

Food and Agriculture Organization of the United Nations,

Forestry Department and



International Network for Bamboo and Rattan (INBAR)

GLOBAL FOREST RESOURCES
ASSESSMENT UPDATE 2005

PAPUA NEW GUINEA

COUNTRY REPORT
ON
BAMBOO RESOURCES

PORT MORESBY 30 APRIL 2005

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General Guidelines:

The main purpose of the Country Thematic Report on Bamboo Resources (CTRB) is to develop a Global Bamboo Resources Assessment (GBRA) and to integrate it in the global UN FAO FRA. The approach is to create sub-category on Bamboo in the framework of FRA 2005 (www.fao.org/forestry/fra) to provide supplementary information on bamboo resources. This document provides format for compiling information on Bamboo resources and should be treated as a supplement to the basic documents of FRA 2005 including Specification of National Reporting tables, FRA Working Paper No. 81; Guidelines for Country Reporting, FRA Working Paper No. 82 and Terms and Definitions, FRA Working Paper No. 83.

The country Bamboo Resources Thematic Study Report should clearly and concisely document all data sources that have been selected and used for this reporting process and assign quality rating to the data sources. Comment on any problems encountered in finding relevant data sources. The Report should also indicate if no data sources have been found which meet the requirements. Similarly all the relevant national classification and definitions should be documented clearly and concisely. Comments on any problems or incompatibilities in classification and definitions should also be provided, if necessary. Please email the Bamboo Thematic Report directly to the focal point at INBAR (mlobovikov@inbar.int) with the copy to FAO (kailash.govil@fao.org) as a part of GFRA.

General information

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Date of submission of 1st draft:	March 1 2005
Date of submission of 2nd draft	April 1 2005
Date of submission of final report	May 1 2005

1 Table T1 – Extent of Bamboo Forest

1.1 GBRA 2005 Categories and definitions

Category	Definition
Bamboo on forest land	Bamboo on lands defined as "Forest" in FRA 2005.

1.2 National Data on Bamboo Resources

1.2.1 Data sources

References	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forest Inventory Mapping Database	H	Area	1998	

1.2.2 Classification and definitions

National class	Definition
Scrub Bamboo	Scrub with Bamboo
Scrub Complexes	Scrub mixed with other vegetation types in complexes
Disturbed Forests	Forest areas subjected to disturbance through logging and other human induced activities

1.2.3 Original data

	1990 ('000ha)	2000 ('000ha)	2005 ('000ha)
Disturbed Forest	2,250	3,659.4	4,364.4
Scrub/ Bamboo	35.7	35.7	35.7
Complexes with Scrub	1,182	1,182	1,182
Total	3,467.7	4,877.1	5,582.1

1.3 Data for National Reporting Table T1

GBRA 2005 Categories	Area (1000 hectares)		
	1990	2000	2005
Bamboo on forest land			
Monopodial bamboo area			
Sympodial bamboo area			
TOTAL	3,467.7	4,877.1	5,582.1

1.4 Comments to National Reporting Table T1

Bamboo is noted to be present in most of the natural forest types especially in disturbed sites however its extent and species composition has never been accounted for in the project inventories that have taken place to date. There are no documented reports of pure natural stands of bamboo in the country although verbal reports of such are sketchy and most likely to cover areas less than 50 hectares at any one site.

The estimated areas for scrub/bamboo have been kept constant for there has not been any new aerial photos or satellite imagery interpretation over the area that was originally mapped as having this

vegetation class. The same applies to Complexes with Scrub. Disturbed forest figure have been based on an annual logging rate of approximately 150,000 ha per annum using best guess. This area has been projected for the Year 1990, 2000 and 2005. As the forest becomes disturbed due to logging activities, there is a high probability of this area containing Bamboo. For the 1990 disturbed forest figure, an annual forest disturbance rate of 150,000ha per was multiplied 15 years using 1975 as a start. The total obtained under the column is then added onto the Disturbed Forest Land in the succeeding assessment period. Vegetation class with Scrub/Bamboo and the Complexes with Scrub have been kept constant throughout the assessment period.

2 Table T2 – Ownership of Bamboo Forest

2.1 GBRA 2005 Categories and definitions

Category	Definition
Private ownership	Same as FRA: Land owned by individuals, families, private co-operatives, corporations, industries, religious and educational institutions, pension or investment funds, and other private institutions.
Public ownership	Same as FRA: Land owned by the State (national, state and regional governments) or government-owned institutions or corporations or other public bodies including cities, municipalities, villages and communes.
Other ownership	Same as FRA: Land that is not classified either as "Public ownership" or as "Private ownership".

