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# Remote Sensing-Based Regional Bamboo Resource Assessment: Vietnam

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# List of Abbreviations

CPC	Commune People's Committee
ESA	European Space Agency
FIPI	Forest Inventory and Planning Institute
GEE	Google Earth Engine
INBAR	International Bamboo and Rattan Organisation
MARD	Ministry of Agriculture and Rural Development
NFI	National Forest Inventory
OP	Sub-sample plot
QGIS	A Free and Open-source Cross-platform Desktop Geographic Information System
SEPAL	System for Earth Observation Data Access, Processing and Analysis for Land Monitoring
USGS	United State Geological Survey

# 1. Methods for Bamboo Forest Inventory and Assessment in Vietnam

## 1.1 Method of Bamboo Forest Mapping

### 1.1.1 Material and Tools

#### a) Materials

- Landsat 7, Landsat 8 and Sentinel 2 satellite images
- All sample plot clusters of the National Forest Inventory (NFI) for training and test samples (accuracy assessment)
- Field trip for addition training samples

#### b) Tools

- Cloud platform software, such as Google Earth Engine (GEE), System for Earth Observation Data Access, Processing and Analysis for Land Monitoring (SEPAL; Food and Agriculture Organization)
- QGIS, Orfeo and R software for analysis and processing maps and data (The Orfeo is ToolBox applications are available within QGIS and R is a programming language and free software environment for statistical computing and graphics supported)

#### c) Classification of bamboo forest

According to the study results, Vietnam has about 200 species of bamboo. Only some of these species of bamboo are purebred, while the rest are mixed with timbers in natural forests. Therefore, when classifying bamboo forests, only pure forest species of bamboo with a large size and large areas in nature are classified as separate types. Bamboo species of small size are grouped into one type of pure forest. Table 1 classifies the bamboo forest types in Vietnam.

**Table 1.** Classification of Bamboo Forest in Vietnam

No.	Name of bamboo forest type	Stock	Forest Type Code
<b>A</b>	<b>Natural bamboo forest</b>		
<b>I</b>	<b>Pure bamboo forest</b>		
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill	$N \geq 500$	TLU
2	<i>Schizostachyum</i> spp. natural forest on hill	$N \geq 500$	NUA
3	<i>Indosasa</i> spp. natural forest on hill	$N \geq 500$	VAU
4	<i>Bambusa balcoa</i> natural forest on hill	$N \geq 500$	LOO
5	Other bamboo natural forest on hill	$N \geq 500$	TNK
6	Bamboo forest in rocky area	$N \geq 500$	TND
<b>II</b>	<b>Mixed bamboo natural forest</b>		
1	Mixed wood and bamboo natural forest on hill (15–30% bamboo)	$Cb < 5$	HG1
2	Mixed bamboo and wood natural forest on hill (30–50% bamboo)	$Cb \geq 5$	HG2
3	Mixed bamboo natural forest in rocky area		HGD
<b>B</b>	<b>Bamboo plantation</b>		
1	Bamboo plantation on hill (by species)	$N \geq 500$	RTTN
2	Bamboo plantation in rocky area (by species)	$N \geq 500$	RTTND

### 1.1.2 Method of Bamboo Forest Mapping

The steps in bamboo forest status mapping are described below.

**Step 1:** Using tools like GEE and SEPAL to combine, analyse and process Landsat and Sentinel satellite images by ecological region in Vietnam.

All the available data sources' cover (Sentinel 2A in 2018 and dense time series Landsat data from 2017 to 2018) will be collected from ESA and USGS. High-resolution images will be purchased for areas with no data (due to cloud cover in 2018) from both Sentinel 2A and Landsat images. The cloud computing platform with GEE and SEPAL tools will be used for supporting pre-processing of images, including the following: top of atmosphere conversion, cloud masking, geo-correction, enhancing and filtering, transformation, resampling, subset data, annual image composite and time series analysis (for Landsat from 2017 to 2018).



**Step 2:** Building training and test samples using sample plot clusters in the NFI project and field trip addition for each ecological region.

**Step 3:** Image classification for ecological zones. Indexes for image classification are as follows:

Normalised difference vegetation index =  $(\text{NIR} - \text{RED}) / (\text{NIR} + \text{RED})$

Ratio vegetation index =  $\text{NIR} / \text{RED}$

Total ratio reflectance index =  $(\text{DN1} + \text{DN2} \dots + \text{DNn}) / (n \times 255)$

Different vegetation index =  $\text{NIR} - \text{RED}$

Green vegetation index =  $1.6225\text{NIR} - 2.2978\text{RED} + 11.0656$

Enhancement vegetation index =  $2.5 \times (\text{NIR} - \text{RED}) / (\text{NIR} + 6 \times \text{RED} - 7.5 \times \text{BLUE} + 1)$

*Note: NIR is Near infrared of Satellite Images*

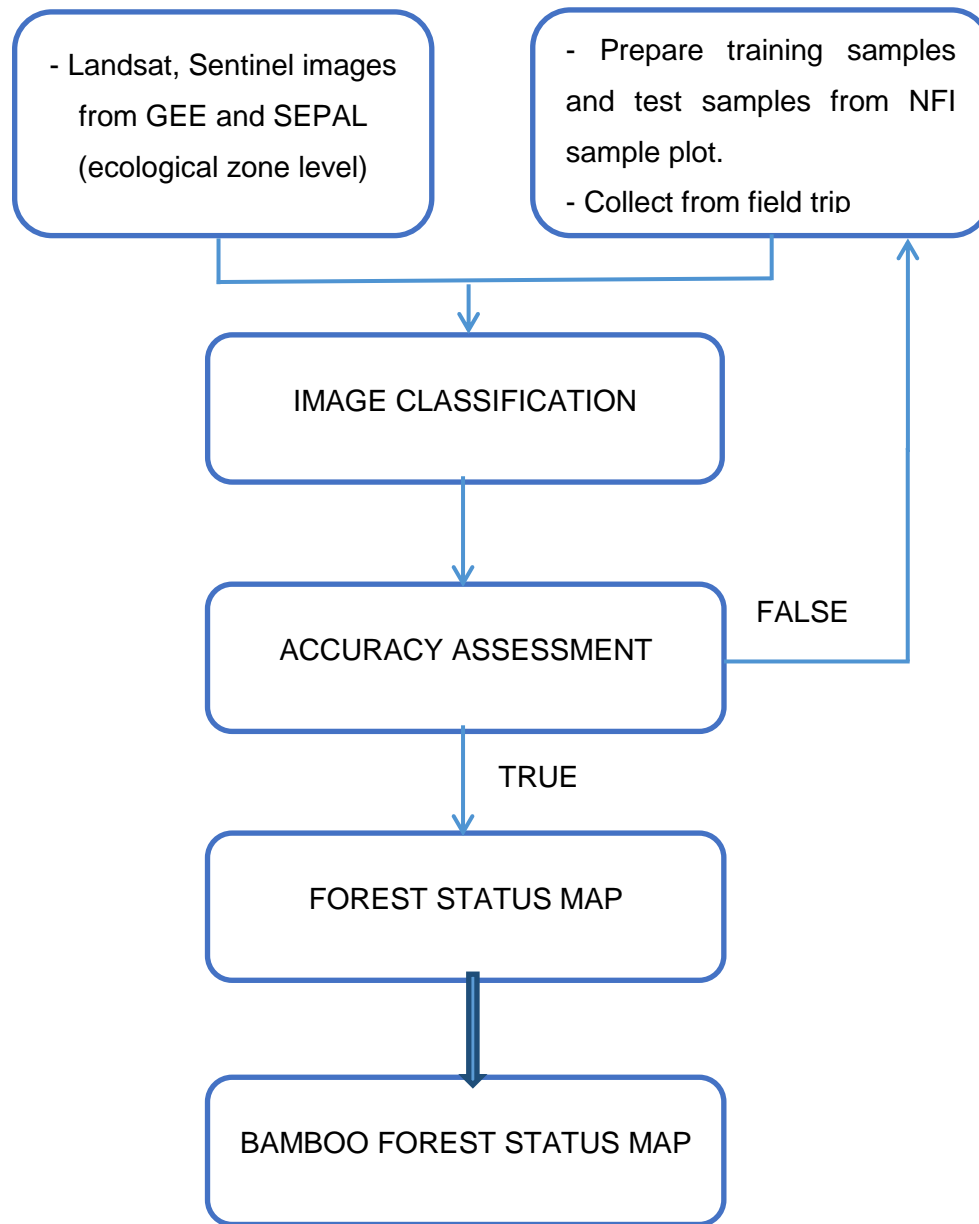
*RED is Red band of Satellite Images*

*BLUE is Blue band of Satellite Images*

*DN is Digital numbers*

**Step 4:** Accuracy assessment. Test samples are used for accuracy assessment of the forest map result. If the accuracies are low, then Step 2 should be reperformed with more training samples added to complete classification again.

**Step 5:** Summary, analysis and processing of the forest map and forest area for ecological regions and the whole country. The workflow of the bamboo forest cover map development is shown in Figure 1.



**Figure 1.** Bamboo forest cover map development.

**Step 6:** Calculate the area of bamboo forests for eco-regions. From the current map of the bamboo forests, synthesise the area of bamboo forests for the eco-regions and whole country.

## 1.2 Survey of Bamboo Forest Stocks and Biomass

The bamboo forest stock and biomass survey was conducted in the NFI sample plot clusters.

### 1.2.1 Preparation of Tools and Equipment

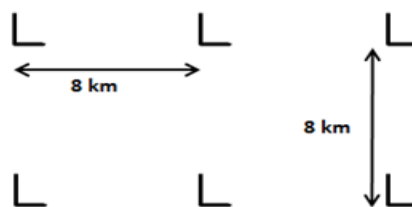
**Table 2.** Tools and Equipment for an Inventory Team

Tools and equipment	Quantity requirement	Details
<b>Measurement tools and equipment</b>		
Compass (360°)	1	Waterproof and resistant
Handheld GPS + battery charger, spare battery	1	
Measuring tape, 20 m	2	Unit: m, cm
Measuring tape, 50 m	1	Unit: m, cm
Measuring diameter tape	1	Unit: mm
Instrument for measuring height, length and slope	1	Haglöf Vertex hypsometer, TruPulse or Suunto hypsometer with 15 m, 20 m and rate % for timber height measuring (m) and slope (%) or equipment with equivalent accuracy
Canopy cover measuring: Spherical densitometer	1	Spherical densitometer or software in the smartphone has the equivalent accuracy
Laptop or tablet	1	To import field data
Electronic weight and weight of 50–100 kg with precision of 0.1 kg	2	To scale biomass samples
Saw or knife	1	To cut the sample
Digital camera or smartphone	1	
Coloured string	2	
Waterproof bag for protection of equipment and forest inventory sheet forms	2	
Paint bottle; paint box, paint pen	1 set	Marking turns on the way; reference point; centre column of sample plots and tree orders
Cutters for cutting branches, fresh mats and litter	1 set	
<b>Documents and papers</b>		
Questionnaire form	Set	
Lookup table with adjustable length in slope	1	Used to measure the radius of the sample plot
Look up names of species and plants		
<b>Logistics</b>		
Camping equipment	1 set	
Medical equipment and medicines	1 set	
Torches and batteries		
Kitchen tools	1 set	
Water and food		

## 1.2.2 Set Up Sample Plots

### Set Up a Sample Plot Cluster System

The sample plot clusters are set up by the systematic sampling method. The grid system with a distance of 8 km x 8 km is established based on the forest status map (original topographic map is VN2000). L-Shape cluster of sample plots is established at each intersection (grid) of the grid system (see figure 2). The total number of sample plot clusters is set to 2705 clusters. The sample plot clusters are named from 1 to n (the sequence number is the name of the cluster).

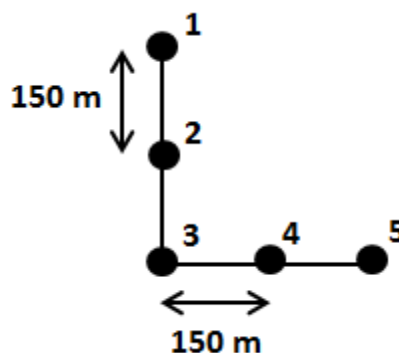


**Figure 2.** Shape and distance between sample plot clusters.

### 1.2.3 Integrated Survey of Bamboo Forest Structure and Stock in the NFI Project

The Ministry of Agriculture and Rural Development (MARD) has assigned the Forest Inventory and Planning Institute (FIPI) to implement the NFI project. The project is being carried out long term and periodically investigated and evaluated in a five-year cycle.

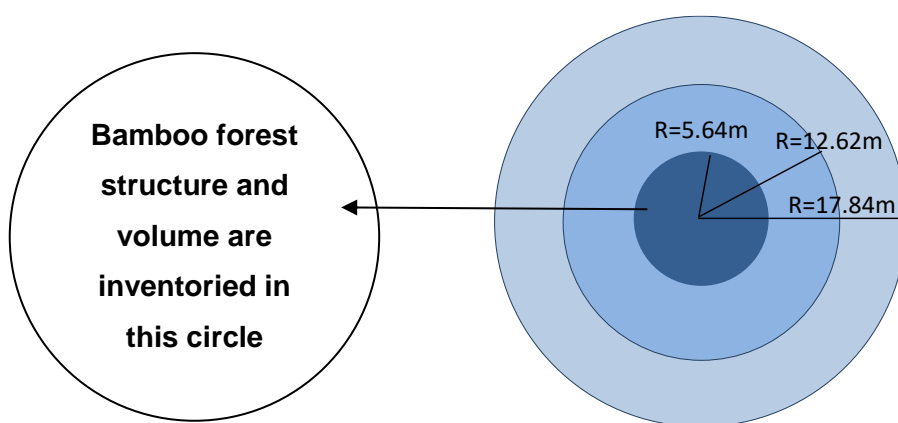
The structure and stocks of bamboo forests are being designed in the forest inventory sample plot clusters. The cluster has the shape shown in Figure 3.



