SURINAME FORESTRY SECTOR 2013

MINISTERIE VAN
RUIMTELIJKE ORDENING
GROND- EN BOSBEHEER

Foundation for Forest Management and Production Control

Directorates: Forestry Economic Services
Research and Development
Forest Management

October 2014

National indicators for Suriname

Land area:	16,4 million ha
Forest estate (ca 94%):	15,3 million ha
Population in 2013:	539.000 inhabitants
Forest per capita:	28 ha
Gross domestic product (GDP) in 2013:	US$ 5 billion
Contribution forestry to GDP in 2013:	1%
Gross national income in 2013:	US$ 5 billion
National income per capita in 2013:	US$ 9.200
Timber consumption per capita in 2013:	0,31 m^3
Growth national economy in 2013:	2,9%
Growth production forestry sector in 2013:	-8%
Timber export revenue in 2013:	US$ 19,1 million
Logging companies in 2013:	201
Sawmills in 2013:	76
Plywood factory in 2013:	1
Timber markets in 2013:	113
Furniture & and Joinery works factories in 2013:	91

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1. INTRODUCTION

The annual forestry report of Suriname is a standard reporting format that gives insight into the activities carried out in the forestry sector. Within this report attention is given to the trends and developments in the forestry sector, taking national as well as international factors into consideration. For the sake of clarity it should be noted that within this framework by the term **forestry sector** is meant: the succession of activities within the production process of timber, i.e. logging, round wood transport and timber processing. For this analysis national timber production, timber exports, timber imports, domestic timber consumption, etc. have been used as instruments to describe the trends and developments. The earning of the forestry sector has also been assessed in order to indicate its contribution to the national economy.

2. THE GLOBAL FOREST AREA AND TIMBER PRODUCTION

2.1 Global forest area

The total land area on the earth is about 13 billion ha, of which 31% (about 4 billion ha) is covered with forest. Europe is the most forested region on earth, with still 1 billion ha of forest. The second most forested region is South-America, with a forest area of 860 million ha. The Pacific region has only 200 million ha of forest.
In the period 2000 – 2010 the annual global deforestation was 13 million ha. In this period natural and artificial reforestation activities took place, which resulted in a net annual forest loss of 5.2 million ha.
According to the FAO, the global forests absorbed in 2010 about 289 gigatonnes of carbon. In the period 2005 – 2010 the annual global carbon reduction from the biomass due to deforestation was 0.5 gigatonne.
In 2010, worldwide there was about 1.4 billion ha of pristine forest, 2.3 billion of natural regenerated forest and 0.3 billion ha artificially regenerated forest.
About 30% (1.2 billion ha) of the total global forest is designated as production forest. About 960 million ha of forest has the status of multiple use areas. The protected areas cover a surface of 800 million ha. About 160 million ha of forest has the status of social and recreation area.
The total global tropical forest has a surface of about 1.9 billion ha, equal to about 52% of all the forest in the world. It is notable that more than 80% of the world's forest is public forest.

Table 1. Global forest extent per region in 2010

Region	Land area in ha	Forest area	
		In ha	In % of land area
Africa	3,031,000,000	674,000,000	23
Asia	3,182,000,000	592,000,000	19
Europe	2,306,000,000	1,000,000,000	45
North & Central America	2,274,000,000	705,000,000	33
Pacific	856,000,000	191,000,000	23
South-America	1,700,000,000	864,000,000	49
Total	**13,432,000,000**	**4,026,000,000**	**31**

***Source**: FAO; FRA 2010*

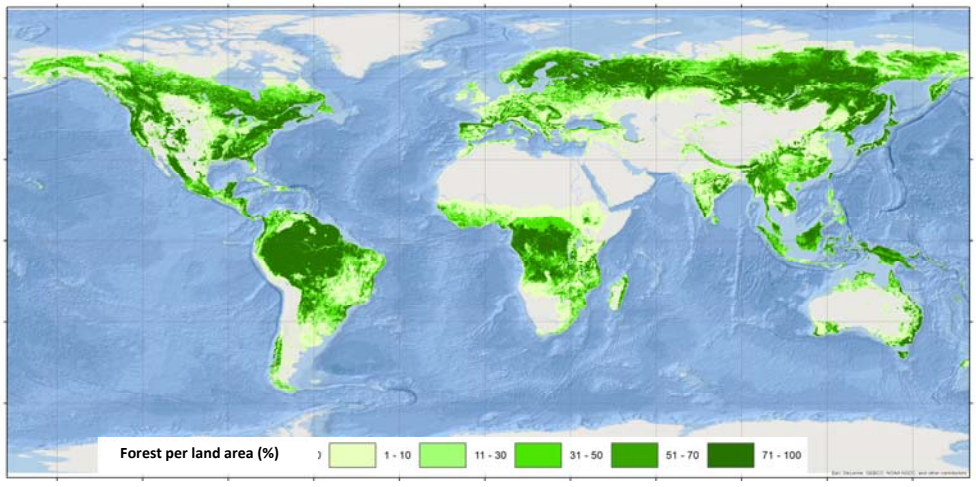


Figure 1. World map indicating forested areas ***Source: FAO; FRA 2010***

2.2 Global timber production

In 2012 the global industrial round wood production was 1.6 billion m^3. The region with the highest production (30%) was Europe. North-America contributed 28% to the industrial round wood production in this year. The regions Asia & Pacific, Latin America & the Caribbean and Africa has contributed respectively 23%, 14% en 4% to the production.

Table 2. Global industrial round wood production per region in 2012

Region	Industrial round wood in m^3	In %
Africa	69,000,000	4
Asia & Pacific	385,000,000	23
Europe	502,000,000	30
North-America	472,000,000	28
Latin America & Caribbean	228,000,000	14
World	**1,656,000,000**	**100**

Source: FAO; Forest products statistics 2012

The global sawn wood production in 2012 was 413 million m^3. Also for this product the highest production (34%) came from Europe. With 28%, Asia & Pacific achieved the second highest production of this product. North-America, Latin America & Caribbean and Africa have contributed respectively 26%, 10% en 2% to the sawn wood production.

Table 3. Global sawn wood production per region in 2012

Region	Sawn wood in m^3	In %
Africa	9,000,000	2
Asia & Pacific	114,000,000	28
Europe	140,000,000	34
North-America	107,000,000	26
Latin America & Caribbean	43,000,000	10
World	**413,000,000**	**100**

Source: FAO; Forest products statistics 2012

The global wood-based panel production in 2012 was 301 million m^3. The highest production of this product came from Asia & Pacific, with a contribution of 54%. The contribution of Europe was 25%. The regions North-America, Latin America & Caribbean and Africa contributed respectively 14%, 6% and 1% to the production of wood-based panels.

Table 4. Global wood-based panel production per region in 2012

Region	Wood-based panel in m^3	In %
Africa	2,000,000	1
Asia & Pacific	163,000,000	54
Europe	74,000,000	25
North-America	44,000,000	14
Latin America & Caribbean	18,000,000	6
World	**301,000,000**	**100**

Source: FAO; Forest products statistics 2012

The global paper and paperboard production in 2012 was 399 million ton. With 46%, the highest production of paper and paperboard came from Asia & Pacific in 2012. The contribution of Europe to the production of these products was 26%.

Table 5. Paper & paperboard production per region in 2012

Region	Paper & paperboard in ton	In %
Africa	3,000,000	1
Asia & Pacific	185,000,000	46
Europe	105,000,000	26
North-America	86,000,000	22
Latin America & Caribbean	20,000,000	5
World	**399,000,000**	**100**

Source: FAO; Forest products statistics 2012

The global fuel wood production in 2012 was 1.8 billion m^3, this is 13% more than the industrial round wood production for the same year. The highest fuel wood production (41%) came from Asia & Pacific. The second highest fuel wood production (34%) came from Africa.

Table 6. Fuel wood production per region in 2012

Region	Fuel wood in m^3	In %
Africa	636,000,000	34
Asia & Pacific	767,000,000	41
Europe	131,000,000	7
North-America	56,000,000	3
Latin America en Caribbean	280,000,000	15
World	**1,870,000,000**	**100**

Source: FAO; Forest products statistics 2012

The global turnover of the forest sector in 2012 was US $ 1.080 billion. The turnover of industrial round wood was US $ 331 billion and of sawn wood US $ 144 billion. The turnover of wood based panel, paper & paperboard and fuel wood were respectively US $ 135 billion, US $ 319 billion and US $ 149 billion.

3. FOREST AREA IN SURINAME

The total land area of Suriname is 16.4 million ha, of which about 94%[1] (15.3 million ha) is covered with forest. About 4.5 million ha of forest is designated as production forest. An area of about 2.3 million ha is protected, of which 1.9 million ha covered with forest. About 9 million ha forest, in the southern part of the country has the status of temporary maintained forest.

An area of about 734,000 ha is other land, because this cannot be classified as forest. The size of inland water bodies is 316,000 ha. An area with the surface of 200,000 ha is utilized for shifting cultivation or traditional agriculture. In dialogue with the communities that are utilizing this area, it is provisionally classified as forest. The gross deforestation from 2000 to 2009 is estimated to around 30,000 ha[2], and mainly takes place in the eastern part of the country.

On an area of 288,000 ha, where the former agriculture plantations were established, natural regeneration took place and this area can again be considered as forest. Furthermore about 1,150 ha of mining area has been rehabilitated.

