Entrepreneurial Opportunities for the Sustainable Use of the Pi Forest Resources of The Bahamas

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Abstract

The Bahamas possesses considerable natural forest resources comprising pine forests, coppice hardwood forests and mangrove forests. There has been a long history of forest exploitation dating back to the 1700s when almost the entire hardwood resource was exploited as logs for export. The last extensive exploitation ended in the early 1970s when the pine forest resources were harvested for pulpwood. Sustained yield practices were not employed during those early years. No man-made forest plantations have been established, and today, no commercial forests industries exit, with the country importing virtually all of its wood products. This paper presents some policy considerations and entrepreneurial opportunities for the sustainable utilization of the pine forests of The Bahamas.

SUMMARY

The Bahamas possesses considerable natural forest resources comprising pine forests, coppice hardwood forests and mangrove forests. It has had a long history of forest exploitation dating back to the 1700s when almost the entire hardwood resource was exploited as logs for export. The last extensive exploitation ended in the early 1970s when the pine forest resource was harvested for pulpwood. Sustainable yield practices were not employed during those formidable years and no man-made forest plantations were established.

The lack of public education and awareness about forestry matters is seen as a critical problem among the general population and the mass media. The vast majority of the portable water resources are located beneath the pine forest and coppice forest the form of water lenses. Of particular concern to water resource experts has been the issue of agricultural expansion and other developments onto water bearing areas, particularly where clear-cutting of forests for these activities arc involved. The lack of effective land use planning for development has resulted in the destruction of forest based resources at the expense of development.

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In terms of forest policies, a National Forest Policy Statement was prepared in 1986 as part of a National Forestry Development Project. The forestry institution uses this policy as a guide in executing its mandate. Draft forestry legislation "A Bill for an Act to Provide for the Conservation and Control of Forests (1996) is before the Government for consideration. The legislation provides a legal framework for the long-term management of forests in The Bahamas. This is to be achieved through the establishment of a governmental forestry agency, a permanent forest estate subject to scientific management, the licensing of timber harvesting activities and for various administrative aspects including regulations, powers of forest officers and offences.

Today, no commercial forest industry exists, and the country imports all its wood products valued at approximately B$68 million in 2001. The forest resources offer considerable potential for future small-scaled forest-based industries to help reduce the wood product import bill in traditional areas such as sawmilling, artifacts and wood carvings, joinery and charcoal production. Some non-wood product opportunities include conservation of biodiversity, game hunting, ecotourism and environmental enhancement.

INTRODUCTION

The Commonwealth of The Bahamas archipelago consists of 35 major islands, 700 cays and some 2,400 rocks occupying a land surface of some 11,700 km^2, and dispersed over some 325,000 km^2 of ocean. The Bahamas is situated on the south western edge of the Atlantic Ocean between longitudes 72^o and 80^o west and latitudes 20^o and 20^o degrees north. The islands are separated from Florida (USA) in the west by the Florida Straits, whilst to the south from Cuba by the Old Bahama and Nicolas Channels.

The climate is subtropical with warm summers (May - November) and mild winters (December -April) and characterized by the Northeast Trade Winds. The archipelago lies within the North Atlantic Hurricane Belt with a risk season from June to November. Annual rainfall averages from 750mm to 1,500mm, with most rain occurring from May to June and a marked dry season from November to April. Temperature ranges from 20^o celsius in winter to 30^o celsius in summer.

The 325,000 km^2 of submerged banks that make up the Bahamas comprises a pure calcium carbonate platform of level bedded shallow water carbonates. The islands are generally flat with no rivers but with occasional dunes and beach ridges sloping into plains and marshes. The highest point in the country is a mere 63m above mean level located at Mount Alvemia, Cat Island.

The forestry resources of The Bahamas have been classified into three distinct types:

a) Pine Forest - The pine forests *(Pinus caribaea var. bahamensis)* are considered the most productive and commercially viable forest resources, comprising an estimated 213,861 hectares and found on four of the most northerly islands on The Bahamas, namely Abaco, Andros, Grand Bahama and New Providence.

b) Coppice Forest - The coppice forests are found predominantly in the Central and Southern Bahamas and have never been inventoried. They comprise various hardwood species harvested in the past for sawlogs. Some noted valuable species include buttonwood, mahogany, gum elemi, ratwood, black ebony, braziletto, horseflesh, lignum vitae and red cedar.
c) Mangrove Forest - The mangrove forest ecosystems occur predominantly on the lee shore of most Bahamian Islands. The total area of wetlands is estimated to be some 4,286 km^2. The major wetlands include the north coast of Grand Bahama Island, western Andros Island, The Maris of Abaco and The Bight of Acklins Island.