**Figure 3.** Sample plot cluster for forest stock inventory.

There are 2750 clusters set up in the field; each has five sample plots. Each sample plot is designed to comprise three concentric circles. The bamboo structure and stock are investigated in the inner circle.

- The plot shape is a circle with three concentric circles; each concentric circle is considered a sub-plot (OP):
  - + OP1: radius 5.64 m, area of 100 m<sup>2</sup>.
  - + OP2: radius of 12.62 m, area of 500 m<sup>2</sup>.
  - + OP3: radius 17.84 m, area 1000 m<sup>2</sup>.
- The radii of the sub-plots are equalised directly in the field.
- Plot centre coordinates are determined according to the coordinates in the design profile.



**Figure 4.** Standard plots for forest inventory.

The above plot is used to survey all forest resources, including timber, bamboo, shrubs, herbs and decayed plants. It should be noted that OP1 (radius of 5.64 m, area of 100 m<sup>2</sup>) of the plot is a sub-plot used for inventory of the pure bamboo forest or mixed bamboo forest types.

It is expected that, by 2020, the entire forest resource survey of 2750 plots will be completed in Vietnam. From 2021 onwards, the investigation will continue in all these plot clusters. All the data on the bamboo forest areas in this project have been included in the FIPI database.

## 2. Results

### 2.1. Survey Results Update the Area and Structure of Bamboo Forest in Vietnam

#### 2.1.1. Area and Development of Bamboo Forest Nationwide

The total forest area of Vietnam is 14,415,381 ha. based on MARD Decision No. 1187/QĐ-BNN-TCLN dated 3 April 2018 on the announcement of the national forest area. The updated total area of mixed and pure bamboo forests in Vietnam in 2018 is 1,532,574.7 ha., accounting for 10.6% of the total forest area in Vietnam and 4.63% of the total area of Vietnam's territory. Among the total bamboo forest areas, natural pure bamboo forests cover 245,073.3 ha, natural mixed bamboo forests represent 1,165,917.7 ha and bamboo plantations cover 122,583.7 ha.

Vietnam is a tropical country with a diverse range of topographies, from the coastal area to the highest mountain of Fan Si Pang (3143 m), of which the mountainous area accounts for three-fourths of the main territory. This feature leads to the high diversity of bamboo species in Vietnam. According to researchers on bamboo, there are nearly 200 different species distributed throughout Vietnam.

As a resource, bamboo is considered the second most important material after wood from forests in Vietnam. Bamboo has commonly been used for household appliances, materials for handicrafts used domestically and for export and raw materials for the forest processing industry. Thus, bamboo is highly important to the Vietnamese people, especially those living in rural and mountainous areas. The types of bamboo forests are listed in Table 3.

**Table 3.** Areas of Bamboo Forests in Vietnam in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha)							
			North-west	North-east	Red River delta	North-central	South-central	Central-plateau—Tay Nguyen	South-east	Mekong delta
	<b>Total</b>	<b>1,532,574.7</b>	<b>227,478.1</b>	<b>456,576.3</b>	<b>796.4</b>	<b>430,759.6</b>	<b>77,857.1</b>	<b>260,564.1</b>	<b>78,128.4</b>	<b>414.6</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>245,073.3</b>	<b>18,579.5</b>	<b>55,162.6</b>	<b>39.1</b>	<b>97,120.5</b>	<b>11,515.8</b>	<b>55,819.1</b>	<b>6836.7</b>	
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill	17,756.5	13,599.4	3219.6		934.9	0.6		2.0	
2	<i>Schizostachyum</i> spp. natural forest on hill	93,008.8	1253.9	19,331.8		68,750.2	3497.5	106.9	68.4	
3	<i>Indosasa</i> spp. natural forest on hill	26,668.6	993.7	16,761.8		8913.0				
4	<i>Bambusa balcooa</i> natural forest on hill	39,220.5		1.3		322.6	5883.8	26,534.3	6478.5	
5	Other bamboo natural forest on hill	63,767.5	565.6	13,523.2	39.1	18,183.0	2134.1	29,177.9	144.8	
6	Bamboo forest in rocky area	4651.5	2167.0	2324.8		16.7			143.0	
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>1,164,917.7</b>	<b>184,021.2</b>	<b>389,375.6</b>	<b>680.5</b>	<b>249,170.9</b>	<b>65,682.6</b>	<b>204,734.2</b>	<b>71,252.7</b>	
1	Mixed wood and bamboo natural forest on hill (15–30% bamboo)	687,939.6	65,181.6	230,177.7	332.1	152,629.3	44,505.6	159,774.9	35,338.4	
2	Mixed bamboo and wood natural forest on hill (30–50% bamboo)	446,125.9	99,020.0	150,608.7		95,609.1	20,014.5	44,959.3	35,914.3	
3	Mixed bamboo natural forest in rocky area	30,852.2	19,819.6	8589.2	348.4	932.4	1162.5			
<b>III</b>	<b>Bamboo plantation</b>	<b>122,583.7</b>	<b>24,877.4</b>	<b>12,038.1</b>	<b>76.8</b>	<b>84,468.3</b>	<b>658.7</b>	<b>10.8</b>	<b>39.0</b>	<b>414.6</b>
1	Bamboo plantation on hill	121,700.9	24,128.6	11,999.1	62.7	84,388.4	658.7	10.8	39.0	413.6
2	Bamboo plantation in rocky area	882.8	748.8	39.1	14.1	79.8				1.0

Bamboo forests in Vietnam have changed over time from 2010 to the present, showing a tendency to increase slightly. Specifically, the changes in bamboo forest areas are shown in Table 4.

**Table 4.** Changes in the Bamboo Forest Areas from 2005 to 2018

No.	Bamboo forest type	Total area (ha)		
		2010	2015	2018
	<b>Total</b>	<b>1,258,672.0</b>	<b>1,495,266.0</b>	<b>1,532,574.7</b>
1	Natural mixed bamboo forest	709,299.0	1,122,205.0	1,164,917.7
2	Natural pure bamboo forest	474,583.0	299,768.0	245,073.3
3	Bamboo plantations	74,790.0	73,293.0	122,583.7

The reasons for the increase in bamboo forest areas are that the natural mixed bamboo forest has been well protected and restored. Moreover, the areas for growing bamboo are also increased due to people planting bamboo for household economic development. However, the areas of pure natural bamboo forest are declining. The main reasons for this are that natural bamboo forests, including bamboos of low economic value, can be converted into economic timber plantations or other agricultural land.

To manage forests in Vietnam, forestland has been allocated to agencies, organisations and households for forest management. Bamboo forests are also managed under these management systems. The area of bamboo forests under management is clarified in Table 5.



**Table 5.** Area of Bamboo Forests under Management in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:				
			Households, communities, CPCs	State Management Boards	Armed forces units	Enterprises	Projects
	<b>Total</b>	<b>1,532,574.7</b>	<b>873,861.7</b>	<b>457,972.9</b>	<b>19,053.5</b>	<b>181,512.8</b>	<b>173.8</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>245,073.3</b>	<b>138,653.1</b>	<b>75,579.8</b>	<b>5087.5</b>	<b>25,748.0</b>	<b>5.0</b>
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill	17,756.5	15,440.1	1953.0	13.6	349.4	0.4
2	<i>Schizostachyum</i> spp. natural forest on hill	93,008.8	58,448.6	31,571.9	2122.0	866.2	
3	<i>Indosasa</i> spp. natural forest on hill	26,668.5	23,759.5	2646.7	151.6	106.1	4.6
4	<i>Bambusa balcooa</i> natural forest on hill	39,220.5	3514.9	23,087.4	347.1	12,271.2	
5	Other bamboo natural forest on hill	63,767.5	33,085.0	16,121.0	2449.3	12,112.1	
6	Bamboo forest in rocky area	4651.5	4404.9	199.8	3.8	43.0	
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>1,164,917.7</b>	<b>622,101.8</b>	<b>374,261.8</b>	<b>13,719.5</b>	<b>154,665.8</b>	<b>168.9</b>
1	Mixed wood and bamboo natural forest on hill (15–30% bamboo)	687,939.6	330,051.7	232,424.5	11,723.1	113,740.4	
2	Mixed bamboo and wood natural forest on hill (30–50%)	446,125.9	263,822.2	139,530.2	1928.4	40,792.5	52.6
3	Mixed bamboo natural forest in rocky area	30,852.2	28,227.9	2307.0	68.0	133.0	116.2
<b>III</b>	<b>Bamboo plantation</b>	<b>122,583.7</b>	<b>113,106.9</b>	<b>8131.3</b>	<b>246.6</b>	<b>1099.0</b>	
1	Bamboo plantation on hill	121,700.9	112,234.1	8121.2	246.6	1099.0	
2	Bamboo plantation in rocky area	882.8	872.8	10.1			

Households, local communities, Commune People's Committees (CPCs) and forest enterprises, which manage most of the bamboo forest areas (Table 5), represent favourable conditions for the development of bamboo and rattan handicrafts in Vietnam. In addition, one-third of bamboo forest areas are part of the Special Use and Protection Forests managed by State Management Board, ensuring conservation of bamboo species in Vietnam. (More details on the bamboo forest areas under management are given in the Annex).

### 2.1.2 Current Status of Bamboo Forest by Ecological Region

Vietnam is divided into eight forest ecological regions, including the north-east, north-west, Red River delta, north-central, south-central coast, central highlands, south-east and Mekong River delta. Bamboo forests are most popularly distributed in the provinces of the north-east, north-west, north-central and central highlands regions, which are also forested mountainous provinces in Vietnam. The regions of the Red River delta, south-east and Mekong delta are flatter and have fewer forests, so the area of bamboo forests is less than that in other regions.

**Table 6.** Area of Bamboo Forest Distributed According to Ecological Regions

No.	Regions	Area
	<b>Total area</b>	<b>1,532,574.7</b>
1	North-west	227,478.1
2	North-east	456,576.3
3	Red River delta	796.4
4	North-central	430,759.6
5	South-central	77,857.1
6	Central highlands—Tay Nguyen	260,564.1
7	South-east	78,128.4
8	Mekong delta	414.6

An overview of the area and structure of bamboo forests by ecological region in Vietnam is given below.

## North-west Region

The north-west region consists of four provinces with a total forest area of 1,680,558 ha., of which, bamboo forest area makes up 227,478.1 ha., accounting for 13.5% of the total forest area of the region. The detailed areas of bamboo forest types in the provinces of the north-west region are given in Table 7.

**Table 7.** Area of Bamboo Forest Types in the North-west Region in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha)			
			Hòa Bình	Sơn La	Điện Biên	Lai Châu
	<b>Total</b>	<b>227,478.1</b>	<b>28,938.8</b>	<b>161,148.0</b>	<b>23,718.5</b>	<b>13,672.9</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>18,579.5</b>	<b>1329.3</b>	<b>15,904.7</b>	<b>510.0</b>	<b>835.5</b>
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill	13,599.4	46.3	13,463.1		90.0
2	<i>Schizostachyum</i> spp. natural forest on hill	1253.9	979.7	274.2		
3	<i>Indosasa</i> spp. natural forest on hill	993.7	242.0	24.6		727.1
4	<i>Bambusa balcooa</i> natural forest on hill					
5	Other bamboo natural forest on hill	565.6	33.8	3.4	510.0	18.4
6	Bamboo forest in rocky area	2167.0	27.6	2139.4		
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>184,021.2</b>	<b>9605.9</b>	<b>139,015.5</b>	<b>22,582.4</b>	<b>12,817.4</b>
1	Mixed wood and bamboo natural forest on hill (15–30% bamboo)	65,181.6	8085.9	36,124.2	14,373.6	6597.8
2	Mixed bamboo and wood natural forest on hill (30–50% bamboo)	99,020.0	1403.0	83,188.7	8208.8	6219.6
3	Mixed bamboo natural forest in rocky area	19,819.6	117.0	19,702.6		
<b>III</b>	<b>Bamboo plantation</b>	<b>24,877.4</b>	<b>18,003.5</b>	<b>6227.8</b>	<b>626.1</b>	<b>20.0</b>
1	Bamboo plantation on hill	24,128.6	17,254.7	6227.8	626.1	20.0
2	Bamboo plantation in rocky area	748.8	748.8			

The natural mixed bamboo forests in the north-west are mainly *Dendrocalamus semiscandens* (Mạ hốc), *Schizostachyum aciculare* (Nua), *Maclurochloa* spp. (Giang), *Bambusa burmanica* (Mạ bó) and *Gigantochloa albociliata* (Mạ lay). These bamboo species usually grow mixed with tree species, rarely in pure bamboo forests. They are usually about 6–12 m in height and 4–8 cm in diameter. Especially, *Maclurochloa* spp. often has extremely long, developed branches based on the length of the host tree, some of them are up to 20–30 m.

The natural pure bamboo forest in the north-west region is mainly the *Indosasa parvifolia* species. The plants are usually 4–15 cm in diameter and 8–18 m high, depending on the site conditions of each area.

Bamboo plantations mainly comprise *Dendrocalamus barbatus* (Luồng) and *Sinocalamus latiflorus* (Diễn), which are frequently used for construction materials. These two bamboo species are large in size, with a diameter of 8–20 cm and height of about 15–18 m. In addition, *Bambusa blumeana* (Tre gai) is also planted in households.



**Figure 5.** Natural bamboo forest of *Schizostachyum aciculare* in Hoa Binh province.

Most bamboo forest areas in the north-west region are managed by households, communities and CPCs. Part of the bamboo forest is managed by special-use and protection forest management boards. A small area of bamboo forests is managed by armed forces (military, police) and private enterprises. Details on the management of bamboo forests in the north-west region are given in Table 8.