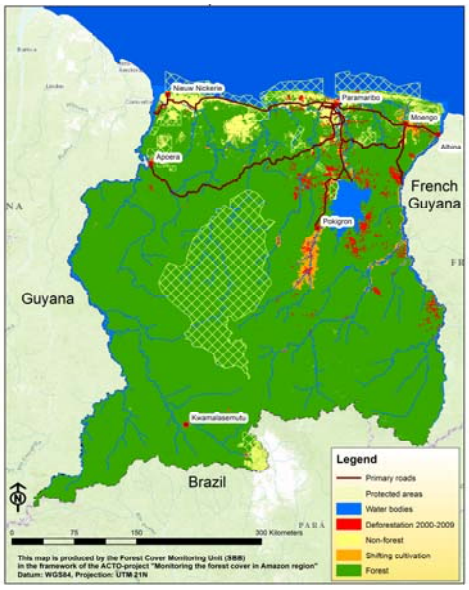


Figure 2. Deforestation map Suriname 2000-2009

The growing stock within the Surinamese forest is estimated to 3.8 billion m^3. The aboveground biomass is estimated to 3.6 billion ton, the belowground biomass to 485 million ton and dead wood to 94 million ton. Taking this into consideration the total biomass in the Surinamese forest is estimated to 4.2 billion ton.

Based on a conversion factor of 47% (McGroddy et al, 2004), the estimated volume of carbon in aboveground biomass, belowground biomass and in dead wood are respectively 1.7 billion ton, 227.7 million ton and 44.5 million ton. The carbon in litter and soil are estimated to respectively 230.3 million ton and 402.2 million ton. Based on these, the total volume of carbon absorbed by the Surinamese forest is estimated to 2.6 billion ton. Currently Suriname is executing projects in the framework of REDD+ which will provide means to calculate more reliable figures of the carbon stock within the Surinamese forests.

[1] Preliminary figures based on the maps that are produced by SBB within the ACTO-project "Monitoring the Forest Cover of the Amazon region"

[2] idem

4. TIMBERCUTTING- AND EXPLORATION LICENSES IN 2013

In 2013 there were 202 valid timber cutting and exploration licenses issued on an area of 2.8 million ha. Of these, 103 licenses were concessions with a surface of 1.6 million ha. Furthermore there were 88 communal cutting licenses (HKV's) and community forests with a total surface of 612,000 ha and 2 incidental cutting licenses (ICL's) with the surface of 168,000 ha. The ICL's were including licenses issued in the van Blommenstein lake and forest conversion area in the district of Marowijne for the implementation of a palm oil project by China Zhong Heng Tai Investment N.V. There were 9 exploration licenses with the surface of 476,000 ha, which gives the license holders the right to do research on the availability of timber stocks in the area.

Table 7. Valid licenses, number and area in ha in 2013

Status/Licenses	Number	Area in ha
Concession	103	1,603,264
HKV and community forest	88	612,594
Incidental cutting licenses (ICL)	2	168,163
Exploration licenses	9	476,425
Total	**202**	**2,860,446**

In this year logging activities took place on 189 terrains, of which 98 with the status of concession, 61 with the status of HKV's and community forest and two ICL's. There were also 28 terrains with other type of licenses where logging activities took place.
It is important to mention that on 523 harvesting blocks with the total surface of 63,189 ha, logging activities took place. Hereby it can be mentioned that 355 harvesting blocks with the total surface of 41,810 ha were within concession areas. Within the HKV's and community forests there were 150 harvesting blocks with the surface of 19,090 ha and in other types of licenses 18 harvesting blocks with the surface of 2,289 ha.

Furthermore it can be mentioned that logging activities were carried out in 360 out of 523 harvesting blocks with the surface of 45,341 ha, in accordance with the extensive forest management system and in 163 harvesting blocks with the surface of 17,848 ha in accordance with the intensive forest management system.

Looking at the actual effective utilization of the forest, it can be mentioned that in 2013 on a number of 61 (59%) out of the 103 valid concessions, logging activities took place. Expressed in area equivalents 68% of the total area of valid concessions were active for this year.
It is notable that no exploration activities have been carried out.

5. TOTAL ROUND WOOD PRODUCTION

5.1 Timber assortments

In 2013 the total round wood production (industrial and non-industrial round wood) was 402,236 m^3. With the volume of 386,080 m^3 round wood (saw- and peel log), round wood was the most important timber assortment produced in this year. The recorded production of hewn square poles was 38 m^3. The greatest part of the production of this assortment has been recorded as round wood.

Furthermore, respectively 3,190 m^3, 31 m^3, 4,807 m^3, 7,982 m^3 and 108 m^3 of fence poles, shingles, sawn wood (produced within the forest with chainsaw or mobile sawmill), fuel wood and charcoal were produced.

Table 8. Total round wood production per assortment in 2013

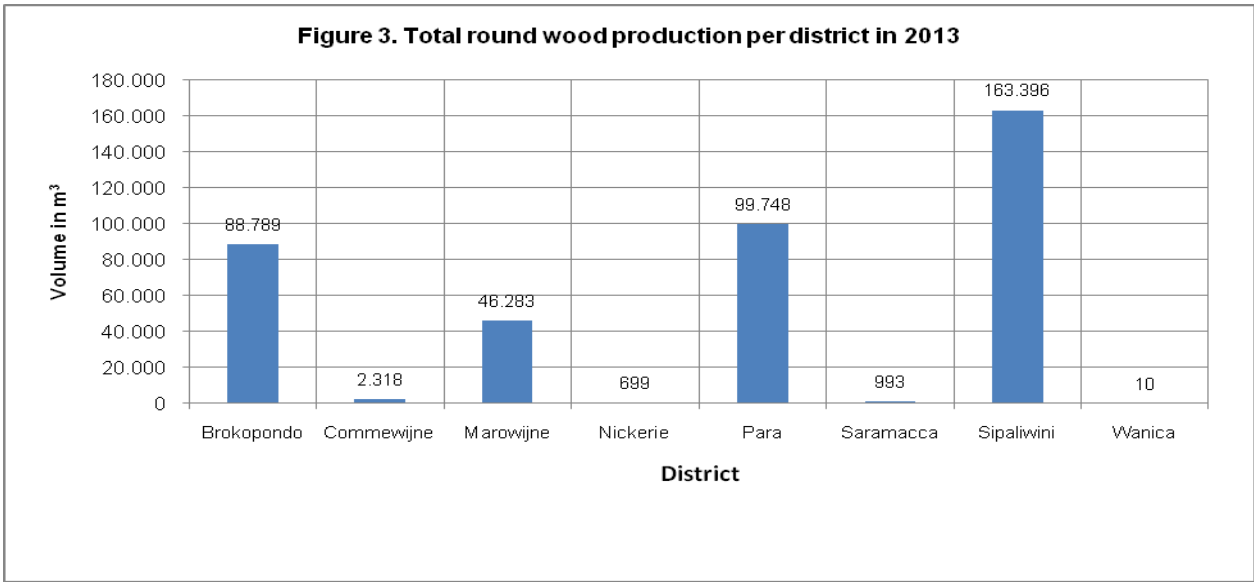
Assortment	Volume in m^3
Round wood	386,080
Hewn square poles	38
Fence poles	3,190
Shingles	31
Sawn wood *	4,807
Fuel wood	7,982
Charcoal	108
Total	**402,236**

* ***Sawn wood, produced within the forest with chainsaw or mobile sawmill***

5.2 Production per district

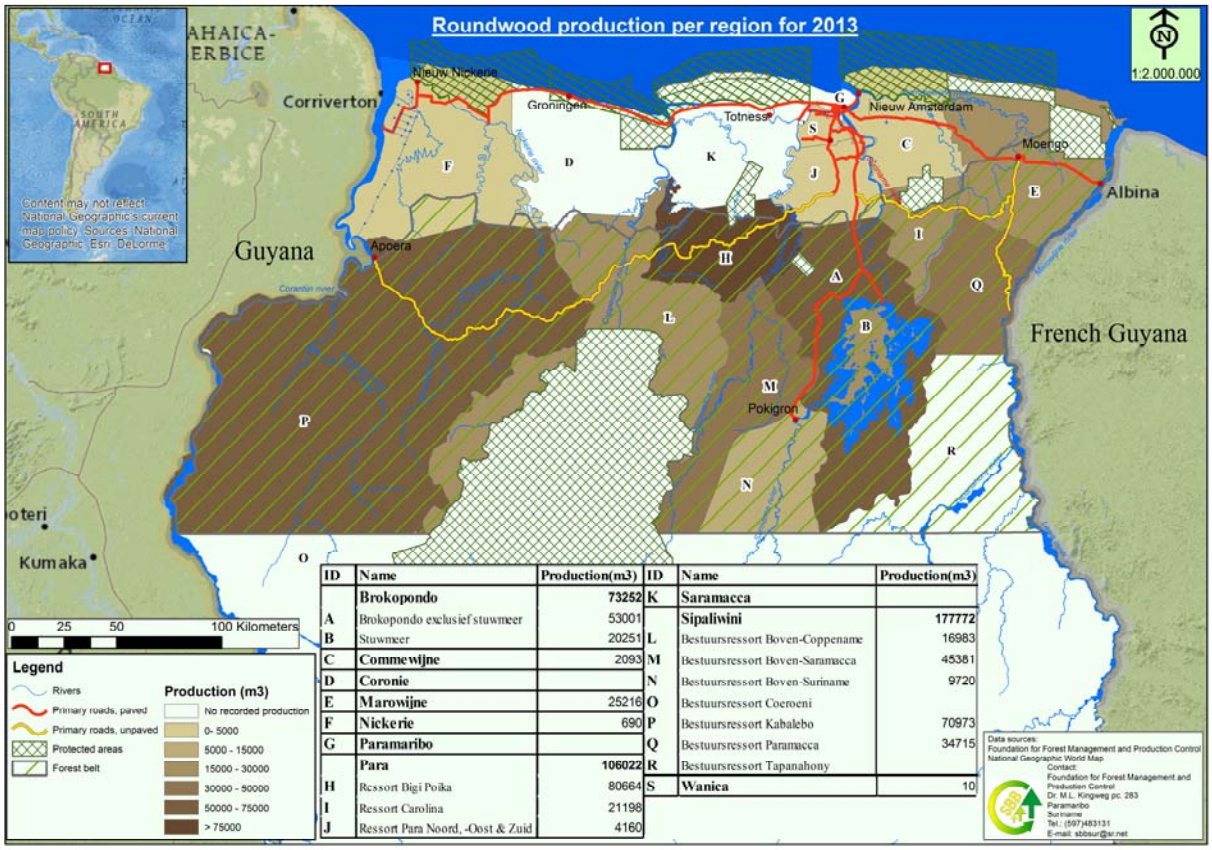
With a contribution of 41%, the highest round wood production came from district Sipaliwini in 2013. The second highest production was realized by district Para (25%). The districts Brokopondo and Marowijne contributed respectively 22% and 12% to the total round wood production in 2013.

