps in our knowledge of the NTFP sector, but also proposes opportunities that could assist in addressing the challenges posed in each of these identified areas while noting that progress in this marginalised sector requires a variety of approaches applied within a concerted manner in a favourable policy context.

1.0 Introduction

The tropical forests of the Caribbean provide a diverse range of important services and products that contribute to the development of the region. An example of a valuable forest service is its ability to function as a watershed thereby securing water resources, reducing severe soil erosion and ameliorating the impacts of shocks to the environment (e.g. torrential rains associated with tropical storms and hurricanes). These regional forests also provide a valuable service through their ability to sustain productive levels of biodiversity from which a variety of products are generated including timber and non timber forest products (NTFPs). The definition of NTFPs, also known as 'minor forest products' or Non Wood Forest Products has proven to be inexact and difficult at times because it is "defined not by what it is, but by what it is not". After noting the exclusive nature of the terminology, Neumann and Hirsch (2000) go on to define a NTFP as "literally any and every natural resource from the forest except timber".

Regional forests have been relied upon for a stream of Non Timber Forest Products (NTFPs) or Non Wood Forest Products (NWFPs) since the pre Columbian era. These NTFPs in many instances reflect cultural history rooted in the use of the region's biodiversity. Some of these resources serve as foods in the form of forest fruits and nuts (e.g. wild passion fruit, Brazil nut) as well as spices and essences (e.g. mauby, peppers, vanilla). In other instances, NTFPs provide material for the traditional craft sector (e.g. calabash, sisal, palm leaves, roots). Various tree barks, flowers and resins are used to extract tannins or dyes. NTFPs also feature in various cultural and religious practices throughout the region (e.g. incense, gommier sap) and there is growing interest in the traditional herbal remedies used throughout the Caribbean.

Many of the rural poor have earned subsistence level income from harvesting such products, selling them either in the raw form or as processed or manufactured goods. The most important NTFPs for the region are (i) medicinal and aromatic plants, (ii) edible products (mainly exotic and natural fruits, bushmeat and bee products) (iii) ornamentals, utensils, handicrafts and (iv) construction material (Rivero 2001). These have been detailed in Table 1.

Table 1. Categories of Non Timber Forest Products in the Caribbean

Plant products		Animals and animal products	
Categories	Description	Categories	Description
Food	Vegetal foodstuff and beverages provided by fruits, nuts, seeds, roots,(e.g. balata, pomme de lienne, gris gris)	Living animals	Mainly vertebrates such as mammals, birds, reptiles kept/bought as pets (e.g. peccaries, parrots, iguana, snakes)
Fodder	Animal and bee fodder provided by leaves, fruits, etc.	Honey, beeswax	Products provided by bees.
Medicines	Medicinal plants (e.g. leaves, bark, roots) used in traditional medicine and/or by pharmaceutical companies	Bushmeat	Meat provided by vertebrates, mainly mammals
Perfumes and cosmetics	Aromatic plants providing essential (volatile) oils and other products used for cosmetic purposes	Other edible animal products	Mainly edible invertebrates such as insects (e.g. caterpillars), crabs and other "secondary" products of animals (e.g. eggs, nests)
Dying and tanning	Plant material (mainly bark and leaves) providing tannins and other plant parts (especially leaves and fruits) used as colorants (e.g. red mangrove)	Hides, skins	Hide and skin of animals used for various purposes
Utensils, handicrafts	Heterogeneous group of products including thatch, bamboo, rattan, wrapping leaves, fibres (e.g. Arouma, Bwa Flo, Silk cotton floss, Screw pine)	Medicine	Entire animals or parts of animals such as various organs used for medicinal purposes (e.g. caterpillars, crab legs, snake oil)
Construction materials	thatch, bamboo, fibres,		
Ornamentals	Entire plants (e.g. orchids, ferns, philodendron) and parts of the plants (e.g. pots made from roots) used for ornamental purposes	Colorants	Entire animals or parts of animals such as various organs used as colorants
Exudates	Substances such as gums (water soluble), resins (water insoluble) and latex (milky or clear juice), released from plants by exudation (e.g. .incense, gommier)	Other non-edible animal products	e.g. bones used as tools
Other	Insecticides (e.g. Ryania), fungicides, alfa grass		

Adapted from FAO (Rivero 2001) others added

The last decade has seen the Caribbean gripped by increasing international economic pressure and rapid global changes that have led to a high level of volatility in the economic contributions from the agriculture and tourism sectors. This is reflected in the substantial losses incurred by those dependant on the banana trade throughout the Windward Islands. As the banana market seeks to adjust to the external negative pressures and agriculture policies strive to cope with changes, there is an ever-increasing burden placed on the poorest in society to earn a livelihood. In some instances, this has led to increasing pressure on forest resources to the detriment of some NTFP species, some of which are on the verge of local extinction. Accompanying the demise of such species is the loss in the capacity for the rural poor to maintain a livelihood and the loss of a traditional way of life. To avert the erosion of NTFP resources and loss of associated livelihoods calls for strategies that recognize NTFPs with the best economic and social potential to contribute to the livelihoods of rural people and achieves effective management of these resources.

The gaps in information for the NTFP sector have led to inadequate management controls and inefficient policies governing the sector and thus heightening the need to: capture information regarding NTFP stakeholder requirements, conduct analysis and extract suitable guidelines for best practice and present suitable policy recommendations. To assist in this end, this report aims to:

a) present an overview of the NTFP sector in the Windward Islands of the Caribbean
b) identify critical constraints, challenges and knowledge gaps confronting the NTFP sector
c) suggest potential opportunities and a suitable policy based context to develop the NTFP sector

Given the level of uncertainty the region faces in its major earning sectors and the promotion of the policy of diversification in the agricultural sector, NTFPs may offer a valid avenue for revenue generation particularly for the rural poor. An important consideration may also be related to a new perspective for natural resource management in the Caribbean that promotes a greater focus on non timber values of forests because of ecological risks and impacts associated with traditional timber forestry practices on small islands that may be too disruptive of natural ecosystem dynamics.

