



ITTO

## PROJECT COMPLETION REPORT

Project Title: Utilization of Lesser Used Wood Species in Guyana

Project Number: PD 344/05 Rev.2 (1)

14 March 2008  
248

**A. Project Identification**

**Title:** Utilization of Lesser Used Wood Species in Guyana

**Serial no:** PD 344/05 Rev.2 (1)

**Executing Agency:** Guyana Forestry Commission

**Host Government:** Government of Guyana

**Starting Date:** March, 2007

**Duration (months):** 12 months

**Project Cost (US\$):** 131,925

**PART 1: Executive Summary**

**1. Background Information about the Project**

Guyana's forest has high species diversity and studies have shown that over 1,000 timber species can be found in the forest of Guyana. Guyana's forests have been looked upon to provide substantial economic benefit to the economy, communities, especially those which depend on forest resources, and commercial entities which generate profit from forestry activities.

Guyana has witnessed a decreasing trend in forest production over the period 1998 to 2005. Production figures show that potential of the forest is not being maximized. Of the 20 cubic meter/hectare allowable cut, a recent study has shown that an average of 5.02 cubic meters per hectare is currently being harvested. Owing to this factor, the forest sector's primary contribution to GDP has not increased significantly over the past 7 years. Given that most of the forested areas are primary forest, now being harvested for the first time, the amount that can be harvested from a hectare under GFC's key guidelines (that is, harvestable size of 35cm in diameter and greater and in accordance with the criteria outlined in the GFC's Code of Practice for Harvesting Operations) is higher than the current industry average.

This level of performance has attributed to several factors including:

- Poor information about markets and trends worldwide
- Lack of skills in processing industry
- Little emphasis on value added processing
- Low level of efficiency in sawmilling
- Lack of trained personnel at all levels in forestry (including management)

Several studies done over the past few years have recommended that Guyana begin to concentrate on harvesting and marketing lesser used species in order to improve the state of the industry. Promotion of Guyana's lesser used species is also emphasized in the 1997 National Forest Policy.

Traditionally, a few select species have been the focus of exploitation in Guyana's forest industry and this has been largely due to the ability to secure markets for these products coupled with more acquired knowledge about these species. There is little knowledge available on what is considered to be 'lesser used' species of wood in Guyana and therefore the industry has been reluctant to utilize and market these. Although Guyana has over 1000 species of trees, only about 32 species are currently harvested with about 12 of these being more extensively exploited. An additional problem is that the industry, with a few exceptions, have poor grasp of conversion technology and value added processing in general. In order to improve sector performance, both the issues of exploiting more species and improving conversion technology has to be addressed.

The **Specific Objective** of the project is to enhance knowledge and use of lesser used species of woods utilized in the forest industry of Guyana.

The **Developmental Objective** of the project is to increase the contribution of the forest sector to the national economy of Guyana from sustainably managed forest resources.

The main outputs are:

Output 1. Technological properties (physical and mechanical) of a selected set of lesser used species analyzed

Output 2. Awareness and use of lesser used species increased

Output 3. Wood processing techniques used by local industry for lesser used species improved

The strategy adopted for the project is one which embraces a national and consultative approach, working in collaboration with the local stakeholders to enhance their knowledge of the 15 targeted

lesser used species through training and the use of promotional materials; additionally this was supplemented through comprehensive testing and the 15 species for natural durability, the ability to withstand abrasion, and marine borer. Within the forest sector of Guyana, the main sub sectors including the processing and the producing sub-sectors have benefited from the initiatives undertaken through this project.

The general process for selection of lesser used species looks at four key criteria -

- Species distribution- should be well distributed in Guyana
- Species availability- can only be promoted if sufficient quantities exist
- Species accessibility- should be accessible or will impact production
- Timber production - focus on species that are harvested at low volumes

Other considerations would include species applicability to current and potential market demands.

