

Country profile

Suriname

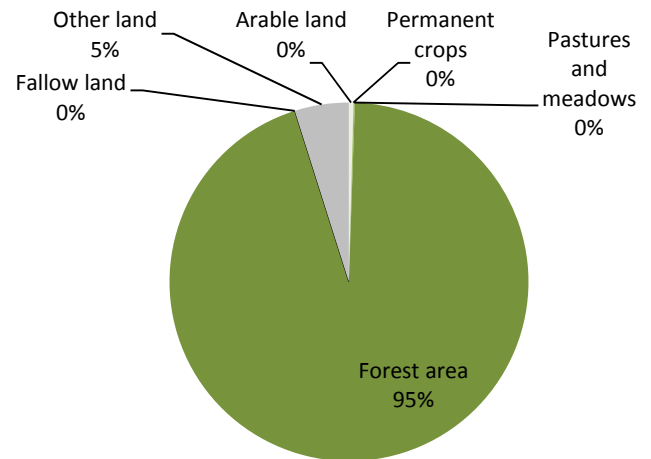
Status 07/2015

Page 1

GENERAL INFORMATION

Base Year..... **MEDIAN 2008-2012**

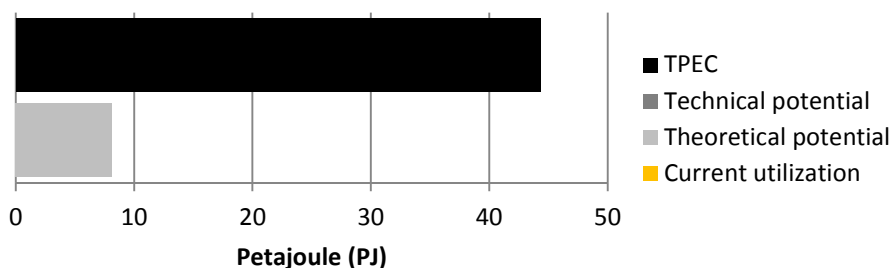
Population.....	539,000
Country area.....	16,382,000 ha
Land area.....	15,600,000 ha
Agricultural area.....	82,000 ha
Arable land.....	59,000 ha
Permanent crops.....	6,000 ha
Pastures and meadows.....	17,000 ha
Forest area.....	14,758,000 ha
Fallow land.....	no data
Other land.....	761,600 ha
Total primary energy consumption (TPEC).....	44 PJ



TOP 10 OF BIOMASS RESOURCES BASED ON AVAILABLE DATA

BIOMASS RESOURCE	THEORETICAL POTENTIAL		TECHNICAL POTENTIAL	UTILIZATION	
				total	free
TOTAL	8.12 PJ	<i>2.42 PJ*</i>	no data in PJ	no data	no data
1. Rice, paddy	3.42 PJ	-	no data in PJ	no data	no data
2. Sugar cane	1.80 PJ	-	no data in PJ	no data	no data
3. Bananas	1.29 PJ	-	no data in PJ	no data	no data
4. Rice straw*	-	<i>1.04 PJ*</i>	no data in PJ	no data	no data
5. Rice husks*	-	<i>0.75 PJ*</i>	no data in PJ	no data	no data
6. Bagasse*	-	<i>0.63 PJ*</i>	no data in PJ	no data	no data
7. Cattle manure	0.56 PJ	-	no data in PJ	no data	no data
8. Others	0.51 PJ	-	no data in PJ	no data	no data
9. Oranges	0.22 PJ	-	no data in PJ	no data	no data
10. Plantains	0.18 PJ	-	no data in PJ	no data	no data
<i>Remaining biomass</i>	0.12 PJ	-	no data in PJ	no data	no data

* This biomass is part of an agricultural product and can not summed up. The share is shown separately.



PJ	Liter Diesel
1	18.5 million
5	92.5 million
10	185.0 million
100	1850.2 million

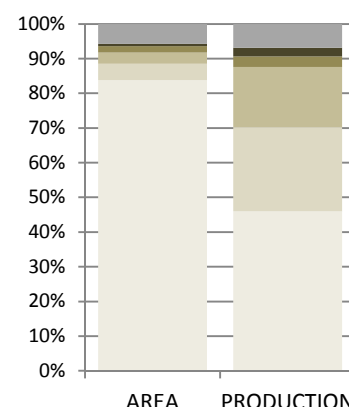
Assumptions:
Lower Heating Value Diesel: 45,4 MJ/kg,
dense: 0,84 kg/m³