THE FORESTRY SECTOR OF THE BAHAMAS

In the past the forestry sector of The Bahamas focused primarily on the utilization of the natural forest resources for wood products such as pulpwood to produce paper and sawlogs for construction lumber. Pine forest utilization commenced in 1906 when the first license was issued to exploit the resource. The exploitation process continued unabated until the early 1970s, when all licenses and concessions were relinquished to the Government. The activity contributed significantly to the national economy in terms of employment opportunities and the development of infrastructure in family Island communities. Revenue was generated to the Government from license fees and royalties collected for the removal of forest produce (Henry, 1974).

The years of extensive forest resource exploitation, were not in unison with the concept of "sustainable yield practices". There was a total disregard of the ecological biodiversity in the islands. This, compounded by the other dramatic negative effects on the local environment, brought about a change in the perspective of the public regarding the tangible and intangible benefits the forest resources contribute to socio-economic development. These changes in local ideologies and the global perspectives regarding environmentalism have signify-cantly influenced to the new definition and scope of the forestry sector in The Bahamas.

Beginning in the late 1980s and early 1990s, it became generally accepted that the Bahamian natural forests have multi-purpose functions. The natural forests provide for commercial forestry, charcoal production and handicrafts, the conservation and protection of freshwater resources, maintenance of the hydrological cycle, conservation of biological diversity in the forest ecosystems, and microclimate regulation. In addition to recreation and ecotourism development, aesthetics and natural scenery, opportunities exits for agricultural and agro-forestry development, and the establishment of national parks and protected areas.

The key actor in the change of focus of the forestry sector away from commercial forestry towards "environmentalis" has been civil society. The Bahamas National Trust, the Conservation Unit of Department of Agriculture and the local forestry institution (Forestry Section - Department of Lands and Surveys) have also played leading roles. The Bahamas National Trust has been

instrumental in bringing to the forefront the issues regarding forest resource conservation and forest degradation due to the continuous encroachment into forest areas from other land use pressures. Additionally, the Trust has able to use its legislative mandate to afford the declaration of national parks and other protected areas, including large areas of national forest lands, under their jurisdiction and control.

Evidence suggests that the forestry sector in The Bahamas is being transformed from one of forest utilization and exploitation, to that of environmental management and conservation, encompassing all the goods and services that can be derived from the resource. The Government of The Bahamas recognizes the significance of the environment to the economic well-being of future generations and, to this end, has incorporated the protection and enhancement of the environment and its biological resources into the national development planning process.

CURRENT FORESTRY POLICY

The last major initiative at a comprehensive National Forestry Policy for The Bahamas took place in 1985. Technical assistance was sought from the FAO along with financial assistance from the Inter-American Bank to execute The Forestry Development Project for The Bahamas. A product of this project was a Forest Management Plan, 1986, which included a draft National Forestry Policy.

The National Forestry Policy states the following:

The Government of the Commonwealth of The Bahamas recognizes the importance of Forestry as a vital facet of land use and gives its fullest support to forest conservation, management and development in the national interest.

The Forestry Section of the Department of Lands and Surveys is the institution responsible for managing the forest estate and is accountable to the Government for the stewardship of the legally constituted forest estate and for expenditure of public funds in exercising this function. The Forestry Section will recommend the licensing and promotion of sound forest development proposals.

The Government recognizes the need to establish a legally constituted forest estate to be managed in the national interest and require that the Forestry Section:

- *Soundly manage the designated forest estate to increase the yields of sawlogs and other forest products on a sustained basis. As part of this management process, to provide fire protection and to develop management systems compatible with the conservation and protection of fresh groundwater resources;*
- *Develop sustained wood resources for the promotion of local forest industries, accepting that initially, due to resources limitations, such enterprises may be small in scale;*
- *Manage designated forest conservation areas for amenities, recreation or protection of rare, fragile or threatened ecological associations;*
- *Encourage tree planting or forest development on suitable private lands;*
- *Manage and sustain a comprehensive forest research programme to provide a sound technical base to improve management and development, and in particular identify silvicultural data directed toward improving the financial yields of*

species important to the national economy; and

- *Define and periodically revise forest royalty of stumpage rates to ensure that the Government derives a reasonable for licensed rights.* (Forest Management Plan, 1986.)