2.2 National Data on Bamboo Resources

2.2.1 Data sources

References	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments

2.2.2 Classification and definitions

National class (Bamboo)	Definition

2.2.3 Original data

2.3 Data for National Reporting Table T2

GBRA 2005 Categories	Area (1000 ha)	
	1990	2000
Private ownership	3,467.7	4,877.1
Public ownership		
Other ownership		
Total	3,467.7	4,877.1

2.4 Comments to National Reporting Table T2

Ownership is on the basis of Clans and Tribal Groupings. The arrangements in PNG are that the Clans own the land and the resources that exist on the land such as forests, bamboo and even mineral, oil and gas and any other natural resources found on the parcel of land. Almost 93% of land in PNG is under this form of ownership.

1 3 Table T3 – Characteristics of Bamboo Forest

3.1 GBRA 2005 Categories and definitions

Category	Definition
Natural bamboo forest	Bamboo area of naturally regenerated native bamboo species.
Plantation	Bamboo area of native or introduced species, established through planting, seeding or assisted natural regeneration.

3.2 National data on Bamboo in Forest

3.2.1 Data sources

References	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forest Inventory Mapping	H	Area	1998	

3.2.2 Classification and definitions

National class	Definition
Scrub / Bamboo	Scrub with bamboo
Scrub Complexes	Scrub mixed with other vegetation complexes
Disturbed Forest	Forest areas subjected to logging and other human induced activities

3.2.3 Original data

3.3 Data for National Reporting Table T3

GBRA 2005 Categories	Area (1000 hectares)		
	1990	2000	2005
Natural bamboo forest	3,467.7	4,877.1	5,582.1
Plantation	0	0	0
TOTAL	3,467.7	4,877.1	5,582.1

3.4 Comments to National Reporting Table T3

There are no pure stands of natural bamboo forest. Nor are there any bamboo plantations in PNG.

4 Table T4 – Bamboo Growing Stock – **No data available**

4.1 GBRA 2005 Categories and definitions

Category	Definition
Bamboo Growing stock	Weight (tons) of all bamboo forest more than X cm in diameter at breast height.
Commercial growing stock of Bamboo	The part of the growing stock of bamboo species that are considered as commercial or potentially commercial under current market conditions, and with a diameter at breast height of Z cm or more.
Growing stock of Common bamboo species	Weight (tons) of the most common bamboo species.

4.2 National data on Bamboo Resources

4.2.1 Data sources

References	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments

4.2.2 Classification and definitions

Category	Definition

4.2.3 Original data

4.3 Data for National Reporting Table T4

GBRA 2005 Categories	Total weight (tons)		
	1990	2000	2005
Bamboo Growing stock			
....			

Note: if possible, please (1) breakdown by species groups (2) include information on the minimum diameter used as thresholds and (3) provide coefficient of number of culms per a ton of weight

4.4 Comments to National Reporting Table T4

There is no data on the growing stock of Bamboo in Papua New Guinea. As mentioned earlier forest inventory in the past have only been for timber assessment and no attention have ever been given to bamboo.

5 Table T5 – Bamboo Biomass stock – No data available

5.1 GBRA 2005 Categories and definitions

Category	Definition
Above-ground biomass of Bamboo	All living biomass above the soil including stem, stump, branches, bark, seeds, and foliage.
Below-ground biomass of Bamboo	All living biomass of live roots. Fine roots of less than 2mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.

5.2 National Data on Bamboo Resources

5.2.1 Data sources

References	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments

5.2.2 Classification and definitions

Category	Definition

5.2.3 Original data

5.3 Data for National Reporting Table T5

GBRA 2005 Categories	Bamboo Biomass (million metric ton dry weight)		
	1990	2000	2005
Above-ground biomass of Bamboo			
Below-ground biomass of Bamboo			
Total of living biomass			
TOTAL			

5.4 Comments to National Reporting Table T5

6 Table 6 – Diversity of bamboo tree species

6.1 GBRA 2005 Categories and definitions

Category	Definition
Number of native Bamboo species	The total number of native tree species that have been identified within the country.
Number of introduced Bamboo species	The total number of introduced tree species that have been identified within the country.
Number of critically endangered Bamboo species	The number of native tree species that are classified as “Critically endangered” in the IUCN red list.
Number of endangered Bamboo species	The number of native tree species that are classified as “Endangered” in the IUCN red list.
Number of vulnerable Bamboo species	The number of native tree species that are classified as “Vulnerable” in the IUCN red list.

6.2 National Data on Bamboo Resources

6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forest Research Institute of PNG	H	Species	??	