**The Planned duration of the project was 12 months. The planned overall cost of the project was US\$131,925.**

## **2. Project Achievements**

### **Outputs Achieved**

The following outputs have been achieved:

#### **Output 1 - Technological properties (physical and mechanical) of lesser used species analysed**

##### ***Activity 1.1 - Conduct literature review on lesser used species***

The draft review of literature was completed and submitted to the Guyana Forestry Commission for comments and queries. Comments were made on this draft and forwarded to Trada Technology. This final review of literature was completed and submitted to the GFC.

The result of the review of literature addresses 15 species: Limonaballi, Black Kakaralli, Muneridan, Burada, Iteballi, Darina, Fukadi, Tonka Bean, Wadara, Itikiboroballi, Morabukea, Futui, Suya, Dalli, and Kurokai. The key areas addressed for each species are: treatability, finishing, durability/decay/insect attack, strength, ease of working, properties, moisture movement, and uses.

The review of literature concluded that although general information on wood properties of the 15 species was available in most cases, information on the test method was not available to make defined conclusions on actual properties. It was recommended that all 15 targeted species be included in the testing phase. The review outlined three main areas of interest of the 15 species identified, these being: marine construction, heavy structural applications, and decking/cladding. Based on these identified end uses and assessment of information available from the Review, the following tests were identified to be conducted: Abrasion, Marine Borer, Natural durability. The Review of literature was effective in establishing the basis upon which the recommendation was made to test and the relevant areas to do so. There are 3 main areas of interest for the 15 targeted species based on the Review:

- Marine construction
- Heavy structural applications
- Decking/cladding

***Activity 1.2 – Contact relevant laboratory to conduct analyses***

Contact was made with Trada Technology to conduct both the Review of Literature and the identified tests which the Review recommended.

***Activity 1.3 – Select species and organize wood to be cut and sent to laboratory***

Following the recommendations resulting from the Review of Literature, samples of each of the 15 species were collected and shipped. There was a delay in the shipment of the samples in the peak period of December 2007.

***Activity 1.4 – Conduct analyses of species***

This activity commenced in December 2007. Owing to this reason the final testing report will be available in early June 2008. However, preliminary report on the testing will be available in March to May 2008. The 15 species are being tested for natural ability, abrasion and marine borer resistance. The results of the test in terms of the suitability of the 15 targeted species to be used in applications which require high natural durability, resistance to marine borer infestation and can withstand abrasion, will be ascertained and this information will be passed on to the forest industry in Guyana.

## Output 2 – Awareness and use of lesser used species increased

### ***Activity 2.1 – Produce booklets and brochures on lesser used species for distribution***

The design and layout and design for these were completed. The booklet was published and distributed to stakeholders within the forest sector. The Booklet outlined key areas on the 15 species:

- Wood description
- Tree description
- Processing requirements: sawing, drying, machining, nailing
- Natural Durability
- Treatability
- Uses
- Physical Properties: green density, air dry density, total tangential shrinkage, total radial shrinkage, and total volumetric shrinkage.
- Mechanical Properties: bending strength, modulus of elasticity, and crushing strength.

### ***Activity 2.2 – Produce sample board displays with lesser used species***

Sample boards (40) were produced. These Boards were effective in highlighting the visual characteristic of the species including colour, texture and grain.

### ***Activity 2.3 – Conduct seminars/workshops with the forest sector***

Three seminars were conducted in Essequibo, Demerara and Berbice. These seminars targeted sawmillers, concession holders, lumber dealers and exporters. 29 persons attended in the session in Demerara, 23 in Berbice and 31 in Essequibo. This session was interactive and participants were able to acquire important information on lesser used species, their availability, general properties and characteristics. It was indicated to all participants, that results of testing will be made available to them.

