

July 2012



منظمة الأغذية
والزراعة للأمم
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Food and
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Продовольственная и
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Organización
de las
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para la
Alimentación y la
Agricultura

COMMITTEE ON FORESTRY

TWENTY-FIRST SESSION

Rome, Italy, 24-28 September 2012

TRANSLATING THE OUTCOME OF RIO+20 INTO ACTION

Wood Energy for a sustainable future

I. WOOD ENERGY AND SUSTAINABLE DEVELOPMENT

1. In the Rio+20 Declaration, world leaders made commitments to improve access to sustainable and modern energy services for the 1.4 billion people who are currently without them. Recognizing its importance for sustainable development, they also reaffirmed support for energy policies and strategies that meet development needs through the use of appropriate technologies and different sources and types of energy. Depending on local conditions, this could include: increased use of renewable energy and low-emission technologies; increased energy efficiency; more use of advanced technologies (e.g. cleaner fossil fuel technologies); and sustainable use of traditional energy sources.

2. Wood was the first fuel used by humans and is still the most important source of renewable energy in the world. Its contribution to total primary energy supply is higher than all of the other renewable energy sources added together. Wood accounts for more than 80 percent of energy from “biofuels and waste” or about eight percent of total primary energy supply in the world. Furthermore, the recent IPCC expert review of renewable energy¹ suggests that the use of biomass for energy in 2050 could be two to six times higher than at present.

3. Wood energy is particularly important in many developing countries, where it may account for over 90 percent of total primary energy supply. In these countries, wood is often the only affordable and locally available fuel for cooking and heating. By enabling people to produce hot meals and boil water, it supports other development goals, such as better health, nutrition and food security.

4. Using wood for energy is also important for forests, forest management and the forest industry. At the global level, woodfuel production accounts for about half of all reported wood production and, in some countries, this figure may be more than 90 percent. There are many other sources of woodfuel in addition to forests, including trees outside forests and wood waste from the forest processing industry and consumers.

¹ IPCC, 2011, IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation, Prepared by Working Group III of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, UK and New York, USA.

II. TRENDS AND OUTLOOK FOR WOOD ENERGY DEMAND

5. Trends in traditional (i.e. low technology) uses of woodfuel vary between countries, but follow some general patterns. For example, charcoal is mostly used for cooking, especially in urban areas; whereas fuelwood may be used for cooking in rural areas and is generally preferred for heating. Traditional uses of woodfuel generally decline as incomes rise and people switch to other fuels. Based on these trends, traditional uses of woodfuel are not expected to increase very much in most countries in the future. The main exception to this is Africa, where rapid urbanisation and relatively low income levels are likely to result in continued increases in charcoal demand in many countries.

6. Modern uses of woodfuel include heat and power production (including co-firing with other fuels), heating with modern wood-burning appliances and second generation biofuels. Most growth in modern uses is expected in Europe and North America, but modern uses of wood energy are also expanding rapidly in some other countries such as China and the Republic of Korea².

7. In many countries, the development of modern wood energy systems is being driven by renewable energy policies, so the outlook for wood energy supply and demand depends largely on these policies. In addition, the accumulation of forest biomass in Europe, North America and East Asia (due, in part, to low demand for small dimension wood in the last decade) has created a biomass resource that is suitable for energy use and would increase the economic viability of forest thinning.

8. Recent studies by FAO and UNECE suggest that woodfuel consumption in Europe could roughly double (an increase of 430 million m³) by 2030 in a scenario where wood energy use is promoted.³ A study for North America shows a four-fold increase in consumption by 2030 (an additional 150 million m³) in a similar scenario.⁴ At the global level, a recent study by the World Bank and FAO suggested that woodfuel use could increase by 25 percent or about 1 billion m³ by 2030 if all targets for renewable energy were met and woodfuel plays a major role in fulfilling those targets⁵.

III. IMPROVING ACCESS TO SUSTAINABLE AND MODERN ENERGY SERVICES

9. Meeting the commitments made at Rio+20 will present a number of opportunities and challenges for the forest sector, particularly in the areas of technology transfer, sustainable forest management, sustainable consumption, policies and information.

10. **Technology transfer:** With respect to traditional uses of woodfuel, the expected increase in demand for charcoal could have significant impacts on forests and the environment, because current charcoal production techniques are often inefficient and polluting. Furthermore, these impacts may affect forests far away from urban areas because it is viable to transport charcoal over long distances.

11. Technology transfer and supportive policies could address some of these issues as well as some other social, health and environmental challenges from traditional woodfuel use, such as:

- opportunity costs, when women and children spend significant amounts of time collecting and cooking with woodfuel, so that less time is available for education or other tasks;

² Although there is some interest in modern uses of woodfuel in Latin America, bioenergy developments there are presently focused mainly on liquid biofuels (ethanol and biodiesel) from sugar cane and oilseeds.

³ UN, 2011, The European Forest Sector Outlook Study II 2010-2030, Geneva Timber and Forest Special Paper - ECE/TIM/SP/28, United Nations, Geneva, Switzerland.

