When Wood Becomes Energy - Promoting Sustainable Wood Energy Value Chains

Wood is a renewable energy source – policy makers in industrialized countries promote it for people to heat and light their homes. Wood is dirty and outdated – policy makers in developing countries ban its use: Promoting sustainable wood energy value chains is a matter of fact in industrialized countries and a challenge in developing countries - not only, but also because it is perceived as something that has to be overcome.

This was one of the conclusions of the Expert Exchange Workshop on the Promotion of Sustainable Wood Energy Value Chains in Development Cooperation that was organised by GIZ and KfW and held in Frankfurt am Main, Germany. To discuss the opportunities and challenges of a modernized wood energy sector in developing countries around 60 participants working for different international organizations, research institutes and consulting firms in the forestry, energy, and agricultural sector came together in March 2016.

After a short introduction of who is in the room, the first day of the workshop kicked off with two presenters delivering the key messages from the World Forestry Congress 2015 and the international workshops on sustainable tree-based bioenergy in Sub-Sahara Africa in Nairobi as well as the Conference on Bioenergy and Development in Berlin respectively. Both presenters focused on the crucial role of wood energy in sustainable development and the need for developing a comprehensive approach for addressing the full value chain for wood energy, from production till end use. They further highlighted the need to change the perception of wood as a poor man's fuel to a sustainable fuel via advocacy programs as well as collecting data on the ground level use of woodfuels.

To set the scene of wood energy as a cross sectorial topic three presentations were held that focused on the global demand of solid biomass, the changing role of wood energy in the global context and measuring the sustainability of wood energy. Key messages and topics included the following points.

The global demand for solid biomass will likely increase in the future and especially wood energy is expected to account to 20-40% of global cost-effective biomass supply potential in 2030. To meet his increasing demand, yield of solid biomass could be accelerated by improving crop yields, cost-effective harvesting of farm and forest residues and better land management and restoration. In terms of wood energy, there is an increasing demand in both the European as well as the African countries. However, while in European countries wood is viewed as an opportunity, in most African countries it is still viewed as a dirty fuel. This situation is gradually changing and more international stakeholders are taking part in the global wood energy market. To further develop the international wood energy market and establish wood as a sustainable fuel, more advocacy tools and data on the impacts of wood energy use on forest conservation is required. To further reiterate this point, an example of wood fuel consumption at meso-scale in India and Kenya using WISDOM methodology was presented.

In a second slot on promoting sustainability three presentations were held. They focused on the crucial issue of developing a sustainable wood energy value chain via different methods such as enacting standards and regulations as well as promoting land and forest management.

By mapping a sustainable wood energy value chain with entry points for public management the first presenter pointed out that wood energy is a cross cutting issue, related to different sectors such as

forestry, energy, agriculture and environment. Therefore, to develop a sustainable wood energy value chain, standards and regulations in place have to accommodate international standards as well as national regulatory rules in the different cross-cutting sectors. Various national and international standards for wood energy were also briefly presented. Another presenter highlighted the role of forest and land management programs in creating a sustainable wood energy value chain. He also focused on the work of International Union for Conservation of Nature (IUCN) in this realm and then presented various tools for forest restoration such as Restoration Opportunities Assessment Methodology (ROAM) and Forest Restoration Prioritization Tool (ROOT).

The first day concluded with the participants discussing about the different aspects of wood energy as introduced by the presenters and the need for more positive examples of wood value chains, international and national standards for establishing wood energy as a commodity and awareness raising regarding the sustainable use of wood energy.

Three crucial areas in building up sustainable wood energy value chains were identified by the participants during the discussions.

First, as wood energy is a cross cutting issue, related to different sectors such as forestry, energy, agriculture, and environment, political attention is hard to get.

Second, wood energy is seen as the “shabby sister of renewables”. This negative perception makes it unpopular among donors and results in low funding for sustainable wood energy projects as compared to other renewables.

Third, considering that wood is mostly used in poor households, it has to be cheap enough to be affordable for poor households. At the same time, it has to have a high value to provide incentives for forest conservation programs as well as sustainable production of wood energy. It is not easy to achieve this balance.

On the second day, three parallel working groups met for discussing details of sustainable production, regulatory and policy framework, and efficient use - electricity generation from biomass.

Session 1 - Sustainable Production

During the session on sustainable production four presentations were held, introducing the topic and presenting practical examples. The first presentation focussed on the relevance of woodfuels in Sub-Sahara Africa for cooking (49% of primary energy supply comes from traditional biomass), and called for the modernization and regulation of the traditional woodfuel consumption in artisanal and domestic chains. This would include increasing sustainable supply, efficient use of woodfuels and use of alternative fuels like LPG, as well as managing value chains. Another speaker pointed out that charcoal is used in more than 80% of urban households in East Africa and most of Southern Africa region. It is among the most commercialised resources in Sub-Sahara-Africa with many stakeholders competing for profit margins at different stages of the value chain. The potential of degraded land for sustainable bioenergy production was shown on the example of Indonesia. Biomass from degraded land provides a win-win solution to restore land while producing bioenergy. In this manner conflicts between land use for food vs. fuel production could be avoided. The example from Madagascar in the last presentation showed that afforestation and the sustainable management of wood energy plantations for charcoal production can be successful if land use rights are secured.

