

Country profile

Haiti

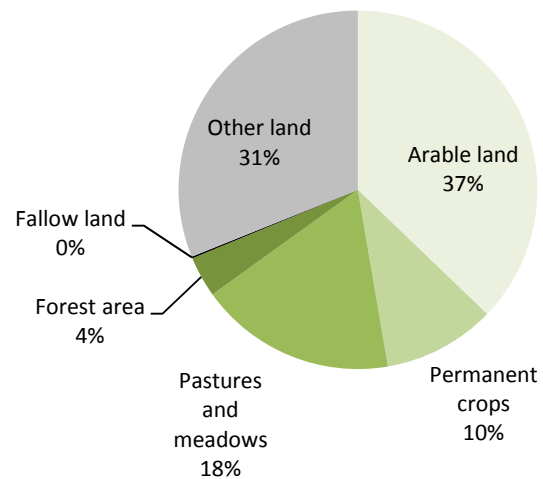
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Page 1

GENERAL INFORMATION

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

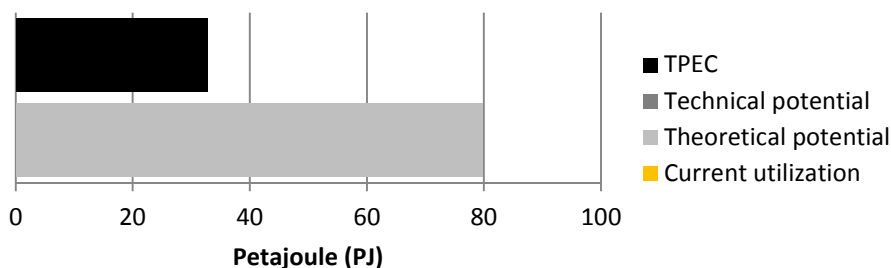
Population.....	10,317,000
Country area.....	2,775,000 ha
Land area.....	2,756,000 ha
Agricultural area.....	1,796,330 ha
Arable land.....	1,026,330 ha
Permanent crops.....	280,000 ha
Pastures and meadows.....	490,000 ha
Forest area.....	101,000 ha
Fallow land.....	4,900 ha
Other land.....	857,870 ha
Total primary energy consumption (TPEC).....	33 PJ



TOP 10 OF BIOMASS RESOURCES BASED ON AVAILABLE DATA

BIOMASS RESOURCE	THEORETICAL POTENTIAL		TECHNICAL POTENTIAL	UTILIZATION	
				total	free
TOTAL	79.77 PJ	<i>6.40 PJ*</i>	no data in PJ	no data	no data
1. Others	25.73 PJ	-	no data in PJ	no data	no data
2. Sugar cane	16.95 PJ	-	no data in PJ	no data	no data
3. Cattle manure	14.48 PJ	-	no data in PJ	no data	no data
4. Cassava	6.64 PJ	-	no data in PJ	no data	no data
5. Bagasse*	-	<i>5.93 PJ*</i>	no data in PJ	no data	no data
6. Sweet potatoes	5.14 PJ	-	no data in PJ	no data	no data
7. Maize	4.80 PJ	-	no data in PJ	no data	no data
8. Yams	4.72 PJ	-	no data in PJ	no data	no data
9. Pigs manure	1.23 PJ	-	no data in PJ	no data	no data
10. Cassava stalks*	-	<i>0.47 PJ*</i>	no data in PJ	no data	no data
<i>Remaining biomass</i>	0.08 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

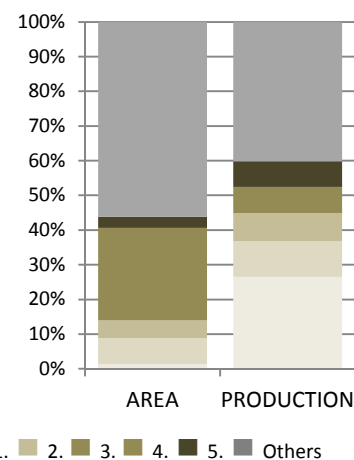
Assumptions:
Lower Heating Value Diesel: 45,4 MJ/kg,
dense: 0,84 kg/m³

BIOMASS FROM AGRICULTURE

STATISTICS AND CALCULATIONS

TOP 5 of agricultural products from statistics

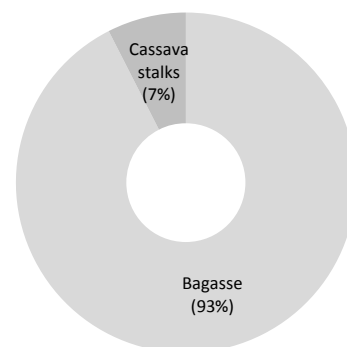
RANK	MAIN PRODUCT	AREA ha	PRODUCTION t	LHV MJ/kg	ENERGY PJ
Total		1,450,224	4,265,216	-	63.98
1.	Sugar cane	18,750	1,130,000	15.0	16.95
2.	Cassava	110,034	442,500	15.0	6.64
3.	Sweet potatoes	74,000	342,932	15.0	5.14
4.	Maize	386,548	319,793	15.0	4.80
5.	Yams	46,620	314,777	15.0	4.72
Others		814,272	1,715,215	15.0	25.73



