Presentation 2.6: Wood waste for energy: lessons learnt from tropical regions

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Abstract
ITTO is an intergovernmental organization established in 1986 by the International Tropical Timber Agreement (ITTA, 1983). ITTO contributes to global policy work in tropical forestry by funding studies, activities and field projects in its member countries.

Improving tropical forest logging practices, higher efficiency in processing of forest products with more value adding, and promoting the use of wood waste to increase energy efficiency and reduce fuel costs at the mills are the main components of the policy and project work of the Forest Industry Division.

Examples are given from policy studies and from lessons learnt from field projects on the type and volumes of wood waste generated by the timber processing industry in tropical countries. Major opportunities and challenges are highlighted for introducing appropriate policies and technological innovations to promote the use of wood waste for energy production. Not only the financial viability of the process needs to be guaranteed but also environmental and sustainable forest management criteria need to be met.




INTERNATIONAL SEMINAR on ENERGY and the FOREST PRODUCTS INDUSTRY

Rome, 30 - 31 October 2006

WOOD WASTE FOR ENERGY: LESSONS LEARNT FROM TROPICAL REGIONS

by the

INTERNATIONAL TROPICAL TIMBER ORGANIZATION (ITTO)

CONTENT



1) What is ITTO ? How does it work ? How does ITTO promotes wood waste as a source for energy?

2) Processing tropical timber: What is wasted, how much, where, use ?

3) Wood waste for energy: lessons from projects in the tropics

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What is ITTO?

An intergovernmental organization established (1986) by the International Tropical Timber Agreement (ITTA, 1983), negotiated under the auspices of the United Nations Conference on Trade and Development (UNCTAD) as part of that organization's Programme for Commodities.

The International Tropical Timber Organization - ITTO

Mandate: Promoting sustainable forestry development through trade, conservation and best-practice forest management

- Global Policy work in tropical forestry
- Secretariat of 35 people based in Yokohama, Japan
- US$290 million grants to projects in member countries (160 ongoing)

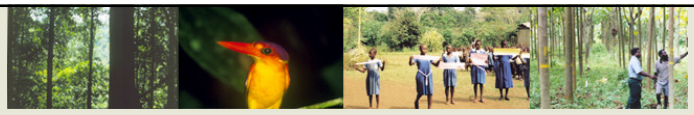
Membership

ITTO:

- brings together tropical timber producers and consumers countries as equal partners in decision-making
- currently has 59 members

ITTO membership represents:

- over 90% of world tropical timber trade
- almost 80% of the world's tropical forests



ITTO – Wood Waste for Energy

Working with member countries, government agencies, NGOs, local communities and private sector for REDUCING waste:

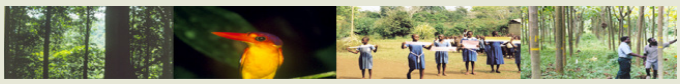
✓**REDUCED IMPACT LOGGING:** to harvest forests without destroying them (less waste)

✓**VALUE ADDING and HIGHER EFFICIENCY** in processing of forest products by reducing & recycling processing waste

✓**WOOD WASTE for BIOENERGY:** to increase efficiency of energy production and reduce fossil fuel consumption at the mill

Examples of Projects on Bio-Energy

Title	Country
Development of energy alternatives for the efficient utilization of wood processing residue for co-generation and briquette production	Ghana
Processing and utilization of logging residues through collaboration with local communities and forest industries	Ghana
Research and development in energy alternative from biomass through briquetting	Malaysia
Increasing the efficiency in the tropical timber conversion and utilization of residues from sustainable sources	Brazil
Increasing utilization efficiency and the reduction of losses and waste throughout the production chain	Cameroon



Ongoing Policy Work

- Promoting the recovery of logging and wood-processing waste for recycling and energy

International Conference on wood based Energy - LIGNA – Hannover,

17-18 May 2007.

focus on needs and challenges of timber producers in the tropics

2) Processing tropical timbers : What is wasted, how much, where ?