**Table 8.** Area of Bamboo Forests Under the Management in the North-west Region in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:				
			Households, communities, CPCs	State management boards	Armed forces units	Enterprises	Projects
	<b>Total</b>	<b>227,478.1</b>	<b>204,984.6</b>	<b>18,170.1</b>	<b>1305.1</b>	<b>2849.4</b>	<b>168.9</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>18,579.5</b>	<b>16,801.0</b>	<b>1515.6</b>	<b>17.5</b>	<b>245.5</b>	
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill	13,599.4	12,199.7	1380.6	13.6	5.5	
2	<i>Schizostachyum</i> spp. natural forest on hill	1253.9	1101.3			152.6	
3	<i>Indosasa</i> spp. natural forest on hill	993.7	814.3	135.0		44.4	
4	<i>Bambusa balcooa</i> natural forest on hill						
5	Other bamboo natural forest on hill	565.6	565.6				
6	Bamboo forest in rocky area	2167.0	2120.1		3.8	43.0	
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>184,021.2</b>	<b>164,249.0</b>	<b>15,887.6</b>	<b>1282.0</b>	<b>2433.7</b>	<b>168.9</b>
1	Mixed wood and bamboo natural forest on hill (15– 30% bamboo)	65,181.6	54,845.5	7638.3	1091.1	1606.7	
2	Mixed bamboo and wood natural forest on hill (30– 50% bamboo)	99,020.0	90,002.7	8144.3	123.0	697.4	52.6
3	Mixed bamboo natural forest in rocky area	19,819.6	19,400.9	105.0	68.0	129.6	116.2
<b>III</b>	<b>Bamboo plantation</b>	<b>24,877.4</b>	<b>23,934.7</b>	<b>766.9</b>	<b>5.6</b>	<b>170.3</b>	
1	Bamboo plantation on hill	24,128.6	23,186.5	766.3	5.6	170.3	
2	Bamboo plantation in rocky area	748.8	748.2	0.6			

(More details for the provinces are given in Annex 1.)



## North-east Region

The north-east region of Vietnam consists of 12 provinces, namely Bac Giang, Bac Kan, Cao Bang, Ha Giang, Lao Cai, Lang Son, Phu Tho, Quang Ninh, Vinh Phuc, Thai Nguyen, Tuyen Quang and Yen Bai. The total forest area is 3,873,457 ha., of which the bamboo area comprises 456,576.3 ha., accounting for 11.8% of the total forest area of the region. This is the region with the largest area of bamboo forests in Vietnam. Natural forests have become secondary forests due to long-term logging, representing good conditions for the development of bamboo forest. Bamboo forests are mostly distributed in the Bac Kan, Ha Giang, Tuyen Quang and Yen Bai provinces.



**Figure 6.** Natural forest of *Indosasa parvifolia* in Tuyen Quang province.

The areas of bamboo forests in the north-eastern provinces are shown in Table 9.

**Table 9.** Area of Bamboo Forests in the North-east in 2018

No.	Bamboo forest type	Total area (ha)	Bac Giang	Bac Kan	Cao Bang	Ha Giang	Lao Cai
	<b>Total</b>	<b>456,576.3</b>	<b>986.1</b>	<b>98,984.7</b>	<b>26,403.3</b>	<b>92,340.1</b>	<b>32,471.8</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>55,162.6</b>		<b>4146.9</b>	<b>1371.2</b>	<b>8744.9</b>	<b>9326.1</b>
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill	3219.6		399.7		33.1	930.8
2	<i>Schizostachyum</i> spp. natural forest on hill	19,331.8		651.6		1573.0	90.7
3	<i>Indosasa</i> spp. natural forest on hill	16,761.8		1643.5	528.7	5754.4	1782.6
4	<i>Bambusa balcooa</i> natural forest on hill	1.3				0.4	
5	Other bamboo natural forest on hill	13,523.2		1422.1	842.5	1384.0	6522.0
6	Bamboo forest in rocky area	2324.8		30.0			
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>389,375.6</b>	<b>969.6</b>	<b>93,953.8</b>	<b>22,995.2</b>	<b>83,090.0</b>	<b>22,541.3</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	230,177.7	964.9	69,401.0	13,397.8	44,571.7	16,520.1
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	150,608.7	4.7	21,972.5	9396.7	38,518.3	6021.2
3	Mixed bamboo natural forest in rocky area	8589.2		2580.3	200.6		
<b>III</b>	<b>Bamboo plantation</b>	<b>12,038.1</b>	<b>16.5</b>	<b>883.9</b>	<b>2037.0</b>	<b>505.1</b>	<b>604.5</b>
1	Bamboo plantation on hill	11,999.1	16.5	883.9	2037.0	505.1	604.5
2	Bamboo plantation in rocky area	39.1					

**Table 9.** Area of Bamboo Forests in the North-east in 2018 (*continued*)

No.	Bamboo forest type	Lang Son	Phu Tho	Quang Ninh	Vinh Phuc	Thai Nguyen	Tuyen Quang	Yen Bai
	<b>Total</b>	<b>18,430.7</b>	<b>26,916.5</b>	<b>17,313.0</b>	<b>553.9</b>	<b>6469.4</b>	<b>70,623.6</b>	<b>65,083.3</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>1275.6</b>	<b>3624.0</b>	<b>1370.1</b>		<b>1171.6</b>	<b>13,753.3</b>	<b>10,379.0</b>
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill	397.3		11.8		297.8	499.3	649.9
2	<i>Schizostachyum</i> spp. natural forest on hill	2.9	3624.0	76.7		184.5	7845.2	5283.0
3	<i>Indosasa</i> spp. natural forest on hill	440.5				364.2	1881.9	4366.1
4	<i>Bambusa balcooa</i> natural forest on hill					0.9		
5	Other bamboo natural forest on hill	434.9		1281.6		318.0	1238.2	80.0
6	Bamboo forest in rocky area					6.2	2288.7	
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>17,149.7</b>	<b>22,663.4</b>	<b>15,712.5</b>	<b>553.7</b>	<b>5291.0</b>	<b>52,692.3</b>	<b>51,763.2</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	17,149.7	3468.4	10,174.5	553.7	4380.4	31,911.6	17,684.0
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)		19,195.0	5538.0		910.6	15,041.8	34,009.7
3	Mixed bamboo natural forest in rocky area						5738.8	69.5
<b>III</b>	<b>Bamboo plantation</b>	<b>5.5</b>	<b>629.2</b>	<b>230.4</b>	<b>0.2</b>	<b>6.9</b>	<b>4178.0</b>	<b>2941.1</b>
1	Bamboo plantation on hill	5.5	629.2	230.4	0.2	6.9	4143.4	2936.6
2	Bamboo plantation in rocky area						34.6	4.5



Species composition of natural mixed bamboo forests in the north-east are similar to those in the north-west. The dominant bamboo species in the region are *Schizostachyum aciculare* (Núra), *Pseudostachyum polymorphum* (small leaf Núra), *Maclurochloa* spp., *Phyllostachys* spp. (Trúc) and *Indosasa parvifolia* (Vầu). However, bamboo stems in the north east are often larger in size than they are in the north-west.

The pure natural bamboo forests in the north-east are also mainly *Indosasa parvifolia*. The forests of *Indosasa parvifolia* have an average diameter of about 8–17 cm and height of 10–20 m, depending on the site conditions. In addition, in mountainous areas above 1000 m above sea level, the natural bamboo forests are usually *Arundinaria* spp. These are small bamboo species of only 1–2 cm in diameter and less than 5 m in height.

Bamboo plantations in the north-east are quite diverse. There are two groups of bamboo materials from plantations, namely, bamboo species for shoots and bamboo species for construction or industrial materials. The bamboo group used for construction or industrial materials mainly consists of *Dendrocalamus barbatus* and *Sinocalamus latiflorus*. The species of *Dendrocalamus barbatus* is planted more frequently. *Dendrocalamus barbatus* usually reaches about 15–25 m in height, and 5–15 cm in diameter. Bamboos planted for bamboo shoots are including exotic bamboo species, *Dendrocalamus* spp. and *Sinocalamus* spp. *Bambusa blumeana* is also planted in a scattered fashion in the north-eastern provinces.



**Figure 7.** Natural pure forest of *Indosasa parvifolia* in Quang Ninh province.

Similar to the north-west, most of the bamboo forests in the north-east are managed by households, communities and CPCs. About 13% of the bamboo forests are located in special-use and protection forests. Only about 4% of the bamboo forests are managed by private enterprises. The details of the bamboo forest owners in the northeast region are shown in Table 10.

**Table 10.** Area of Bamboo Forests under the Management of the North-east Region in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:				
			Households, communities, CPCs	State management boards	Armed forces units	Enterprises	Projects
	<b>Total</b>	<b>456,576.3</b>	<b>378,729.6</b>	<b>59,885.9</b>	<b>391.2</b>	<b>17,564.6</b>	<b>5.0</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>55,162.6</b>	<b>46,973.5</b>	<b>6317.4</b>		<b>1866.7</b>	<b>5.0</b>
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill	3219.6	2303.0	572.4		343.9	0.4
2	<i>Schizostachyum</i> spp. natural forest on hill	19,331.8	17,809.8	1204.1		317.9	
3	<i>Indosasa</i> spp. natural forest on hill	16,761.8	15,362.6	1332.9		61.7	4.6
4	<i>Bambusa balcooa</i> natural forest on hill	1.3	1.3				
5	Other bamboo natural forest on hill	13,523.2	9212.3	3167.6		1143.2	
6	Bamboo forest in rocky area	2324.8	2284.6	40.3			
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>389,375.6</b>	<b>320,620.1</b>	<b>53,399.9</b>	<b>377.2</b>	<b>14,978.4</b>	
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	230,177.7	184,740.2	37,489.3	141.0	7807.2	
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	150,608.7	128,948.6	14,256.1	236.2	7167.8	
3	Mixed bamboo natural forest in rocky area	8589.2	6931.3	1654.6		3.4	
<b>III</b>	<b>Bamboo plantation</b>	<b>12,038.1</b>	<b>11,136.1</b>	<b>168.7</b>	<b>14.0</b>	<b>719.4</b>	
1	Bamboo plantation on hill	11,999.1	11,097.0	168.7	14.0	719.4	
2	Bamboo plantation in rocky area	39.1	39.1				

(More details for the provinces are given in Annex 2)



**Figure 8.** Plantation of *Sinocalamus latiflorus* in Ha Giang province.

### **Red River Delta Region**

The Red River delta region consists of four provinces, namely, Hanoi, Hai Phong, Nam Dinh and Ninh Binh. This is a plain region, so the areas of bamboo forest are much smaller than those in the other ecological regions. The total area of bamboo forests is only 746.4 ha., accounting for 0.9% of the total forest area (82,942 ha.) of the whole region. The areas of bamboo forests in the Red River delta provinces are shown in Table 11.

**Table 11.** Area of Bamboo Forests in the Red River Delta in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha)			
			Hanoi	Hai Phong	Ha Nm	Ninh Binh
	<b>Total</b>	<b>796.4</b>	<b>426.7</b>	<b>11.2</b>	<b>348.4</b>	<b>10.1</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>39.1</b>	<b>39.1</b>			
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill					
2	<i>Schizostachyum</i> spp. natural forest on hill					
3	<i>Indosasa</i> spp. natural forest on hill					
4	<i>Bambusa balcooa</i> natural forest on hill					
5	Other bamboo natural forest on hill	39.1	39.1			
6	Bamboo forest in rocky area					
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>680.5</b>	<b>332.1</b>		<b>348.4</b>	
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	332.1	332.1			
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)					
3	Mixed bamboo natural forest in rocky area	348.4			348.4	
<b>III</b>	<b>Bamboo plantation</b>	<b>76.8</b>	<b>55.6</b>	<b>11.2</b>		<b>10.1</b>
1	Bamboo plantation on hill	62.7	47.2	11.2		4.3
2	Bamboo plantation in rocky area	14.1	8.4			5.7

Natural bamboo forest in the Red River delta is mainly concentrated in Ba Vi National Park (Hanoi) and limestone areas of Ha Nam province. Bamboo species in this area are mainly *Schizostachyum* spp. and *Maclurochloa* spp. The bamboo species usually have small stems with a diameter of 2–4 cm and height of 4–12 m. *Maclurochloa* spp. forests are usually thick, with a diameter of about 2–5 cm and height of 5–20 m.

Bamboo plantations are mainly *Dendrocalamus barbatus* and *Bambusa blumeana*, which are used as local construction materials. Nearly all areas of bamboo forests in the Red River delta are managed by households, communities and CPCs. Details of bamboo forest in the area under management are shown in Table 12.

**Table 12.** Area of Bamboo Forest under the Management of the Red River Delta in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by			
			Households, communities, CPCs	State management boards	Armed forces units	Enterprises
	<b>Total</b>	<b>796.4</b>	<b>463.8</b>	<b>316.4</b>	<b>2.5</b>	<b>13.8</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>39.1</b>	<b>38.6</b>		<b>0.5</b>	
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill					
2	<i>Schizostachyum</i> spp. natural forest on hill					
3	<i>Indosasa</i> spp. natural forest on hill					
4	<i>Bambusa balcooa</i> natural forest on hill					
5	Other bamboo natural forest on hill	39.1	38.6		0.5	
6	Bamboo forest in rocky area					
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>680.5</b>	<b>383.6</b>	<b>285.7</b>		<b>11.1</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	332.1	35.2	285.7		11.1
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)					
3	Mixed bamboo natural forest in rocky area	348.4	348.4			
<b>III</b>	<b>Bamboo plantation</b>	<b>76.8</b>	<b>41.6</b>	<b>30.6</b>	<b>2.0</b>	<b>2.7</b>
1	Bamboo plantation on hill	62.7	35.8	22.2	2.0	2.7
2	Bamboo plantation in rocky area	14.1	5.7	8.4		

(More details for the provinces are given in Annex 3.)

## North-central Region

The north-central region consists of six provinces, specifically, Thanh Hoa, Nghe An, Ha Tinh, Quang Binh, Quang Tri and Thua Thien Hue. The total forest area of the region is 3,098,385 ha., of which, the bamboo forest area is 430,759.6 ha, accounting for 13.9% of the total forest area of the region. This is the eco-region with the largest area of bamboo forests in Vietnam. The detailed areas of bamboo forests by provinces in the north-central region are illustrated in Table 13.

