

# Criteria and indicators for sustainable woodfuels

Case studies from Brazil, Guyana, Nepal,  
Philippines and Tanzania



# **CRITERIA AND INDICATORS FOR SUSTAINABLE WOODFUELS**

Case studies from Brazil, Guyana,  
Nepal, Philippines and Tanzania

Edited by

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## Acronyms

<b>AC</b>	Acre
<b>ADB/OECF</b>	Asian Development Bank/Overseas Economic Cooperation Fund
<b>AFC</b>	The Austrian Students
<b>AMS</b>	Associacao Mineira de Silvicultura
<b>ANSAB</b>	Asia Network for Sustainable Agriculture and Bio-Resources
<b>APFC</b>	Asia Pacific Forestry Commission
<b>A/R</b>	Afforestation/ Reforestation
<b>ATO</b>	African Timber Organization
<b>BA</b>	Bahia
<b>BERC</b>	Biomass Energy Resource Center
<b>BRACELPA</b>	Brazilian Pulp and Paper Corporation
<b>BZCF</b>	Buffer Zone Community Forest
<b>BZCF</b>	Buffer Zone Community Forest
<b>CBD</b>	Convention of Biological Diversity
<b>CBFM</b>	Community-based Forestry Management
<b>CBFMA</b>	Community-based Forestry Management Agreement
<b>CBO</b>	Community Based Organization
<b>CDC</b>	Commonwealth Development Cooperation
<b>CDM</b>	Clean Development Mechanism
<b>CE</b>	Ceara
<b>CF</b>	Community Forest
<b>CHAPOSA</b>	Charcoal Potential in Southern Africa
<b>CIFOR</b>	Center for International Forestry Research
<b>C&amp;I</b>	Criteria and Indicators
<b>CME</b>	Coconut fatty acid methyl ester
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>CONPET</b>	National Programme of Rationalization of Petroleum Derivatives and Natural Gas
<b>CSA</b>	Canadian Standards Association
<b>CVRD</b>	Companhia Vale do Rio Doce
<b>DA</b>	Department of Agriculture
<b>DAP</b>	Development Academy of the Philippines
<b>DAR</b>	Department of Agrarian Reform
<b>DDC</b>	District Development Committee
<b>DENR</b>	Department of Environment and Natural Resources
<b>DFO</b>	District Forest Officer
<b>DFPSC</b>	District Forest Products Supply Committee
<b>DOE</b>	Department of Energy
<b>DOF</b>	Department of Forests
<b>DOST</b>	Department of Science and Technology
<b>ERB</b>	Energy Regulatory Board
<b>ESMAP</b>	Energy Sector Management Program
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FBD</b>	Forestry & Beekeeping Division
<b>FCS</b>	Family Consumption Survey
<b>FD</b>	Field Document
<b>FECOFUN</b>	Federation of Community Forest Users Nepal
<b>FMB</b>	Forest Management Bureau



<b>FMP</b>	Forest Management Plan
<b>FMU</b>	Forest Management Unit
<b>FPDB</b>	Forest Products Development Board
<b>FSC</b>	Forest Stewardship Council
<b>FSMP</b>	Forestry Sector Master Plan
<b>FUG</b>	Forest Users Group
<b>GDP</b>	Gross Domestic Product
<b>GFC</b>	Guyana Forestry Commission
<b>GHG</b>	Greenhouse Gas
<b>GIS</b>	Geographic Information System
<b>GJ</b>	Giga Joule
<b>GoG</b>	Government of Guyana
<b>HDI</b>	Human Development Index
<b>HECS</b>	Household Consumption Survey
<b>IBAMA</b>	Instituto o Brasileiro do Meio Ambiente e dos Recursos Naturais Renovaveis
<b>IBIGE</b>	Brazilian National Statistics Agency
<b>IEA</b>	International Energy Agency
<b>IHEP</b>	Integrated Human Ecology Project
<b>INEE</b>	Instituto Nacional de Eficiencia Energetica
<b>IPED</b>	Institute for Private Investment Development
<b>ITTC</b>	International Tropical Timber Council
<b>ITTO</b>	International Tropical Timber Organization
<b>IUCN</b>	International Union for Conservation of Nature
<b>JAFTA</b>	Japan Forest Technical Association
<b>JBIC</b>	Japan Bank for International Cooperation
<b>KFW</b>	Kreditanstalt für Wiederaufbau, ( <i>Reconstruction Credit Institute</i> )
<b>LEI</b>	The Indonesian Ecolabelling Institute
<b>LGU</b>	Local Government Unit
<b>LHF</b>	Lease Hold Forest
<b>LPG</b>	Liquefied Petroleum Gas
<b>LSGA</b>	Local Self Governance Act
<b>MAI</b>	Mean Annual Increment
<b>MEM</b>	Ministry of Energy and Minerals
<b>MFSC</b>	Ministry of Forests and Soil Conservation
<b>MGJ</b>	Million Giga Joule
<b>MLHSD</b>	Ministry of Lands and Human Settlement Development
<b>MMBFOE</b>	Million barrels of oil equivalent
<b>MME</b>	Ministry of Energy and Mines
<b>MNRT</b>	Ministry of Natural Resources and Tourism
<b>MOF</b>	Ministry of Finance
<b>MPFD</b>	Master Plan for Forestry Development
<b>MTCC</b>	Malaysian Timber Certification Council
<b>MTOE</b>	Million tons of oil equivalent
<b>MT</b>	Mato Grosso
<b>MT</b>	Metric tons
<b>MTCC</b>	Malaysian Timber Certification Council
<b>MW</b>	Mega watt
<b>NAPOCOR</b>	National Power Corporation
<b>NDS</b>	National Development Strategy