General characteristics wood processing industry in the tropics

#, non-integrated, small, scattered mills, supply from natural forests, reduced log supplies, limited range of products (saw/ply), low technology & investment

growth through increase efficiency – no longer by expanding logging area

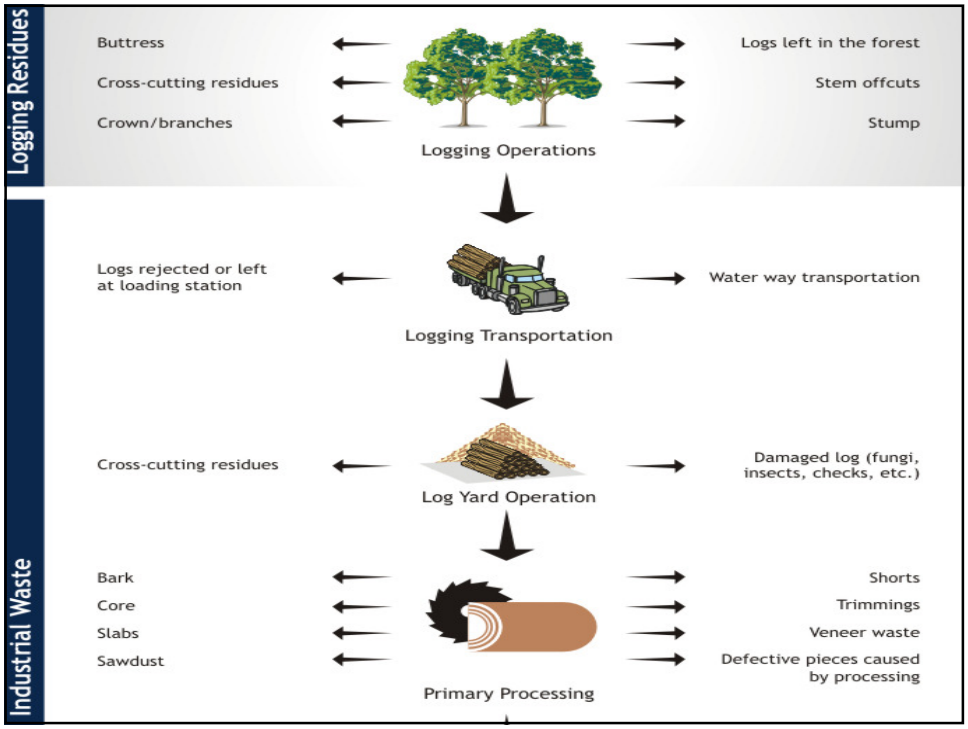
What is waste?

FOREST: Logging, road & infrastructure construction

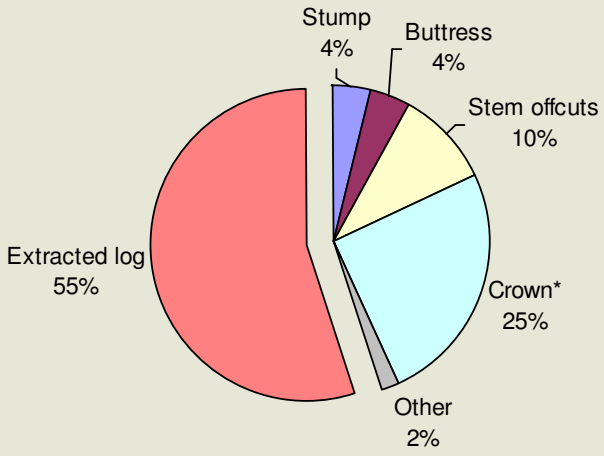
MILLS: Industrial wood waste from primary processing

Heterogeneity of waste and long transport distances

Amazon wood waste case study



Estimate on Forest Logging Residues in the Amazon Region



Wood Waste Generation in the Amazon Region by **Sawmill** and **Plywood/veneer** Industry

Activity	Range of losses (%)
Log yard operations	5-10
Sawing	40-45
Grading	2-5
Storage	3-5
Total	**50-65**

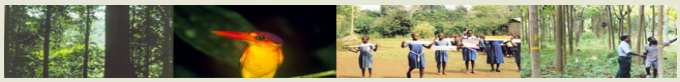
Activity	losses (%)
Log yard operations	4
Peeling process	30
Veneer preparation (drying, jointing, gluing,	7
Plywood manufacturing process (sanding, trimming, etc.)	8
Storage	2
Total	**51**

Logging Residues and Wood Waste Generation by Tropical Timber Industry in the Amazon

Type of residue	Volume	Share
	million m^3	%
Logging residues	28.0	57
Industrial residues		
Sawmills	20.0	40
Plywood plants	1.2	2
Other processing plants	0.5	1
	21.7	43
Total	**49.7**	**100**

Logging Residues and Wood Waste Generation by Tropical Timber Producers

	Production (M m3) 2004				Waste%	**Waste Volum**
	Asia	L.Am	Africa	Total		
Logs	74	36	18	128	0.8	**105**
Sawn	18	18	4	40	1	**40**
Plyw	12	2	0.3	14	1	**14**
Ven	2	0.3	0.7	3	1	**3**
Total wood waste estimate (million m3)						**162**