**Table 13.** Area of Bamboo Forest in the North-central Region in 2018

No.	Bamboo forest type	Total area (ha)	Thanh Hoa	Nghe An	Ha Tinh	Quang Binh	Quang Tri	TT-Hue
	<b>Total</b>	<b>430,759.6</b>	<b>189,359.7</b>	<b>219,994.4</b>	<b>12,385.0</b>	<b>1338.6</b>	<b>282.2</b>	<b>7399.6</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>97,120.5</b>	<b>51,974.0</b>	<b>43,667.0</b>	<b>259.8</b>	<b>32.3</b>	<b>165.6</b>	<b>1021.8</b>
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill	934.9	782.6	152.3				
2	<i>Schizostachyum</i> spp. natural forest on hill	68,750.2	29,914.2	38,479.5	164.1	18.5		174.0
3	<i>Indosasa</i> spp. natural forest on hill	8913.0	8913.0					
4	<i>Bambusa balcooa</i> natural forest on hill	322.6			95.7			226.9
5	Other bamboo natural forest on hill	18,183.0	12,364.1	5018.6		13.8	165.6	620.9
6	Bamboo forest in rocky area	16.7		16.7				
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>249,170.9</b>	<b>59,207.0</b>	<b>170,312.0</b>	<b>12,125.2</b>	<b>1133.9</b>	<b>116.2</b>	<b>6276.5</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	152,629.3	51,323.8	85,046.2	11,452.7	329.9	109.9	4366.8
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	95,609.1	7883.3	85,082.1	669.4	58.4	6.3	1909.7
3	Mixed bamboo natural forest in rocky area	932.4		183.7	3.1	745.6		
<b>III</b>	<b>Bamboo plantation</b>	<b>84,468.3</b>	<b>78,178.7</b>	<b>6015.4</b>		<b>172.4</b>	<b>0.4</b>	<b>101.3</b>
1	Bamboo plantation on hill	84,388.4	78,098.9	6015.4		172.4	0.4	101.3
2	Bamboo plantation in rocky area	79.8	79.8					

The natural bamboo forest in the north-central region is rich in species composition, with the *Schizostachyum* spp. occupying the largest area. The *Indosasa parvifolia* forest is only distributed to the northern region. The north-central region has high-value bamboo species, such as the *Bambusa* sp (Lung in Vietnamese- Lung is unknown species). This species has culm internodes up to 2 m long, which are commonly used for high value handicrafts. Despite its high economic value, this species has not been identified with a scientific name. Further research is needed on its morphology, identification, distribution and planting and development.

The north-central region is home to the largest area of bamboo plantations in Vietnam. *Dendrocalamus barbatus* is planted in large areas in Thanh Hoa province (more than 78,000 ha.) and Nghe An province (more than 6000 ha.). *Dendrocalamus barbatus* is planted for construction and industrial materials; in this area, it reaches 8–15 cm in diameter and 12–20 m in height or above 20 m in some places.

More than half the area of bamboo forests in the north-central region is managed by households, communities and CPCs. More than one-third of the bamboo forest area is managed by management boards of special use forests and protection forests. The remaining small area of bamboo forests is managed by armed forces and private enterprises. Details of the areas of bamboo forest in the north-central region according to their management are shown in Table 14.



**Table 14.** Area of Bamboo Forest under the Management of the North-central Region in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:			
			Households, communities, CPCs	State management boards	Armed forces units	Enterprises
	<b>Total</b>	<b>430,759.6</b>	<b>241,904.8</b>	<b>169,180.3</b>	<b>15,348.1</b>	<b>4326.4</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>97,120.5</b>	<b>57,459.3</b>	<b>34,430.2</b>	<b>4715.1</b>	<b>515.9</b>
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill	934.9	934.9			
2	<i>Schizostachyum</i> spp. natural forest on hill	68,750.2	37,995.5	28,287.8	2122.0	344.8
3	<i>Indosasa</i> spp. natural forest on hill	8913.0	7582.7	1178.8	151.6	
4	<i>Bambusa balcooa</i> natural forest on hill	322.6	292.6	30.0		
5	Other bamboo natural forest on hill	18,183.0	10,653.6	4916.9	2441.4	171.1
6	Bamboo forest in rocky area	16.7		16.7		
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>249,170.9</b>	<b>107,504.7</b>	<b>127,647.5</b>	<b>10,408.1</b>	<b>3610.5</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	152,629.3	72,486.0	68,925.9	8851.4	2366.0
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	95,609.1	34,392.7	58,415.2	1556.7	1244.5
3	Mixed bamboo natural forest in rocky area	932.4	626.0	306.4		
<b>III</b>	<b>Bamboo plantation</b>	<b>84,468.3</b>	<b>76,940.8</b>	<b>7102.5</b>	<b>225.0</b>	<b>199.9</b>
1	Bamboo plantation on hill	84,388.4	76,862.0	7101.5	225.0	199.9
2	Bamboo plantation in rocky area	79.8	78.8	1.1		

(More details for the provinces are given in Annex 4.)





**Figure 9.** Natural bamboo forest in Thanh Hoa province.

### **South-central Region**

The south-central region includes eight provinces, namely, Da Nang, Quang Nam, Quang Ngai, Binh Dinh, Phu Yen, Khanh Hoa, Ninh Thuan and Binh Thuan. The total forest area of this region is 2,411,528 ha. South-central Vietnam is an ecological area with a dry climate, so the area of bamboo forests in this region is not large. The total area of bamboo forest is 77,857.1 ha., accounting for only 3.2% of the total forest area of the region. Here, bamboo forest mainly comprises mixed forests of bamboos and timbers. Specifically, the area of bamboo forest in the south-central provinces is shown in Table 15.

**Table 15.** Area of Bamboo Forest in the South-central Region in 2018

No.	Bamboo forest type	Total area (ha)	Quang Nam	Quang Ngai	Bình Định	Phu Yen	Khanh Hoa	Ninh Thuan	Binh Thuan
	<b>Total</b>	<b>77,857.1</b>	<b>13,365.2</b>	<b>2111.8</b>	<b>3985.5</b>	<b>32.7</b>	<b>4210.6</b>	<b>6462.0</b>	<b>47,689.2</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>11,515.8</b>	<b>5353.1</b>	<b>700.6</b>			<b>1606.4</b>	<b>276.6</b>	<b>3579.2</b>
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill	0.6					0.6		
2	<i>Schizostachyum</i> spp. natural forest on hill	3497.5	3,210.7	286.7					
3	<i>Indosasa</i> spp. natural forest on hill								
4	<i>Bambusa balcooa</i> natural forest on hill	5883.8	404.5	157.1			1605.8	276.6	3439.8
5	Other bamboo natural forest on hill	2134.1	1737.8	256.8					139.4
6	Bamboo forest in rocky area								
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>65,530.8</b>	<b>8,004.9</b>	<b>793.4</b>	<b>3985.5</b>		<b>2603.3</b>	<b>6185.5</b>	<b>44,110.0</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	44,505.6		259.6	3830.5		2565.8	1494.0	36,355.8
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	20,014.5	8004.9	459.0	3.3		37.5	3755.6	7754.2
3	Mixed bamboo natural forest in rocky area	1010.8		74.9	151.7			935.9	
<b>III</b>	<b>Bamboo plantation</b>	<b>810.5</b>	<b>7.2</b>	<b>617.8</b>		<b>32.7</b>	<b>1.0</b>		
1	Bamboo plantation on hill	810.5	7.2	617.8		32.7	1.0		
2	Bamboo plantation in rocky area								

Bamboo forests in the south-central region are mainly natural forests, most of which are mixed bamboo forests. The major bamboo species are *Bambusa balcooa* (Lồ ô), *Schizostachyum* spp., *Melocalamus* spp. and *Maclurochloa* spp.

Natural pure bamboo forests with *Bambusa balcooa* species occupy the largest area (nearly 6000 ha.). Mixed bamboo and timber forests are also mainly *Bambusa balcooa*. The culm size of *Bambusa balcooa* is 10–18 m in height and 5–10 cm in diameter. This species is used for pulp making and construction materials. Forests of *Schizostachyum* spp. also occupy a large area after the *Bambusa balcooa* forests. The stems of *Schizostachyum* are 6–15 m high and 2–5 cm in diameter. *Bambusa balcooa* and *Schizostachyum* forests are currently used mainly as pulp and construction materials.



**Figure 10.** Natural *Bambusa balcooa* in Phuoc Binh National Park.

Unlike other ecological regions in the north, few areas of bamboo forests are managed by households, communities and the CPCs. Most of the bamboo forests are in the special use forests and protection forests managed by the state management boards. About 11% of the bamboo forest areas are managed by private enterprises. Details of bamboo forest management in the south-central region are shown in Table 16.



**Table 16.** Area of Bamboo Forest under the Management of the South-central Region in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:			
			Households, communities, CPCs	State management boards	Armed forces units	Enterprises
	<b>Total</b>	<b>77,857.1</b>	<b>10,288.3</b>	<b>58,255.4</b>	<b>868.3</b>	<b>8445.2</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>11,515.8</b>	<b>3093.4</b>	<b>6830.0</b>		<b>1592.5</b>
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill	0.6	0.6			
2	<i>Schizostachyum</i> spp. natural forest on hill	3497.5	1485.8	2011.6		
3	<i>Indosasa</i> spp. natural forest on hill					
4	<i>Bambusa balcooa</i> natural forest on hill	5883.8	330.0	3961.3		1592.5
5	Other bamboo natural forest on hill	2134.1	1277.0	857.1		
6	Bamboo forest in rocky area					
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>65,682.6</b>	<b>6567.9</b>	<b>51,393.7</b>	<b>868.3</b>	<b>6852.7</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	44,505.6	1955.3	37,856.0	855.7	3838.6
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	20,014.5	3691.2	13,296.6	12.6	3014.1
3	Mixed bamboo natural forest in rocky area	1162.5	921.4	241.1		
<b>III</b>	<b>Bamboo plantation</b>	<b>658.7</b>	<b>627.1</b>	<b>31.7</b>		
1	Bamboo plantation on hill	658.7	627.1	31.7		
2	Bamboo plantation in rocky area					

(More details on the provinces are given in the Annexes.)

### Central Highlands Region

The central highlands region consists of five provinces, namely, Gia Lai, Con Tum, Dak Lak, Dak Nong and Lam Dong. The total forest area of the central highlands is 2,553,819 ha. This region is one of Vietnam's eco-regions with the greatest coverage of primary (or low-impact) natural forests. Primary forest is often not a good ecological condition for bamboo forests, so bamboo forests in this eco-region are not extensive. The area of bamboo forests in the central highlands is 260,564.1 ha., representing only 10.2% of the total forest area of the central highlands. The areas of bamboo forests in the central highlands provinces are listed in Table 17.

**Table 17.** Area of Bamboo Forest in the Central Highlands Region in 2018

No.	Bamboo forest type	Total area (ha)	Dak Lak	Dak Nong	Gia Lai	Kon Tum	Lam Dong
	<b>Total</b>	<b>260,564.1</b>	<b>14,952.7</b>	<b>38,916.5</b>	<b>408.0</b>	<b>74,395.4</b>	<b>131,891.5</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>55,819.1</b>	<b>5154.9</b>	<b>12,030.1</b>	<b>273.7</b>	<b>21,743.2</b>	<b>16,617.2</b>
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill						
2	<i>Schizostachyum</i> spp. natural forest on hill	106.9	38.2	5.0	8.1		55.6
3	<i>Indosasa</i> spp. natural forest on hill						
4	<i>Bambusa balcooa</i> natural forest on hill	26,534.3	3175.1	7049.6		13.5	16,296.1
5	Other bamboo natural forest on hill	29,177.9	1941.6	4975.5	265.6	21,729.7	265.5
6	Bamboo forest in rocky area						
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>204,734.2</b>	<b>9797.0</b>	<b>26,886.4</b>	<b>124.3</b>	<b>52,652.2</b>	<b>115,274.2</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	159,774.9	9657.4	23,429.3	124.3	38,846.2	87,717.7
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	44,959.3	139.5	3457.2		13,806.1	27,556.6
3	Mixed bamboo natural forest in rocky area						
<b>III</b>	<b>Bamboo plantation</b>	<b>10.8</b>	<b>0.8</b>		<b>10.0</b>		
1	Bamboo plantation on hill	10.8	0.8		10.0		
2	Bamboo plantation in rocky area						

Bamboo forests in the central highlands are mainly distributed in Lam Dong and Kon Tum provinces. The main bamboo forests in the central highlands comprise *Bambusa balcooa*, *Vietnamosasa* spp. (Le), *Schizostachyum* spp. and *Maclurochloa* spp.

The forests of *Bambusa balcooa* occupy the largest area of bamboo forests in the central highlands, with a culm height of 10–18 m and diameter of 5–10 cm. *Vietnamosasa* spp. are popular in the central highlands, but they are small in size, at about 2–5 cm in diameter and 5–12 m in height. Bamboo forests in the central highlands have not been exploited much, so they have not been planted extensively in the region.



**Figure 11.** Natural forest of *Vietnamosasa* in Dak Lak province.

Only about 14% of the bamboo forests in the central highlands are managed by households, communities and CPCs. About 37% of the bamboo forests are in the special-use forest and protection forest systems. Nearly half the bamboo forest areas are managed by enterprises. Details of the bamboo forests' management in the central highlands are shown in Table 18.

**Table 18.** Area of Bamboo Forest under the Management of the Central Highlands Region in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:			
			Households, communities, CPCs	State management boards	Armed forces units	Enterprises
	<b>Total</b>	<b>260,564.1</b>	<b>36,769.7</b>	<b>95,837.6</b>	<b>1138.3</b>	<b>126,818.5</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>55,819.1</b>	<b>14,263.2</b>	<b>21,121.9</b>	<b>354.5</b>	<b>20,079.6</b>
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill					
2	<i>Schizostachyum</i> spp. natural forest on hill	106.9	56.1	13.1		37.7
3	<i>Indosasa</i> spp. natural forest on hill					
4	<i>Bambusa balcooa</i> natural forest on hill	26,534.3	2869.1	13,938.3	347.1	9379.9
5	Other bamboo natural forest on hill	29,177.9	11,338.0	7170.5	7.4	10,662.0
6	Bamboo forest in rocky area					
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>204,734.2</b>	<b>22,495.7</b>	<b>74,715.7</b>	<b>783.9</b>	<b>106,738.9</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	159,774.9	15,930.0	54,382.2	783.9	88,678.8
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	44,959.3	6565.7	20,333.5		18,060.1
3	Mixed bamboo natural forest in rocky area					
<b>III</b>	<b>Bamboo plantation</b>	<b>10.8</b>	<b>10.8</b>			
1	Bamboo plantation on hill	10.8	10.8			
2	Bamboo plantation in rocky area					

(More details for the provinces are given in the Annexes.)