To date, there is very little published on the non timber forest sector for these islands and the regional biodiversity studies produced to date (e.g. Rivero 2001, GOSL 1998, GOSL 1991, GOSVG 1991) have focused on cataloguing the species used and the conservation related issues pertaining to NTFP usage. Very little attention has been paid to the socio-economic aspects related to the NTFP sector. In many instances there are distinct gender and age related dynamics pertaining to the harvesting and the manufacturing process involving NTFPs that are yet to be understood. There is also a lack of knowledge related to the trade, markets and the socio-economic impacts on the stakeholders involved in the NTFP sector. Due to the paucity of such studies and the seeming poverty of those involved in the trade, some recent international studies have gone on to suggest that reliance on such products have had little impact on poverty alleviation (Fisher 2000) and may even be responsible for perpetuating poverty (Neumann and Hirsch 2000). They suggest that NTFPs;

1. provide basic level income for the poorest in society rather than truly creating socio-economic advancement
2. perpetuate poverty by creating dependency
3. tend to be unsustainably harvested on a destructive basis

Most of these studies have focused on the experiences of Asia and South America. While there may be validity to such views, they substantiate a need to understand the nexus between NTFPs

and poverty in the Caribbean and the need for concerted research in NTFP management approaches that could include cultivation as a means of reducing dependency on harvesting from the wild. Other than establishing the fact that NTFP usage forms a common basis for a traditional form of rural livelihood, current regional research on the NTFP sector is inadequate to answer the question as to its level of success in alleviating poverty and to wholly refute these assertions. Clearly the level of demand for some NTFPs has lasted in the face of advancing technological changes. The level of consumer demand may be due in part to the quality of craftsmanship and/or quality of the products (e.g. NTFP organic based insecticides (citronella, ryacin based products), palm leaf and bamboo brooms versus plastic broom, traditional herbal remedies versus pharmaceutical remedies). Some of the products have commercial potential and are arguably constrained by resource limitations faced by those involved in the sector.

2.0 Challenges and Constraints in the NTFP Sector

An analysis of the constraints and challenges confronting the NTFP Sector can be distilled into the following categories:

- Livelihoods
- Resource sustainability
- Finance
- Marketing
- Policy and institutions
- Public awareness
- Training

Addressing the challenges posed in each of the identified areas requires a variety of approaches applied in a concerted manner.

2.1 Livelihoods

The importance of NTFPs is undisputed in the countries of the insular Caribbean. This is revealed by the scale of trade in the region for some products, which ranges from a domestic or local scale to regional and international markets (Table 2). However, given their primary importance to rural society and largely informal marketing systems they remain an under assessed sector of economic activity that is relatively unreported throughout the region. Given the restructuring of the banana sector and its subsequent impact on the economies of the Eastern Caribbean states, many rural households have had to seek either alternative or diverse strategies to generate income. Testimonies from NTFP producers in St. Lucia who were involved in banana production revealed the difficulties that the restructuring of the banana industry had imposed on them and the importance of the supplemental income through NTFPs (e.g. broom making). The sector is particularly important to rural communities given their limited ability to meaningfully participate in the increasingly important tourism sector.

Table 2. Commonly traded NTFPs of the Windward Islands

NTFP resource	Products	Scale of trade
Latanyé palm	Broom products, place mats,	National, regional
Mauby bark	Infusion drink	National, regional
Bay leaf	Bay-oil, bay-rum	Large scale national, regional international
Ryania	Organic insecticide	National, international
Larouman grass	Basketry, mats	National, regional, international

Regional stakeholders involved in the NTFP sector tend to be landless and semi-skilled. Their interest in the sector stems from the potential to produce a relatively high volume of products within a relatively short time thereby earning some much needed income. Income generated by involvement in the NTFP sector can represent as much as 25-100% of total earnings in rural households (Burt 2002, John 2001). However, the domestic consumption aspect of NTFP resource use is a "hidden" or an unaccounted element in NTFP resource use as a consequence of user ease of access to the resource and products not passing through the markets (e.g. domestic food supplies are supplemented through communal hunting in St. Vincent and Grenada, and the domestic use of traditional herbal remedies).

Women comprise a significant segment of those involved in the NTFP sector and its income can be quite substantial to single female-headed households in rural communities. In many instances there is a gender based division of labour in the sector (Burt 2002, James 2004, Lendore 2004). In some cases, harvesting of raw materials is a role largely dominated by men (e.g. broom stick handle collection, palm leaf harvesting in St. Lucia), whereas purchase of raw materials is dominated by women in St. Lucia and craft production tends to be mixed males and females (Burt 2002). In Dominica, where hundreds are employed in the Bay oil industry, women are mainly involved in the harvesting, bundling and portering of the Bay leaf branches (James 2004).

In most islands there also tends to be high representation by individuals in the 50-70 age cohort, involved in NTFPs who have limited livelihood options available to them. While both genders tend to be involved, elderly females tend to dominate the sector particularly in sales (Burt 2002, Lendore 2004).

In the households where NTFPs were processed, there is also a great likelihood of children being involved in the process. They tend to be involved in the roles of harvesting of raw material, craft production and sales. Children provide an inexpensive form of labour for the family and a means of passing on skills and traditions. This is important, as most aspects of NTFP processes tend to be a labour intensive. However, the prevailing view in the sector is that young people are less inclined to remain involved in NTFPs due to the relatively arduous work and low financial returns. Closely connected to this concern is the loss of traditional skills through the rural to urban migration by young people seeking alternative livelihoods.

Stakeholders also revealed the importance of NTFPs to disabled community members. The blind, particularly in rural communities, are restricted in livelihood options but the ability to produce

items based on the "art of touch" enables them to generate income through the use of NTFPs. One approach is being developed and employed by the Trinidad and Tobago Blind Welfare Association (Lalite 2004) and a similar experience has been reported from Grenada (*en voce* Paterson).

Sustainable livelihoods research

The leading aspects for related research include an assessment of the needs of those involved in the NTFP sector and its economic contributions to rural communities in the Caribbean:

- What resources are available and are being used by community members?
- Which groups of individuals are involved, to what extent, during what periods (e.g. seasonality, economic fluctuations)?
- What are the major social divisions?
- What services are available and used?

Potential next steps

- Inclusion of NTFP producer needs in planning processes
- Create spaces for those involved in the sector to articulate those needs
- Foster the development of co-management agreements between communities whose livelihoods depend on NTFPs and appropriate management agencies
- Provide greater institutional support required for NTFP sector from service providers (Government or private sector) for training, market research, funding, technology, and product development
- Support formation of partnerships and alliances (i.e. industry based, cooperative or association type) at the local, national and regional level

2.2 Resource sustainability

Stakeholders from the forest administrations point out that in many instances the existing policies for NTFP management are inadequate to address sustainability in the sector. This is reflected in the archaic legislative terminology for NTFPs (i.e. minor forest produce) which does not accurately reflect the current levels of use or value of the resource. This terminology reflects a past emphasis placed on forest timber management and harvesting. For many islands (particularly in the Windward Islands) the role of timber harvesting has in fact declined in favour of forest management for other products and services (e.g. ecotourism, watershed management). This weak framework allows for unsustainable over harvesting of NTFP resources which are perceived by producers to be free goods. This level of exploitation proceeds largely unchecked from both private and public lands.