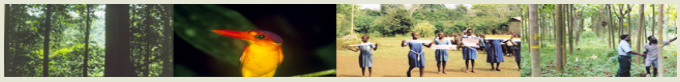


uses for wood waste

CHIPS
CHARCOAL
PELLETS
BRIQUETTES
COMPOSTING, MULCH: event. with CH4 recovery
SAWDUST & flakes: absorbent for accidental chemical spills

MILL: heat, steam (drying) improve boiler efficiency
Electricity cogeneration

POWERPLANT: Energy production

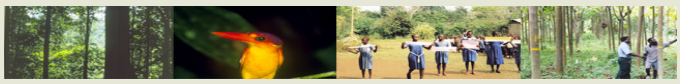


3) Lessons learnt from projects

Brazil: "Increasing the efficiency in the tropical timber conversion and utilization of residues from sustainable sources"
Biomass availability for Energy production studied at 4 sites
Mills:
Financially viable: use of industrial processing waste and logging residues (till 50 km)
harvesting of non-commercial species for energy is NOT (high costs + jeopardizing SFM)

Power plants: (2 MWH) (2-10 MWH)
NOT VIABLE: industrial waste (>50 Km) and logging waste (all)
- Subsidies for fuel oil (hydro power)
- Legal impediment for use of forest harvest residues (taxes,?)
- Seasonality of raw material supply + ? Sustainabilty > 15 year

(Viable if developed jointly with the expanding agri-business (for ex. drying soybeans, or by using agri-business waste)



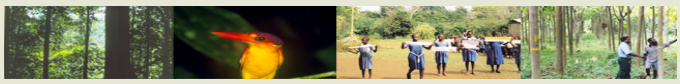
3) Lessons learnt from projects

Malaysia: " **Research and development in energy alternative from biomass through briquetting"**

legal environmental restrictions on dumping / burning sawdust (Klang municipality)

- Financial viability

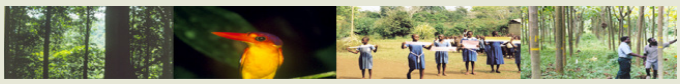
  Incentives (reductions in taxes, import duties,….)
- Technology transfer and marketing support package (FRIM + ITTO project)



3) Lessons learnt from projects

Ghana: "**Processing and utilization of logging residues through collaboration with local communities and forest industries**"

- Social constraints: availability of wood waste for energy is limited due to recovery by local communities (logging & mill waste)
- Developing Public - Private - Local community's partnerships & enabling policy framework



Conclusions

Major constraints for waste recycling

Uncertainty in log supply from natural forests

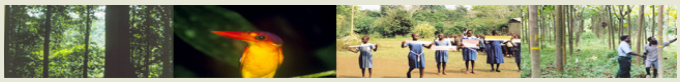
Smaller diameter logs, SFM, legality, ….

High waste throughout the entire supply chain

for ex. Log export bans – low price of logs for local market

- Narrow range of products **(saw, ply, veneer) in a non-integrated, fragmented industry structure, and with a distant location to reconstituted panels/products manufacturing** (lack of vertical and horizontal integration)
- Heterogeneity of waste and long transport distances
- Lack of data on availability on wood waste limits investors' interest in waste recycling
- Lacking Policy, Institutional & Incentive support

insufficient investment in Human resources & equipment, inadequate enforcement of environmental, labor regulations..



Recommendations for Actions by tropical producers

- **Policy Development**: Detect & Remove conflicting taxation - forest policies; more stringent standards for reducing waste into C&I of SFM, certification and processing; incentives for reducing waste – lower CO2 emissions; tighter integration of industry;
- **Market Development**: identify and expand market opportunities for engineered products made from recycling wood waste;
- **Technological Development:** Improved efficiencies in wood processing and wood combustion technologies
- **Skill Development:** upgrading and capacity building; facilitate dissemination of information and consultations; technology transfer; R&D; enhance consciousness for reducing waste

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Thank you

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Producer member countries

Africa	Asia	Latin America
Cameroon	Cambodia	Bolivia
Central African Rep.	Fiji	Brazil
Congo	India	Colombia
Cote d'Ivoire	Indonesia	Ecuador
Dem. Rep. of Congo	Malaysia	Guatemala
Gabon	Myanmar	Guyana
Ghana	Papua New Guinea	Honduras
Liberia	Philippines	Mexico
Nigeria	Thailand	Panama
Togo	Vanuatu	Peru
		Suriname
		Trinidad & Tobago
		Venezuela