### ***Activity 2.4 – Establish link with the Marketing Council to promote trade in lesser used species***

The GFC has successfully established an effective partnership with the Forest Products Marketing Council of Guyana Inc. (FPMC), and has capitalized on the Council's information dissemination activities both locally in Guyana and internationally. The Council has, to date, passed on information related to possible end use application and properties of LUS to its contacts locally and internationally. The Council also sought to use techniques of drawing similarities with popular species and the targeted LUSs. Follow up promotional brochures were

developed by the Forest Product Marketing Council promoting the following species among others:

<b>Common Name</b>	<b>International Trade Names</b>
Burada	Parinari
Black Kakaralli	Mata Mata
Dalli	Virola
Darina	Angelim
Fukadi	Nargusta/Merendiba branca/Rouble
Futui	Gobaja/Caroba
Iteballi	Quaruba
Itikibororalli	Saboranranta
Kurokai	Beru/Copal
Limonaballi	Abiurana
Morabukea	Morabukea
Muniridan	Muniridan
Suya	Pajura
Tonka Bean	Cumaru
Wadara	Tauari

Output 3 – Wood processing technique used by local industry for lesser used species improved.

**Activity 3.1 – Recruit expert for training for local industry**

The training expert was identified to conduct the industry training. This expert was contracted in the second half of the review period.

**Activity 3.2 – Produce manuals for training**

Manuals were completed and covered the following key areas:

- Traditional Use of Wood in Guyana
- Common Wood Utilization Practices
- Properties of LUS

The manuals were developed in a very user friendly manner to enable successful execution of training areas. The main aim of the manual is to assist persons to better interpret the properties

of the Lesser Used Species so that they can better utilize these. These were aided by diagrams and a discussion segment where participants asked questions which were relevant to their area of work.

***Activity 3.3 – Identify persons for training***

A list was formulated including forest concession holders, saw millers, lumber yard holders, exporters, and other stakeholders.

***Activity 3.4 – Identify and procure wood and equipment needed for training***

Wood samples were displayed at the sessions held to give the trainees a better understanding of the properties of the wood. All necessary training materials and equipment were sourced and utilized in the training sessions.

***Activity 3.5 – Execute Training***

Three sessions were held in the three major counties of Guyana: Essequibo, Demerara and Berbice. These sessions were attended by (25) in Essequibo, (27) in Berbice and (32) in Demerara. These sessions were attended by forest concession holders, saw millers, lumber yard holders, exporters, and other stakeholders.

The main areas of discussions included:

- The availability of this species in some parts of Guyana
- The end use application of species which has the potential to be used in added value applications.
- The unique properties of some of the species in terms of the colour and texture of the finished product.
- The ease of workability of some of the denser species owing to high silica content.

The Specific Objective of enhancing knowledge and use of lesser used species of woods utilized in the forest industry of Guyana was achieved. A number of persons were trained in the forest sector in LUS utilization. Log Production has increased for 9 of the 15 species targeted in this project for 2005 to 2007. The largest production of the 15 species was recorded for Darina, Muneridan and Limonaballi.

The Developmental Objective of increasing the contribution of the forest sector to the national economy of Guyana from sustainably managed forest resources has also been achieved. This has expanded the species utilization base and has increased in production over the project period, allowing more raw materials to be made available locally for use.



### **3. Target Beneficiaries Involvement**

The main target beneficiaries under the project were:

- **Forest industry (includes producers and manufacturers):** forest producers were trained in the utilization of lesser used wood species and the availability of these within Guyana. In addition, they were sensitized as to the characteristics of these species so as to better guide them on the application. The use of these LUS internationally was also elaborated on so as to enable producers to see the value of the LUS targeted under this project. The forest industry was empowered in these areas and is now able to develop better marketing strategies that will assist the development of the sector on the whole. The GFC will continue to work with producers to enable them to make better utilize the LUS available to them.
- **Local communities:** forest based communities were also invited to the training sessions and materials produced under this project were disseminated to these communities. The GFC has committed to working with communities to assist them in conducting forest inventories so as to better plan and utilize LUSs available to them.
- **National Benefits:** from the Government's standpoint, an increase in the production of 9 of the 15 species from 2006 to 2007 is an indication that the efforts made by the GFC through this project have been successful in expanding the species base and encouraging the utilization of a broader range of species through mechanisms such as promotion, training and marketing efforts.
- **Academic forestry programmes:** All materials produced were shared with the University of Guyana, the Guyana School of Agriculture, the Forestry Training centre Inc. and some Secondary Schools. The GFC's Public Relations department will also continue to promote the utilization of these species in their routine programmes in the sector.