In some instances, a highly sought after NTFP may pose an indirect ecological threat to other species. In Dominica, the artisanal distillery processing of the bay-oil from the Bay leaf is dependent on the ready availability of wood fuel. Out of an annual total production 10,795 kg of bay oil approximately 10,206 kg is distilled with 4,500 cubic metres of stacked wood harvested from local forests (Eckelmann, 2003). In St. Lucia, a survey of the latanyé broom industry revealed that producers harvested 18 different tree species to make broom handles, all of which are harvested at the intermediate 'pole' stage of development from the coastal dry forests (John, 2001).

The ability to sustain livelihoods in the NTFP sector rests on the sustainable management of such NTFP resources. The increasing concern over the diminishing wild stocks of NTFP resources due to over exploitation has led to efforts to cultivate NTFP resources, not only on state lands but in collaboration with private land owners. In St. Lucia, the Forestry Department in partnership with private producers is undertaking cultivation trials in latanyé palm and mauby (*Colubrina elliptica*). The Forestry Department secured the participation of the private producers through the provision of incentives that included provision of planting material, technical assistance and labour in some instances. The producers tend to the plants, allow collection of data at the various stages of plant development and product manufacture. Similar trials are underway with the larouman grass in a collaboration between the Kalinago or "Carib" community and the Forestry Department in Dominica. Such co-management arrangements help meet conservation of species threatened by market demands and help secure livelihoods.

With improved marketing there is the accompanying need to secure the sustainability of the raw material resource base. An unsustainable level of exploitation has made acquiring NTFP raw materials particularly difficult for many stakeholders. NTFP resource management requires implementation of primarily two approaches. Some of the NTFP resources can be cultivated while others due to slow maturity rates or specific habitat requirements may have to be managed by extraction or removal permit systems or by co-management agreements among resource users or between resource users and management agencies. These approaches are being employed or experimented with in some islands. An example of experimentation with the cultivated approach is the latanyé and mauby cultivation in St. Lucia and cultivation of larouman grass in Dominica. These also exemplify the possibilities offered through co-management systems. The removal permit system is applied in many islands by the forest management authorities but it is not employed as a tool of resource management in many cases.

The islands share many of the species required for production of NTFPs. However, while the raw material base may be over exploited in one island, the same resource remains unused in a neighbouring island due to cultural differences (e.g. lack of traditional knowledge). This situation may exist even while there may be trade conducted between states in finished products (e.g. traditional medicines from St. Lucia to Martinique, or latanyé brooms trade between St. Lucia and Barbados). Economic differences between island states may also be a factor regarding people's involvement in the NTFP trade. Those in wealthier states may have better livelihood options available to them and therefore while the NTFP resources may be available they have no interest in pursuing NTFP livelihood activities.

NTFP stakeholders suggest the possibility of not only securing domestic stocks but the possibility of establishing import/export trade arrangements for raw materials between islands (e.g. palm leaves, seeds) instead of importing from extra regional sources. In some instances raw material is imported from an extra regional source at significant expense (e.g. rattan from Indonesia and Taiwan) due to a regional lack of availability, reliability of supply and consistency in quality (i.e. treatment and durability) of the raw materials. The value of some NTFPs (e.g. rattan furniture, herbal medicines) may warrant fostering interest in the private sector in cultivation of some of the plants rather than strictly relying on harvest from the wild.

Biodiversity research: There are cases where the exploitation of NTFP resources in the wild has resulted in diminishing stocks. In many instances there is a need to inventory stocks in the various forests or vegetative zones. On the other hand there are other indicators that can reveal a resource under pressure. Some of these indicators include:

- reduced availability of NTFP product(s) in the market place due to scarcity of resources
- inferior quality or immature material/stock appearing in the market
- producers having to resort to sourcing raw materials from increasingly further distances
- loss of known skills or traditional NTFP production from some communities
- high prices for scarce products

NTFP potential for Agriculture: Over harvesting pressure on wild resources can lead to genetic degradation as fewer individuals are left to mature and reproduce successfully. This could also result in reduced opportunities for increased diversity in the agricultural sector. It is important to recognize that most of the agricultural crops established in the region were originally exotic to this hemisphere (e.g. banana, pineapples, sugar cane, mangoes) with a few exceptions (e.g. cassava, maize). The introduced crops have undergone extensive research both in their countries of origin and in the Caribbean since their arrival. In 2001, the Consultative Group on Agricultural Research (CGIAR) spent approximately US$ 9.5 million on banana and plantain research and approximately US $24.4 million on maize research which represents 3.2 percent and about 8.3 percent of the total commodity research investment respectively (www.cgiar.org).

Bioprospecting is actively pursued by major pharmaceutical firms in their efforts to secure access to resources that may yield valuable drugs in the fight against disease. A similar investment in research towards food security is yet to be applied to most of the New World NTFP species that are already established as being credible sources of foods, fruits and fibre (Appendix 1). This process could assist in identifying species suitable to cultivation processes.

Resource sustainability research
The leading aspects for biodiversity related research includes:

- inventories of NTFP resources in the wild and habitat requirements
- Amounts of NTFP traded in markets and sources of raw materials
- current practices that degrade the NTFP resources
- harvesting systems, applied technology, processing and manufacture of products
- alternatives to damaging exploitation

2.3 Finance

In most instances stakeholders involved in the NTFP sector are constrained in their ability to engage in the formal financial structures and to access the capital needed for effective business development. Additionally in most islands, many of those involved in the sector are semi-literate or illiterate and this handicaps their ability to access assistance from formal business institutions (i.e. banks, credit unions). Generally, a successful business venture is largely predicated on an entrepreneur's skill in financial management, production/operations management and marketing. Many involved in the NTFP sector lack such skills.

Although business operations in the NTFP sector remain mainly informal in their approach, there are exceptional regional examples of relatively large-scale NTFP businesses in some instances employing hundreds of people and involving complex domestic marketing and export arrangements (e.g. Bay oil industry in Dominica (Hypolite, 1997)). Some businesses have been able to access government or private sector assistance for either direct financial support or to enhance marketing capacity (e.g. The Kalinago "Carib" community craft producers in Dominica with the Dominica Export Import Agency (DEXIA), Trinidad & Tobago Blind Welfare Association access support from the Government of Trinidad and Tobago). However, typical NTFP producers seldom engage or have access to formal business facilities (e.g. access to credit

facilities, capacity to prepare business proposals or plans) and they tend to bear the characteristics of small business home based operations. Traditional financial institutions lack experience in the sector, cannot access related trade data/information and are therefore unable to establish appropriate benchmarks. They lack appropriate mechanisms to manage risk on investments in the sector.