Figure 3. Total round wood production per district in 2013



5.3 Production per region

Figure 4. Map of round wood production per region 2013



ID	Name	Production(m3)	ID	Name	Production(m3)
	Brokopondo	**73252**	K	**Saramacca**	
A	Brokopondo exclusief stuwmeer	53001		**Sipaliwini**	**177772**
B	Stuwmeer	20251	L	Bestuursressort Boven-Coppename	16983
C	**Commewijne**	2093	M	Bestuursressort Boven-Saramacca	45381
D	**Coronie**		N	Bestuursressort Boven-Suriname	9720
E	**Marowijne**	25216	O	Bestuursressort Coeroeni	
F	**Nickerie**	690	P	Bestuursressort Kabalebo	70973
G	**Paramaribo**		Q	Bestuursressort Paramacca	34715
	Para	**106022**	R	Bestuursressort Tapanahony	
H	Ressort Bigi Poika	80664	S	**Wanica**	10
I	Ressort Carolina	21198			
J	Ressort Para Noord, -Oost & Zuid	4160			

To illustrate the important timber production regions, a part of Suriname (above the 4^0 north latitude) has been divided into 19 administrative regions (see Figure 4. Map of round wood production per region 2013). This analysis shows that in 2013 the highest round wood production came from the region Bigi Poika in the district Para (80,664 m^3). The second highest production came from the jurisdiction Kabalebo in the district Sipaliwini. This region has supplied 70,973 m^3 of round wood. With the volume of 53,001 m^3 round wood, the region Brokopondo except the Lake was also an important timber production area. Other important production regions are the administration jurisdictions Boven-Saramacca and Paramacca in Sipaliwini, which supplied respectively 45,381 m^3 en 34,715 m^3 of round wood.
This indicates the intensity of the utilization of the different roads due to timber transport. Beside other forest management rules, this analysis provide insight to arrange the necessary infrastructural facilities.

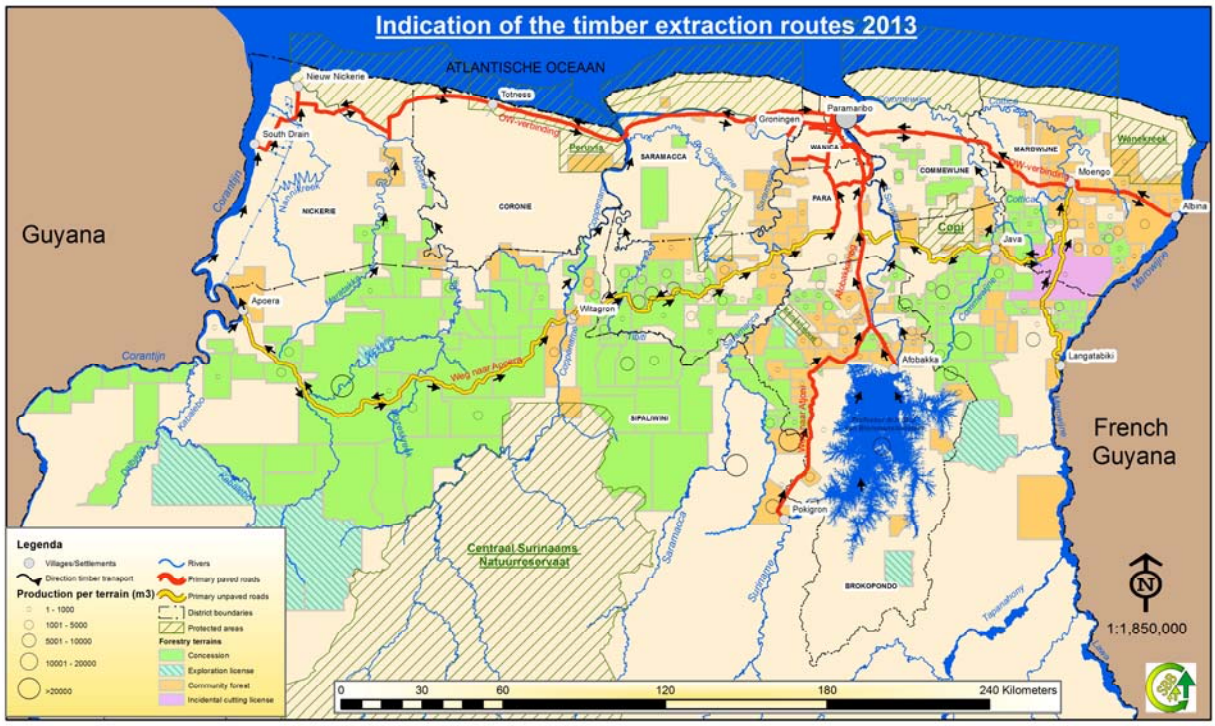
5.4 Round wood transport

The Surinamese forest sector implements two systems of round wood transport. The round wood is transported by means of trucks/trailers via road or by pontoons via waterways (rivers, creeks or channels). In 2013 wood has been transported from the production region as follows:

- The region Brokopondo except the Hydropower Lake, supplied 53,000 m^3 of round wood. This wood has been transported via the Road to Atjoni, the Afobakkaweg and the Indira-Gandhiweg.
- The production from the Lake was 20,250 m^3 of round wood. From the Lake the timber has been transported to the shores of the lake, where a part of the timber has been processed. From the shores of the lake, processed timber as well as round wood has been transported via the Afobakkaweg and the Ds.Martin Lutherkingweg.
- From the region Commewijne, a part of the 2,093 m^3 of round wood has been transported via the Suriname river and the eastern part the East-west connection. A part of the round wood was processed in Commewijne and sold locally.
- Marowijne had a production of 25,216 m^3 round wood. The transport of this timber took place via the Road to Langatabiki, the Road to Java and the eastern part of the East-west connection.
- The production from the region Nickerie was 690 m^3 of round wood. The transport took place via the Maratakka river, the Nickerie river and the western part of the East-west connection road.
- Region Bigi Poika achieved a production of 80,664 m^3 round wood. From this region the timber has been transported via the Tibiti river, the Coppename river, the Road to Apoera and the Indira-Gandhiweg.
- Region Carolina had a production of 21,198 m^3 round wood, which was transported via the Suriname river, the Commewijne river, the Road to Java and the eastern part of the East-west connection road.
- Region Para North, -East & South had a production of 4,160 m^3 round wood. The transport took place via the Road to Apoera and the Indira-Gandhiweg.
- Administration jurisdiction Boven-Coppename realized a production of 16,983 m^3 round wood. This timber was transported via the Coppename river, the Tibiti river, the road to Apoera and the Indira-Gandhiweg.
- Administration jurisdiction Boven-Saramacca had a production of 45,381 m^3 of round wood. The timber has been transported via the Road to Atjoni, the Afobakkaweg and the Ds.Martin Lutherkingweg.
- Administration jurisdiction Boven-Suriname realized a production of 9,720 m^3 round wood. The timber has been transported mainly by the Road to Atjonie, the Afobakkaweg and the Ds. Martin Lutherkingweg.
- Administration jurisdiction Kabalebo had a round wood production of 70,973 m^3 . The timber has been transported via the Road to Apoera, the Maratakka river and the Corantijn river.

In 2013 seventeen companies have transported the round wood via waterways with tugboats and pontoons. The important waterways for the transport of round wood were the Corantijn river, the Marataka river, the Nickerie river, the Coppename river, the Tibiti river, the Suriname river, the Commewijne river and the Lake. In 2013 about 100,000 m^3 of round wood has been transported through the waterways, which is equal to 25% of the total nation round wood production of Suriname.
The round wood transport by road took place via East-West connection roads, the Afobakkaweg, the Road to Atjoni, the Road to Apoera, the Road to Java, the Road to Langatabiki, the Indira Gandhiweg and the Ds. Martin Lutherkingweg.
In this year about 300,000 m^3 round wood, which is equal to 75% of the total national round wood production, took place through the road.

Figure 5. Map with the indication of the timber transport ways in 2013



5.5 Total round wood production type of licenses

When taking into consideration the contribution of the types of timber cutting licenses to the total round wood production, it showed that in 2013 the highest production (64%) came from the concessions. The communal cutting licenses and the community forest has contributed 21% to the round wood production. The LBB forest reserves, the disposed forest and the incidental cutting licenses contributed respectively 1%, 5% and 3% to the total round wood production. Furthermore the contribution of the private owned forest, hereditary tenure area, long lease of state land and others was together 6%.

