BIO4AFRICA

POLICY BRIEF

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Ghana

Enhancing supply of lowcost livestock feeds through Biobased solutions in Ghana: What Policymakers need to know

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Summary

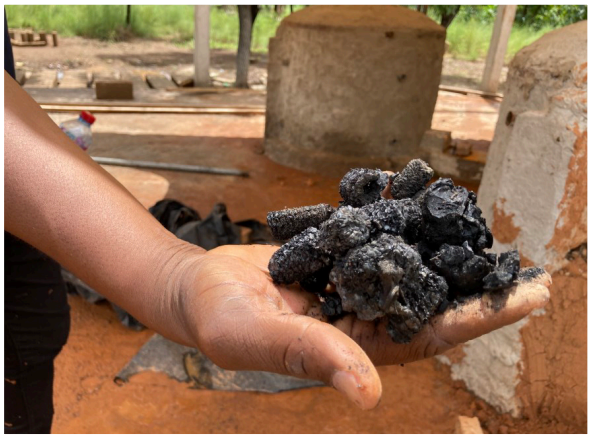
- Ghana's livestock sector continues to face challenges of high cost of feeds and low productivity.
- The country can potentially tap into biobased solutions to facilitate low cost feed production.
- The Bio4Africa project is promoting livestock feed production using a green biorefinery, biochar production from crop residues such as maize and sorghum stover, and production of fish pellets from crop residues.
- Stakeholders in the bioeconomy face challenges related to taxation, limited enforcement of quality standards, limited private sector incentives, land tenure biased against youth and women, limited funding for local research and development for biobased solutions.
- This brief proposes some policy options to deal with these challenges and enhance development and commercialization of biobased solutions.

Background

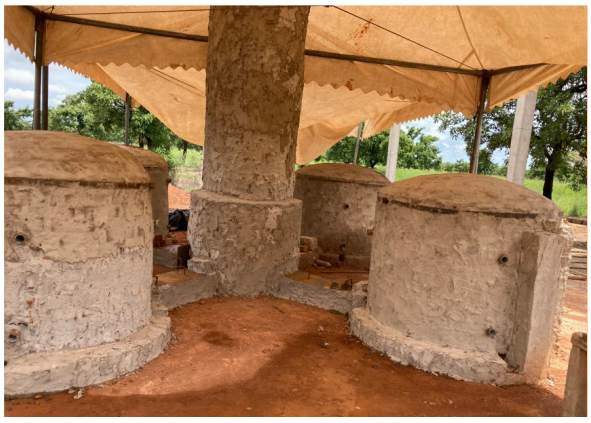
More than half of Ghana's population is engaged in agriculture, with women representing around 39% of the labour force on the predominantly smallholder, traditional and rain-fed farm [1]. Due to climate change, farmers are experiencing the negative impact of declining rainfall and soil conditions, rising temperatures and other weather extremes. The supply of livestock feeds fluctuates due to rainfed production systems experienced in the savanna regions where cattle production is a major activity. As a result, live-stock keepers turn to purchased feeds, particularly unformulated ruminant feeds such as crop residues (groundnut haulms, cowpea haulms, and pigeon pea residue), agro-industrial by-products (maize, rice and sorghum bran) and fresh grasses and local browse leaves *(Ficus sp, Afzelia sp.* and *Pterocarpus evinacelus*)[2].

A recent study[3] identified the need for equipping farmers with knowledge of feed preparation skills to enable them prepare quality feed for their birds as well reduced cost of feed preparation tools and equipment by these stakeholders to address the issue of feed cost and quality. In line with the quest for facilitating the transfer of innovations for low cost biobased livestock feeds, the Bio4Africa project is piloting technologies for the production of cattle press cake and concentrated protein for livestock feeds formulation. Also in the innovation tool kit is the production of Biochar that will be used for soil conditioning and palletization to produce fish feeds.

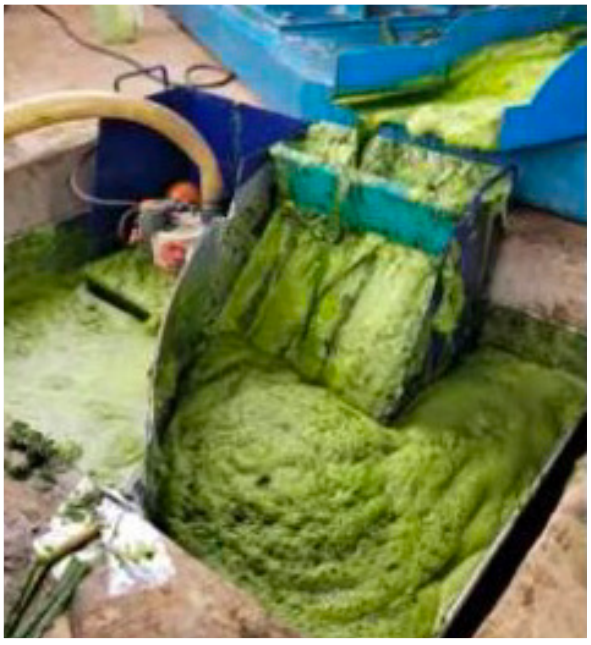
This brief provides a description of these technologies and their benefits to the farming community in Ghana as well as some of the challenges that could hinder the development and commercialization of these technologies. Finally policy options to deal with these challenges are provided.