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

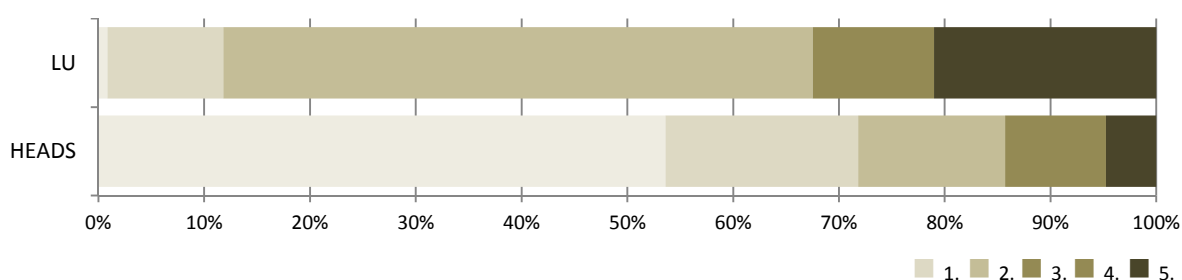
Residues related to the TOP 5 of agricultural products

MAIN PRODUCT	RELATED RESIDUE	CROP-RESIDUE-FACTOR	t	LHV MJ/kg	ENERGY PJ
1. Sugar cane	Bagasse	0.3	339,000	17.5	5.93
2. Cassava	Cassava stalks	0.062	27,435	17	0.47
3. Sweet potatoes	no data	no data	no data	no data	no data
4. Maize	no data	no data	no data	no data	no data
5. Yams	no data	no data	no data	no data </tr	



TOP 5 of animal manure

RANK	LIVESTOCK	HEADS in 1,000	LU in 1,000	Calculation		LHV PJ/t	PJ
				t _{manure} /Head	t _{manure}		
Total		10,494	2,617	-	24,444,113	-	15.790
1.	Chickens	5,625	23	0.0125	70,313	1.155	0.081
2.	Goats	1,910	287	no data	no data	no data	no data
3.	Cattle	1,458	1458	14.8	21,571,000	0.671	14.477
4.	Pigs	1,001	300	2.8	2,802,800	0.439	1.231
5.	Horses	500	550	no data	no data	no data	no data



BIOMASS FROM AGRICULTURE

LITERATURE AND SURVEYS*

*results are only listed, not processed on page 1

Source	Biomass	Regional level	Description	Time frame	Theoretical biomass potential		Technical biomass potential		Utilization	
					Value	Unit	Value	Unit	used %	free %
Lit	Pig manure	National	no data	2014	600,000	animals	no data	no data	no data	no data
Lit	Sugarcane	National	no data	2003	5,000,000	t fm	7,342,500	m ³ /a	no data	no data
Lit	Bagasse	National	no data	no data	5,000	t/a	44	GWh	no data	no data
Lit	Vetiver roots	National	no data	no data	1,400 - 1,600	t/d	29	GWh	no data	no data

Lit: literature, Prim: Primary data from surveys

BIOMASS FROM FORESTRY

Source	Biomass	Regional level	Description	Time frame	Theoretical biomass potential		Technical biomass potential		Utilization	
					Value	Unit	Value	Unit	used %	free %
	no data									

Lit: literature, Prim: Primary data from surveys

BIOMASS FROM WASTE AND OTHER RESIDUES

Source	Biomass	Regional level	Description	Time frame	Theoretical biomass potential		Technical biomass potential		Utilization	
					Value	Unit	Value	Unit	used %	free %
Lit	Municipal solid waste	Local	no data	2014	no data	no data	no data	no data	no data	no data
Lit	Municipal solid waste	National	no data	2000	5,055,330	t	no data	no data	no data	no data
Lit	Food waste (from MSW)	National	no data	2000	2,370,950	t	no data	no data	no data	no data
Lit	Food waste (from MSW)	National	no data	2000	4,255	TJ	no data	no data	no data	no data
Lit	Household waste	National	no data	2000-2003	120,000	t/a	no data	no data	no data	no data

Lit: literature, Prim: Primary data from surveys

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

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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: Worldwatch 2014:Haiti Sustainable Energy Roadmap | FAO 2014:Livestock Waste Management and Bioenergy Generation Concept Note | UNIVERSITE CATHOLIQUE DE LOUVAIN (UCL) 2009:VALORISATION DE LA BIOMASSE-ENERGIE EN HAITI | Worldwatch 2014:Haiti Sustainable Energy Roadmap | UNIVERSITE CATHOLIQUE DE LOUVAIN (UCL) 2009:VALORISATION DE LA BIOMASSE-ENERGIE EN HAITI | SURVEYS: no data