6.2.2 Classification and definitions

Category	Definition

6.3 Data for National Reporting Table T6

GBRA 2005 Categories	Number of species (Year 2000)
Native Bamboo species	25
Introduced Bamboo species	12
Critically endangered Bamboo species	None
Endangered Bamboo species	None
Vulnerable Bamboo species	None

6.4 Comments to National Reporting Table T6

There have been a total of 37 Bamboo species identified in Papua New Guinea of which samples are being held in the Forest Research Institute Herbarium. Little is known about their extent except that they are found throughout the mainland and smaller islands of PNG. Again no information is available on the endangerment of these different species as they are not being exploited for commercial purposes in any major scale. Bamboo uses are confined primarily to local uses only by the village people and to a very limited urban market for artefacts etc.

7 Table T7 – Bamboo Removal – **No data available**

7.1 GBRA 2005 Categories and Definitions

Category	Definition
Bamboo Wood removal	The Bamboo wood removed (volume) for production of goods and services other than energy production (woodfuel).
Woodfuel Bamboo removal	The Bamboo wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

7.2 National Data on Bamboo Resources

7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments

7.2.2 Classification and definitions

National class	Definition

7.2.3 Original data

7.3 Data for National Reporting Table T7

GBRA2005	Bamboo removal (million ton)		
	1990	2000	2005
Bamboo wood removal			
Bamboo woodfuel removal			
Total			

7.4 Comments to National Reporting Table T7

8 Table 8 – Value of Wood Removal – **No Data available**

8.1 GBRA 2005 Categories and Definitions

Category	Definition
Bamboo Wood removal	The Bamboo wood removed (volume) for production of goods and services other than energy production (woodfuel).
Woodfuel Bamboo removal	The Bamboo wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

8.2 National Data

8.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments

8.2.2 Classification and definitions

National class	Definition

8.2.3 Original data

8.3 Data for National Reporting Table T8

GBRA2005	Value (million USD)		
	1990	2000	2005
Bamboo wood removal			
Bamboo woodfuel removal			
Total			

8.4 Comments to National Reporting Table T8

9 Table 9 – Non Wood Bamboo Product Removal - No Data**9.1 GBRA2005 Categories and Definitions**

Category
<u>Plant products / raw material</u>
1. Food
2. Raw material for medicine and aromatic products
3. Raw material for utensils, handicrafts & construction
4. Ornamental plants
5. Other plant products
<u>Animal products / raw material</u>
1. Living animals
2. Other edible animal products
3. Other non-edible animal products

9.2 National Data on Bamboo Resources**9.2.1 Data sources**

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments

9.2.2 Classification and definitions**9.2.3 Original data****9.3 Data for National Reporting Table T9**

GBRA 2005 Categories	Scale factor	Unit	NWFP removal		
			1990	2000	2005
<u>Plant products / raw material</u>					
1. Food (bamboo shoots)					
2. Raw material for medicine and aromatic products					
3. Raw material for utensils, handicrafts & construction					
4. Ornamental plants					
5. Other plant products					
<u>Animal products / raw material (if any)</u>					
1. Living animals					
2. Other edible animal products					
3. Other non-edible animal products					

9.4 Comments to National Reporting Table T9

10 Table T10– Value of Non Wood Bamboo Product – **No data**

10.1 GBRA 2005 Categories and Definitions

10.2 National Data on Bamboo Resources

10.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments

10.2.2 Classification and definitions

10.2.3 Original data

10.3 Data for National Reporting Table T10

GBRA 2005 Categories	Value of the other than culms removal (Million USD)		
	1990	2000	2005
Plant products / raw material			
1. Food (bamboo shoots)			
2. Raw material for medicine and aromatic products			
3. Raw material for utensils, handicrafts & construction			
4. Ornamental plants			
5. Other plant products			

10.4 Comments to National Reporting Table T10

11 Map of country's bamboo resources distribution

Bamboo is distributed widely throughout Papua New Guinea both on the mainland of New Guinea and in the large and small islands. Its altitudinal distribution is from sea level up to as high as 3,000m asl. Along altitudinal gradients the distribution may become restricted, for example *Schizostachyum* and *Bambusa* species are found mostly on lowlands up to a altitude of 750m asl while *Racemobambos* and *Nastus* are commonly found in elevations between 2,000 – 2,900m asl.

Bamboo occurrence is more profound in disturbed forest areas such as along river banks, edges of rainforest savannah grasslands, scrublands, abandoned garden sites. These can be dominated by one of two species at any given time. (Saulei & Kiapranis 1994)

During natural forest inventories, bamboo stands have been noted but never accounted for in the assessments. Although bamboo is widely distributed throughout PNG, notable presence had detected on the island of Bougainville where it is present in the central mountain range being associated with the scrub forest. Using the Forest Inventory Mapping Database this forest type had been distinguished as one with a predominant bamboo presence. Ground truthing is not possible as the island is presently under rebel control and despite a ceasefire and rebuilding, there is much danger to access this area to verify the presence of this large Bamboo forest.

