Tropentag, September 20-22, 2023, hybrid conference

"Competing pathways for equitable food systems transformation: Trade-offs and synergies"

Automated national biomass profiles for sub-Saharan Africa: Data for circular economy

Sebastian Semella, Fabian-Constantin Sittaro, Friederike Naegeli de Torres

German Biomass Research Center (DBFZ), Germany

Abstract

Utilising agricultural by-products for energy production or material use can help diversify income opportunities for small-scale farmers in rural communities in the Global South. This increased income can then be reinvested, subsequently improving yields and enhancing food security. Furthermore, circular farming practices maintain soil health by applying by-products like bio-fertilizers or bio-char from biomass use. However, a bioeconomic transition towards advanced smart-farming practices and the optimal use of agricultural by-products requires policy implementation and stakeholder engagement. Therefore, rapid assessment of national key indicators and national and regional biomass availability is an essential first step for informed decision-making and continuous monitoring.

The national biomass potentials are assessed at the Deutsche Biomasseforschungszentrum gGmbH (DBFZ) using an automated workflow with R markdown. The process involves identifying relevant data and querying APIs from international databases to compile key biomass information from various sources in a structured manner. More specifically, key figures and trends on the social-economic status and the natural resource base are identified. These include data on the most relevant crops, quantitative assessment of agricultural by-products, and animal excreta. The National Biomass Profiles resulting from this compilation and data review contain not only the current biomass potentials but also time series allowing analyses of interannual production stability.

Automated data updates will allow decision-makers and local stakeholders to track the key figures gathered. Linking this information with an automated mapping tool based on IFPRI SPAM data shows patterns of spatial biomass production on complementary maps. Thus, it serves as a decision-support tool, such as identifying suitable regions for implementing circular economy activities, including the installation of pyrolysis and biogas plants.

Keywords: Automatic mapping, circular economy, fact sheet, IFPRI SPAM, R markdown, sub-Saharan Africa

Contact Address: Sebastian Semella, German Biomass Research Center (DBFZ), Leipzig, Germany, e-mail: sebastian.semella@dbfz.de