### South-east Region

The south-east region consists of one city and five provinces, namely, Ho Chi Minh city, Dong Nai, Ba Ria Vung Tau and Binh Duong, Binh Phuoc and Tay Ninh provinces. This is a transshipment region between plain and mountainous areas, so the total forest area is not large, at only 487,008 ha. Almost natural forest areas have been heavily affected, becoming secondary forests. Therefore, although the bamboo forests are not large, they account for a large percentage of the total forest area.

Bamboo forests in this area are concentrated in three provinces, namely, Binh Phuoc, Ba Ria Vung Tau and Dong Nai. The total bamboo forest area is 78,128.4 ha., accounting for 16% of the total forest area of the whole region. The areas of bamboo forests in the provinces of the south-east region are listed in Table 19.

**Table 19.** Area of Bamboo Forest in the South-east Region in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha)		
			Bình Phước	BR Vũng Tàu	Đồng Nai
	<b>Total</b>	<b>78,128.4</b>	<b>41,961.6</b>	<b>119.7</b>	<b>36,047.1</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>6836.7</b>	<b>4,488.6</b>	<b>119.1</b>	<b>2229.1</b>
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill	2.0		2.0	
2	<i>Schizostachyum</i> spp. natural forest on hill	68.4			68.4
3	<i>Indosasa</i> spp. natural forest on hill				
4	<i>Bambusa balcooa</i> natural forest on hill	6478.5	4343.8		2134.8
5	Other bamboo natural forest on hill	144.8	144.8		
6	Bamboo forest in rocky area	143.0		117.1	25.9
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>71,252.7</b>	<b>37,435.0</b>		<b>33,817.8</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	35,338.4	23,073.1		12,265.4
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	35,914.3	14,361.9		21,552.4
3	Mixed bamboo natural forest in rocky area				
<b>III</b>	<b>Bamboo plantation</b>	<b>39.0</b>	<b>38.0</b>	<b>0.6</b>	<b>0.3</b>
1	Bamboo plantation on hill	39.0	38.0	0.6	0.3
2	Bamboo plantation in rocky area				

Bamboo forests in the south-east region are mainly natural mixed bamboo and timber forests, with major species like *Bambusa balcooa*, *Vietnamosasa* spp., *Schizostachyum* spp. and *Maclurochloa* spp. Here, *Bambusa balcooa* occupies the main bamboo forest areas; the *Bambusa balcooa* culm size is about 10–18 m in height and 5–10 cm in diameter.

There are few bamboo plantations in the south-east region (39 ha.), mainly representing the species *Dendrocalamus asper* (Manh tong). This is a relatively large bamboo with a diameter of about 10–20 cm and height of 12–20 m.





**Figure 12.** Plantation of *Dendrocalamus asper* in Dong Nai province.

Few areas of bamboo forests in the south-east are managed by households, communities and CPCs (only 0.4%). Nearly two-thirds of the bamboo forest are in the Special Use Forests and Protection Forests. About 27% of the bamboo forest is managed by enterprises. Details of the bamboo forest management in the south-east region are shown in Table 20.

**Table 20.** Area of Bamboo Forest under the Management of the South-east Region in 2018

No.	Bamboo forest type	Total area (h)	Forest area (ha) owned by:		
			Households, communities, CPCs	State management boards	Enterprises
	<b>Total</b>	<b>78,128.4</b>	<b>306.3</b>	<b>56,327.2</b>	<b>21,494.9</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>6836.7</b>	<b>24.1</b>	<b>5364.8</b>	<b>1447.9</b>
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill	2.0	2.0		
2	<i>Schizostachyum</i> spp. natural forest on hill	68.4		55.3	13.2
3	<i>Indosasa</i> spp. natural forest on hill				
4	<i>Bambusa balcooa</i> natural forest on hill	6478.5	21.9	5157.8	1298.8
5	Other bamboo natural forest on hill	144.8		8.9	135.8
6	Bamboo forest in rocky area	143.0	0.2	142.8	
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>71,252.7</b>	<b>280.8</b>	<b>50,931.5</b>	<b>20,040.4</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	35,338.4	59.6	25,847.0	9431.8
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	35,914.3	221.2	25,084.5	10,608.6
3	Mixed bamboo natural forest in rocky area				
<b>III</b>	<b>Bamboo plantation</b>	<b>39.0</b>	<b>1.4</b>	<b>30.9</b>	<b>6.7</b>
1	Bamboo plantation on hill	39.0	1.4	30.9	6.7
2	Bamboo plantation in rocky area				

(More details for the provinces are given in the Annexes.)

## South-west/Mekong Delta Region

The Mekong River delta region has 13 provinces, namely, Long An, Tien Giang, Ben Tre, Vinh Long, Tra Vinh, Dong Thap, Hau Giang, Soc Trang, An Giang, Kien Giang, Bac Lieu and Ca Mau. Bamboo forests are mainly distributed in An Giang and Hau Giang provinces.

The total area is 414.6 ha. All the bamboo forests in this area are planted forests in only two provinces, specifically, 413.2 ha. in An Giang and 1.4 ha. in Hau Giang. The main species of bamboo is *Dendrocalamus asper*. This is a relatively large bamboo, with a diameter of about 10–20 cm and height of 12–20 m. The area of bamboo plantations in the Mekong delta is mainly managed by households and communities.

## 2.2 Recommendations

- The statistical results of the areas of bamboo forests in this project show that they are only centralised forest areas (with forest lots larger than 0.5 ha. for natural bamboo forests and 0.2 ha. for bamboo plantations). The area of bamboo plantations are quite large in Vietnam because they are planted mostly in villages or along rivers and streams near villages nationwide. Thus, it is recommended to continue gathering the statistics of scattered bamboo, especially scattered bamboo plantations;
- There is a lack of funding for surveying the structure and reserves of bamboo forest in the forest inventory system. It is recommended for the International Bamboo and Rattan Organisation (INBAR) to support funding to carry out further investigation of the structure and volume of bamboo forests in the cluster system; and
- Information on bamboo processing and the bamboo market is lacking. Thus, INBAR and MARD should supplement the budget to investigate this information in Vietnam.

# Annexes

## Annex 1. Area of Bamboo Forests Under Management by Provinces of the North-west

**Annex 1.1.** Area of bamboo forest under the management of Hoa Binh province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:			
			Households, communities, CPCs	State Management Boards	Armed Force Units	Enterprises
	<b>Total</b>	<b>28,938.8</b>	<b>26,887.1</b>	<b>1,633.6</b>	<b>5.1</b>	<b>413.0</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>1,329.3</b>	<b>1,145.4</b>	<b>31.4</b>		<b>152.6</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill	46.3	36.0	10.3		
2	<i>Schizostachyum spp.</i> natural forest on hill	979.7	827.2			152.6
3	<i>Indosasa spp.</i> natural forest on hill	242.0	220.9	21.1		
4	<i>Bambusa balcooa</i> natural forest on hill					
5	Other bamboo natural forest on hill	33.8	33.8			
6	Bamboo forest on rocky area	27.6	27.6			
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>9,605.9</b>	<b>8,210.9</b>	<b>1,139.6</b>		<b>255.4</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	8,085.9	6,828.6	1,044.0		213.3
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	1,403.0	1,349.2	11.7		42.1
3	Mixed bamboo natural forest on rocky area	117.0	33.1	83.9		
<b>III</b>	<b>Bamboo plantation</b>	<b>18,003.5</b>	<b>17,530.8</b>	<b>462.6</b>	<b>5.1</b>	<b>5.0</b>
1	Bamboo plantation on hill	17,254.7	16,782.7	462.0	5.1	5.0
2	Bamboo plantation on rocky area	748.8	748.2	0.6		

**Annex 1.2.** Area of bamboo forest under the management of Son La province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:				
			Households, communities, CPCs	State Management Boards	Armed Force Units	Enterprises	Projects
	<b>Total</b>	<b>161,148.0</b>	<b>144,344.9</b>	<b>13,076.9</b>	<b>1,300.0</b>	<b>2,257.3</b>	<b>168.9</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>15,904.7</b>	<b>14,477.2</b>	<b>1,361.5</b>	<b>17.5</b>	<b>48.5</b>	
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill	13,463.1	12,082.5	1,361.5	13.6	5.5	
2	<i>Schizostachyum spp.</i> natural forest on hill	274.2	274.2				
3	<i>Indosasa spp.</i> natural forest on hill	24.6	24.6				
4	<i>Bambusa balcooa</i> natural forest on hill						
5	Other bamboo natural forest on hill	3.4	3.4				
6	Bamboo forest on rocky area	2,139.4	2,092.6		3.8	43.0	
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>139,015.5</b>	<b>124,106.4</b>	<b>11,411.2</b>	<b>1,282.0</b>	<b>2,047.1</b>	<b>168.9</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	36,124.2	29,536.5	4,147.3	1,091.1	1,349.4	
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	83,188.7	75,202.2	7,242.8	123.0	568.2	52.6
3	Mixed bamboo natural forest on rocky area	19,702.6	19,367.7	21.1	68.0	129.6	116.2
<b>III</b>	<b>Bamboo plantation</b>	<b>6,227.8</b>	<b>5,761.3</b>	<b>304.3</b>	<b>0.5</b>	<b>161.7</b>	
1	Bamboo plantation on hill	6,227.8	5,761.3	304.3	0.5	161.7	
2	Bamboo plantation on rocky area						

**Annex 1.3.** Area of bamboo forest under the management of Dien Bien province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:	
			Households, communities, CPCs	State Management Boards
	<b>Total</b>	<b>23,718.5</b>	<b>23,536.8</b>	<b>181.8</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>510.0</b>	<b>510.0</b>	
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill			
2	<i>Schizostachyum spp.</i> natural forest on hill			
3	<i>Indosasa spp.</i> natural forest on hill			
4	<i>Bambusa balcooa</i> natural forest on hill			
5	Other bamboo natural forest on hill	510.0	510.0	
6	Bamboo forest on rocky area			
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>22,582.4</b>	<b>22,400.7</b>	<b>181.8</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	14,373.6	14,252.6	121.0
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	8,208.8	8,148.0	60.8
3	Mixed bamboo natural forest on rocky area			
<b>III</b>	<b>Bamboo plantation</b>	<b>626.1</b>	<b>626.1</b>	
1	Bamboo plantation on hill	626.1	626.1	
2	Bamboo plantation on rocky area			

**Annex 1.4.** Area of bamboo forest under the management of Lai Chau province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>13,672.9</b>	<b>10,215.9</b>	<b>3,277.9</b>	<b>179.2</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>835.5</b>	<b>668.4</b>	<b>122.8</b>	<b>44.4</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill	90.0	81.2	8.8	
2	<i>Schizostachyum spp.</i> natural forest on hill				
3	<i>Indosasa spp.</i> natural forest on hill	727.1	568.8	114.0	44.4
4	<i>Bambusa balcooa</i> natural forest on hill				
5	Other bamboo natural forest on hill	18.4	18.4		
6	Bamboo forest on rocky area				
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>12,817.4</b>	<b>9,531.1</b>	<b>3,155.1</b>	<b>131.2</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	6,597.8	4,227.8	2,326.0	44.0
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	6,219.6	5,303.3	829.1	87.2
3	Mixed bamboo natural forest on rocky area				
<b>III</b>	<b>Bamboo plantation</b>	<b>20.0</b>	<b>16.4</b>		<b>3.6</b>
1	Bamboo plantation on hill	20.0	16.4		3.6
2	Bamboo plantation on rocky area				

## Annex 2. Area of Bamboo Forests Under Management by Provinces of the Northeast

**Annex 2.1.** Area of bamboo forest under the management of Bac Giang province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>986.1</b>	<b>82.4</b>	<b>689.7</b>	<b>214.1</b>
<b>I</b>	<b>Bamboo natural forest</b>				
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill				
2	<i>Schizostachyum spp.</i> natural forest on hill				
3	<i>Indosasa spp.</i> natural forest on hill				
4	<i>Bambusa balcooa</i> natural forest on hill				
5	Other bamboo natural forest on hill				
6	Bamboo forest on rocky area				
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>969.6</b>	<b>65.8</b>	<b>689.7</b>	<b>214.1</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	964.9	65.6	685.9	213.4
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	4.7	0.2	3.8	0.7
3	Mixed bamboo natural forest on rocky area				
<b>III</b>	<b>Bamboo plantation</b>	<b>16.5</b>	<b>16.5</b>		
1	Bamboo plantation on hill	16.5	16.5		
2	Bamboo plantation on rocky area				



**Annex 2.2.** Area of bamboo forest under the management of Bac Kan province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>98,984.7</b>	<b>91,182.2</b>	<b>345.1</b>	<b>7,457.4</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>4,146.9</b>	<b>4,054.1</b>	<b>11.0</b>	<b>81.9</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill	399.7	371.3		28.5
2	<i>Schizostachyum spp.</i> natural forest on hill	651.6	617.0		34.6
3	<i>Indosasa spp.</i> natural forest on hill	1,643.5	1,626.8	7.3	9.5
4	<i>Bambusa balcooa</i> natural forest on hill				
5	Other bamboo natural forest on hill	1,422.1	1,409.1	3.8	9.3
6	Bamboo forest on rocky area	30.0	30.0		
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>93,953.8</b>	<b>86,361.9</b>	<b>302.6</b>	<b>7,289.4</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	69,401.0	64,702.3	249.1	4,449.6
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	21,972.5	19,081.4	53.5	2,837.7
3	Mixed bamboo natural forest on rocky area	2,580.3	2,578.2		2.1
<b>III</b>	<b>Bamboo plantation</b>	<b>883.9</b>	<b>766.2</b>	<b>31.5</b>	<b>86.2</b>
1	Bamboo plantation on hill	883.9	766.2	31.5	86.2
2	Bamboo plantation on rocky area				