Finance based research
The leading aspects for finance based research include:

- How do entrepreneurs using NTFPs currently obtain finance
- What avenues are potentially available
- What levels of financing and risk are involved with different products

2.4 Marketing

The lack of effective marketing has also been identified as a limiting factor. A typical characteristic of the NTFP sector is that producers continue to make their traditional products and then sell them, rather than assessing what products are in demand and can command premium prices. Other key elements of marketing such as positioning and promotion are often overlooked.

The general public in the Caribbean is largely unaware of the sources of the raw materials for the variety of craft products, herbs, medicines or construction materials that are marketed. They are also unaware of the costs, time and labour spent in acquiring NTFP raw materials for some of the commonly marketed NTFP items (e.g. brooms, mats, whisks). Ultimately, this lack of awareness results in a lack of concern regarding the status of the raw materials in the wild and impacts on market value of NTFP products.

One of the current challenges in the NTFP sector is that a high demand from a domestic or foreign market can lead to producers overexploiting the resource base and engaging in price wars, ultimately resulting in the undermining of product quality and value and threatening livelihoods in the process (e.g. demand in Martinique for traditional herbal medicines and incense from St. Lucia, demand in Guadeloupe/France for Bwa Bandé products from Dominica).

The tourism industry has established itself as the fastest growing sector in many of the island economies, overtaking the agriculture, financial and manufacturing sectors in the process. For many islands, there is an existing close association between NTFPs and the tourism sector as producers vend traditional craft, art and jewellery from craft centres to locals and visitors. Closer scrutiny is being paid to the ability of the tourism sector to reduce poverty particularly in rural communities. Efforts have been made at promoting natural heritage and cultural aspects of the islands through nature heritage tourism (e.g. St. Lucia, Barbados) thereby diversifying the tourism product away from the traditional "Sun Sea and Sand". NTFP producers at the workshop reported that peak sales are often associated with seasonal cultural events such as Carnival (Jaramogi 2004). The potential for nature heritage tourism to serve as a marketing tool for NTFPs as well as increasing public awareness of the value of indigenous NTFP items and the need for conservation of such resources merits further research. However, it was noted that while most visitors are interested in collecting memorabilia depicting indigenous aspects of island culture, it is quite common to find vendors selling plastic or haematite items manufactured in Asia (e.g. Indonesia and Taiwan). This may be due to resource constraints such as raw material availability or expense of local materials.

Stakeholders regard the current interest in herbal medicinal products as another potential source of profitability in the NTFP sector. They have noted the various professionally packaged and

cleverly marketed products readily available in pharmacies across the region (e.g. Ginseng, Gingko biloba) and wish to see similar attempts for regional herbal resources. There are already some entrepreneurs exploring this niche in the region but more research needs to be done on the existing and potential market demand for medicinal products based on regional NTFPS.

The NTFP sector requires a coordinated and systematic approach at the local, national and in some cases regional level that can harness sufficient funding and institutional capacity to address NTFP marketing issues. Stakeholders suggested that there is an opportunity to place greater emphasis on the value of the "Caribbean" as a brand, both to establish authenticity and create a price premium for locally produced products from the region. This level of product association to the region is well known for some trade items (e.g. Trinidad's Angostura bitters, Jamaica's Blue Mountain coffee, and rums of Barbados and Guyana). Trade marking NTFP products of the region also offers a means of distinguishing Caribbean products on the international markets. DEXIA is an example of a national institution undertaking this role on behalf of the Kalinago community in the Commonwealth of Dominica. The Agency offers brochures, web based marketing and secures contacts on behalf of the craft producers. This approach would also provide an opportunity to explore niche markets for products indigenous to particular islands in the region. Tobago is in the process of researching and establishing its niche products. This mechanism could also serve to provide greater information on the NTFP sector to the public and serve to lift the price of NTFP products in the domestic market by instilling a sense of pride in indigenous products and promoting a "buy local" campaign, consequently empowering rural stakeholders.

The skills applied in the NTFP sector have evolved mainly through the passing on of traditional knowledge from generation to generation with most of these practices having remained largely unchanged in the process. This knowledge includes both the techniques and the applied technology in the processes of harvesting, treatment of materials and in manufacturing. However, stakeholders recognize that there is scope to apply innovative scientific processes in NTFP development some of which could bring efficiency and enhance the quality of finished products (e.g. use of solar dryer systems versus open air drying).

Market based research
The leading aspects for market related research includes:

- Determining approaches to fair pricing for NTFPs
- Determining market constraints to replacing imported souvenirs with locally produced "heritage crafts"
- Research domestic and regional and international, NTFP markets and examine income distribution from NTFP markets
- Identification of potential high value niche markets, particularly for products which can be cultivated commercially
- Determining approaches to pricing for NTFPs, especially given the "common property" bias against fair pricing
- The effectiveness of various marketing channels (e.g. government tourism and craft promotion agencies such as Dominica Import and Export Agency, cooperatives, cruise ship vendor markets) and the potential of new channels such as the Internet
- Capacity building needed to improve marketing skills

2.5 Policy and institutions

The policy and institutional challenges posed to NTFP management are not in themselves insurmountable but they reflect the inadequate attention paid to the sector and the need to evaluate its current and potential role in contributing to sustainable rural livelihoods.

Legislation; NTFPs are listed under most of the region's forestry related articles of legislation, some of which date back to the mid 1940's (e.g. Dominica, St. Lucia). Some also state payment rates for persons employed in extraction of NTFP materials from Forest Reserves. However, most of the stakeholders from the national forest management authorities commented on the inadequacy of their legislation regarding NTFPs and for the need to update them. Many feature outdated lists of royalty rates that are inconsistent in terminology regarding quantities allowed for extraction under a removal permit. Descriptions varied from a set fee per 100 lb bags, a rate for an unspecified "bundle" or a fee per individual item. The fees charged for extraction in many instances are also outdated since they have not been revised since they were first instituted. Most permit regimes monitor extraction solely from the forest reserves, while harvesting from private lands remains unmonitored. The consequences from over harvesting could be dire to a species that is commonly located on coastal private or common property rather than inland protected areas.