In the following discussion and group work three main questions for sustainable production of woodfuels were discussed. How to produce sufficient fuelwood to meet demand sustainably? How to overcome challenges connected to fuelwood production on degraded land? Can we achieve both smallholder engagement and massive scale up? The participants discussed about the lack of examples for sustainable fuel wood production to take into considerations for future projects. However, they came to the conclusion that for sustainable production of fuelwood and charcoal at the local level to be successful as well as for avoiding illegal markets, promoting legal frameworks for woodfuels as well as the issue of land tenure were identified as crucial factors. They linked this problem to the fact that in many African countries there is bad governance in land use rights issues. Smallholder engagement and massive scale up could be achieved if an appropriate legal framework for the market is established. The lack of data about the available amount of wood for woodfuel production also makes it difficult to establish national management plans for meeting the demand sustainably, especially in those countries where wood fuel is the most important source of energy. Participants also agreed on the notion that it is important to start a change of perception at the policy level to promote the efficient use of fuel wood.

Session 2 - Regulatory and Policy Framework

Three presentations gave a short introduction into the discussion. They focussed on the actors in the wood energy sector in the developing world with special attention to Sub Sahara Africa, showcasing that it is a purely private sector in which however incentives for sustainable production or efficient use of the resource are lacking due to its informality and illegality. Sector policies, unlike in agriculture, have not focussed on sustainable production but rather done everything to discourage sustainable production and efficient use. One of the presenters highlighted experiences with taxation and fiscal reforms in developing countries that tried to bring in incentives for sustainable production. It showed that experiences exist, but that these are rather local and often not durable solutions and that far more political will and international attention is needed to for these first initiatives to succeed. Incentives for the promotion of an enabling framework for sustainable production can also be given externally through indicators in international funding mechanisms as was shown in the example from Rwanda where budget support to the Energy Sector was attached to meeting sustainable biomass indicators.

The discussion following the three presentations highlighted that policy makers on the local, sub-national, national and international level need to put more attention to the policy and regulatory framework changing their mind set to encouraging rather than discouraging the sustainable production of wood energy. However all participants identified that for informed policy decisions the lack of reliable data on wood energy consumption and production is a major challenge. Collected data needs to include the economic value of the wood energy sector – this would make policy makers not only aware of the relevance of a more sustainable wood energy sector for energy and food security as well as climate change mitigation and forest protection, but also of its potential for rural development and a growing green economy. Any intervention to modernize the sector and enable more sustainable production will need to ensure that social, environmental and economic safeguards are in place not only to meet the local and regional demand, but also to meet the global demand sustainably.

Session 3 - Efficient use - electricity generation from biomass

Four presentations set the frame for this session. During this session, it became clear that industrial process heat (combined heat and power from wood) is a key part of the wood value chain and should

not be overseen when looking at electricity generation from biomass. Lessons learned regarding transformation technologies for electricity generation showed that combustion and boilers with steam turbines are a proven conversion technology but only profitable for larger plants.. In contrast to boilers, the gasification of biomass and its transformation in external or internal combustion engines is feasible for smaller plants but attention has to be paid to toxic by-products that are produced by many plants. The practical example of Namibia showed how encroacher bushes could be used for power generation and processing heat, for example in industries like cement companies or beer breweries. Thus, adding value to de-bushing strategies for land restoration. The use of agro-industrial waste for heat and electricity cogeneration was presented in the examples from Mauritius and Reunion and showed that the key point for making biomass competitive and attractive is the electricity tariff. It was further stressed that the supply chain runs from wood producers through power plant investors. For assessing the potential of wood energy in a given region, another presenter emphasised on the need to have an overview of the whole system, namely production and marketing, harvesting and transport, assembly and distribution, and conversion plant.

In the discussions after the presentations as well as during the group work it became clear that for promoting sustainable wood energy value chains, transparent feed-in-tariffs are key. Bringing farmers or agro-businesses together with power plant investors to develop supply and demand side at the same pace, was considered to be the main challenge for generating electricity from wood energy. To overcome this barrier, assurances to both groups should be provided. While electricity or combined heat and power producers need to have a reliable and sustainable wood supply, wood suppliers need assurances that power generators provide secure off take. It also became clear that generation from crop residues is an important bioenergy option with which wood is competing. Expanding project development support for small-scale wood to electricity or combined heat and power projects was also a key suggestion of the group as small industrial firms may not be able to cover the high capital cost of a power plant. It was further considered to be crucial to establish international sustainability standards for production and trade and to support the development of wood energy strategies as trade flows may be significant due to different costs of wood in different regions.

The workshop ended with a short feedback round. One central conclusion which ran like a thread through the whole expert workshop was that there are few positive examples of sustainable wood energy value chains in developing countries although there are many studies and different approaches under discussion. It was highlighted that the intended nationally determined contributions (INDCs) of many developing countries that include goals on making wood energy production more sustainable and its use more efficient give hope that the potentials of a modernized and formalized wood energy sector will get more attention in these countries. Commitments to the New York Declaration on Forests or Bonn Challenge give hope that the sustainable production of energy wood will be promoted. The related AFR 100 initiative offers great potential for modernizing the sector as does the planned REFORM Initiative.