Draft forestry legislation in the form of "A Bill for An Act to Provide for the Conservation and Control of Forests, 1996" is before the Government for consideration. It has the objective of providing a legal framework for the long-term management of forests in The Bahamas. This is to be achieved through the establishment of a Governmental forestry agency, a permanent forest estate subject to scientific management, the licensing of timber harvesting activities and for various administrative aspects including regulations, powers of forest officers and offences.

EMERGING AND CURRENT ISSUES

The lack of proper management of the natural resource, due in part to a weak forestry institution, continues to result in permanent losses in natural forest cover from wildfires, agricultural expansion, illegal encroachments on forest lands etc. In order to establish and manage the legally constituted forest estate, adequate and necessary funding must be provided to set up and staff a forestry organization to carry out the objectives.

There have been great monetary losses and loss opportunities due to lack of effective forest resource management. In a report by Soares (1990), it was estimated that the total monetary losses due to wildfires amounted to some $1,575,400, annually, throughout the pine forest islands of The Bahamas. Successive wildfires in the pine forests, due to fuel build-up and overgrown forest roads, have resulted in destruction of old snag trees, the natural habitat for swallows.

There is conflict between communities who depend on the forest for their livelihoods and the agencies in government responsible for natural resource conservation and management. The sustainable development of the natural forest resources and associated ecosystems are at stake as well as the quality of life of communities. There is bound to be a lot of emotional reactions to any future large-scale forest resource exploitation and hence the need for clear policies to prevent such type of exploitation, complemented by education of civil society.

Due to the lack of education and awareness of forestry and resource conservation and management, that there is potential for considerable costs to the environment due resource fragmentation. When the general populace is uneducated or unaware of the benefits that can be derived from natural forests, the resource will be taken for granted and abused; loss of biodiversity within forest ecosystems is the end result.

Public education and awareness have become an issue as on a dairy basis there is evidence of forest resource depletion and destruction, caused by the high incidence of forest fires adjacent to nearby communities particularly during the dry season. The causes in many cases are due to negligence from farmers and boar hunters. The phenomenon is compounded by the lack of appreciation of the resource.

The best arable lands are those comprising natural pine forests (Little et. al., 1977). In 1993, following the release of the Agricultural Land Policy, designed to facilitate and foster the long-term development of the agricultural industry, 14,639 hectares of forested lands were transferred from the forest estate to the Ministry of Agriculture.

No detailed quantitative economic costs/benefits analyses have been done on the various mixes of land use - in particular agriculture versus forestry - and there is the need for such analysis. However, there have been qualitative analysis studies undertaken in The Bahamas on the issue of agricultural land use and forestry. Of significance are the recommendations of the Land Resource Study, 1977 which state that, "although it is inevitable that the acreage of forest land will diminish because of agriculture... it is considered essential that such encroachment should be carefully controlled. What is required is a mechanism that would enable sustainable agricultural regimes to co-exist, with sustainable forestry regimes.

Stakeholders agree that forestry cannot be developed in isolation. It must be compatible with other land use patterns and give due consideration to the legitimate needs and aspirations of local communities (Little et. al., 1997). The absence of strategic land use planning, particularly long range planning for sustainable development of land based resources has resulted in tremendous conflicts in the appropriate use of land resources. The conflicts have been compounded by the high incidence of encroachments on Crown forest lands by illegal squatters who build dwelling homes and contribute to habitat fragmentation. Numerous sensitive areas are under threat from urbanization as industrial developments continue to encroach on forest lands. No guidelines are in place as to how to develop lands adjacent to these areas (Proctor & Redfern, 1997).

Of particular concern to water resource experts is the issue of agricultural expansion and other developments onto water bearing areas, particularly where clear-cutting of forests for these activities are involved. Developments into water bearing forested areas would result in a loss of water resources, potential pollution due to sewerage disposal and encroachment of buffer zone between supply areas and human settlements. There is the need to coordinate planning of water extraction systems with forest management and an Integrated Water Resource Management Strategy has been identified for this purpose

THE POTENTIALITIES OF THE PINE FORESTS OF THE BAHAMAS

In 1986, the areas of State and privately-owned pine forests lands recorded during the National Forest Inventory are shown in Table 1.

The most productive and commercially viable forest resources are the pine forests *(Pinus caribaea var. bahamensis),* found on four of the northerly islands of The Bahamas, namely, Abaco, Andros, Grand Bahama and New Providence. There are no man-made plantations the country.