NTFPs have languished as "Minor Forest Produce" in many of the region's forest management plans and activities in the past due to priority placed on forest management for timber. Yet the harvest of certain types of NTFPs has proven to be a substantial income generator for some rural communities (e.g. Marquis and Vendome of Grenada in the use of bamboo and screwpine (Dunn 2000). In some instances, NTFP resources have been traditionally extracted without removal permit regimes and royalty charges. Implementing such a system for what has been traditionally considered a "free" good from common property frequently comes with unpopular consequences for those seeking to impose a management regime.

While there is a recognized need to review NTFP related legislation and institutional arrangements, there is equally a need to (i) have a much better understanding of existing and potential use levels and associated harvest sustainability levels, and (ii) a consensus on the types of management regimes and institutional arrangements needed to optimise returns to producers while ensuring sustainability of the resources. Both of these objectives require time and a commitment of resources to research and testing of possible approaches. It would be best to identify the most suitable management options before entrenching recommendations in legislation. In many instances the level of enforcement of current NTFP legislation is weak and hindrances to effective enforcement needs to be understood and remedied before attempts are made for further legislation.

Institutions; Generally, there has been limited government support for the NTFP sector and its role to date has been mainly protection of state resources. In many instances, stakeholders have come to perceive the authorities as a threat to their livelihoods and in some islands the relationship between the users and the resource managers is strained by political sensitivities and communities may be unwilling to collaborate with departments if they (i.e. communities) perceive the government departments as acting in the interest of the ruling party.

This study has noted a range of existing and potential institutional arrangements that are or could be employed in the region for NTFP management. Such arrangements range from state-managed permitting systems, co-management agreements between resource users and state agencies, to broader and less hierarchical stakeholder agreements, and resource user management systems.

Stakeholders pointed to specific areas where they desired an increased role by the government sector. The areas included; supervision over resource extraction rates as a means of ensuring resource sustainability and protection of livelihoods, government support for product research, marketing, trade arrangements, and establishment of co-management agreements between resource users and resource managers. There may be opportunities for the authorities to offer incentives that could foster support for effective management for specific resources (e.g. technical assistance provided to stakeholders, purchase of seeds or planting materials from stakeholders by forestry institutions or private sector enterprise).

Policy framework

The outlined scenarios point to a need to develop a framework that addresses issues specific to NTFP management within the broader context of national sustainable development strategies. Such a context is most appropriate since the outlined strategies for sectoral development have direct or indirect linkages to the NTFP sector (e.g. poverty alleviation, environmental sustainability, sustainable tourism, small business development, trade, forestry and agriculture). The following elaborates on some of the related policies.

Forest policies: For many islands, forest policies consist mainly of articles of legislation or outlining of forest management plans that are endorsed by Government. Most of these types of policy were developed primarily by the forest management authorities in the respective islands and seldom have they arisen out of a participatory process that engaged stakeholders with forest resource interests. An exception in this regard is the Grenada Forest Policy development process. Frequently the constraints cited in developing a full fledged policy inclusive of participatory processes are due to limited finance and time. As a result of such limitations, very few policy articles reflect the livelihood issues that attend to the NTFP sector. Forest policy development now calls for an approach that recognizes and incorporates livelihoods considerations.

Agriculture policies: Sustainable agriculture policies in the region should recognize the potential contribution from developing potential NTFP resources as foods. The eventual failure of mono-cropping regimes throughout the region has had major impacts on national economies (e.g. sugar cane, bananas) and the call has been for increased diversification in agriculture. The extensive research conducted on most of the traditional agricultural crops introduced to the region reduced the investment in establishing crop and livestock requirements. This has led to a lack of awareness, reduced interest and financial resources available for investigating the potential contribution to agriculture by New World species. Regional NTFPs offer excellent potential indigenous agricultural resources for small livestock farming (e.g. agouti), cultivation of fruit and fibres.

Trade related issues: There is an active level of regional and extra-regional trade in NTFPs (Hypolite 1997, John 2001, James 2004). Producers reported exporting within the region and making attempts at securing international markets and therefore there is a need for clarity on matters relating to international trade in NTFPs. They also reported problems at the regional level where producers have been confronted by suspicious customs authorities while trading between islands and in some cases have had their items confiscated. There are implications in such reports for the Caribbean Single Market Economy (CSME) effort underway in the region.

NTFP items that enter international trade may be considered under the various appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). While knowledge of listed fauna may be fairly widespread, this is a greater challenge for

monitoring the trade in floral parts (e.g. bark, seeds and flowers). Possible attending issues to be addressed include quarantine and certification of sustainability of production.

Policy and institutional research:

- What aspects of existing law and policy support or constrain development of the NTFP sector in different countries?
- What institutions, both formal and informal, currently exist within the frameworks for production and marketing?
- What is the implication of regional and international trade agreements (e.g. CSME, CITES) on the development of NTFP markets?
- Develop adequate legislative or regulatory systems and examine potential impacts to ensure sustainable livelihoods
- Establish frameworks to facilitate co-management arrangements between communities whose livelihoods depend on NTFPs and appropriate agencies and strengthen such co-management agreements where they exist
- Develop national forest policies through participatory processes and employ integrated forest management systems that incorporate livelihoods in their approach

2.6 Public awareness and information

Consumers tend to regard NTFP materials as acquired free of cost from public lands (i.e. common property) and thereby justify a reduction in the price of the products. Typically the bargaining process works to the disadvantage of the NTFP producer. The collective impact is negative on the livelihoods of all involved in the sector as individuals undervalue and undercut each other. The informal marketing approach and the socio-economic strata of those that tend to be involved has led to a negative stigma associated with the sector and an effort by young people to disassociate themselves from family involvement in NTFP sector. This has in turn impacted negatively on the transference of skills and knowledge about NTFPs through generations.

Public education needs:

- Increased public education and awareness about NTFPs and lift the value of the products. This needs to be tailored for a range of stakeholders (e.g., policy makers, consumers, harvesters)
- Community development initiatives to encourage education on NTFPs and emphasise sustainable management of resources
- Establishment of a regional network on the NTFP sector

2.7 Training

Those involved in the NTFP sector have acquired their knowledge through traditionally informal systems. The skills base and market knowledge have been preserved mainly through apprenticing of primarily family members or community members who indicate interest. However, given the lack of institutional support for the sector, many young people are seeking alternative livelihoods and tend towards job opportunities in urban environs forgoing the opportunity to learn the crafts from those involved in the NTFP sector. Some training has been provided by voluntary efforts of artisans to fellow community members and in a few cases by government supported community craft training initiatives but these initiatives are not sustained and are not set within a context where business management skills or marketing is considered.