BIOMASS FROM AGRICULTURE

STATISTICS AND CALCULATIONS

TOP 5 of agricultural products from statistics

RANK	MAIN PRODUCT	AREA ha	PRODUCTION t	LHV MJ/kg	ENERGY PJ
Total		64,170	495,662	-	7.43
1.	Rice, paddy	53,777	228,028	15.0	3.42
2.	Sugar cane	3,050	120,100	15.0	1.80
3.	Bananas	2,029	86,000	15.0	1.29
4.	Oranges	1,216	14,976	15.0	0.22
5.	Plantains	400	12,330	15.0	0.18
	Others	3,698	34,228	15.0	0.51

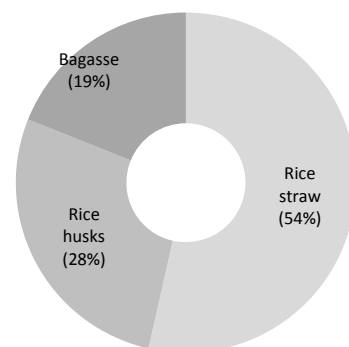


Remarks: In case of no available data for energy content the assumption was set to 15 MJ/kg.

1. 2. 3. 4. 5. Others

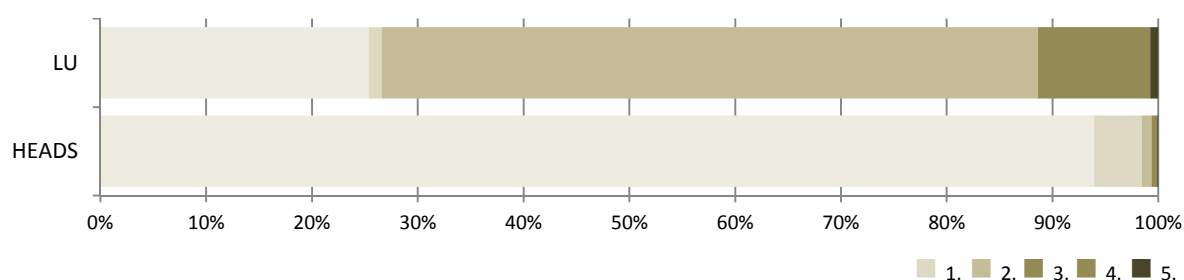
Residues related to the TOP 5 of agricultural products

MAIN PRODUCT	RELATED RESIDUE	CROP-RESIDUE-FACTOR	t	LHV MJ/kg	ENERGY PJ
1. Rice, paddy	Rice straw	0.447	101,929	10.2	1.04
2. Rice, paddy	Rice husks	0.23	52,446	14.3	0.75
3. Sugar cane	Bagasse	0.3	36,030	17.5	0.63
4. Bananas	no data	no data	no data	no data	no data
5. Oranges	no data	no data	no data	no data	no data
6. Plantains	no data	no data	no data	no data	no data



TOP 5 of animal manure

RANK	LIVESTOCK	HEADS in 1,000	LU in 1.000	Calculation		LHV PJ/t	PJ
				$t_{\text{manure}}/\text{Head}$	t_{manure}		
Total		6,111	91	-	993,361	-	0.681
1.	Chickens	5,740	23	0.0125	71,750	1.155	0.083
2.	Ducks	276	1	no data	no data	no data	no data
3.	Cattle	56	56	14.8	831,619	0.671	0.558
4.	Pigs	32	10	2.8	89,992	0.439	0.040
5.	Sheep	7	1	no data	no data	no data	no data



1. 2. 3. 4. 5.

PREFERENCE REGIONS, NEXT STEPS AND DEFINITIONS

TOP 5 PREFERENCE REGIONS

1. no data
2. no data
3. no data
4. no data
5. no data

TOP 5 NEXT STEPS FOR RESEARCH

1. Harmonize literature data with statistical data to find a comparable basis.
2. Identify the technical potential of the most important biomass resource(s).
3. Find specific locations for an utilization.
4. Find sustainable concepts for biomass supply.
5. Ensure the sustainable distribution of power and heat.

