



Small-scale community biorefining of sorghum for food, sugar and biomaterials in rain fed areas of Eastern Africa

Preamble

Despite its dietary protein and energy advantages, sorghum is considered a low value cereal crop in eastern Africa with minimal exploitation and investment towards its development. On the other hand, low utilization of sorghum could be partly associated with limited specialty technologies for niche markets which further presents a challenge of unavailable feedstock suitable for value addition.

Besides the traditional uses of sorghum for grain, no value is attached to the other parts of the plant, and as a result, a large tonnage of sorghum stalks is discarded each growing season.

Therefore, the project will establish small-scale community biorefineries based on high yielding multipurpose sorghum varieties referred to as 'sormaize' as primary feedstock. This will entail full utilization of the sorghum plant through value addition with little or no waste. Small-scale biorefineries provide opportunities for economic returns and can act as a pathway towards development of rural bioeconomies along diverse value chains. The project will mainly benefit smallholder farmers and communities engaged in sorghum production in eastern Africa living in arid and semi-arid areas.

Technology

The project will mainly use novel intergeneric sorghum-maize hybrids 'sormaize' which have exhibited diverse agronomic traits such as high biomass, grain yield and brix (23 percent compared to sugarcane at 25 percent). Other commercially available sorghum varieties and hybrids will also be included in the project as checks. The sormaize comprises sorghum crop developed by cross-pollinating sorghum with maize.

The biorefinery process shall encompass extraction of juice from sorghum stalks to produce intermediary high value biobased products such as syrup. Furthermore, the project shall also focus on small-scale value addition of sorghum syrup to produce secondary high value products such as crystal sugar and bioethanol. Besides the primary products from the biorefinery process, sorghum grain shall also be harnessed as an additional benefit for the food and beverage industry.

Local and Regional benefits

Sorghum is considered a climate smart feedstock because it is adapted to local conditions and farmers are familiar with its cultivation. Utilizing it to develop biobased products will boost investments into sorghum production in eastern Africa and also enhance its utility thereby contributing to niche business opportunities in the food and beverage industry among others.

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Project Partners

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- National Livestock Resources Research Institute (NaLIRRI), Uganda
- Bomvitae Agro-Industries Limited (BAIL), Uganda