The process of training in the NTFP sector requires a holistic approach. It should empower artisans by equipping them with information and skills on marketing, application of suitable technology and business management. Such skills could enhance the capacities of not only the rural stakeholders, particularly rural women stakeholders but also those of the disabled community who are active in NTFP production. In many instances where training has been provided with government support, artisans are contracted to teach basketry, weaving or similar skills and relevant aspects of craft production. For many stakeholders, such support by government indicates a start in provision of support for the sector that they wish to have continued and developed.

Training needs:

- Training in NTFP management, manufacture and marketing could be conducted at the national and regional level through skills based exchanges
- Training in application of suitable technology for harvesting, drying and other aspects of NTFP manufacture (e.g. solar dryers, kilns)
- Increased opportunities to build skills through regional exchange of artisans

In conclusion, this section sought to demonstrate that NTFPs offer a potentially valuable source of economic activity and yet the sector has remained marginalised to mainstream economic activity due to a range of constraints and challenges. NTFP economic activity needs to be harnessed and managed effectively in order to capture its contribution to national sustainable development particularly for rural livelihoods. Amidst the current challenges, the following section seeks to frame the context for the development of the NTFP sector, and identifies requirements and emerging opportunities that should be exploited.

3.0 NTFPs and Sustainable Livelihoods; Options for development

" The SL approach emphasises greater reliance on local resources and strategies to cope with social and economic issues, empowerment of local actors, and the need for improving access to additional resources that can help them make progress on their own" (Singh, 2003)

The regional discourse on NTFPs has remained mainly in the domain of forest resource managers who are charged with ensuring protection of biodiversity resources. However, NTFPs are not only a conservation issue but are essentially a sustainable livelihoods issue (SL) particularly for rural populations. The policy environment for NTFPs requires greater support because the sector has demonstrated its capacity to contribute to sustainable livelihoods particularly in rural communities for generations. These rural communities have been hardest hit by the current contraction in many of the regional island economies and Governments have responded with a policy emphasis on poverty alleviation. This has led to various donor driven or state led poverty reduction initiatives that may address income needs but are inadequate for addressing sustainable livelihoods in the long term.

Therefore, the discourse on NTFPs should be taken up within a wider context of sustainable development and cross sectoral approaches should be applied to overcome the challenges and constraints. The principle of sustainability should be considered in the NTFP sector given the fact that NTFPs potentially can: (1) benefit local entrepreneurs (2) create sustainable economic activity and (3) play a role in safeguarding the environment in the long term. Social sustainability is indicated where the activities of forest products enterprises do not harm disadvantaged members of the community and do not create disruption. Safeguarding the environment or biodiversity conservation is achieved by encouraging stakeholders "to reallocate labour away from undesirable activities towards desirable ones, in a substitutional manner" (Bovernick 2003). Therefore NTFPs should be addressed within the context of:

- Sustainable livelihoods
- Governance
- Biodiversity conservation

The current climate not only poses challenges for development of the NTFP sector but presents opportunities also. An example can be taken from the restructuring of the banana sector and its subsequent impact on economies and livelihoods of the Eastern Caribbean states. Many agricultural policies today stress the need for agricultural diversification. This emphasis on diversification has led some countries to recognize the significant trade underway for some NTFPs and an opportunity towards including some of the more readily marketable NTFPs in their thrust for diversification. Such budding efforts point to possible options for development that can reconcile livelihoods and resource management considerations. There is also the possibility of linking NTFPs to the Fair Trade marketing arrangement which is already established in some islands for agricultural produce (e.g. banana export in Dominica).

3.1 Governance and NTFPs

For most of the insular Caribbean islands there is little to no formal organization in the NTFP sector. Stakeholders involved in the sector tend to operate individually in most instances with little communication between them or information available to them. In contrast, the current structures involved in rural development are formal and are geared towards the service of mainstream agricultural activity (e.g. agricultural extension services). Given the challenge that many of those involved in the NTFP sector are landless and semi-skilled, they tend to fall outside the ambit of the formal rural administrative arrangements. Stakeholders need to have a context or space created for them by administrative institutions to articulate the challenges they experience in sustaining their livelihoods in the NTFP sector. Such a space can serve to identify challenges and provide an opportunity to mobilise them to seek possible solutions through collaboration.

There is a need for institutions involved in rural community development to recognize the special requirements of those who are involved in the NTFP sector and foster the development or create the necessary support networks. They should serve to increase the social space and resources available to NTFP stakeholders thereby enhancing the chances for success of initiatives. In St. Lucia, attempts to address rural poverty in the face of the restructuring of the banana industry and the need for diversification in the agriculture sector led to the St. Lucia Rural Enterprises Project (SLREP) supporting rural micro-enterprise projects, one of which involved NTFPs (i.e. latanyé palm production and mauby cultivation). The Ministry of Agriculture, the Forestry Department and the St. Lucia Rural Enterprises Project (SLREP) collaborated in research on the latanyé broom industry and established a Latanyé Task Force. This forum facilitated exchange of views of broom producers, a major broom exporter and the Forestry Department who were concerned about the rate of exploitation of the palm. The Task Force allowed for cooperation between the Forestry Department and broom makers who were interested in cultivating the palm on their lands. SLREP provided financial support for nursery production of seedlings under the Forestry Department and in some instances, facilitated construction of water tanks on farmers' properties. The role of the public institutions in this example is perceived as one of providing guidance for resource management through establishing a suitable framework that would facilitate a participatory role for communities in management of the NTFP resource. In the aforementioned example, the Latanyé Task Force could ultimately assist in establishing community based latanyé broom makers associations which would facilitate partnership arrangements between communities with less formal and less hierarchical structures involved.

Governments of the region need to recognize the constraints of land ownership and the demand for resources faced by stakeholders in the sector. Collateral management arrangements that provide NTFP producers with access to forest resources and/or land for the explicit purpose of NTFP production and management can serve to give stakeholders a vested interest in effective management and an incentive to protect scarce resources.

3.2 Research

There are gaps in knowledge on various aspects of the NTFP sector which indicate a need for research on various levels. Research should be pursued on both the socio-economic and biodiversity related aspects of the sector. This research must establish a baseline that can inform policy development and decision making on the sector. For most countries in the region there is need to assess the socio-economic aspects relating to levels of income generated, level of subsistence support obtained through NTFPs, gender and intergenerational related roles or influences in the NTFP sector. Table 2 summarises identified gaps for research.