⁴ UN, 2012, The North American Forest Sector Outlook Study 2006-2030, Geneva Timber and Forest Special Paper - ECE/TIM/SP/29, United Nations, Geneva, Switzerland.

⁵ Cushion, E, Whiteman, A, and Dieterle, G, 2010, Bioenergy Development: Issues and Impacts for Poverty and Natural Resource Management, World Bank, Washington DC, USA.

- indoor air pollution that causes severe respiratory problems (especially for women and children), which are some of the leading causes of premature death; and
- unmanaged and unsustainable woodfuel collection that results in deforestation and forest degradation in some areas (e.g. such as arid countries with scattered tree resources).

12. Technology transfer for electricity generation from wood energy also has significant potential to improve access to energy. Modern technologies such as gasification technology and co-generation of heat and power are highly energy and water efficient, but do urgently require transfer of technologies to enable developing countries to partially leapfrog the age of electricity from imported fossil fuels.

13. It should also be noted that electricity generation from wood relies heavily on favourable local conditions to be reliable, affordable, economically viable and socially and environmentally acceptable in developing countries. For example, the relatively low efficiency of direct electricity generation from biomass combined with the large amounts of biomass needed (with high transport costs) would suggest that decentralised heat and power production, cogeneration or heat production will often be a preferred option. In addition, competing for wood suitable for industrial processing should generally be avoided.

14. **Sustainable forest management:** The rapid increase in modern uses of woodfuel could also present challenges in the future. For example, the European outlook study referred to earlier showed that it would be possible to satisfy the expected increase in European woodfuel demand from European forest resources. However, current market conditions are likely to cause a tremendous increase in international trade, especially in wood pellets. Sea transport is highly cost effective (even over long distances), so it is feasible to meet these increasing demands from countries far away. This will present an economic opportunity for exporting countries, but will only be sustainable if the woodfuel is produced from sustainably managed forests

15. **Sustainable consumption:** With rising woodfuel demand, the increased competition between wood energy producers and existing users of wood is another issue that has been raised. Wood can be re-used and re-cycled many times to manufacture forest products but can only be burnt once. Efficient use of forest resources suggests that wood should be used in a way that maximises its value for the production of material goods before it is finally used for energy. This “*cascaded use principle*”, is being promoted in some countries but it remains unclear to what extent it can be implemented to promote resource efficiency.

16. **Policy development:** Many of the challenges raised above could be addressed with the introduction of improved techniques and technologies for woodfuel production and use. Forest management may also need to adapt in some countries to the increased demand for woodfuel⁶ to remain sustainable. Forest policies should support such changes by facilitating investment, where necessary, and promoting long-term strategies for woodfuel production and use, especially where this may be a challenge to existing wood users. In addition, due to the potential for wood energy to meet a number of broader development goals (e.g. poverty alleviation, employment and income generation, gender equality, reduced greenhouse gas emissions, improvements in health, nutrition and food security, etc.), it will be important to ensure that wood energy is considered in other policies, both in terms of their impacts on wood energy and the potential of wood energy to meet their goals and objectives.

17. **Improved information:** In support of policy development, it is also important to have reliable information about the trends and outlook for wood energy. For example, a Joint Wood Energy Enquiry

⁶ See, for example: FAO, 2010, Criteria and indicators for sustainable woodfuels, FAO Forestry Paper 160, Food and Agriculture Organization of the United Nations, Rome, Italy.

has recently been developed and implemented by FAO and UNECE for European countries⁷ and this information was used to develop some of the scenarios presented earlier. The most recent enquiry has shown that woodfuel production (from all sources) may be many times higher than previously reported,⁸ because wood processing waste accounts for as much as 60 percent of woodfuel production in European countries, compared with 25 percent to 35 percent coming directly from trees and forests. The enquiry has also provided other information relevant for policymakers, such as that waste wood recovered from consumers can contribute up to 20 percent of the wood used for energy, particularly in countries with effective policies for waste recycling and measures prohibiting the disposal of organic waste in landfills.

IV. POINTS FOR CONSIDERATION

18. The Committee may wish to invite countries to consider how the development of wood energy can improve access to sustainable and modern energy services and strengthen sustainable forest management.

19. The Committee may wish to recommend FAO to support countries to achieve their development goals for wood energy, especially in relation to:

- information on woodfuel production and consumption in national and international statistics;
- the formulation, implementation and monitoring of targeted and holistic wood energy policies that promote access to sustainable and modern energy services;
- cross-sectoral communication and collaboration to support sustainable and resource efficient production, consumption and trade in wood energy; and
- ways to optimise the different uses of wood in terms of value added, employment, and carbon balances over the complete life cycle of different uses.

⁷ UNECE-FAO, 2009, Results of the Joint Wood Energy Enquiry (JWEE) 2009, United Nations, Geneva, Switzerland. Survey results are also available for 2007 and 2005 and an enquiry for 2011 has just been issued.

⁸ Generally three to five times higher but, in one case, twenty times higher than previously reported in forest products statistics.