DEFINITIONS

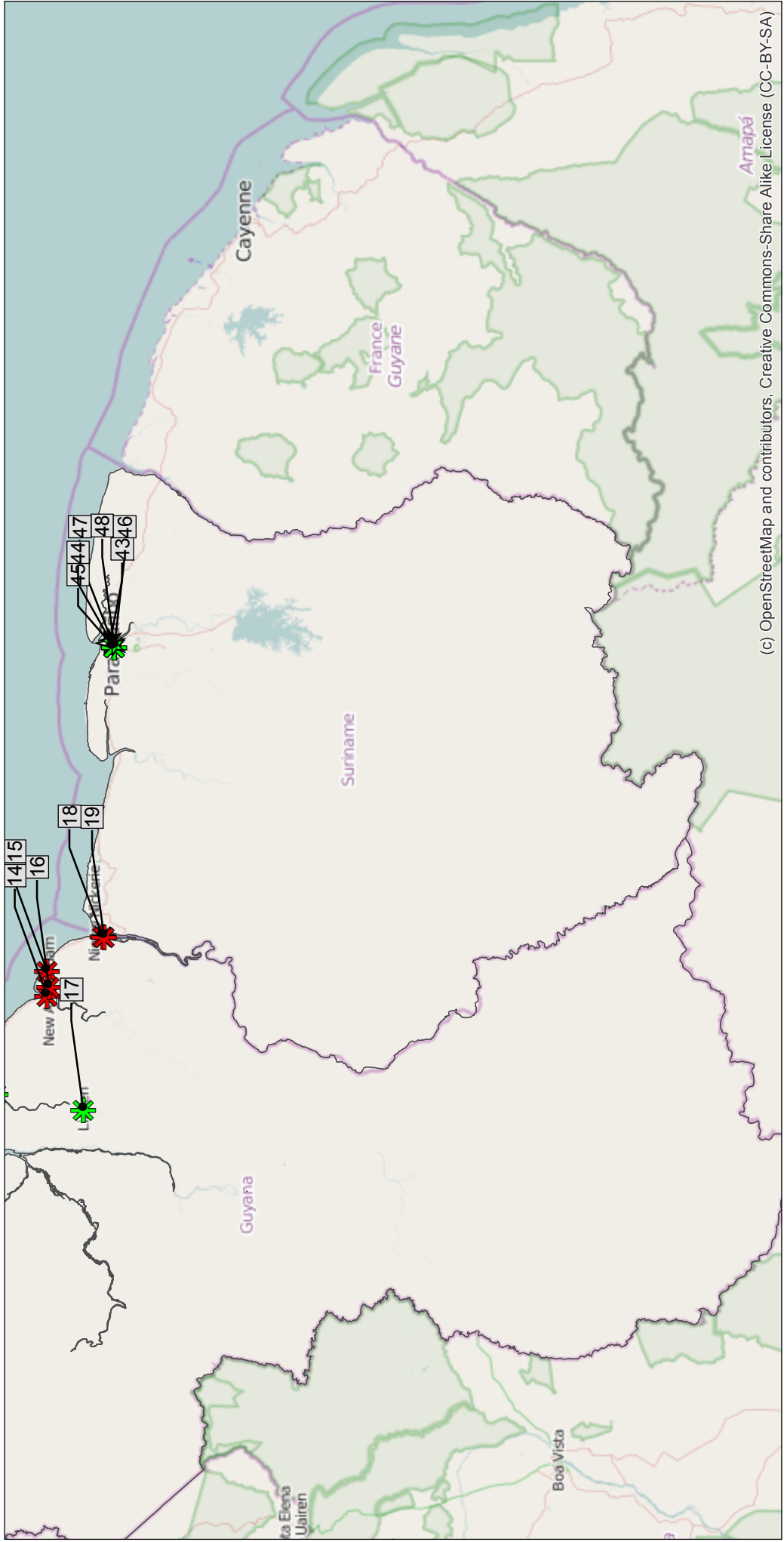
Arable land	Capable of being ploughed and used to grow crops.
Permanent crops	Cultivable land that is not being used for annually-harvested crops.
Theoretical biomass potential	Means the maximum without any regard to other demands like food, fodder or material use. This information gives a very first overview about available data regarding the amount of biomass that exists in the selected country.
Technical biomass potential	Includes all relevant restriction and competing uses. But, the calculations in literature (if available) often take only some of the restrictions into account. Also different time horizons and geographical coverage can cause huge inconsistencies. Consequently, various results can exist for the same resource.

CONTACT

DBFZ - Deutsches Biomasseforschungszentrum gGmbH
 Torgauer Str. 116
 D-04347 Leipzig
 +49 (0) 341 2434 112
 info@dbfz.de
 www.dbfz.de

ACKNOWLEDGEMENT

The research leading to these results has received funding from GIZ. Special thanks are directed to all partners in the CARICOM consortium for their support in reviewing and collecting primary data.