These listed needs clearly extend beyond the reach of public institutions directly involved in NTFP management (e.g. Forestry Departments). A more valid approach requires the support of a range of institutions and would be one of cross sectoral involvement which includes national NGOs involved in forest management, small business enterprise, rural development and poverty alleviation. There is a need to establish NTFPs as an active economic sector and collaborate on assessing the current and potential role of the sector in reducing poverty, particularly rural poverty.

There is also a role for regional Government and Non Governmental Organizations (e.g. OECS-ESDU, CANARI, CNIRD) and developmental type organizations (e.g. UNDP, FAO, UNEP) that could provide resources for research through regional institutions (e.g. University of The West Indies) and capacity building for community based initiatives (e.g. GEF-Small Grants Programme). The support of these institutions are key to the task of mainstreaming the NTFP sector if the objective of reducing poverty and enhancing rural development is to be achieved. The OECS Development Charter recognises that "the poor must be enabled to change the conditions of their existence rather than simply adjust to those conditions".

Table 2: Summary of research gaps and recommendations

Sustainable livelihood	Resource sustainability	Finance	Marketing	Policy and institutions	Public awareness and information	Training
What NTFP resources are being used by stakeholders Determine which groups of individuals are involved What services are available and used by NTFP producers Institutional arrangements suitable for NTFP producers (e.g. co-management agreements) and management agencies Determine institutional support required for NTFP sector from Government or private sector.(e.g. market research, technology, product development) Formation of NTFP partnerships (i.e. industry based, cooperative or association type) at the local, national and regional level	Inventories of forest NTFP resources and assess habitat requirements Assess quantities of NTFP traded in markets and sources of raw materials Determine current practices that degrade the NTFP resources Determine NTFP harvest systems, applied technology, processing and manufacture of products Seek alternatives to damaging exploitation	Establish how NTFP entrepreneurs currently obtain finance Determine what avenues for financial assistance are potentially available What levels of financing and risk are involved with different products	Determine approaches to fair pricing for NTFPs Determine market constraints to replacing imported souvenirs with locally produced "heritage crafts" Research domestic and regional and international, NTFP markets and examine income distribution from NTFP markets Determine effective marketing mechanisms (e.g. Internet) and arrangements that include cultural value Identification of potential high value niche markets, particularly for products which can be cultivated commercially	Examine existing laws and policies that support or constrain development of NTFP sector in the Caribbean Examine institutions, (formal and informal) that exist for production and marketing Determine implications of regional and international trade agreements (e.g. CSME, CITES) on development of NTFP markets Examine legislative or regulatory systems (e.g. seasonal permit regimes, extraction limits, resource management plans) to ensure resource sustainability and frameworks for certification of sustainable production	Increased public education and awareness about NTFPs and the value of NTFP products. Needs to be tailored for a range of stakeholders (e.g., policy makers, consumers, harvesters) Community development initiatives to encourage education on NTFPs and emphasise sustainable management of resources Establishment of a regional network on the NTFP sector	Training in NTFP management, manufacture and marketing to be conducted at the national and regional level through skills based exchanges Training in application of suitable technology for harvesting, drying and other aspects of NTFP manufacture (e.g. solar dryers, kilns) Increased opportunities to build skills through regional exchange of artisans Training in NTFP management, manufacture and marketing to be conducted at the national and regional level through skills based exchanges

4.0 Conclusion

NTFPs have an established traditional economic role in most of the islands of the region particularly for rural communities. They offer a potentially valuable contribution to sustainable livelihoods and yet it has remained marginalised to mainstream economic activity due to a variety of challenges and constraints. NTFP economic activity needs to be harnessed and managed effectively in order to capture its potential contribution to national sustainable development particularly for rural livelihoods. Amidst challenges that are emerging, there are opportunities that the sector provides that should be recognized and capitalized on.

This research brought into focus (i) the important role that NTFPs do and can play in rural livelihood strategies, and (ii) the resource management, marketing, finance, policy and institutional challenges that need to be overcome for NTFPs to meet their full potential within such livelihood strategies. Various regional management agencies, primarily forestry departments, are mandated to manage NTFPs but are challenged by a lack of adequate resources and scenarios where exploitation of the resources occurs on properties beyond the confines of forest reserves. In some instances, conflict management may be required as scarcity of the resources promotes competition and desperation on the part of stakeholders.

Peer review of this report has served to further endorse the need for regional research in the sector as one reviewer expressed the view that "profit margins for most NTFPs are so small that it really does not pay to work them" while another felt that "ecological risks and increasing unacceptability associated with traditional timber forestry practices" make NTFPs a suitably viable alternative. Additionally, it was felt that this paper did not examine the need to "record and protect intellectual property of traditional knowledge systems" associated with long standing NTFP use.

It is clear that in order for the NTFP sector to be developed, it has to be analyzed beyond the narrow confines of biodiversity conservation and framed within the broader context of poverty alleviation and sustainable livelihoods. Within this context, the needs of the sector to be addressed should include policy and institutional arrangements, resource management and access, marketing, finance and training because sustainable livelihoods can only be achieved through governance arrangements that allow effective management of natural resources (i.e. NTFPs) while empowering those dependent on such resources. This calls for a policy environment that allows for participatory based approaches providing NTFP stakeholders with information, access to and a role in management of the NTFP resource base and their personal development.

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Websites
http://www.nmnh.si.edu/botany/projects/cpd/ma/table46.htm
Regional Overview of Caribbean Islands. Table 46. Selected list of Economically important plants.
This is a site under the Smithsonian National Museum of Natural History that presents a table of a selected list of economically important plants of the Caribbean. Species are listed according to timber and non-timber species used for food, craft and medicine.

APPENDIX 1

The following has been extracted from the Smithsonian National Museum of Natural History website : " A regional overview of Caribbean Islands."
http://www.nmnh.si.edu/botany/projects/cpd/ma/table46.htm

SELECTED LIST OF ECONOMICALLY IMPORTANT NTFP PLANTS

2. Species used as food

a. Regularly used

Anacardium occidentale	cashew	Tropical America
Annona muricata	soursop	Tropical America
Annona reticulata	custard apple	Tropical America
Annona squamosa	sweetsop	Tropical America
Bixa orellana	annatto	Tropical America
Carica papaya	pawpaw	Tropical America
Chrysobalanus icaco	coco plum	Tropical America
**Chrysophyllum cainito*	star apple	Greater Antilles (widely cultivated elsewhere)
Colubrina arborescens	mauby	Tropical America
Colubrina elliptica	mauby	Tropical America
Malpighia emarginata	West Indian cherry	Antilles, northern South America
Mammea americana	mammey	Tropical America
Myrciaria floribunda		Tropical America
Pimenta dioica	pimento	Central America, West Indies
Pimenta racemosa	bay rum tree	South America, West Indies
Psidium guajava	guava	Tropical America
Spondias mombin	hog plum	? Tropical America
Spondias purpurea	Jamaica plum	Tropical America
Ximenia americana	tallow plum	Pantropical
**Ziziphus rignonii*		Antilles

b. Irregularly used

Acrocomia spinosa and spp.	maccafat	Tropical America
Annona glabra	pond apple	Tropical America, West Africa
Bomarea edulis	salsilla	Tropical America
Byrsonima coriacea	hogberry	Tropical America
Byrsonima crassifolia	savanna serette	Tropical America