#### **4. Lessons Learned**

##### **Developmental Lessons**

- The aspect of the project design which contributed the greatest to the success is the consultative approach imbedded within the project. Broadening the timber species utilization base in Guyana and increasing the utilization of lesser use wood species can only be achieved if the forest sector – both producers and down stream wood processors, work together.
- The formation of the FPMC has impacted positively on the success of this project and has been the most major intersectoral link that has affected the project's success. The FPMC was established in 2005 with the main aim of enhancing Guyana's marketing efforts in the development of the forestry sector. This body which has been set up to specifically address the promotion of Guyana's forest products, as part of its mandate, looked at key areas of developing lesser used wood species and improving added value forest activity within the forest sector.
- Additional cooperation in areas of linking forest producers with forest products manufacturers can improve the utilization of lesser used species. One point which was made by forest product manufacturers is that they are not getting a large supply of the species on a continuous basis which would enable them to forward plan and conduct marketing activities. This can be corrected if producers have more up-to-date information on the stocking of the species in these concessions so that they can more effectively plan and supply local value added manufacturers.
- The main factor which will most likely affect the project sustainability is the sustained sector interest in continuing their efforts to utilize other species other than the prime commercial species. If this interest is sustained, then the efforts will continue to improve in broadening the species utilization base in Guyana and enhance the social and economic development of the forest sector.

## **Operational Lessons**

- The mechanism through which the project was managed and organized was effective for the successful implementation of the project. The project also received key guidance from the Project Technical Committee which contributed to the successful implementation of the project activities.
- Project documentation was sufficient and adequate to guide the implantation of the project. The deliverables of the project were disseminated to all relevant stakeholders.
- The monitoring and evaluation mechanism was effective in ensuring that the deliverables were successfully completed. The Project planning could have been improved by allowing a longer time for the lab testing element of the Activity 1.4. Testing of the 15 targeted lesser used species, owing to the time which needed to be committed and the sequential order which was necessary for the testing to be done, resulted in a delayed delivery of the final testing report which will be submitted as follows:
  - o Marine Borer – 4<sup>th</sup> Week in March, 2008
  - o Abrasion – 2<sup>nd</sup> Week in April, 2008
  - o Natural Durability – 2<sup>nd</sup> Week in June, 2008

The additional tests for fungi by culturing the species into growth media, in part, caused an additional delay resulting in the above time line falling out of the originally agreed dates. The lab had initially estimated the testing time to be 6 weeks. This has been extended by the Lab. The GFC has committed to undertaking the dissemination and the final training report and will conduct sensitization exercises, as part of its planned work programme, on the contents of the final testing report. The finding of this report will form the basis of GFC's future work with similar activities in the sector.

- The definitions of the role and responsibilities of the institutions involved were precise and were effective in execution of the project activities. The GFC took the lead role as the executing agency and worked with the relevant sector agencies including the FPMC. and the Forest Products Association. The interaction with the stakeholders in the various geographic locations makes it imperative to execute follow-up activities for this project through GFC's 21 forest stations throughout Guyana. This will be important to expand the level of training and promotion that was executed in the three key areas in Guyana.

- The action was implemented within the budgeted cost but the timeline for delivery of the last report was delayed in the final submission. The GFC has recognized that when laboratory work is involved in project outputs, a buffer time needs to be allocated for possible pre-testing and preparatory works to be conducted. This will enable the possible extension which may be needed to be accommodated under the allocated project period.
- There was no external factor that would have been predicated that influenced the project implementation.
- The external factor that could not have been predicted is the extended testing time given that these processes often take longer than originally scheduled.

## **5. Recommendations**

The following recommendations that can be made are as follows:

1. For similar project that involve a promotional component, it is recommended that key stakeholders be exposed to experiences in other countries to observe the level of use of all timber species available in the forest. This will assist in giving the forest stakeholders more direct appreciation of the level of maximum utilization which may be possible if the species utilization base is expanded.
2. Additional time will be allocated to any activity that involves laboratory testing and research work. Although the originally planned time indicated to the GFC by the lab was 6 weeks, this was exceeded due to unforeseen pre tests which became necessary.
3. It is recommended that activities which involve demonstrations and promotion of use of timber species for value added end uses, that models be made to display to the forest sector that the species can be well suited for the end use application promoted, for example, the use in decking and cladding.
4. Further, it is recommended that the Guyana Forestry Commission or relevant Specialist work with smaller groups of stakeholders to provide individual support at the level of the processing plant so that any problems which may arise from the usability of these species can be addressed at this level.