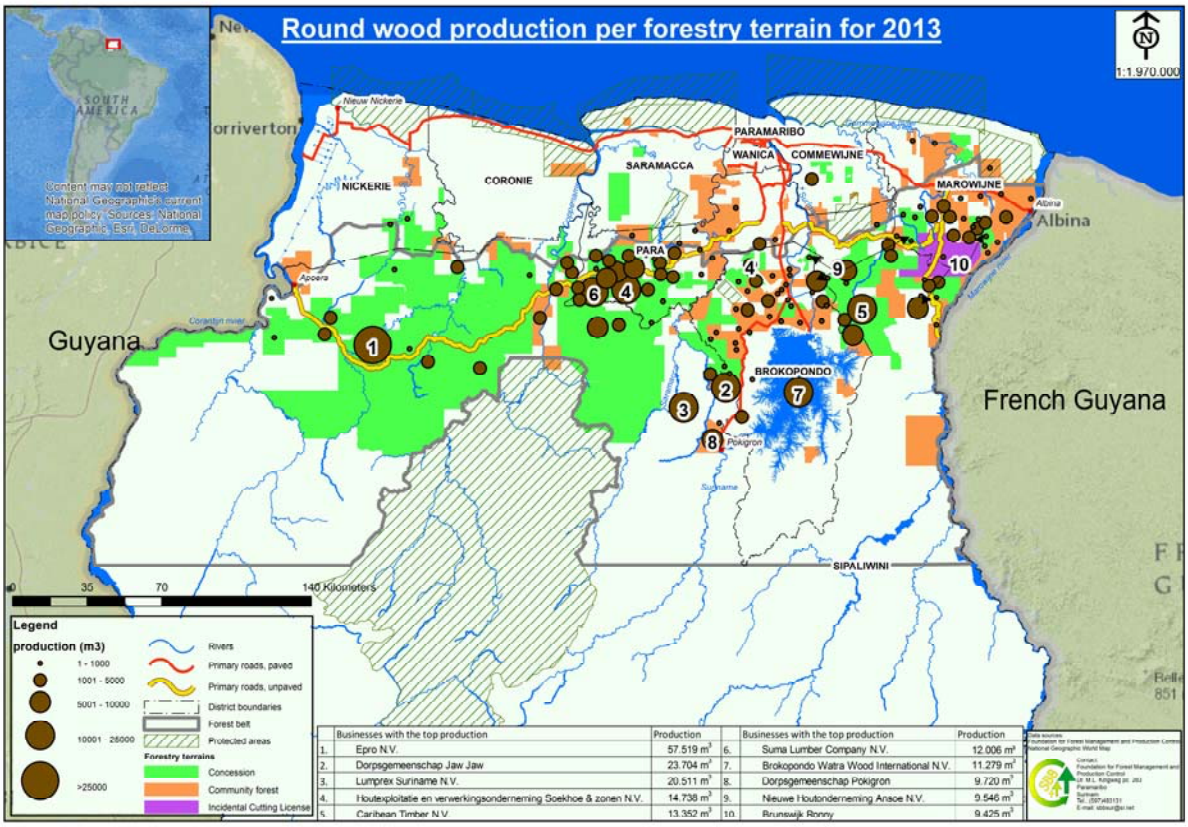
5.6 Production per license holder/logger

In 2013 more than 201 persons and/or companies carried out logging activities in Suriname. Based on the realized production volume the following 10 (ten) license holders and/or loggers can be categorized as important timber producers in Suriname.

- Epro N.V. (57,519 m^3)
- Dorpsgemeenschap Jaw Jaw (23,704 m^3)
- Lumprex Suriname N.V. (20,511 m^3)
- Houtexploitatie en verwerkingsonderneming Soekhoe & zn N.V. (14,738 m^3)
- Caribean Timber N.V. (13,352 m^3)
- Suma Lumber Company N.V. (12,006 m^3)
- Brokopondo Watra Wood International N.V. (11,279 m^3)
- Dorpsgemeenschap Pokigron (9,720 m^3)
- Nieuwe Houtonderneming Ansoe N.V. (9,546 m^3)
- Brunswijk Ronny (9,425 m^3)

In this year these 10 producers have produced 45% of the total round wood of Suriname.

Figure 6. Map with the indication of the production size per producer in 2013



Beside the indication of the important timber producers it is also interesting to provide insight of the degree of production realization by the producers.
In this year the majority of the producers (110 producers), has produced round wood less than 500 m^3 per producer. Furthermore 24 producers has accomplished a production between 500 and 1,000 m^3 round wood. While 22 producers realized a production between 1,000 and 2,000 m^3 and 15 producers between 5,000 and 10,000 m^3. Also can be noted that four producers achieved a production between 10,000 and 20,000 m^3 and 2 producers a production between 20,000 and 40,000 m^3. For one producer the production was more than 40,000 m^3 round wood.

Table 9. Number of producers and the production size in 2013

Production class (m^3)	Number of Producers
<500	110
501 – 1,000	24
1,001 – 2,000	22
2,001 – 3,000	13
3,001 – 5,000	10
5,001 – 10,000	15
10,001 – 20,000	4
20,001 – 40,000	2
>40,000	1

It can be noted that 88 timber cutting license holders carried out timber harvesting activities themselves on the terrains where they have the harvesting rights. By 113 producers, harvesting activities were carried out on forestry terrains where a third party has harvesting rights. Also can be noted that 41 producers have processed the logs in their own timber processing unit. While 23 producers have exported the timber themselves, with or without processing.
Interesting to remark:

- Producers in the production class <1,000 m^3; 18% have processed the round wood themselves and only 2% of them have exported the timber themselves.
- Producers in the production class 1,001 m^3 – 3,000 m^3; 18% have processed the timber themselves and 17% have exported the timber themselves.
- Producers in the production class 3,001 m^3 – 10,000 m^3, 29% have processed the timber themselves and 29% have exported themselves.
- Producers in the production class 10,001 m^3 – 40,000 m^3; 83% have processed the timber themselves and 100% have exported themselves.
- The producers in the production class >40,000 m^3; 100% have processed themselves and 100% have exported themselves.

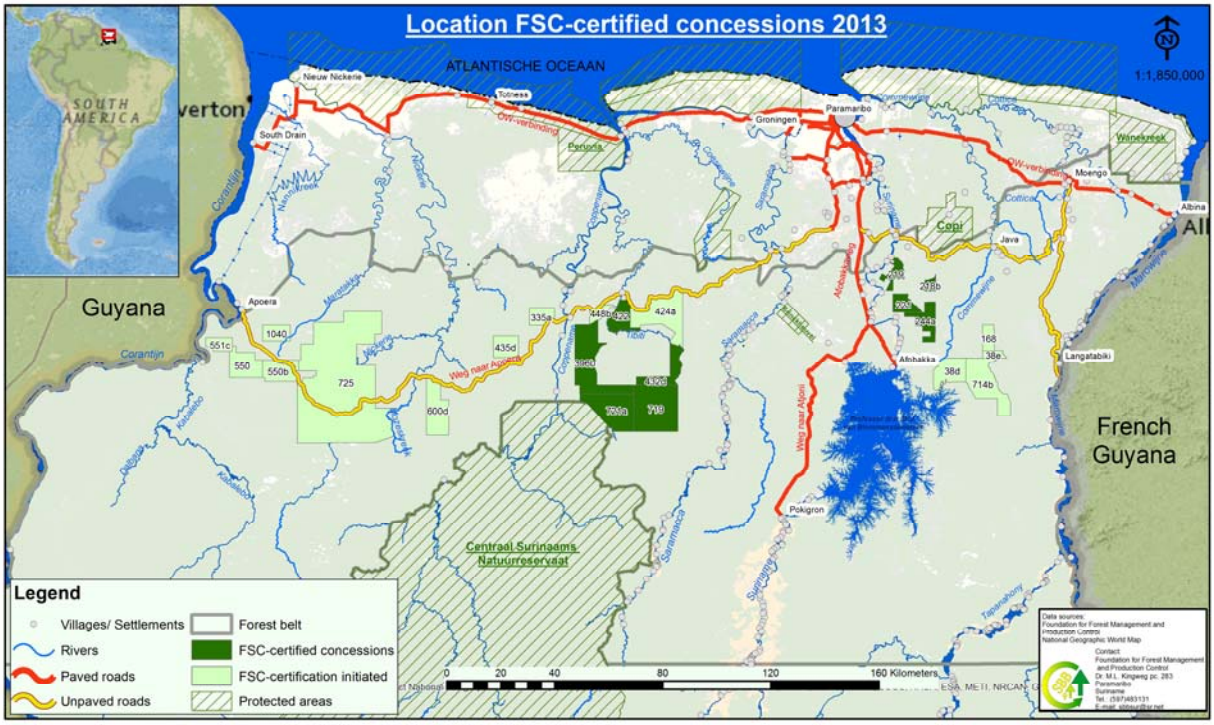
Table 10. Number of producers with own harvesting, own processing, own export and the production size in 2013

Production class (m^3)	Production		Own processing	Own Export
	Own	Third party		
<500	47	63	9	1
501 – 1,000	10	14	9	2
1,001 – 2,000	12	11	6	2
2,001 – 3,000	5	8	4	4
3,001 – 5,000	3	6	4	2
5,001 - 10,000	8	7	3	5
10,001 - 20,000	3	1	4	4
20,001 - 40,000		2	1	2
>40,000		1	1	1
Total	**88**	**113**	**41**	**23**

5.7 Forest certification

The concessions of two timber companies in Suriname are FSC certified. The timber company Suma Lumber Company N.V. has a concession with a total surface of 92,261 ha which is FSC certified. Furthermore, a part of the concession of Nieuwe Houtonderneming Ansoe N.V. with a surface of 21,600 ha, which is managed by E-Timber Industry Suriname N.V. is also certified. This brings the total surface of FSC certified concessions in Suriname to 113,861 ha, which is about 8% of the total area of valid concessions in 2013.
There are a number of timber companies that are in process to certify there concession. These are Dennebos Suriname N.V., Dynasty Forestry Industry N.V., Epro N.V., Houtexploitatie en verwerkingsonderneming Soekhoe en Zonen N.V. and Houtmaatschappij Tropical Timber Company N.V. The total surface of these concessions is 257,538 ha. When the certification process of the mentioned companies is successfully finalized the total area of certified forest in Suriname will increase to an area of 371,399 ha, which will be about 26% of the total area of valid concessions in Suriname.
In 2013 the production of FSC certified timber was 20,832 m^3. This is about 5% of the total timber production of Suriname. The timber production from the forest that are in the certification process equaled 81,206 m^3, or 20% of the total timber production.