Calathea allouia	topitambu	South America, West Indies
Crossopetalum rhacoma	poison cherry	Pan-Caribbean
Coccoloba uvifera	seagrape	Tropical America
Cucumis anguria	West Indian gherkin	Native to Africa
Eugenia ligustrina	rodwood	Tropical America
Ficus spp.		
**Garcinia humilis*	wild mammee	Antilles
Hymenaea courbaril	West Indian locust	Tropical America
Inga laurina	pois doux	Tropical America
Inga vera	pois doux	Greater Antilles (excluding Cuba)
Maclura tinctoria	fustic tree	Tropical America
Manilkara bidentata	balata	Tropical America
Melicoccus bijugatus	guinep	Tropical America
Miconia spp.	cotelette; fishleaf	Tropical America
Micropholis rugosa		
Opuntia spp.	tuna	Tropical America
Pereskia aculeata	West Indian gooseberry	Tropical America
Pilosocereus royeni	dildo pear	Antilles
**Pouteria multiflora*	bullet	Antilles
Rollinia mucosa	wild cashimar	Tropical America

3. Medicinal plants

Anacardium occidentale	cashew	Tropical America
Aristolochia trilobata	tref	Central America, West Indies
Bontia daphnoides	olive bush	South America, West Indies
Canella winterana	canella	Florida, Northern Antilles
Capraria biflora	thé-pays	Tropical America
Capsicum spp.	chilli pepper	Tropical America
Cassia alata	wild senna	Tropical America
Cecropia peltata	trumpet tree	Tropical America
Chione venosa	bois bandé	Antilles
Cordia curassavica	black sage	South America, West Indies

Eryngium foetidum	fitweed	Tropical America
Eupatorium odoratum	Christmas bush	Tropical America
Eupatorium triplinerve	japana	Tropical America
Fevillea cordifolia	antidote caccoon	Tropical America
Gossypium barbadense	cotton	Tropical South America
Gouania lupulina	chew stick	Tropical America
Guaiacum officinale	lignum vitae	Tropical America
Guaiacum sanctum	lignum vitae	Northern subtropical America
Hymenocallis spp.	spiderlily	Tropical America
Jatropha curcas	physicnut	Tropical America
Justicia pectoralis	garden balsam	Tropical America
Justicia secunda	St John bush	South America, West Indies
Microtea debilis		Tropical America
Mimosa pudica	sensitive plant	Tropical America
Myrica cerifera	waxwood	Central America, West Indies
Neurolaena lobata	zebapique	Tropical America
Parthenium hysterophorus		Tropical America
Petiveria alliacea	gully root	Tropical America
Phyllanthus amarus	seed-under-leaf	Tropical America
Picrasma excelsa	bitterwood	Greater Antilles, Venezuela
Pilocarpus racemosus		Antilles, mainland Caribbean coast
Piper spp.	jointers	Tropical America
Piscidia carthagenensis	dogwood	Tropical America
Pluchea carolinensis	wild tobacco	Tropical America
Porophyllum ruderale	shiny bush	Tropical America
Quassia amara	quassia	Tropical America
Richeria spp.	bois bande	Tropical America
Ryania speciosa	bois l'agli	Trinidad, Venezuela
Roupala montana	bois bande	South America, Trinidad
Ruellia tuberosa	minny root	Tropical America
Solanum americanum	gouma	Tropical America
Stachytarpheta jamaicensis	vervine	Tropical America

Tournefortia spp.	jigger bush	Tropical America

4. Craft materials

Abrus precatorius	crabs eyes	Tropics
Agave sobolifera and spp.	coratoe, sisal	Tropical America
Caesalpinia bonduc and spp.	nickel	Antilles
Carludovica palmata	jippi jappa	Tropical America
Coccothrinax jamaicensis	silver thatch,	Antilles
Coccothrinax barbadensis and spp.	latanyé	Antilles
Entada gigas and spp.	caccoon	Antilles
Hibiscus elatus	blue mahoe	Antilles
Hura crepitans	sandbox	Tropical America
Ischnosiphon arouma	larouman, tirite	South America, West Indies
Manicaria plukenetii and many other palms	timite	Trinidad

5. Genera of economic importance

The following genera include well known economic plants with species which are indigenous in the region. The value of the native Caribbean species as sources of genetical material has mostly still to be investigated.

Agave (Agavaceae)	*Juglans* (Juglandaceae)
Canna (Cannaceae)	*Juniperus* (Cupressaceae)
Cinnamomum (Lauraceae)	*Magnolia* (Magnoliaceae)
Corchorus (Tiliaceae)	*Persea* (Lauraceae)
Crotalaria (Leguminosae)	*Phaseolus* (Leguminosae)
Crotalaria (Leguminosae)	*Pimenta* (Myrtaceae)
Erythroxylum (Erythroxylaceae)	*Podocarpus* (Podocarpaceae)
Eugenia (Myrtaceae)	*Psidium* (Myrtaceae)
Garcinia (Guttiferae)	*Solanum* (Solanaceae)
Glycine (Leguminosae)	*Vanilla* (Orchidaceae)
Gossypium (Malvaceae)	*Vigna* (Leguminosae)
Ipomoea (Convolvulaceae)	*Vigna* (Leguminosae)

Note: * endemic species

APPENDIX 2

Caribbean Natural Resources Institute

Regional Workshop:

Non Timber Forest Products

Cara Suites Hotel, 13 - 14 July 2004

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Caribbean Natural Resources Institute

The Caribbean Natural Resources Institute (CANARI) is an independent, regional research and technical assistance organisation concerned with issues of sustainable development in the insular Caribbean.

CANARI's mission is to create avenues for the equitable participation and effective collaboration of Caribbean communities and institutions in managing the use of natural resources critical to development.

Based in Trinidad and Tobago the Institute has specific interest and extensive experience in the identification and promotion of participatory and collaborative approaches to natural resource management.

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