**Annex 2.3.** Area of bamboo forest under the management of Cao Bang province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>26,403.3</b>	<b>23,892.0</b>	<b>1,893.3</b>	<b>617.9</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>1,371.2</b>	<b>1,321.9</b>	<b>25.4</b>	<b>23.8</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill				
2	<i>Schizostachyum spp.</i> natural forest on hill				
3	<i>Indosasa spp.</i> natural forest on hill	528.7	500.3	25.4	3.0
4	<i>Bambusa balcooa</i> natural forest on hill				
5	Other bamboo natural forest on hill	842.5	821.6		20.8
6	Bamboo forest on rocky area				
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>22,995.2</b>	<b>20,633.2</b>	<b>1,767.8</b>	<b>594.1</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	13,397.8	12,080.7	989.6	327.5
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	9,396.7	8,351.9	778.2	266.7
3	Mixed bamboo natural forest on rocky area	200.6	200.6		
<b>III</b>	<b>Bamboo plantation</b>	<b>2,037.0</b>	<b>1,936.9</b>	<b>100.1</b>	
1	Bamboo plantation on hill	2,037.0	1,936.9	100.1	
2	Bamboo plantation on rocky area				

**Annex 2.4.** Area of bamboo forest under the management of Ha Giang province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:				
			Households, communities, CPCs	State Management Boards	Armed Force Units	Enterprises	Projects
	<b>Total</b>	<b>92,340.1</b>	<b>85,859.6</b>	<b>4,170.6</b>	<b>102.9</b>	<b>2,202.0</b>	<b>5.0</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>8,744.9</b>	<b>8,561.9</b>	<b>86.8</b>		<b>91.2</b>	<b>5.0</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill	33.1	27.5	2.2		2.9	0.4
2	<i>Schizostachyum spp.</i> natural forest on hill	1,573.0	1,523.2	5.0		44.9	
3	<i>Indosasa spp.</i> natural forest on hill	5,754.4	5,650.3	78.8		20.7	4.6
4	<i>Bambusa balcooa</i> natural forest on hill	0.4	0.4				
5	Other bamboo natural forest on hill	1,384.0	1,360.5	0.8		22.7	
6	Bamboo forest on rocky area						
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>83,090.0</b>	<b>77,066.6</b>	<b>4,082.3</b>	<b>102.9</b>	<b>1,838.2</b>	
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	44,571.7	40,650.2	2,858.7	102.3	960.5	
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	38,518.3	36,416.3	1,223.7	0.6	877.7	
3	Mixed bamboo natural forest on rocky area						
<b>III</b>	<b>Bamboo plantation</b>	<b>505.1</b>	<b>231.1</b>	<b>1.4</b>		<b>272.6</b>	
1	Bamboo plantation on hill	505.1	231.1	1.4		272.6	
2	Bamboo plantation on rocky area						

**Annex 2.5.** Area of bamboo forest under the management of Lao Cai province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:			
			Households, communities, CPCs	State Management Boards	Armed Force Units	Enterprises
	<b>Total</b>	<b>32,471.8</b>	<b>13,239.0</b>	<b>16,631.1</b>	<b>34.4</b>	<b>2,567.4</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>9,326.1</b>	<b>4,501.8</b>	<b>3,695.4</b>		<b>1,128.9</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill	930.8	291.9	412.1		226.8
2	<i>Schizostachyum spp.</i> natural forest on hill	90.7	90.7			
3	<i>Indosasa spp.</i> natural forest on hill	1,782.6	1,142.0	629.8		10.7
4	<i>Bambusa balcooa</i> natural forest on hill					
5	Other bamboo natural forest on hill	6,522.0	2,977.2	2,653.5		891.3
6	Bamboo forest on rocky area					
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>22,541.3</b>	<b>8,333.6</b>	<b>12,915.5</b>	<b>20.4</b>	<b>1,271.7</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	16,520.1	5,411.5	10,228.4	20.4	859.8
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	6,021.2	2,922.1	2,687.1		412.0
3	Mixed bamboo natural forest on rocky area					
<b>III</b>	<b>Bamboo plantation</b>	<b>604.5</b>	<b>403.6</b>	<b>20.2</b>	<b>14.0</b>	<b>166.8</b>
1	Bamboo plantation on hill	604.5	403.6	20.2	14.0	166.8
2	Bamboo plantation on rocky area					

**Annex 2.6.** Area of bamboo forest under the management of Lang Son province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:	
			Households, communities, CPCs	Enterprises
	<b>Total</b>	<b>18,430.7</b>	<b>18,288.4</b>	<b>142.4</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>1,275.6</b>	<b>1,269.9</b>	<b>5.6</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill	397.3	397.3	
2	<i>Schizostachyum spp.</i> natural forest on hill	2.9	2.9	
3	<i>Indosasa spp.</i> natural forest on hill	440.5	434.8	5.6
4	<i>Bambusa balcooa</i> natural forest on hill			
5	Other bamboo natural forest on hill	434.9	434.9	
6	Bamboo forest on rocky area			
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>17,149.7</b>	<b>17,013.0</b>	<b>136.7</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	17,149.7	17,013.0	136.7
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)			
3	Mixed bamboo natural forest on rocky area			
<b>III</b>	<b>Bamboo plantation</b>	<b>5.5</b>	<b>5.5</b>	
1	Bamboo plantation on hill	5.5	5.5	
2	Bamboo plantation on rocky area			

**Table 2.7.** Area of bamboo forest under the management of Phu Tho province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:			
			Households, communities, CPCs	State Management Boards	Armed Force Units	Enterprises
	<b>Total</b>	<b>26,916.5</b>	<b>18,585.0</b>	<b>5,596.4</b>	<b>110.2</b>	<b>2,624.9</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>3,624.0</b>	<b>2,982.6</b>	<b>500.7</b>		<b>140.7</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill					
2	<i>Schizostachyum spp.</i> natural forest on hill	3,624.0	2,982.6	500.7		140.7
3	<i>Indosasa spp.</i> natural forest on hill					
4	<i>Bambusa balcooa</i> natural forest on hill					
5	Other bamboo natural forest on hill					
6	Bamboo forest on rocky area					
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>22,663.4</b>	<b>15,034.5</b>	<b>5,083.0</b>	<b>110.2</b>	<b>2,435.7</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	3,468.4	2,393.1	1,014.3		61.0
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	19,195.0	12,641.4	4,068.7	110.2	2,374.7
3	Mixed bamboo natural forest on rocky area					
<b>III</b>	<b>Bamboo plantation</b>	<b>629.2</b>	<b>567.9</b>	<b>12.7</b>		<b>48.5</b>
1	Bamboo plantation on hill	629.2	567.9	12.7		48.5
2	Bamboo plantation on rocky area					

**Annex 2.8.** Area of bamboo forest under the management of Quang Ninh province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:			
			Households, communities, CPCs	State Management Boards	Armed Force Units	Enterprises
	<b>Total</b>	<b>17,313.0</b>	<b>6,608.1</b>	<b>9,622.2</b>	<b>98.2</b>	<b>984.4</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>1,370.1</b>	<b>856.5</b>	<b>325.7</b>		<b>187.9</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill	11.8	3.9	7.9		
2	<i>Schizostachyum spp.</i> natural forest on hill	76.7		76.7		
3	<i>Indosasa spp.</i> natural forest on hill					
4	<i>Bambusa balcooa</i> natural forest on hill					
5	Other bamboo natural forest on hill	1,281.6	852.6	241.1		187.9
6	Bamboo forest on rocky area					
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>15,712.5</b>	<b>5,586.9</b>	<b>9,296.5</b>	<b>98.2</b>	<b>730.8</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	10,174.5	3,887.3	5,751.7	16.0	519.5
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	5,538.0	1,699.6	3,544.8	82.2	211.3
3	Mixed bamboo natural forest on rocky area					
<b>III</b>	<b>Bamboo plantation</b>	<b>230.4</b>	<b>164.7</b>			<b>65.7</b>
1	Bamboo plantation on hill	230.4	164.7			65.7
2	Bamboo plantation on rocky area					

**Annex 2.9.** Area of bamboo forest under the management of Vinh Phuc province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:	
			Households, communities, CPCs	State Management Boards
	<b>Total</b>	<b>553.9</b>	<b>20.1</b>	<b>533.8</b>
<b>I</b>	<b>Bamboo natural forest</b>			
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill			
2	<i>Schizostachyum spp.</i> natural forest on hill			
3	<i>Indosasa spp.</i> natural forest on hill			
4	<i>Bambusa balcooa</i> natural forest on hill			
5	Other bamboo natural forest on hill			
6	Bamboo forest on rocky area			
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>553.7</b>	<b>19.9</b>	<b>533.8</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	553.7	19.9	533.8
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)			
3	Mixed bamboo natural forest on rocky area			
<b>III</b>	<b>Bamboo plantation</b>	<b>0.2</b>	<b>0.2</b>	
1	Bamboo plantation on hill	0.2	0.2	
2	Bamboo plantation on rocky area			



**Annex 2.10.** Area of bamboo forest under the management of Thai Nguyen province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Armed Force Units
	<b>Total</b>	<b>6,469.4</b>	<b>3,755.2</b>	<b>2,712.0</b>	<b>2.3</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>1,171.6</b>	<b>677.0</b>	<b>494.6</b>	
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill	297.8	148.1	149.6	
2	<i>Schizostachyum spp.</i> natural forest on hill	184.5	184.5		
3	<i>Indosasa spp.</i> natural forest on hill	364.2	279.7	84.5	
4	<i>Bambusa balcooa</i> natural forest on hill	0.9	0.9		
5	Other bamboo natural forest on hill	318.0	57.5	260.5	
6	Bamboo forest on rocky area	6.2	6.2		
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>5,291.0</b>	<b>3,074.1</b>	<b>2,214.7</b>	<b>2.3</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	4,380.4	2,993.7	1,384.4	2.3
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	910.6	80.3	830.3	
3	Mixed bamboo natural forest on rocky area				
<b>III</b>	<b>Bamboo plantation</b>	<b>6.9</b>	<b>4.2</b>	<b>2.7</b>	
1	Bamboo plantation on hill	6.9	4.2	2.7	
2	Bamboo plantation on rocky area				

**Annex 2.11.** Area of bamboo forest under the management of Tuyen Quang province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:			
			Households, communities, CPCs	State Management Boards	Armed Force Units	Enterprises
	<b>Total</b>	<b>70,623.6</b>	<b>55,463.1</b>	<b>14,556.8</b>	<b>43.2</b>	<b>560.5</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>13,753.3</b>	<b>12,472.0</b>	<b>1,173.5</b>		<b>107.7</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill	499.3	498.8	0.5		
2	<i>Schizostachyum spp.</i> natural forest on hill	7,845.2	7,126.8	621.8		96.6
3	<i>Indosasa spp.</i> natural forest on hill	1,881.9	1,379.0	502.9		
4	<i>Bambusa balcooa</i> natural forest on hill					
5	Other bamboo natural forest on hill	1,238.2	1,219.0	8.1		11.1
6	Bamboo forest on rocky area	2,288.7	2,248.5	40.3		
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>52,692.3</b>	<b>38,886.8</b>	<b>13,383.3</b>	<b>43.2</b>	<b>379.0</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	31,911.6	20,333.4	11,369.7		208.5
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	15,041.8	14,470.4	359.0	43.2	169.3
3	Mixed bamboo natural forest on rocky area	5,738.8	4,083.0	1,654.6		1.3
<b>III</b>	<b>Bamboo plantation</b>	<b>4,178.0</b>	<b>4,104.3</b>			<b>73.7</b>
1	Bamboo plantation on hill	4,143.4	4,069.7			73.7
2	Bamboo plantation on rocky area	34.6	34.6			

**Annex 2.12.** Area of bamboo forest under the management of Yen Bai province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>65,083.3</b>	<b>61,754.6</b>	<b>3,135.0</b>	<b>193.6</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>10,379.0</b>	<b>10,275.8</b>	<b>4.2</b>	<b>99.0</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill	649.9	564.2		85.7
2	<i>Schizostachyum spp.</i> natural forest on hill	5,283.0	5,281.9		1.1
3	<i>Indosasa spp.</i> natural forest on hill	4,366.1	4,349.8	4.2	12.2
4	<i>Bambusa balcooa</i> natural forest on hill				
5	Other bamboo natural forest on hill	80.0	80.0		
6	Bamboo forest on rocky area				
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>51,763.2</b>	<b>48,543.8</b>	<b>3,130.7</b>	<b>88.7</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	17,684.0	15,189.4	2,423.7	70.9
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	34,009.7	33,284.9	707.0	17.8
3	Mixed bamboo natural forest on rocky area	69.5	69.5		
<b>III</b>	<b>Bamboo plantation</b>	<b>2,941.1</b>	<b>2,935.0</b>	<b>0.1</b>	<b>6.0</b>
1	Bamboo plantation on hill	2,936.6	2,930.5	0.1	6.0
2	Bamboo plantation on rocky area	4.5	4.5		

