The value web approach – so that the South can also benefit from the bioeconomy

The increasing global demand for biomass, as primary agricultural products and feedstock for various forms of usage, has started to change the global agricultural production and price structure. Studies conclude that the high demand for biofuels in the USA and European Union was the most crucial factor for the emergence of the food price crisis in 2007/8.

However, on bioenergy’s coat-tails, biomass demand for other uses has increased: Substituting biomass-based products for crude oil-based products in various industrial areas is – if not yet in mass-production – in its experimental phase. For instance, the market for biomass-based plastic is growing. The Coca-Cola company is already using 30 per cent biomass-based PET plastic, while Toyota and other car brands have started to replace oil-based plastic for cars with bioplastics. This rise in global biomass demand is an opportunity for many agricultural-based, low-income economies to diversify their economy. Yet, concerns prevail that producing more and diversified non-food crop biomass commodities will compete with domestic food production and perpetuate these countries’ status as mere suppliers of raw materials. Three strategies may counter these concerns:

1) The countries involved have to ascertain the priority of ensuring or improving the status of food security at national, regional and local level while taking advantage of emerging bioeconomies world-wide. To achieve this, the focus should be on labour-intensive, job-creating crops, production and processing. Another approach is the certification of the production of all types of biomass (food, feed, fuel, fibre, etc.), whether exported or nationally used, for not being in conflict with food and nutrition security, preferably in combination with a global monitoring of the impact of non-food biomass use on food security.

2) The agrarian-dominated economies will benefit significantly more from the increasing demand for biomass if major parts of the value addition to the raw product “biomass” take place domestically in a labour-intensive processing sector.

3) To prevent excessive pressure on natural production resources, a sustainable productivity increase has to be part of the emerging bioeconomy, partly through sustainable biomass production intensification, but also through efficiency gains in all required post-harvest, processing and trading activities.

The old dilemma: biomass only becomes valuable through processing

Where and how much value is best added to biomass-based products is an old discussion within the development community. Even today, the majority of low-income, agrarian-dominated countries are not fully exploiting processing opportunities for their biomass-based products exported to other countries.

The cut-flower industry in Eastern Africa is a good example of how value addition through processing (mainly handling in this case) can take place in the country of biomass production. Due to high labour requirements...
The complexity of value chains of agricultural products is increasing significantly. With the evolving bioeconomy, especially the demand side for different biomass types will be branching out with impacts at the handling, processing and trading level leading to an augmented diversity of activities. The example of a modern pulp mill stated above demonstrates the growing complexity. This bio-refinery will adjust both the quantity (and quality) of the diverse biomass sources as input and the produced output depending on biomass availability and demanded products as well as the relevant prices, thereby optimising the plant’s profit. The rising demand for food and non-food biomass transforms agriculture from a food to a biomass-supplying and -processing sector in which the utilisation of the various feedstock crops and intermediate products is more flexible than it was in the past. Part of this development is that especially at the processing and trading level, the recycling and cascading effects to utilise and reutilise biomass at a very high degree (“zero waste”) will lead to merged value chains. Hence, it is no longer sufficient to analyse the system by following the conventional more (isolated and) linear, mainly product-focused value chain approach. Analytical perspectives are needed which cover the complex pathways of biomass which include but go beyond the concept of value chain analysis. Here the holistic concept of biomass-based value webs becomes instrumental.

A biomass-based value web approach utilises the ‘web perspective’ as a multi-dimensional framework to un-
nderstand the interrelation and linkages between several value chains and how they are governed. Instead of depicting the pathway of one product and thus being in tendency more industry-oriented, the web approach captures the manifold products which are and can be derived from one biomass raw product and respectively looks at the whole product mix produced on family farms, the different value chains the households participate in and how they are and could be linked. The web perspective helps to explore synergies between these value chains, identify inefficiencies and pinpoint potential for sustainable productivity increases in the entire biomass-based value web of a defined local, national or international system. This includes the analysis of existing and potential recycling processes and cascading uses during the processing phase of biomass, which opens new opportunities to locally capture more of the value-added. The cascades of use and interlinking of value chains are instrumental to increase the efficiency of resources and the sector, reduce possible areas of competition between uses and to make use of innovation potential.

The web perspective also helps to better identify who participates and benefits in the value webs (e.g. men or women, small or large producers/processors, national or international actors) and who does not, in which activities and processes, and whether and how the actors co-operate and network with each other. This helps to identify missing links and actors needed, information gaps, and capacity constraints as well as governance issues and power relations. The analytical approach also contributes to identifying profit and other benefit distributions among the different actors and participants in the whole web. Thus, opportunities can be detected how and where more value could be captured in poor producing countries, how it could be more equitably distributed and where access to food through job and income generation can be increased.

Increasing the activities of the domestic processing industry for biomass products requires the political commitment of governments as well as international support. Technical and physical infrastructure, a skilled labour force, and financial instruments are part of the solution. Further research and investment in labour-intensive yet capital-saving processing technologies for biomass commodities in developing countries is important. In the long term, a sustainable domestic processing and value addition will also require that domestic demand and markets develop.

The emerging bioeconomies may help low-income, agrarian-dominated countries to generate jobs and income in the biomass producing, processing and trading sector, particularly in rural areas. The key challenges are to identify ways for poor countries and poor producers to take advantage of these opportunities, which types of biomass, processing and technologies offer a realistic chance for biomass producers and processors in these countries and how, at the same time, food security can be enhanced and poverty reduced. Further knowledge gaps exist where the respective value chains and value webs need adjustments and support to ensure that value addition not only stays in the producing countries but also contributes to improving the livelihoods of family farmers, to foster small and medium-sized processors and generate employment opportunities.

The project also examines how small-scale farmers’ typical diversified cropping systems can be integrated into a value web approach.