5. It is recommended that future projects be designed to accommodate the upgrading of the processing facilities of pilot processing plants since some of the factors inhibiting the use of certain species, is the challenges involved in the setting of saw blades and mill layout to accommodate these. These can be set up and used as demonstration sites for groups of saw millers and value added wood processors.
  
6. In addition, forest producers should be exposed to formal field training on identification of lesser used species in the forest. This added field based training will augment the work done in the session to add to the effectiveness and efficient of similar projects.

## **Part II. Main Text**

### **Project Results**

The following are the main deliverables from the Project:

1. Review of Literature
2. Brochure on LUS
3. LUS Sample Board
4. Training Report
5. Report on Results of Test

- The utilization of the 15 targeted lesser used species has increased over the period 2005 to 2007. Total production of logs and primary (chainsawn) lumber represented 7.2% of total production in 2007 as compared to 6.04% in 2005. It is projected that this will be higher in 2008 as the short and medium term impact of the training and promotional (sensitization) activities will come into effect.

Producers have expressed at the sessions a level of willingness to integrate other species into their list of commercial species targeted. The GFC will expand the work currently started in terms of marketing the 15 LUS with the international trade names which may enable some of these to gain access into lucrative overseas markets.

- The specific objective has been successfully achieved with the enhancement of knowledge and use of the 15 targeted LUS in the forest industry in Guyana. This has been reflected by the

increase in the proportion of production which the LUSs have accounted for in 2007 as compared to 2005.

- This project has impacted positively on the forest sector in Guyana in terms of expanding the species utilization base. The GFC's programme of development for the forest sector addresses key areas of increasing the productivity of the sector by promoting the increase of the species harvested from the forest. This will certainly, in the medium to long term, reduce the pressure on just a few commercial species as has been the case in the past and thereby reduce the pressure on the physical environment. The local sawmilling sector and processing sub-sectors has also had, and is projected to have, in the future, a wider range of species to utilize in their production processes. Community forestry groups have also benefited from the training exercises and are now cognizant that the 15 targeted LUS have great potential which can be taken advantage of to generate additional financial flows for the communities. Academic institutions also now have a collection of scientific and technical information on the 15 LUS to use in their training and field exercises to promote sustainable forest management.

- The Project activities have formed part of the GFC long term strategy for the development of the forest sector in Guyana. Activities aimed at enhancing the contribution that the forest sector makes to the national economy, forest sector and community development. The project will therefore form an important part of the work programme of the GFC and the Forest Products Marketing Council. The project was conceptualized to expand in scope to include other species. The work done on the 15 targeted species will continue and be expanded to additional communities, producers and processing entities and will be enhanced by similar activities (under this project) targeting other species in Guyana's forest.

The assumptions taken by the project have met with favourable results and have in no way negatively affected the project outputs. Below are the assumptions taken with relevant comments regarding project outputs realized:

1. ***International demand for tropical forest products continues*** – the past three years has seen a growth in the international tropical timber trade in Guyana and worldwide. Demand has grown and prices have risen, even after discounting increased in cost of production, owing to mainly fuel cost increases. Many of the Lesser Used Species targeted under this project are already traded as high end species by Brazil, Peru and other South American countries. This project has sought to build on that work already done by other tropical countries. Some of the species which are already popular in the international tropical timber trade are: Dalli (Virola), Tonka Bean (Cumuru), Iteballi (Quaruba) and Darina (Angelim).

2. **National forestry policy and strategy continues to support sustainable development of forest products.** The recent National Competitiveness Strategy for Guyana has identified the development of this area and based on all policy indications, this will continue into the future.