## Annex 3. Area of Bamboo Forests Under Management by Provinces of the Red River Delta

**Annex 3.1.** Area of bamboo forest under the management of Hanoi city in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:			
			Households, communities, CPCs	State Management Boards	Armed Force Units	Enterprises
	<b>Total</b>	<b>426.7</b>	<b>96.7</b>	<b>315.7</b>	<b>0.5</b>	<b>13.8</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>39.1</b>	<b>38.6</b>		<b>0.5</b>	
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill					
2	<i>Schizostachyum spp.</i> natural forest on hill					
3	<i>Indosasa spp.</i> natural forest on hill					
4	<i>Bambusa balcooa</i> natural forest on hill					
5	Other bamboo natural forest on hill	39.1	38.6		0.5	
6	Bamboo forest on rocky area					
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>332.1</b>	<b>35.2</b>	<b>285.7</b>		<b>11.1</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	332.1	35.2	285.7		11.1
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)					
3	Mixed bamboo natural forest on rocky area					
<b>III</b>	<b>Bamboo plantation</b>	<b>55.6</b>	<b>22.9</b>	<b>30.0</b>		<b>2.7</b>
1	Bamboo plantation on hill	47.2	22.9	21.6		2.7
2	Bamboo plantation on rocky area	8.4		8.4		

**Annex 3.2.** Area of bamboo forest under the management of Hai Phong city in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by households, communities, CPCs
	<b>Total</b>	<b>11.2</b>	<b>11.2</b>
<b>I</b>	<b>Bamboo natural forest</b>		
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill		
2	<i>Schizostachyum spp.</i> natural forest on hill		
3	<i>Indosasa spp.</i> natural forest on hill		
4	<i>Bambusa balcooa</i> natural forest on hill		
5	Other bamboo natural forest on hill		
6	Bamboo forest on rocky area		
<b>II</b>	<b>Mixed bamboo natural forest</b>		
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)		
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)		
3	Mixed bamboo natural forest on rocky area		
<b>III</b>	<b>Bamboo plantation</b>	<b>11.2</b>	<b>11.2</b>
1	Bamboo plantation on hill	11.2	11.2
2	Bamboo plantation on rocky area		

**Annex 3.3.** Area of bamboo forest under the management of Ha Nam province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by households, communities, CPCs
	<b>Total</b>	<b>348.4</b>	<b>348.4</b>
<b>I</b>	<b>Bamboo natural forest</b>		
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill		
2	<i>Schizostachyum spp.</i> natural forest on hill		
3	<i>Indosasa spp.</i> natural forest on hill		
4	<i>Bambusa balcooa</i> natural forest on hill		
5	Other bamboo natural forest on hill		
6	Bamboo forest on rocky area		
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>348.4</b>	<b>348.4</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)		
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)		
3	Mixed bamboo natural forest on rocky area	348.4	348.4
<b>III</b>	<b>Bamboo plantation</b>		
1	Bamboo plantation on hill		
2	Bamboo plantation on rocky area		

**Annex 3.4.** Area of bamboo forest under the management of Ninh Binh province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Armed Force Units
	<b>Total</b>	<b>10.1</b>	<b>7.4</b>	<b>0.6</b>	<b>2.0</b>
<b>I</b>	<b>Bamboo natural forest</b>				
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill				
2	<i>Schizostachyum spp.</i> natural forest on hill				
3	<i>Indosasa spp.</i> natural forest on hill				
4	<i>Bambusa balcooa</i> natural forest on hill				
5	Other bamboo natural forest on hill				
6	Bamboo forest on rocky area				
<b>II</b>	<b>Mixed bamboo natural forest</b>				
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)				
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)				
3	Mixed bamboo natural forest on rocky area				
<b>III</b>	<b>Bamboo plantation</b>	<b>10.1</b>	<b>7.4</b>	<b>0.6</b>	<b>2.0</b>
1	Bamboo plantation on hill	4.3	1.7	0.6	2.0
2	Bamboo plantation on rocky area	5.7	5.7		

## Annex 4. Area of Bamboo Forests Under Management by Provinces of the North-central

**Annex 4.1.** Area of bamboo forest under the management of the Thanh Hoa province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:			
			Households, communities, CPCs	State Management Boards	Armed Force Units	Enterprises
	<b>Total</b>	<b>189,359.7</b>	<b>132,985.5</b>	<b>44,498.1</b>	<b>11,389.4</b>	<b>486.7</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>51,974.0</b>	<b>35,796.0</b>	<b>11,595.0</b>	<b>4,456.8</b>	<b>126.2</b>
1	<i>Bambusa</i> spp./ <i>Dendrocalamus barbatus</i> natural forest on hill	782.6	782.6			
2	<i>Schizostachyum</i> spp. natural forest on hill	29,914.2	20,686.1	7,257.4	1,943.6	27.1
3	<i>Indosasa</i> spp. natural forest on hill	8,913.0	7,582.7	1,178.8	151.6	
4	<i>Bambusa balcooa</i> natural forest on hill					
5	Other bamboo natural forest on hill	12,364.1	6,744.6	3,158.7	2,361.7	99.1
6	Bamboo forest on rocky area					
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>59,207.0</b>	<b>25,906.2</b>	<b>26,416.6</b>	<b>6,709.7</b>	<b>174.5</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	51,323.8	23,105.9	21,493.8	6,586.5	137.7
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	7,883.3	2,800.3	4,922.8	123.2	36.9
3	Mixed bamboo natural forest on rocky area					
<b>III</b>	<b>Bamboo plantation</b>	<b>78,178.7</b>	<b>71,283.3</b>	<b>6,486.6</b>	<b>222.9</b>	<b>185.9</b>
1	Bamboo plantation on hill	78,098.9	71,204.6	6,485.5	222.9	185.9
2	Bamboo plantation on rocky area	79.8	78.8	1.1		



**Annex 4.2.** Area of bamboo forest under the management of the Nghe An province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:			
			Households, communities, CPCs	State Management Boards	Armed Force Units	Enterprises
	<b>Total</b>	<b>219,994.4</b>	<b>93,523.0</b>	<b>119,188.5</b>	<b>3,958.8</b>	<b>3,324.2</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>43,667.0</b>	<b>21,014.4</b>	<b>22,007.8</b>	<b>258.2</b>	<b>386.7</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill	152.3	152.3			
2	<i>Schizostachyum spp.</i> natural forest on hill	38,479.5	17,287.4	20,698.9	178.5	314.7
3	<i>Indosasa spp.</i> natural forest on hill					
4	<i>Bambusa balcooa</i> natural forest on hill					
5	Other bamboo natural forest on hill	5,018.6	3,574.7	1,292.2	79.8	72.0
6	Bamboo forest on rocky area	16.7		16.7		
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>170,312.0</b>	<b>66,956.1</b>	<b>96,733.9</b>	<b>3,698.4</b>	<b>2,923.6</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	85,046.2	36,931.3	43,629.3	2,265.0	2,220.7
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	85,082.1	30,024.8	52,920.9	1,433.5	702.9
3	Mixed bamboo natural forest on rocky area	183.7		183.7		
<b>III</b>	<b>Bamboo plantation</b>	<b>6,015.4</b>	<b>5,552.6</b>	<b>446.8</b>	<b>2.1</b>	<b>14.0</b>
1	Bamboo plantation on hill	6,015.4	5,552.6	446.8	2.1	14.0
2	Bamboo plantation on rocky area					

**Annex 4.3.** Area of bamboo forest under the management of the Ha Tinh province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>12,385.0</b>	<b>9,175.9</b>	<b>2,695.2</b>	<b>513.9</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>259.8</b>	<b>115.0</b>	<b>141.8</b>	<b>3.0</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill				
2	<i>Schizostachyum spp.</i> natural forest on hill	164.1	19.3	141.8	3.0
3	<i>Indosasa spp.</i> natural forest on hill				
4	<i>Bambusa balcooa</i> natural forest on hill	95.7	95.7		
5	Other bamboo natural forest on hill				
6	Bamboo forest on rocky area				
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>12,125.2</b>	<b>9,061.0</b>	<b>2,553.4</b>	<b>510.9</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	11,452.7	8,893.2	2,553.4	6.1
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	669.4	164.7		504.8
3	Mixed bamboo natural forest on rocky area	3.1	3.1		
<b>III</b>	<b>Bamboo plantation</b>				
1	Bamboo plantation on hill				
2	Bamboo plantation on rocky area				

**Annex 4.4.** Area of bamboo forest under the management of the Quang Binh province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:	
			Households, communities, CPCs	State Management Boards
	<b>Total</b>	<b>1,338.6</b>	<b>903.2</b>	<b>435.4</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>32.3</b>	<b>16.5</b>	<b>15.8</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill			
2	<i>Schizostachyum spp.</i> natural forest on hill	18.5	2.7	15.8
3	<i>Indosasa spp.</i> natural forest on hill			
4	<i>Bambusa balcooa</i> natural forest on hill			
5	Other bamboo natural forest on hill	13.8	13.8	
6	Bamboo forest on rocky area			
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>1,133.9</b>	<b>883.5</b>	<b>250.4</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	329.9	202.2	127.7
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	58.4	58.4	
3	Mixed bamboo natural forest on rocky area	745.6	622.9	122.7
<b>III</b>	<b>Bamboo plantation</b>	<b>172.4</b>	<b>3.2</b>	<b>169.2</b>
1	Bamboo plantation on hill	172.4	3.2	169.2
2	Bamboo plantation on rocky area			

**Annex 4.5.** Area of bamboo forest under the management of the Quang Tri province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:	
			Households, communities, CPCs	State Management Boards
	<b>Total</b>	<b>282.2</b>	<b>275.9</b>	<b>6.3</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>165.6</b>	<b>165.6</b>	
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill			
2	<i>Schizostachyum spp.</i> natural forest on hill			
3	<i>Indosasa spp.</i> natural forest on hill			
4	<i>Bambusa balcooa</i> natural forest on hill			
5	Other bamboo natural forest on hill	165.6	165.6	
6	Bamboo forest on rocky area			
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>116.2</b>	<b>109.9</b>	<b>6.3</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	109.9	109.9	
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	6.3		6.3
3	Mixed bamboo natural forest on rocky area			
<b>III</b>	<b>Bamboo plantation</b>	<b>0.4</b>	<b>0.4</b>	
1	Bamboo plantation on hill	0.4	0.4	
2	Bamboo plantation on rocky area			

**Annex 4.6.** Area of bamboo forest under the management of the Thua Thien Hue province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>7,399.6</b>	<b>5,041.2</b>	<b>2,356.8</b>	<b>1.6</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>1,021.8</b>	<b>351.9</b>	<b>670.0</b>	
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill				
2	<i>Schizostachyum spp.</i> natural forest on hill	174.0		174.0	
3	<i>Indosasa spp.</i> natural forest on hill				
4	<i>Bambusa balcooa</i> natural forest on hill	226.9	196.9	30.0	
5	Other bamboo natural forest on hill	620.9	154.9	466.0	
6	Bamboo forest on rocky area				
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>6,276.5</b>	<b>4,588.1</b>	<b>1,686.9</b>	<b>1.6</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	4,366.8	3,243.5	1,121.8	1.6
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	1,909.7	1,344.6	565.1	
3	Mixed bamboo natural forest on rocky area				
<b>III</b>	<b>Bamboo plantation</b>	<b>101.3</b>	<b>101.3</b>		
1	Bamboo plantation on hill	101.3	101.3		
2	Bamboo plantation on rocky area				

## Annex 5. Area of Bamboo Forests Under Management by Provinces of the South-central

**Annex 5.1.** Area of bamboo forest under the management of the Quang Nam province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:	
			Households, communities, CPCs	State Management Boards
	<b>Total</b>	<b>13,365.2</b>	<b>5,594.5</b>	<b>7,770.7</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>5,353.1</b>	<b>2,546.4</b>	<b>2,806.7</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill			
2	<i>Schizostachyum spp.</i> natural forest on hill	3,210.7	1,427.0	1,783.7
3	<i>Indosasa spp.</i> natural forest on hill			
4	<i>Bambusa balcooa</i> natural forest on hill	404.5	87.0	317.5
5	Other bamboo natural forest on hill	1,737.8	1,032.4	705.4
6	Bamboo forest on rocky area			
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>8,004.9</b>	<b>3,040.9</b>	<b>4,964.1</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)			
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	8,004.9	3,040.9	4,964.1
3	Mixed bamboo natural forest on rocky area			
<b>III</b>	<b>Bamboo plantation</b>	<b>7.2</b>	<b>7.2</b>	
1	Bamboo plantation on hill	7.2	7.2	
2	Bamboo plantation on rocky area			

**Annex 5.2.** Area of bamboo forest under the management of the Quang Ngai province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:	
			Households, communities, CPCs	State Management Boards
	<b>Total</b>	<b>2,111.8</b>	<b>1,558.7</b>	<b>553.1</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>700.6</b>	<b>460.5</b>	<b>240.2</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill			
2	<i>Schizostachyum spp.</i> natural forest on hill	286.7	58.8	227.9
3	<i>Indosasa spp.</i> natural forest on hill			
4	<i>Bambusa balcooa</i> natural forest on hill	157.1	157.1	
5	Other bamboo natural forest on hill	256.8	244.6	12.3
6	Bamboo forest on rocky area			
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>793.4</b>	<b>480.9</b>	<b>312.6</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	259.6	123.0	136.6
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	459.0	357.9	101.1
3	Mixed bamboo natural forest on rocky area	74.9		74.9
<b>III</b>	<b>Bamboo plantation</b>	<b>617.8</b>	<b>617.4</b>	<b>0.4</b>
1	Bamboo plantation on hill	617.8	617.4	0.4
2	Bamboo plantation on rocky area			



**Annex 5.3.** Area of bamboo forest under the management of the Binh Dinh province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>3,985.5</b>	<b>792.5</b>	<b>3,187.6</b>	<b>5.4</b>
<b>I</b>	<b>Bamboo natural forest</b>				
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill				
2	<i>Schizostachyum spp.</i> natural forest on hill				
3	<i>Indosasa spp.</i> natural forest on hill				
4	<i>Bambusa balcooa</i> natural forest on hill				
5	Other bamboo natural forest on hill				
6	Bamboo forest on rocky area				
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>3,985.5</b>	<b>792.5</b>	<b>3,187.6</b>	<b>5.4</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	3,830.5	637.4	3,187.6	5.4
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	3.3	3.3		
3	Mixed bamboo natural forest on rocky area	151.7	151.7		
<b>III</b>	<b>Bamboo plantation</b>				
1	Bamboo plantation on hill				
2	Bamboo plantation on rocky area				