Suriname

- ☆ Brewery
- ★ Juice Production
- ◆ Farmer
- ◆ Landfill
- ★ Rum Distillery
- ◆ Sawmill
- ★ Sugarcane Factory
- Landfill/Transfer Station



DATA DESCRIPTION

DATA DESCRIPTION AND REFERENCES

The "Country Profile" is a very first and quick option to get an overview about the available information on biomass resources in the selected country. The results are based on statistics, literature, surveys and calculations made by DBFZ/Germany. **Because of insufficient data the results have to be interpreted with the awareness of uncertainties! The compilation has not the claim of completeness!**

PAGE 1

Page 1 contains general information on population, land use and total primary energy consumption (TPEC) as well as a summary about the most important biomass resources. Furthermore, page 1 presents a chart with the share of energy content of the compiled data compared to the TPEC.

Page 2

Page 2 shows the TOP 5 results for agricultural products, its related residues and results for animal manure as well. The data on this page is based on official FAO-Statistics and calculations/conversions made by DBFZ.

Page 3

Page 3 is focused on additional data from literature and primary data collection. Results are presented with the most relevant level of information. The tables contain a specific identification of the biomass that is also categorized into "Biomass from agriculture", "Biomass from forestry" and "Waste and other residues", the regional level (e.g. national, regional, local), a description (if necessary) and the underlying time frame. The results for theoretical and/or technical potential are shown in units that were mentioned in literature. Mainly, the authors describe the compiled potentials in different units. Relevant information (e.g. specific factors for mass, volumina, energy content etc.) for an objective consideration is often missing. This circumstance makes it difficult to find a common level for a comparison. In context of these "Country profiles" the data from literature and survey is only listed but not processed. Please contact the DBFZ for further information.

PAGE 4

Page 4 contains qualitative information for TOP 5 "Preference regions", TOP 5 "Next steps for research". These information present options for the discussion about an efficient development of biomass resources.

PAGE 5

On page 5 a thematic map presents an overview about the selected country. In conjunction with basic information (open street maps) also collected primary data is included. Because of a better handling the spatial information is referenced as a number. Please check country profile's annex for further description. In case of aggregated regions please contact DBFZ.

REFERENCES

General information (page 1), biomass from agriculture (page 2) and factors for residues and/or energy content

FAO Statistics 2015: <http://faostat.fao.org/> | U.S. Energy Information Administration, <http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=44&pid=44&aid=1> | Koopmans, A., Koppejan, J. 1998: Agricultural and forest residues - generation, utilization, and availability, in: <http://www.fao.org/docrep/006/AD576E/ad576e00.pdf>; 27.01.2015 | Thrän et al. 2010: Global and regional spatial distribution of biomass potentials - status quo and options for specification, in www.dbfz.de/web/fileadmin/user_upload/DBFZ_Reports/DBFZ_Report_7.pdf, 08.06.2015 | S. Prasertsan et al. 2005: "Biomass and biogas energy in Thailand: Potential, opportunity and barriers"; 13 September 2005 | Akgün, O., Korkeakoski, M., Mustonen, S., Luukkanen, J. 2011: Theoretical Bioenergy Potential in Cambodia and Laos, Bioenergy Technology (BE), World Renewable Energy Congress 2011 - Linköping Sweden, 08-13.05.2011, available at: http://www.ep.liu.se/ecp/057/vol1/045/ecp57vol1_045.pdf | EGGLESTON H.S. et al. (ed.): INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC): 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 5 Waste, Prepared by the National Greenhouse Gas Inventories Programme, IGES, Japan, 2006

Country-specific sources from literature and surveys (page 3)

LITERATURE: Staatsoil 2012: Sugarcane to ethanol and sugar project | Suriname Business Forum (SBF) 2010: Renewable energy potential and business opportunities in Surinam | SURVEYS: no data

SPATIAL REFERENCES

Number | Name | Description | Type of biomass | Amount

42	Sranan Biri	Brewery	Beer	no data for amount
43	Suriname Alcoholic Beverages N.V.	Rum Distillery	Rum	no data for amount
44	Houthandel Mangal	Sawmill	Lumber	no data for amount
45	New Life N.V.	Sawmill	Lumber	no data for amount
46	Nooitgedacht N.V.	Sawmill	Lumber	no data for amount
47	Houthandel de Eenheid	Sawmill	Lumber	no data for amount
48	Surinaamse Brouwerij NV	Brewery	Beer	no data for amount