Figure 7. Map with the indication of the location of FSC certified concessions in 2013



5.8 Timber species

In 2013 more than 123 species were harvested. gronfolo *(mandio, quaruba),* with a harvested volume of 67,203 m^3 (17% of the production) was the most harvested timber species. basralocus *(angelique)* was the second most produced timber species. The production volume of this species equaled 62,017 m^3 in 2013. The contribution of these two species was about 33% of the total timber production of Suriname in 2013. Other species that had a significant

contribution to the production are: kopi (5%), bruinhart (5%), purperhart (4%), bolletrie (4%), wana (4%), maka-kabbes (4%), walaba (4%) and gindya-udu (3%).
These 10 timber species together have contributed about 66% to the total production of 2013.

Table 11. Industrial round wood production per timber species in 2013

Local Trade name	International Trade name	Botanical Name	Industrial Round wood Production In m^3	Percentage
Gronfolo	*Mandio, Quaruba*	*Qualea spp.*	67,203	17
Basralocus	*Angelique*	*Dicorynia guianensis*	62,017	16
Kopi	*Cupiuba, Kabukalli*	*Goupia glabra*	19,666	5
Bruinhart	*Wacapou*	*Vouacapoua americana*	18,329	5
Purperhart	*Amarante*	*Peltogyne paniculata*	15,728	4
Bolletrie	*Macaranduba*	*Manilkara bidentata*	15,581	4
Wana	*Louro vermelho*	*Ocotea rubra*	15,536	4
Maka-kabbes	*Angelim da mata*	*Hymenolobium flavum*	15,342	4
Walaba	*Wallaba*	*Eperua spp.*	13,568	4
Gindya-udu	*Nargusta, Fukadi*	*Terminalia guyanensis*	9,992	3
Sub-total				
Others			133,156	34
Total			**386,118**	**100**

5.9 Diameter class of produced timber species

Timber production statistics show that the four timber species; gronfolo, basralocus, kopi and bruinhart, have contribute 43% to the total round wood production.
Focusing on the timber species gronfolo, it can be concluded that most of the produced logs are of the diameter class 50 and 80 cm. These three diameter classes have contributed to 72% of the production of this species. The highest realized diameter class for gronfolo was 170cm – 180cm. One log is produced of this diameter class with the volume of 10 m^3. The average volume of all the produced logs of this species is 3.28 m^3.
The most produced logs of the timber species basralocus are of the diameter classes between 50 and 70 cm. These three diameter classes have contributed to 86% of the total production of this timber species. The two largest harvested trees can be found in diameter class 130cm – 140cm, with the total volume of 19 m^3. The average volume of all logs produced of this species is 2.62 m^3.
Just as basralocus, the most produced logs for the timber species kopi are of the diameter classes between 40 and 70 cm. These three diameter classes have contributed 80% to the total production of this species. The highest produced diameter class for kopi was 110 cm -120 cm, and five logs have been produced of this diameter class with the total volume of 41 m^3. The average volume of all logs produced of kopi is 2.15 m^3.
Because bruinhart is a species that is appropriate to produce poles, it is allowed to harvest trees of this species smaller that the allowed minimal cut diameter of 35cm. Most of the logs produced of the species bruinhart are of the diameter classes between 20cm and 50 cm. These three diameter classes have contributed 94% to the total production of this timber species. The highest produced diameter class for bruinhart was 80cm – 90cm. Of this diameter class five logs have been harvested with the total volume of 17 m^3. The average volume of all logs produced of this timber species is 0.79 m^3.

Table 12. Diameter class of produced logs of the timber species gronfolo, basralocus, kopi en bruinhart.

Diameter Class	Gronfolo		Basralocus		Kopi		Bruinhart	
	Number of logs	Volume In m^3	Number of logs	Volume In m^3	Number of logs	Volume In m^3	Number of logs	Volume In m^3
10-20							453	90
20-35							9,586	4,182
35-40	449	430	604	622	941	763	9,058	7,513
40-50	3,100	4,975	5,398	8,641	2,750	3,826	3,286	4,508
50-60	6,298	15,250	9,087	21,170	2,959	6,237	722	1,496
60-70	5,282	18,106	5,810	18,803	1,618	4,889	125	400
70-80	3,215	14,753	1,990	8,459	607	2,406	27	123
80-90	1,402	8,076	569	3,067	199	1,027	5	17
90-100	548	3,758	135	883	62	409		
100-110	170	1,350	41	291	9	68		
110-120	44	406	7	62	5	41		
120-130	6	65						
130-140	1	15	2	19				
140-150								
150-160	1	11						
160-170								
170-180	1	10						
Total	**20,517**	**67,203**	**23,643**	**62,017**	**9,150**	**19,666**	**23,262**	**18,329**

5.10 Production trend and projection

5.10.1 Trend

In the 1st six months of 2013 the realized total round wood production was 169,239 m^3, while this was 232,997 m^3 in the 2nd six months of the same year. This shows that the total round wood production in the 2nd six months compared with the 1st six months of 2013, increased with about 38%. The total round wood production for the whole year in 2013 decreased with 8% compared with the production of 2012.

When focusing on the realized round wood production, the period 2000 until 2013 can be divided as follow.

Period 2000 to 2007
In this period the round wood production was stable and the average production was 170,000 m^3 per annum.

Period 2008 to 2012
From 2008 to 2012 the round wood production in Suriname showed a steady increase. The average production in this period was 290,000 m^3 round wood per annum. And the average growth in this period was 23% per annum.

Period 2013
In contrast with the expectation the round wood production decreased with 8% in 2013 compared with 2012. After a steady growth of 5 years, the production decreased in that year. In April 2013 the EU-FLEGT regulation became into force in Europe. According to this regulation, from this date only legally produced timber are allowed on the European market. Possibly this development has an effect on the timber production of Suriname.

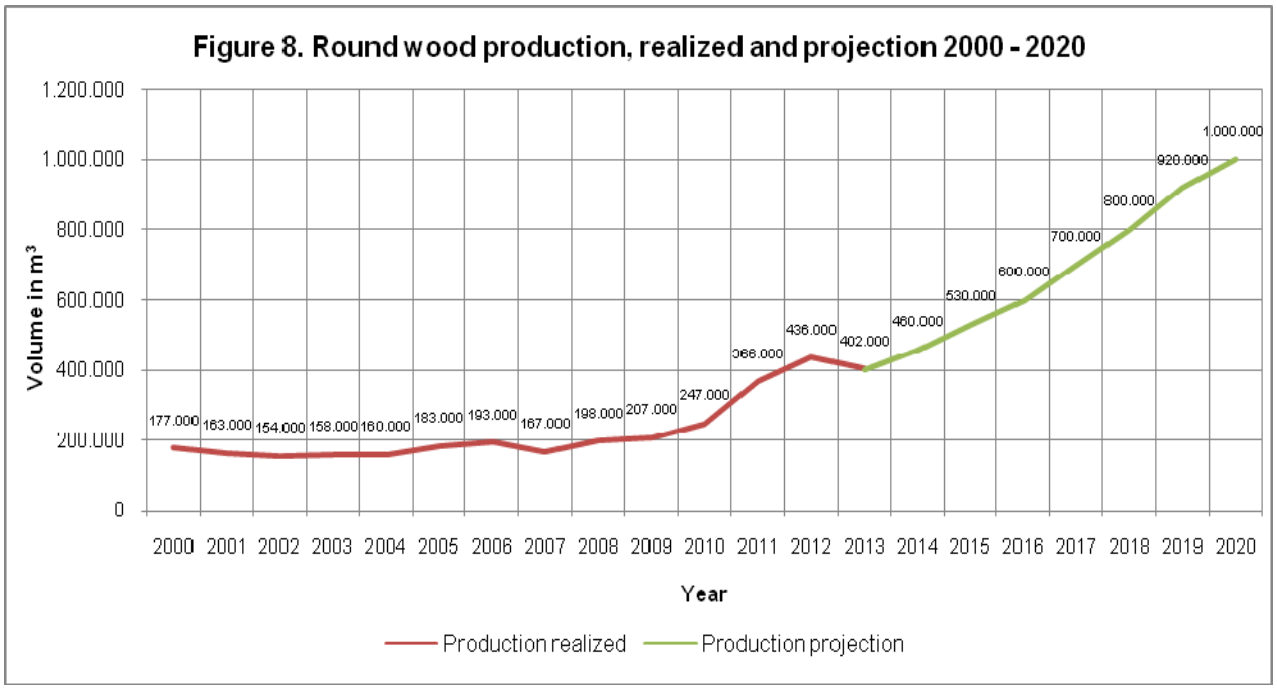
5.10.2 Growth possibility of round wood

It is expected that the timber production growth in Suriname will recover in 2014. In the 1st six months of 2014 the registered round wood production was 200,000 m^3. From 2014 the expected average growth is 15% per annum. The expected production for 2014 is estimated to 460,000 m^3 and ultimately in 2020 the maximum production potential of 1 million m^3 of round wood will be realized.
In 2013 the area fee on concessions within the Surinamese forest sector increased and the expectation was that for a lot of concessionaires it would be very difficult to keep their concessions which might cause a negative effect on the round wood production. However, it can be noted that until now the effect of the increased area fee was limited.