**Annex 5.4.** Area of bamboo forest under the management of the Phu Yen province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:	
			Households, communities, CPCs	State Management Boards
	<b>Total</b>	<b>32.7</b>	<b>1.5</b>	<b>31.3</b>
<b>I</b>	<b>Bamboo natural forest</b>			
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill			
2	<i>Schizostachyum spp.</i> natural forest on hill			
3	<i>Indosasa spp.</i> natural forest on hill			
4	<i>Bambusa balcooa</i> natural forest on hill			
5	Other bamboo natural forest on hill			
6	Bamboo forest on rocky area			
<b>II</b>	<b>Mixed bamboo natural forest</b>			
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)			
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)			
3	Mixed bamboo natural forest on rocky area			
<b>III</b>	<b>Bamboo plantation</b>	<b>32.7</b>	<b>1.5</b>	<b>31.3</b>
1	Bamboo plantation on hill	32.7	1.5	31.3
2	Bamboo plantation on rocky area			

**Annex 5.5.** Area of bamboo forest under the management of the Khanh Hoa province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>4,210.6</b>	<b>373.3</b>	<b>65.8</b>	<b>3,771.6</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>1,606.4</b>	<b>86.5</b>		<b>1,519.9</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill	0.6	0.6		
2	<i>Schizostachyum spp.</i> natural forest on hill				
3	<i>Indosasa spp.</i> natural forest on hill				
4	<i>Bambusa balcooa</i> natural forest on hill	1,605.8	85.9		1,519.9
5	Other bamboo natural forest on hill				
6	Bamboo forest on rocky area				
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>2,603.3</b>	<b>285.8</b>	<b>65.8</b>	<b>2,251.7</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	2,565.8	248.3	65.8	2,251.7
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	37.5	37.5		
3	Mixed bamboo natural forest on rocky area				
<b>III</b>	<b>Bamboo plantation</b>	<b>1.0</b>	<b>1.0</b>		
1	Bamboo plantation on hill	1.0	1.0		
2	Bamboo plantation on rocky area				

**Annex 5.6.** Area of bamboo forest under the management of the Ninh Thuan province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>6,462.0</b>	<b>1,755.4</b>	<b>1,272.0</b>	<b>3,434.7</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>276.6</b>		<b>204.0</b>	<b>72.6</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill				
2	<i>Schizostachyum spp.</i> natural forest on hill				
3	<i>Indosasa spp.</i> natural forest on hill				
4	<i>Bambusa balcooa</i> natural forest on hill	276.6		204.0	72.6
5	Other bamboo natural forest on hill				
6	Bamboo forest on rocky area				
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>6,185.5</b>	<b>1,755.4</b>	<b>1,068.0</b>	<b>3,362.1</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	1,494.0	844.0	197.6	452.4
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	3,755.6	141.8	704.2	2,909.6
3	Mixed bamboo natural forest on rocky area	935.9	769.7	166.2	
<b>III</b>	<b>Bamboo plantation</b>				
1	Bamboo plantation on hill				
2	Bamboo plantation on rocky area				

**Annex 5.7.** Area of bamboo forest under the management of the Binh Thuan province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:			
			Households, communities, CPCs	State Management Boards	Armed Force Units	Enterprises
	<b>Total</b>	<b>47,689.2</b>	<b>212.5</b>	<b>45,374.9</b>	<b>868.3</b>	<b>1,233.5</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>3,579.2</b>		<b>3,579.2</b>		
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill					
2	<i>Schizostachyum spp.</i> natural forest on hill					
3	<i>Indosasa spp.</i> natural forest on hill					
4	<i>Bambusa balcooa</i> natural forest on hill	3,439.8		3,439.8		
5	Other bamboo natural forest on hill	139.4		139.4		
6	Bamboo forest on rocky area					
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>44,110.0</b>	<b>212.5</b>	<b>41,795.7</b>	<b>868.3</b>	<b>1,233.5</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	36,355.8	102.7	34,268.4	855.7	1,129.1
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	7,754.2	109.8	7,527.4	12.6	104.5
3	Mixed bamboo natural forest on rocky area					
<b>III</b>	<b>Bamboo plantation</b>					
1	Bamboo plantation on hill					
2	Bamboo plantation on rocky area					

## Annex 6. Area of Bamboo Forests Under Management by Provinces of the Central Highlands

**Annex 6.1.** Area of bamboo forest under the management of the Dak Lak province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>14,952.7</b>	<b>576.1</b>	<b>5,706.8</b>	<b>8,669.8</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>5,154.9</b>	<b>222.3</b>	<b>861.9</b>	<b>4,070.8</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill				
2	<i>Schizostachyum spp.</i> natural forest on hill	38.2	0.5		37.7
3	<i>Indosasa spp.</i> natural forest on hill				
4	<i>Bambusa balcooa</i> natural forest on hill	3,175.1	172.1	837.8	2,165.3
5	Other bamboo natural forest on hill	1,941.6	49.7	24.1	1,867.7
6	Bamboo forest on rocky area				
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>9,797.0</b>	<b>353.1</b>	<b>4,844.9</b>	<b>4,599.0</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	9,657.4	339.8	4,789.2	4,528.4
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	139.5	13.3	55.6	70.6
3	Mixed bamboo natural forest on rocky area				
<b>III</b>	<b>Bamboo plantation</b>	<b>0.8</b>	<b>0.8</b>		
1	Bamboo plantation on hill	0.8	0.8		
2	Bamboo plantation on rocky area				

**Annex 6.2.** Area of bamboo forest under the management of the Dak Nong province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:			
			Households, communities, CPCs	State Management Boards	Armed Force Units	Enterprises
	<b>Total</b>	<b>38,916.5</b>	<b>4,973.7</b>	<b>14,028.8</b>	<b>917.2</b>	<b>18,996.8</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>12,030.1</b>	<b>3,451.1</b>	<b>3,173.7</b>	<b>325.2</b>	<b>5,080.1</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill					
2	<i>Schizostachyum spp.</i> natural forest on hill	5.0		5.0		
3	<i>Indosasa spp.</i> natural forest on hill					
4	<i>Bambusa balcooa</i> natural forest on hill	7,049.6	212.2	3,133.8	317.9	3,385.7
5	Other bamboo natural forest on hill	4,975.5	3,238.9	34.9	7.4	1,694.4
6	Bamboo forest on rocky area					
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>26,886.4</b>	<b>1,522.6</b>	<b>10,855.2</b>	<b>592.0</b>	<b>13,916.7</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	23,429.3	1,234.4	9,712.8	592.0	11,890.2
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	3,457.2	288.2	1,142.4		2,026.5
3	Mixed bamboo natural forest on rocky area					
<b>III</b>	<b>Bamboo plantation</b>					
1	Bamboo plantation on hill					
2	Bamboo plantation on rocky area					

**Annex 6.3.** Area of bamboo forest under the management of the Gia Lai province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>408.0</b>	<b>96.0</b>	<b>301.1</b>	<b>11.0</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>273.7</b>		<b>273.7</b>	
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill				
2	<i>Schizostachyum spp.</i> natural forest on hill	8.1		8.1	
3	<i>Indosasa spp.</i> natural forest on hill				
4	<i>Bambusa balcooa</i> natural forest on hill				
5	Other bamboo natural forest on hill	265.6		265.6	
6	Bamboo forest on rocky area				
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>124.3</b>	<b>85.9</b>	<b>27.4</b>	<b>11.0</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	124.3	85.9	27.4	11.0
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)				
3	Mixed bamboo natural forest on rocky area				
<b>III</b>	<b>Bamboo plantation</b>	<b>10.0</b>	<b>10.0</b>		
1	Bamboo plantation on hill	10.0	10.0		
2	Bamboo plantation on rocky area				



**Annex 6.4.** Area of bamboo forest under the management of the Kon Tum province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>74,395.4</b>	<b>22,815.7</b>	<b>22,603.1</b>	<b>28,976.7</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>21,743.2</b>	<b>8,049.4</b>	<b>6,845.8</b>	<b>6,848.0</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill				
2	<i>Schizostachyum spp.</i> natural forest on hill				
3	<i>Indosasa spp.</i> natural forest on hill				
4	<i>Bambusa balcooa</i> natural forest on hill	13.5			13.5
5	Other bamboo natural forest on hill	21,729.7	8,049.4	6,845.8	6,834.4
6	Bamboo forest on rocky area				
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>52,652.2</b>	<b>14,766.3</b>	<b>15,757.2</b>	<b>22,128.7</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	38,846.2	10,907.8	10,693.3	17,245.0
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	13,806.1	3,858.5	5,063.9	4,883.7
3	Mixed bamboo natural forest on rocky area				
<b>III</b>	<b>Bamboo plantation</b>				
1	Bamboo plantation on hill				
2	Bamboo plantation on rocky area				

**Annex 6.5.** Area of bamboo forest under the management of the Lam Dong province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:			
			Households, communities, CPCs	State Management Boards	Armed Force Units	Enterprises
	<b>Total</b>	<b>131,891.5</b>	<b>8,308.2</b>	<b>53,197.8</b>	<b>221.1</b>	<b>70,164.3</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>16,617.2</b>	<b>2,540.4</b>	<b>9,966.8</b>	<b>29.2</b>	<b>4,080.8</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill					
2	<i>Schizostachyum spp.</i> natural forest on hill	55.6	55.6			
3	<i>Indosasa spp.</i> natural forest on hill					
4	<i>Bambusa balcooa</i> natural forest on hill	16,296.1	2,484.8	9,966.8	29.2	3,815.3
5	Other bamboo natural forest on hill	265.5				265.5
6	Bamboo forest on rocky area					
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>115,274.2</b>	<b>5,767.8</b>	<b>43,231.1</b>	<b>191.9</b>	<b>66,083.5</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	87,717.7	3,362.0	29,159.5	191.9	55,004.3
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	27,556.6	2,405.7	14,071.6		11,079.2
3	Mixed bamboo natural forest on rocky area					
<b>III</b>	<b>Bamboo plantation</b>					
1	Bamboo plantation on hill					
2	Bamboo plantation on rocky area					

## Annex 7. Area of Bamboo Forests Under Management by Provinces of the South-east

**Annex 7.1.** Area of bamboo forest under the management of Binh Phuoc province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>41,961.6</b>	<b>42.5</b>	<b>26,066.5</b>	<b>15,852.6</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>4,488.6</b>		<b>3,090.4</b>	<b>1,398.2</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill				
2	<i>Schizostachyum spp.</i> natural forest on hill				
3	<i>Indosasa spp.</i> natural forest on hill				
4	<i>Bambusa balcooa</i> natural forest on hill	4,343.8		3,081.4	1,262.4
5	Other bamboo natural forest on hill	144.8		8.9	135.8
6	Bamboo forest on rocky area				
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>37,435.0</b>	<b>41.1</b>	<b>22,945.5</b>	<b>14,448.3</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	23,073.1	6.0	18,458.0	4,609.1
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	14,361.9	35.2	4,487.5	9,839.2
3	Mixed bamboo natural forest on rocky area				
<b>III</b>	<b>Bamboo plantation</b>	<b>38.0</b>	<b>1.4</b>	<b>30.6</b>	<b>6.1</b>
1	Bamboo plantation on hill	38.0	1.4	30.6	6.1
2	Bamboo plantation on rocky area				

**Annex 7.2.** Area of bamboo forest under the management of Ba Ria Vung Tau province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>119.7</b>	<b>2.2</b>	<b>116.9</b>	<b>0.6</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>119.1</b>	<b>2.2</b>	<b>116.9</b>	
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill	2.0	2.0		
2	<i>Schizostachyum spp.</i> natural forest on hill				
3	<i>Indosasa spp.</i> natural forest on hill				
4	<i>Bambusa balcooa</i> natural forest on hill				
5	Other bamboo natural forest on hill				
6	Bamboo forest on rocky area	117.1	0.2	116.9	
<b>II</b>	<b>Mixed bamboo natural forest</b>				
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)				
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)				
3	Mixed bamboo natural forest on rocky area				
<b>III</b>	<b>Bamboo plantation</b>	<b>0.6</b>			<b>0.6</b>
1	Bamboo plantation on hill	0.6			0.6
2	Bamboo plantation on rocky area				

**Annex 7.3.** Area of bamboo forest under the management of Dong Nai province in 2018

No.	Bamboo forest type	Total area (ha)	Forest area (ha) owned by:		
			Households, communities, CPCs	State Management Boards	Enterprises
	<b>Total</b>	<b>36,047.1</b>	<b>261.6</b>	<b>30,143.8</b>	<b>5,641.8</b>
<b>I</b>	<b>Bamboo natural forest</b>	<b>2,229.1</b>	<b>21.9</b>	<b>2,157.5</b>	<b>49.6</b>
1	<i>Bambusa spp./Dendrocalamus barbatus</i> natural forest on hill				
2	<i>Schizostachyum spp.</i> natural forest on hill	68.4		55.3	13.2
3	<i>Indosasa spp.</i> natural forest on hill				
4	<i>Bambusa balcooa</i> natural forest on hill	2,134.8	21.9	2,076.4	36.5
5	Other bamboo natural forest on hill				
6	Bamboo forest on rocky area	25.9		25.9	
<b>II</b>	<b>Mixed bamboo natural forest</b>	<b>33,817.8</b>	<b>239.7</b>	<b>27,986.0</b>	<b>5,592.1</b>
1	Mixed wood and bamboo natural forest on hill (15-30% bamboo)	12,265.4	53.6	7,389.0	4,822.7
2	Mixed bamboo and wood natural forest on hill (30-50% bamboo)	21,552.4	186.1	20,597.0	769.4
3	Mixed bamboo natural forest on rocky area				
<b>III</b>	<b>Bamboo plantation</b>	<b>0.3</b>		<b>0.3</b>	
1	Bamboo plantation on hill	0.3		0.3	
2	Bamboo plantation on rocky area				









### **About INBAR**

Established in 1997, the International Bamboo and Rattan Organisation (INBAR) is an intergovernmental development organisation that promotes environmentally sustainable development using bamboo and rattan.

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