3. **Relevant Government Ministries, agencies, NGOs and the forest sector industry continue to work together to improve the industry.** There has been collaboration among the GFC and the relevant NGO and sector agencies. The GFC in collaboration with the Marketing Council will continue to work with the forest industry to enhance and continue the work done under this project.

4. **Consumer countries willing to buy lesser used species.** This assumption reflected favourable results since the Review of Literature revealed that many of these 15 species were already internationally known under other trade names while the others have been tied to key end use applications such as decking, which are demanded overseas.

5. **Local industry willing to market and buy lesser used species.** Based on the results of the training and sensitization exercise, the sector has indicated a willingness to work with other species including some of the LUSs targeted.

6. **Laboratory is available to conduct test** – the GFC was able to successfully locate a laboratory to conduct the testing as recommended by the Review of Literature.

7. **Willingness of forest sector to utilize and market lesser used species** – the results of the sensitization exercise have reflected positive results in this assumption.

8. **Marketing Council is successfully established** – the FPMC was successfully established and focuses on key areas of market promotion, industry development and enhancing Guyana's capability to target key markets regionally and internationally.

Owing to the overall favourable impact of the assumptions taken, the sustainability of the project is assured. The approach undertaken by the project has also effectively targeted the main areas of species promotion and application. This approach can be easily applied to other LUSs that can be targeted in the future for promotional work and possible testing.

**Synthesis of the Analysis**

<b>Specific Objective(s) Achievement</b>	Realized	√
	Partly Realized	
	Unrealized	
<b>Outputs</b>	Realized	√
	Partly Realized	
	Unrealized	
<b>Schedule</b>	In advance/on time	
	Delayed, not seriously	√
	Seriously delayed	
<b>Actual Expenditure</b>	Below Planned	
	> 10% above planned	√
	> 20% above planned	
<b>Potential for replication</b>	No potential	
	Modest potential	
	Significant potential	√
<b>Potential for scaling-up</b>	No potential	
	Modest potential	
	Significant Potential	√



### **Part III: Conclusions and Recommendations**

#### **Developmental Lessons:**

1. Testing of the application of the species for specific end uses is imperative to ascertaining conclusively the suitability of species for an end use application.
2. The sustainability of the project rests on the industry's ability to maintain the momentum which has been created by the project and other GFC's planned activities in the near future.
3. Promotion of lesser used species may need to be specific to geographic areas as some species are found more predominantly in some areas than others.
4. At the company level, some amount of promotional work needs to be done to expand the marketing efforts to target new products and species to achieve effective market penetration for these.

#### **Operational Lessons:**

1. Demonstration models (e.g decking) need to be made in future promotional and sensitization efforts so as to give persons a more hands on experience of the end use application of LUS.
2. A buffer time needs to be allocated to testing activities to cater for any unforeseen time extension which may become necessary.
3. Individual assistance need to be given to added value manufacturers to enable them to effectively process LUS in the best way to maximize the output.

## **Recommendations for future Projects regarding:**

### **1. *Identification***

- The testing areas for species should be decided upfront, as much as possible and practicable, so as to enable more effective scheduling of testing duration.

### **2. *Design***

- The species targeted for promotion could be done in the locations where they are most prevalent, so that producers and added value manufacturers can be assured of supplies of species they may have an interest in marketing and using.

### **3. *Implementation***

- Projects of this kind should be implemented over an 18 month period to more effectively implement any research/testing activities that require execution.

### **4. *Organisation***

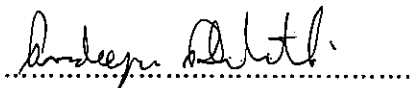
- The structure under which the project was organized was effective in the implementation. The approach of cross-sectoral collaboration with the producers and processor was effective in doing this.

### **5. *Management***

- The management of the project under the GFC, given the coordination and support rendered by the executing agency to the project activities was effective in achieving the outputs.

**Responsible for the Report**

**Name:** Pradeepa Bholanath

  
.....

**Position held:** Head, Planning and Development Division, Guyana Forestry Commission

**Date:** 6<sup>th</sup> March, 2008