<b>NFA</b>	Nepal Foresters' Association
<b>NEA</b>	National Electrification Administration
<b>NGO</b>	Non-Government Organization
<b>NPC</b>	National Power Corporation
<b>NRE</b>	Non-Renewable Energy
<b>NSCB</b>	National Statistics Coordinating Board
<b>NSO</b>	National Statistics Office
<b>NTFP</b>	Non-Timber Forest Products
<b>NWFP</b>	Non-wood forest products
<b>PA</b>	Para
<b>PEFC</b>	Program for the Endorsement of Forest Certification
<b>PEP</b>	Philippine Energy Plan
<b>PFE</b>	Permanent Forest Estate
<b>PHP</b>	Philippine Peso
<b>PJ</b>	Peta Joule
<b>PR</b>	Parana
<b>PRESSEA</b>	Promotion of Renewable Energy Sources for Southeast Asia
<b>RA</b>	Republic Act
<b>RE</b>	Renewable Energy
<b>RETRUD</b>	Renewable Energy Technology for Rural Development
<b>RLDC</b>	Rural Livelihood Development Company
<b>RPS</b>	Renewable Energy Portfolio Standards
<b>RWEDP</b>	Regional Wood Energy Development Programme
<b>SADC</b>	Southern Africa Development Conference Cooperation
<b>SDS</b>	Swiss agency for Development and Cooperation
<b>SFA</b>	Sustainable Forest Initiative
<b>SFP</b>	State Forest Permission
<b>SFM</b>	Sustainable Forest Management
<b>SIFMA</b>	Socialized Industrial Forest Management Agreement
<b>SSC</b>	Swedish Space Corporation
<b>SWP</b>	Sustainable Woodfuels Production
<b>TANWAT</b>	Tanganyika Wattle Company
<b>TaTEDO</b>	Tanzania Traditional Energy Development Organization
<b>TCN</b>	The Timber Corporation of Nepal
<b>TLA</b>	Timber License Agreement
<b>TOF</b>	Trees Outside of Forest
<b>TPES</b>	Total Primary Energy Supply
<b>TSI</b>	Timber Stand Improvements
<b>UBET</b>	Unified Bioenergy Terminology
<b>UNCED</b>	United Nations Conference on Environment and Development
<b>UNDP</b>	United Nations Development Programme
<b>URT</b>	United Republic of Tanzania
<b>USAID</b>	United States Agency for International Development
<b>USDA</b>	United States Department of Agriculture
<b>VDC</b>	Village Development Committee
<b>V &amp; M</b>	Vallourec and Mannesmannrohren
<b>WECS</b>	Water and Energy Commission Secretariat
<b>WISDOM</b>	Woodfuel Integrated Supply/Demand Overview Mapping
<b>WRI</b>	World Resources Institute

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## Summary

The International Energy Agency's (IEA) Key World Energy Statistics published in 2008 show that the World Total Final Consumption for Combustible Renewables and Waste stood at 13.2% in 2006 as compared to 13.2% in 1973. This means that after more than 30 years, the reality that biofuels and bioenergy, including woodfuels and fuelwood will remain to be used in the many years to come. Its consumption may yet persist to be traditional in poverty regions, but modernization efforts are rapidly expanding particularly in more developed countries. This is mainly due to the fact that bioenergy resources are still abundant in many areas, it can be locally sourced as it is indigenous, and if managed properly, these resources are environmentally appropriate and sustainable.

According to FAO, woodfuels consist of all types of biofuels originating directly or indirectly from wood biomass that includes fuelwood, charcoal and black liquor (not included in this study). The growing interest in wood energy is leading to a high demand for woodfuels. There is a general concern that increased woodfuel use may cause additional pressure of already dwindling supply sources leading to additional deforestation and devegetation. As such, standards for sustainable management of different supply sources of fuelwood and charcoal are needed to ensure renewable woodfuel production and uses. However, many aspects influencing the different processes and operation units of the production of woodfuels are not yet properly understood, described and quantified.

FAO and IEA Bioenergy Task 31 have developed a project to evaluate criteria and indicators applicable to woodfuel systems to ensure sustainability. This project considered environmental, economic and social criteria, as well as the legal and institutional framework, which can ensure the sustainable production of woodfuels from forests, trees outside forests and other sources. As part of this project case studies were conducted in five developing countries covering three geographical regions. The case studies of Brazil, Guyana, Nepal, Tanzania and Philippines provide essential information to contribute to the elaboration of principles, criteria and indicators for sustainable woodfuels.

The importance and significance of woodfuel production and consumption all over the world particularly among developing countries is huge. The need for a policy framework that will provide sustainability in production and management can no longer be delayed. But are countries ready to establish one? Are data and information available? Is there political will among governments and its citizens so that despite rapid industrialization, a sustainable woodfuel production will continue to be achieved in the years to come? These are some of the questions that these case studies sought to answer. Each country's case is unique from the other yet similar in the way that woodfuels continue to be a traditional source of energy yet data and policies are wanting. And despite these circumstances, there is much evidence to show that woodfuels particularly charcoal and fuelwood production, consumption, and trade do have tremendous socioeconomic and environmental impact in all these countries.