The production potential of the part of the Surinamese forest that is issued for production purposes is 1 million m^3 round wood per annum.
The local market can consume under the current circumstances about 300,000 m^3 round wood per year. There are possible markets for the production growth, e.g. the Chinese market. China imports on a yearly basis millions of m^3 timber, including tropical timber to consolidate their economic growth. It is important to mention that Chinese entrepreneurs have invested in the Surinamese forest sector with the purpose to produce timber for the local Chinese market. It seems that this trend is continuing, because in 2014 a new Chinese business delegation came to orientate within the Surinamese forest sector. The members of this delegation were loggers, owners of timber processing companies, timber traders and construction companies. According to the plans these construction companies will set up house construction factories in Suriname or other Caribbean countries.
Based on the above-mentioned, it can be concluded that, there is potential for production growth as well as a market available for Surinamese timber. However, there are a number of bottlenecks such as: structural lack of technical staff for logging as well as for timber processing. In case the national labor policy allows it, this could be covered by foreign laborers (e.g. Chinese). The production- and export growth is and will be facilitated by the governmental institutions (forest management/SBB). Recently the capacity of SBB has been strengthened significantly. The capacity of the harbor for the handling of the increased export has to be assessed. A decrease of the production cost of locally produced timber is one of the conditions to compete on the international market (Brazil, Africa en Asia). One option to achieve this, could be the availability of cheap fuel (about 40% of the production cost consists of fuel cost), by for instance discharging fuel tax for the forest sector.

Table 13. Round wood production, realized and projected per m^3 2000 – 2020

Year	Round wood production	
	Realized in m^3	Projected in m^3
2000	177,000	
2001	163,000	
2002	154,000	
2003	158,000	
2004	160,000	
2005	183,000	
2006	193,000	
2007	167,000	
2008	198,000	
2009	207,000	
2010	247,000	
2011	366,000	
2012	**436,000**	
2013	**402,000**	
2014		460,000
2015		530,000
2016		600,000
2017		700,000
2018		800,000
2019		920,000
2020		1,000,000



6. TIMBER PROCESSING

6.1 Production of processed timber

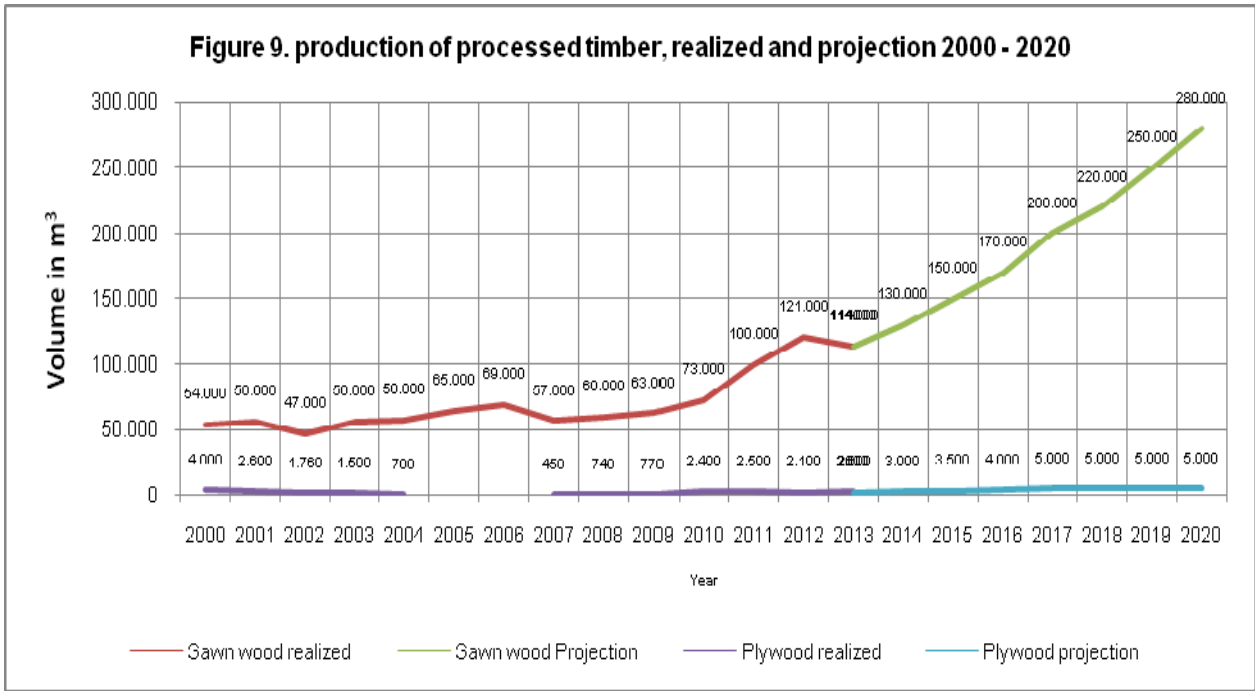
In 2013 the Surinamese timber processing industry consisted of 76 sawmills and one plywood factory. Timber processing in the sawmill takes place with gang saw machines, band saw machine and mobile saw machines. The production in the plywood factory takes place with peeling machines.
The sawmills are established in the districts Wanica (24%), Paramaribo (21%), Para (18%), Nickerie (14%) and Commewijne (13%).
The installed processing capacity of the Surinamese sawmill-industry is estimated to 850,000 m^3 round wood input per annum. With a recovery rate of 40%, the estimated production capacity of sawn wood is 340,000 m^3 per annum. About 72% of the round wood (saw- and peel log) produced in Suriname is processed locally. With this 114,000 m^3 of produced sawn wood 34% of the available capacity was utilized. The production of sawn wood in 2013 declined with 6% compared to the production of 2012. The plywood production in 2013 was 2,600 m^3 which was an increase of 24% compared with 2012.

6.2 Growth possibilities processed timber

As mentioned in paragraph 6.1, the capacity of the sawmill-industry is 340,000 m^3 sawn wood per annum. In 2013 the sawn wood production was 114,000 m^3. The expected average growth from 2014 is 15% per year. The expected sawn wood production for 2014 is 130,000 m^3 the expectation is that in 2020 a sawn wood production of 280,000 m^3 will be realized, which corresponds to the utilization of about 80% of the installed production capacity.
The plywood production in 2013 was 2,600 m^3. The expected average growth for the period 2014 to 2017 is 18% per year. The expected plywood production for 2014 is 3,000 m^3, expected to increase steady to reach 5,000 m^3 in 2017, after which it will be stable until 2020. The growth expectation is based on the expected growth of the demand for construction material, on the local as well as international market. The estimated maximum production capacity of the existing plywood factory equals 5,000 m^3 plywood per year. Without a re- and or expansion investment within this company or set up of other plywood factories, production growth of plywood in Suriname is not feasible.

Table 14. Processed timber, realized and projected 2000 - 2020

Year	Sawn timber		Plywood	
	Realized in m^3	Projected in m^3	Realized in m^3	Projected in m^3
2000	54,000		4,000	
2001	56,000		2,600	
2002	47,000		1,760	
2003	56,000		1,500	
2004	58,000		700	
2005	65,000		-	
2006	69,000		-	
2007	57,000		450	
2008	60,000		740	
2009	63,000		770	
2010	73,000		2,400	
2011	100,000		2,500	
2012	121,000		2,100	
2013	114,000		2,600	
2014		130,000		3,000
2015		150,000		3,500
2016		170,000		4,000
2017		200,000		5,000
2018		220,000		5,000
2019		250,000		5,000
2020		280,000		5,000



7. LOCAL TIMBER PRICES

Table 15. Round wood price per timber species in SRD in 2013

Timber species	Paramaribo		Wanica	
	Price/m^3 Market A	Price/m^3 Market B	Price/m^3 Market A	Price/m^3 Market B
Basralocus	300.00	375.00	310.00	380.00
Gele kabbes	350.00	375.00	350.00	350.00
Groenhart				720.00
Gronfolo	300.00	300.00	310.00	300.00
Kopi	370.00	375.00	350.00	350.00
Mataki	300.00	300.00	310.00	300.00
Pakuli		300.00	310.00	300.00
Pikinmisiki	300.00		310.00	300.00
Rode kabbes				300.00
Rode locus				420.00
Sali			310.00	290.00
Soemaroeba	300.00	300.00	350.00	300.00
Walaba			330.00	300.00
Wana	400.00	425.00	350.00	380.00
Wanakwari	300.00	300.00	300.00	300.00
Wiswiskwari	300.00	300.00	300.00	300.00
Zwarte kabbes	370.00	425.00	400.00	400.00

Table 15 indicates the local market prices of the round wood for a number of timber species for 2013. Hereby the focus is on the most traded timber species within Paramaribo and Wanica. It is notable that the round wood prices of 2013 in Paramaribo and Wanica have declined with respectively 6% and 1%, compared with the prices of 2012. According to the loggers the reason of this decline is excessive competition and -supply of timber on the local market.

Table 16. Average price of semi processed sawn wood and planed sawn wood per timber species in SRD in 2013

Timber species	Paramaribo		Wanica	
	Price/m^3 semi-processed sawn wood	Price/m^3 planed sawn wood	Price/m^3 semi-processed sawn wood	Price/m^3 planed sawn wood
Basralocus	1,700	2,400	1,600	
Gronfolo	1,200	1,900	1,200	
Kopi	2,000		1,900	2,800
Wana	2,500	3,000	2,200	3,000

Table 16 shows the average prices of semi-sawn wood and planed sawn wood for Paramaribo and Wanica. Hereby the focus is on the most traded timber species on the local market. Compared with 2012 the prices of semi processed sawn wood in Paramaribo and Wanica have declined respectively with 2% and 3% in 2013. In the same period and the same districts the price of planed sawn wood declined with respectively 1% en 2%.

8. TIMBER EXPORT

8.1 Timber export per assortment

In 2013 timber and timber products have been exported with the volume and value of respectively 114,868 m^3 and US$ 19,107,557. The most important export assortment was round wood. The export volume and value of this assortment was respectively 94,629 m^3 and US$ 11,314,229. The second most exported assortment was sawn wood, the realized export volume was 18,453 m^3 and the export value US$ 6,156,360.
Furthermore hewn square poles and letterwood has been exported, with the respective volumes of 1,115 m^3 and 453 m^3 and values of US$ 248,384 and US$ 1,248,322. Besides this, the assortment finished product consisting of the timber products door, window, window frame, stair parts, furniture and shingles has been exported with the volume of 218 m^3 and the value of US$ 140,262.