Apart from small-scale charcoal enterprises there have been no primary forestry industries in The Bahamas, such as

Table 1: Areas of Pine Forests by Location and Land Tenure

Island	Crown (ha)	Private (ha)	Total (ha)	% Total Land Area of Island
Abaco	55,860	4,402	60,262	35
Andros	114,630	6,746	121,376	20
Grand Bahama	26,216	2,091	28,307	20
New Providence	2,416	1,500	3,916	18
Total	199,122	37,351	213,861	23

(Source: Bahamas Pine Forest Inventory, 1986)

sawmilling, since forest exploitation ceased completely in the late 1970s. Consequently, The Bahamas relies heavily on imports of forest products to sustain its demand for the goods and services that are derived from such resources. The sector currently contributes little to GDP, however, the existing naturally regenerating pine forests on State lands provide an excellent asset for renewed sustainable forest utilization for small-scale local forest industries which can meet the local demand for approximately one-third of the imported products.

In a Technical, Report "Options for Forest Industries in The Bahamas, 1986" by a FAO forest industries consultant, the following potentialities were recognized as providing feasible options for industrial development:

- Sawmffing - To initially develop a small-scale operation in North Abaco Island and North Andors Island. In general, the report stated that the production of good quality domestic sawn-wood should readily compete with imported pine.
- Utility poles - The production of utility poles for local consumption represents a small but special mark-et. The operation could readily form part of a sawmill logging operation.
- Posts - the production of fences posts provides a potential use for thinnings or selected cordwood. Posts can be preserved by pressure treatment or diffusion methods.
- Charcoal - On a small scale based on thinnings and sawmill waste the potential for local charcoal operations are excellent. The entire domestic demand for imported charcoal can be met by such local production.

The Department of Statistics Trade Statistics reveal the extent to which The Bahamas is dependent upon timber and timber product imports. The total value of these goods of some B$63 million in 1995, shows the great economic opportunities that local forest industries can contribute to socio-economic development. While it is not feasible to totally reduce the wood product imports, a significant dent in the expenditure of GDP on imported wood products could be achieved by the development of local forest industries, as prescribed earlier. In this regard there is the need for government policy to assure selective harvesting of sized trees as opposed to clear-felling activities. The resource can then be used to produce wood paneling, flooring, picture frames, artifacts workshops, carvings and other similar products.

In addition to the potential of the local forest for primary forest products, there is considerable potential of trees and forest to local watershed management and maintenance of the hydrological cycle. This is particularly significant on the larger northern islands of The Bahamas where the natural pine forests are located, which is the major source of fresh water in the form of fresh water lenses. It has been estimated, based on Land Resource Studies in the 1970s, that the thickness of these lenses vary from 1.5m to 18m on some 13 islands and containing approximately 7,649 million m^3. (Little, et. al., 1977 and Cant, 1980).

The forest vegetation cover of land over the lenses plays a role in the absorption and storage of rainwater in the underground lenses. It is not known to what extent the present stands of pine forest influences water lenses build-up and storage.

The forest resources offer great opportunity for game hunting of wild animals (quail, wild hogs, pigeons and introduced deer) by tourists, once the activity is properly planned and managed. Proper scientific studies and assessments are required to determine whether the activity is sustainable with forestry.

The indigenous forest resource also offers opportunities for agriculture and agro-forestry development. Evidently, the best arable lands for agriculture production are situated on lands forested with natural pine forests, particularly in the northern islands. Currently, large acreage of this arable land is under citrus cultivation and other cash crops, for domestic and export markets. In addition to large-scale agricultural operations, small farmers are being encouraged to cultivate cash crops intermixed with forest trees and other agro-forestry systems. The natural forest which fringes these agricultural developments provide much shelter from strong winds and can reduce the effect of catastrophic tropical storms and hurricanes that the country may experience.

Other significant potentials of the forest resources include conservation of biological diversity, ecotourism, aesthetics and natural beauty, establishment of natural parks and protected areas. The establishment of a network of biotic corridors to remain in their natural state within the pine forests of Abaco, Andros and Grand Bahama Islands has been suggested by environmentalists. Also recommended is a policy which allows setbacks from the borders of blue holes, creeks and other wetlands, thus preventing development and permitting the protection of biodiversity within these ecosystems for the enjoyment of all.

CONCLUSION

The Bahamas possesses one of the largest natural pine forest resource in the Caribbean with some 200,000 hectares, most of which is owned by the Government. Whilst there has been a transformation in the approach to the exploitation of the resource, namely from exploitation to conservation and sustainable management, much remains to be done in utilizing the resource to derive maximum economic benefits.

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