Bamboo have also been noted in complexes with other vegetation types and more so in areas that have been subjected to disturbances. Annually there are approximately 150,000 ha of forest cleared largely through logging activities and subsistence farming through shifting cultivation. These human induced activities cause disturbances that create habitats where bamboo presence had been noted.

Another notable presence of bamboo forest is that found in the Sogeram Area of the Madang province where its heavy presence among the small crowned forest portrays on satellite imagery a false interpretation of an area being devastated by logging operations. This area was subjected to a very large bushfire in the early 1900's and the subsequent revegetation has been grassland, scrub and bamboo mixed with small crowned forest.

A lot more work will need to be done in mapping the bamboo resources of PNG as not much work had been done on both assessing and determining its distribution. Information to date is very sketchy and very broad.

We hope INBAR and others such as FAO will in future be able to assist PNG carry out an assessment of its Bamboo forest resources and even venture into exporting of this resource.

Reference:

1. PNG Forest Research Institute Internal Paper by Robert Kiapranis
2. Bamboo Research and Development in PNG by Dr. Simon Saulei and Robert Kiapranis.

12 List of bamboo species in the country

Genera	Species	Native / Introduced	Critically endangered / vulnerability
Bambusa	Atra Lindl	Native	Unknown
	Dolicholada	Unknown	Unknown
	forbesii (Ridl) Holtt	Native	Not threatened
	fruticosa Holtt	Native	Not threatened

	glaucescens Holtt	Unknown	Unknown
	hirsuta Holtt	Native	Unknown
	hooglandii Holtt	Native	Unknown
	Microcephala	Native	Unknown
	Macrolemma Holtt	Native	Unknown
	oldhamii Holtt	??	Unknown
	riparia Holtt	Native	Not threatened
	solomonensis Holtt	Native	Unknown
	tuldoides Munro	Introduced??	Unknown
	Utilis Holtt	Introduced??	Unkknown
	Vulgaris Schrad	Introduced?	Not Threatened
Dendrocalamus	aspera(shcult) Backer	?	Unknown
	gigantus Munro	?	Unknown
Nastus	elatus Holtt	Native	Unknown
	hooglandii Holtt	Native	Unknown
	longispicula Holtt	Native	Unknown
	obtusus Holtt	Native	Unknown
	productus Holtt	Native	No threats, maybe a weed
	rudimentifer Holtt	Native	Unknown
	schlechteri (Pilger) Holtt	Native	Unknown
Racemobambus	congesta (Pilger)Holtt	Native	Not Vulnerable
	Hirta (Pilger) Holtt	Native	Unknown
	holtfumii S.Dransfield	Native	Unknown
	multiramosa Holtt	Native	Unknown
	novohibornica S.Drans		Unknown
Schizostachyum	schultzei (pilger) Holtt	Native	Unknown
	Lima (Blanco) Merr	Native	Unknown
	jaculans Holtt	? Introduced	Unknown
	brachycladum Kurz	???	Unknown
	brachythrusus (K.Sc.) Holtt	Native	Maybe threatened
	whitei Holtt	Native	Not known
Gigantichola	Verticillata	? Introduced	Unknown
	apus (Schult) Kurz	Introduced	Unknown

Reference: PNG Forest Research Institute Internal Report.

List main uses, quantity, value of the bamboo removal

Main Uses

Bamboo is being used by the local people for the following;

1. Housing components such as flooring, walls, and posts for temporary shelter and ladder for house construction.
2. Fencing posts
3. Furniture to a limited degree especially chairs and tables and food baskets
4. Food from Bamboo shoots
5. Hair Comb
6. Water containers to carry water

7. Cooking utensils for food especially by rural people who stuff food into the stem of the bamboo and roast it over open fires.
8. Bamboo act as containers for carrying grounded sago
9. Musical instruments such as flute and drums
10. Hunting and fishing implements such as spears, arrow tips and fishing baskets

Note that the use of bamboo is confined mostly to local use in the villages however bamboo products such as artefacts and furniture are increasingly being made and sold locally in towns and cities. Only a limited number of people have the skills to make artefacts and furniture using bamboo and it is not used in any major urban construction works like in other Asian countries.

Value of Bamboo Removals

Note that there is no reliable statistics on the value of bamboo removal as no survey had been done nor are there any records to the best of my knowledge.

Add the table: list of the main pest species

Unknown at this stage

Map of Estimated Bamboo Distribution in PNG