Table 17. Timber export per assortment in 2013

Assortment	Volume in m^3	Value in US$
Round wood	94,629	11,314,229
Hewn square poles	1,115	248,384
Letterwood	453	1,248,322
Sawn wood	18,453	6,156,360
Finished product	218	140,262
Total	**114,868**	**19,107,557**

8.2 Timber export per region

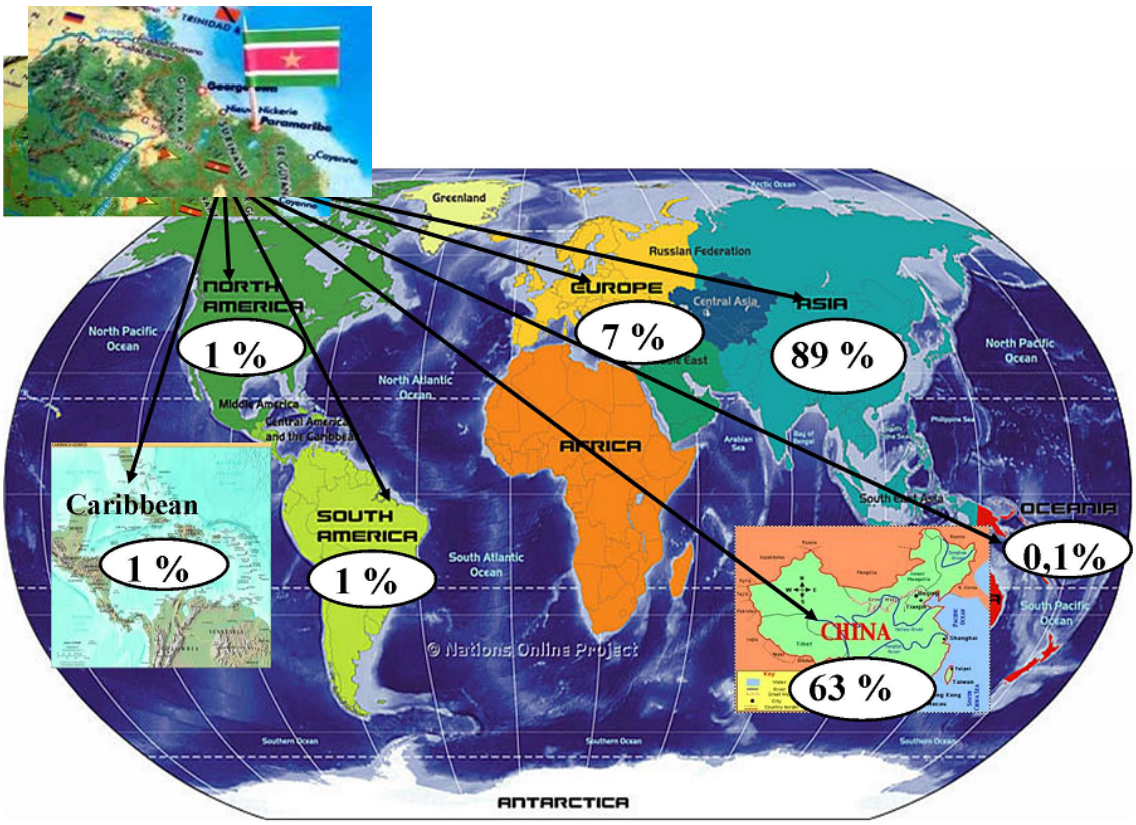
In 2013 timber and timber product have been exported to 32 countries within 6 regions.
Asia: This region was the most important market (89% of the export) for Surinamese timber. Together the countries China, India, Singapore and Taiwan imported about 85% of the timber. With 63% of the total export, China was the largest buyer of Surinamese timber. The Asian market is the largest buyer of as well round wood (99%) as processed timber (43%) from Suriname.
Europe: With 7% of the total export Europe was the second most important market of Surinamese timber. The Netherlands and Belgium are the important markets in this region, each with respectively 3% of the export. The Netherlands is the most important buyer of hewn square poles and imported 77% of this product in 2013. Europe is the second largest buyer of processed timber, with a realized volume of 7,340 m^3 and a value of US$ 2,722,906. The timber exported to the European Union timber has the value of US $ 2,978,825.

North & Central America and South-America, Caribbean en Pacific: These regions took respectively 1%, 1%, 1% and 0,1% of Surinamese timber. Despite the fact that Suriname is a member of the Caribbean Community (CARICOM), only a very small

quantity is exported to this common market. In 2013 timber with an export value of US $ 22,468 has been exported to the CARICOM.

More than 75% of the timber (US$ 15,300,868) had the destination of the ITTO consuming member countries. To the ITTO producing member countries timber has been exported with the value of US$ 2,127,088.

Figure 10. Timber export per region in 2013



8.3 Export per timber exporter

In this year 70 timber traders have exported timber from Suriname. The highest export volume (22,061 m^3) has been realized by the company Woody Wood Timber N.V. The 2nd largest exporter was Wintrip International N.V. This company has exported timber with the volume of 15,080 m^3. The export volume of Greenheart Suriname N.V. was 13,892 m^3. Other companies that have contributed significantly to the timber export are RNS. Natural Resources N.V., Smart Nice Wood Lumber N.V. and Tacoba Forestry Consultant N.V. These six companies have contributed 63% to the total timber export of Suriname in 2013.

8.4 Export per timber species

Round wood: In 2013 the Surinamese forest sector has exported 54 species of round wood. Compared with the last years is this 36% lower. With a contribution of 29% basralocus is the most exported timber species of this assortment. The second most exported species was bruinhart (contribution of 10%). Other species with significant contribution are purperhart, maka-kabbes, bolletrie, groenhart, kopi and gindya-udu. In total, eight timber species have contributed 72% to the total export of the assortment round wood.

Hewn square poles: Of this timber assortment, which is produced of the timber species basralocus, a volume of 1,115 m^3 has been exported.

Letterwood: As known, the core of the trunk of this timber species is utilized for the production of fancy timber products. In 2013 letterwood with a total volume of 453 m^3 has been exported, representing an export value of US$ 1,248,322.

Sawn wood: About 59 timber species have been exported as sawn wood. The most exported timber species of this assortment was basralocus. This species contributed 24% to the total export of this assortment. Other important timber species were walaba (19%), bolletrie (9%), gindya-udu (6%), gronfolo (6%) and groenhart (5%). These six species have contributed about 69% to the total export of sawn wood.

8.5 Export of wooden souvenirs and gift packages

Table 18. Export of wooden souvenirs and gift packages per assortment in 2013

Assortment	Quantity In pieces	Value in US $
Furniture	208	16,534
Kitchen utensils	51	1,007
Wooden sample	3,611	17,867
Music instrument	36	1,918
Ornament	21,916	63,253
Other timber product	610	929
Total	**26,432**	**101,508**

Table 18 shows that in 2013 the total of 26,432 pieces of wooden souvenirs and gift packages have been exported. Including this the revenue earned from export was US$ 101,508. Ornaments were the most exported assortment, with a number of 21,916 pieces and a value of US $ 63,253 (62%). Just like in 2012 the second most exported assortment was wooden sample, consisting of different timber species for promotion purposes. With this the promotion of Surinamese timber on the international market has been further pursued.

8.6 Export trend and projection

Based on the realized timber export, the period 2000 to 2013 can be classified as follows:

Period 2000 to 2007

Just like the timber production the timber export was also stable in this period. The average annual timber export volume was 19,000 m^3.

Period 2008 to 2012

This period can be characterized as one of a strong growth of the timber export for Suriname. The average annual export volume was 68,000 m^3, with an average annual growth of 39%. It is worth mentioning that in 2012 utmost timber export volume of 120,338 m^3 has been realized.

Period 2013

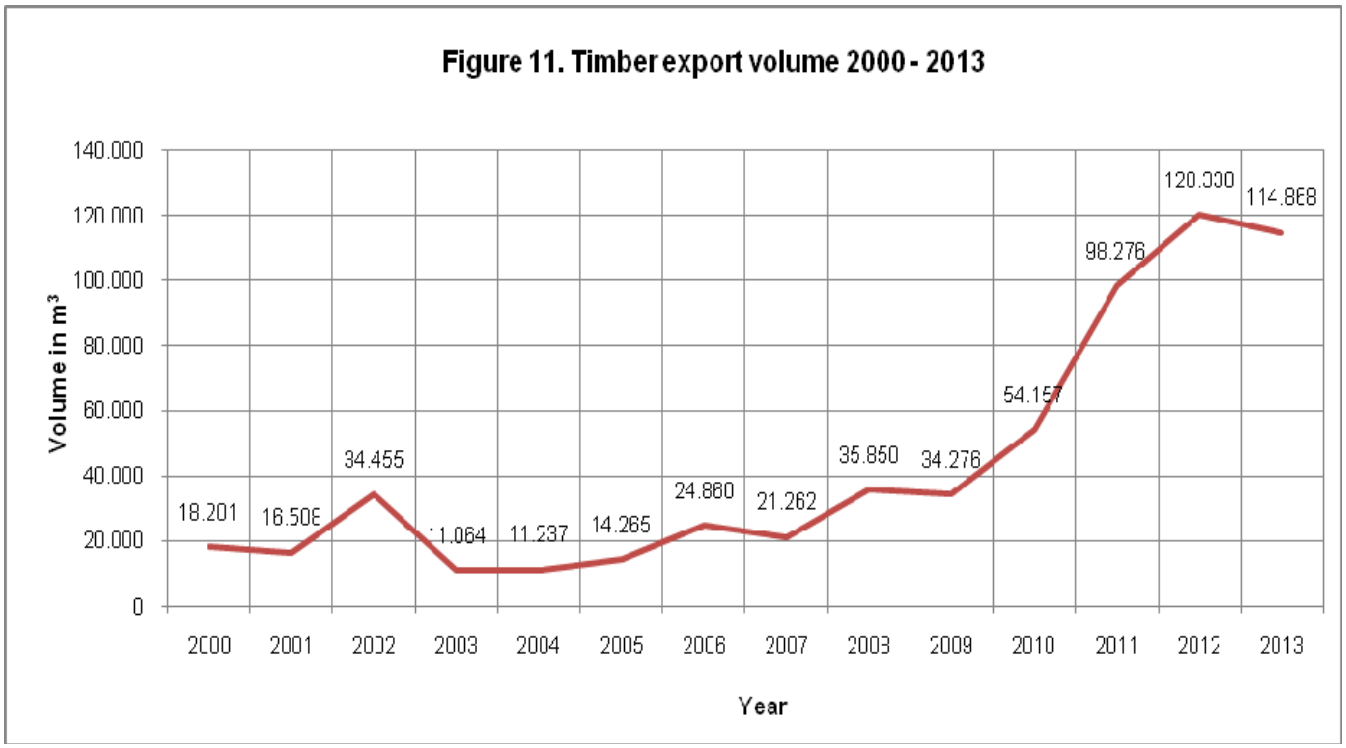
In 2013 the timber export volume declined with 5% compared with 2012, while the export value for the same period increased with 4%. This has to do with the fact that more processed wood is exported in 2013 .

The expectation is that in 2014 the export growth will recover and will increase with 15% compared to 2013.

The total national export revenue of Suriname was US$ 2.2 billion in 2013, and the contribution of timber export was about 0.9%.

Table 19. Timber export 2000 – 2013

Year	Volume in m^3	Value In US $
2000	18,201	3,295,800
2001	16,508	3,520,500
2002	34,455	5,405,000
2003	11,064	2,488,100
2004	11,237	2,339,500
2005	14,265	2,936,100
2006	24,860	4,554,100
2007	21,262	4,957,100
2008	35,850	5,542,900
2009	34,276	5,180,300
2010	54,157	8,299,900
2011	98,276	14,260,200
2012	120,338	18,315,100
2013	114,868	19,107,500



9. TIMBER IMPORT

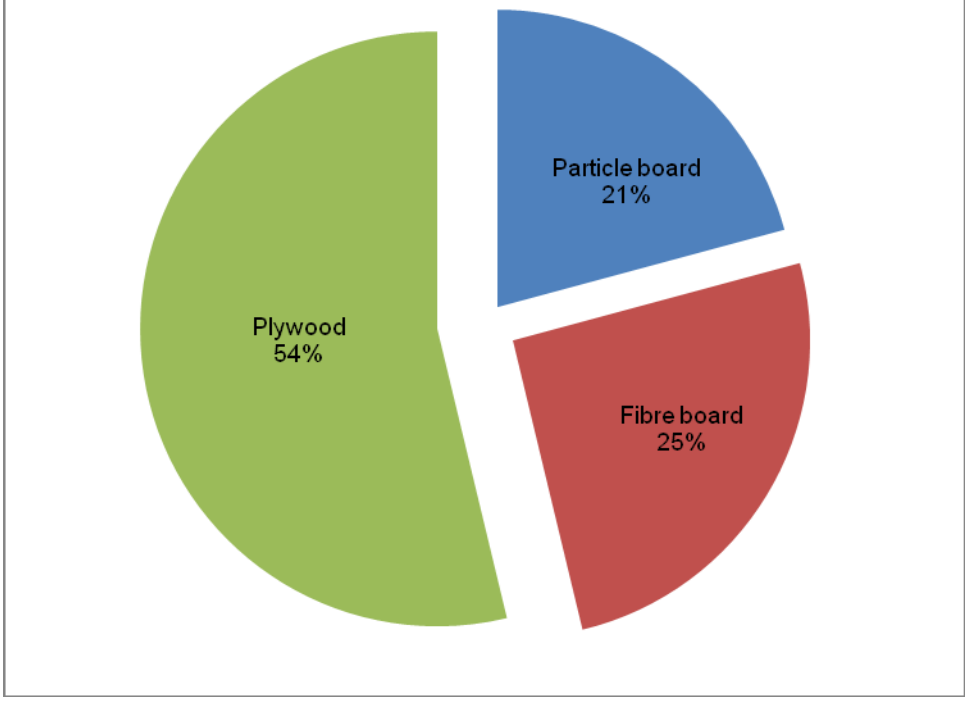
Table 20. Import of timber products in 2013

Assortment	2013	
	Volume in m^3	Value in US $
Particle board	1,733	595,463
Fibre board	2,118	1,083,373
Plywood	4,478	1,999,023
Total	**8,329**	**3,682,653**

The most important timber products imported by Suriname in 2013 were particle board, fibre board and plywood. The respective import volumes were 1,733 m^3, 2,118 m^3 and 4,478 m^3. The total realized import value was US$ 3,682,653.
Looking at the realized timber import value, China can be categorized as the most important business partner of Suriname. About 55% of all the timber products came from this country. The import of these products from Brazil, Guyana and the Netherlands were respectively 13%, 11% and 7%.

The total national import value in 2013 was US$ 2.3 billion, and the contribution of timber import was about 0.2%.

Figure 12. Import of timber products per assortment in 2013



10. DOMESTIC TIMBER CONSUMPTION

Table 21. Production, export, import and domestic timber consumption in m^3 in 2013

Assortment	Production in m^3	Export in m^3	Import in m^3	Domestic consumption in m^3
Round wood	386,080	94,629		291,451
Hewn square poles	38	1,115		
Sawn wood	114,000	18,453		95,547
Plywood	2,600		4,478	7,078
Particle board			1,733	1,733
Fibre board			2,118	2,118

The following factors are used to determine the domestic timber consumption; local timber production, timber import and timber export.
On the local market a volume of 291,451 m^3 of round wood has been traded in 2013. Since Suriname does not import round wood, it can be assumed that all the round wood was locally produced. Round wood is processed by the local timber processing industry into hewn square poles, sawn timber and plywood.

In 2013 the domestic sawn wood consumption was 95,547 m^3. This was also locally produced sawn timber.

The domestic consumption of plywood in 2013 was 7,078 m^3, of which 4,478 m^3 was imported plywood and 2,600 m^3 locally produced plywood.

Furthermore, 1,733 m^3 of particle board and 2,118 m^3 of fiber-board were sold domestically in 2013. These are imported timber products. It is worth mentioning that these import products are not produced in Suriname.

The total domestic timber consumption was 164,302 m^3 round wood equivalent in 2013. The per capita timber consumption was 0.31 m^3 round wood equivalent in 2013.

11. GOVERNMENT EARNINGS FROM THE FORESTRY SECTOR

The government charges forestry taxes on forest areas issued for forest production. In 2013 the tariffs of the forest area charges in Suriname has been revised. At this moment the valid tariffs of the forest charges are:

- Exploration fee; SRD 5.00 per ha per year
- Concession rights; SRD 20,00 per ha per year
- Retribution on A class of timber species; US $ 6.00 per m^3
- Retribution on B class of timber species; US $ 5.50 per m^3
- Grading fee on round wood and timber products; SRD 3.00 per m^3
- Grading fee on letterwood; SRD 3.00 per 1,000 kg
- Grading fee on forest byproducts SRD 3.00 per kg
- Export duties on unprocessed and semi-processed timber 20% - 5% depend on the degree of processing

In 2013 the government collected SRD 1,039.- exploration fees, SRD 279,614.- concession rights, SRD 8,468,495.- retribution, SRD 47,251.- grading fee and SRD 8,700,000.- export duties on unprocessed and semi-processed timber. The total direct earning of the government from the forestry sector was SRD 17,496,399.- in this year.

The export revenues earned due to the export of timber and timber products was US$ 19,107,500.- in 2013.
The estimated local market timber trade turnover was SRD 200,000,000.-.

The gross domestic product of all the economic activities in Suriname was about SRD 17 billion in 2013. The contribution of the forestry sector, including logging and timber processing was (SRD 151 million) about 1%.

The forestry sector in Suriname provides work to 5,500 people, this is 4% of the working population of Suriname.

12. CARBON IN THE FOREST

The forest area of Suriname is 15.3 million ha. With an average of ca. 170 ton[3] of carbon storage per ha forest, the Surinamese forest stores about 2,610 million ton of carbon in the therein occurring above- and below ground biomass and soil.

The production forest of Suriname with the surface of 4.5 million ha stores about 765 million ton of carbon.
Due to logging activities, shifts in the carbon content or emissions of carbon dioxide can occur. The direct causes here for are:

- About 20% of the felled tree (branches and leaves) remains on the forest soil, where the tree was felled.
- Soil disturbance is caused by the extraction of the round wood, etc.
- The undergrowth in the surrounding area is also affected by felling and extraction.
- The other trees in the vicinity of the tree that was felled are damaged during the felling and extraction process.

In 2013, 385,117 m^3 of timber was extracted from the production forests of Suriname. Because of this, approximately 172,000 tons of carbon were moved from the forest. The local saw mills processed 290,000 m^3 of round wood. This resulted in approximately 114,000 m^3 of processed products. Because of this processing 174,000 m^3 of timber was released in the form of waste, which was presumably destroyed by burning. This process resulted in the emission of approx. 285,000 tons of carbon dioxide into the atmosphere.

[3] Estimation based on the executed forest inventories in Suriname. Currently these estimations are being improved, including in a number of REDD+ related projects

SOURCES:

National Bureau of statistics (ABS), Division National Accounts

National Bureau of statistics (ABS), Suriname Basic Indicators 2012-1

SBB, Forestry statistics, Production, export en import of timber and timber products in 2012

SBB, Forestry sector analysis 2010

SBB, Forestry sector analysis 2011

SBB, Forestry sector of Suriname 2012

SBB, Sawmill industry in Suriname 2012

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