Biochar from Maize cobs in Ghana



Brazilian Kilns installed in Loagri, Ghana



Liquid Whey from the Green Biorefinery for piglet feeds

Bio4Africa Biobased technologies promoted in Ghana

The **Bio4Africa** project supports the deployment of the bioeconomy in rural Africa through the development of bio-based solutions and value chains with a circular approach to drive the use of local re-sources and diversify the income of farmers. The focus of the project is on transferring simple, small-scale, and robust bio-based techs adapted to local biomass. The Bio4Africa test sites in Ghana are located at Nasia and Yagaba-Kubori in the north-east savannah region of Ghana. The area is characterized by intense transhumant pastoralism activities due to its diverse grasslands and annual rainy season, will test small-scale bio-based technologies with potential to improve the livelihood and food security of transhumant pastoralist communities and help curtail the nomad/farmer conflict over grazing lands and pasture. In the test sites, 45 farmer groups, including small, medium and large-scale farmers, in and are providing local forage species for the test site. The technologies that the project has been promoting are described in detail below.

A **green bio-refinery** was installed at the SavaNet Agriculture Technology Research Center in Loagri. The facility features technology and equipment from Grassa, a Dutch biotech company which is used to refine green matter, mainly Cajanus biomass, which is then processed into three products: protein concentrate (for pig and poultry feed), the press cake (for dairy cow feed) and whey juice (for piglet feed). A Green Biorefinery has the advantage of being a multi-productive system that produces low-price feedstock that is available in large quantities [4]. The extraction of proteins from leaves was found to be a highly favourable alternative to the high dependency on soy imports in Europe[5]. The plant can also utilize Gamba grass, the wild-growing lucaena tree and crop residues from local legumes, vegetables, cereals and tuber crops. This technology leads to reduced cost of livestock feeds, higher in-comes for farmers from the sale of crop waste and access to low cost livestock feeds.

Pyrolysis is a technique where green matter is subjected to combustion without oxygen at very high temperatures (approx. 450-600º C) leading to the formation of charcoal like product called biochar. This process utilizes crop-based feedstock such as peanut shells, cashew shells or millet and maize stalks. The finished product is used for soil conditioning. When added to farms, this helps to enhanced soil fertility, reduced acidity and ability of soil to catch and store carbon. Because of better management of crop wastes, this also leads top cleaner environment and environmental sustainability. When added to farms, this helps to enhanced soil fertility, reduced acidity and ability of soil to catch and store carbon. Because of better management of crop wastes, this also leads to environmental sustainability [6].

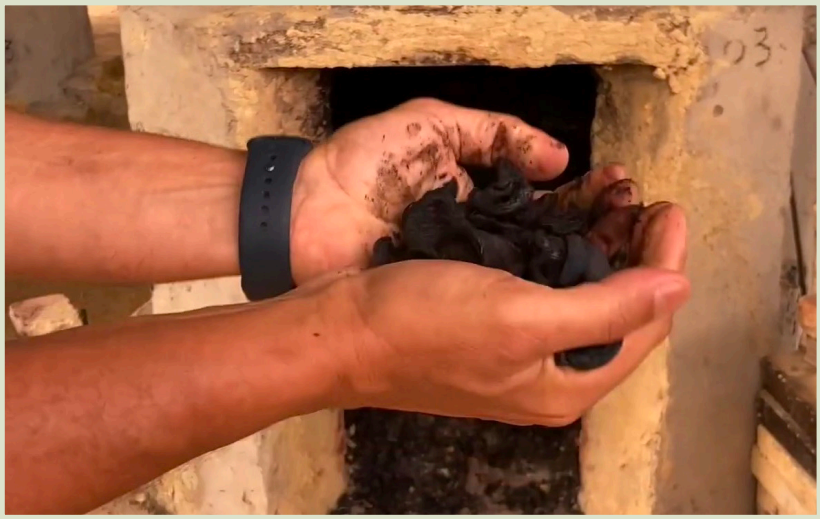
Palletizing is a technique that utilizes a machine, called an extruder palletization mill, for the production of livestock feeds pellets. This machine can be fed with crop residues from local legumes, vegetables, cereals and tuber crops. Waste products like\ cassava peels can be processed into High quality cassava peels (HQCP) which then are used to produce pellets for animal feed to benefit poultry, pig, rabbits and guinea pig farmers. These products help to reduce cost of livestock feeds by 30% and also to higher incomes for farmers from the sale of crop waste and access to low cost livestock feeds.

Bioeconomy stakeholders in Ghana have identified the challenges that are hindering the production and marketing of biobased products. Addressing these issues that need to be prioritized to enable communities in Ghana access full benefits from the Bioeconomy. The following are the key issues:

SavvaNet Ghana CEO, Moses Tia consulting with Livestock keepers

Challenges in the Bioeconomy of Ghana

1. Weak alignments between national strategies with regional and international frameworks such as the Africa Continental Free trade area (AfCFTA).
2. Due to limited awareness, there is low adoption of products from biobased technologies such as bio-gas and briquets.
3. The investment of the private sector in the bioeconomy and renewable energy is limited by the lack of targeted tax related instruments such as tax breaks and subsidies in favor of renewable energy and bioeconomy related technologies.
4. There is limited enforcement of quality standards by the Ghana Standards Authority (GSA), Environ-mental Protection Agency (EPA) and Food and Drugs Authority (FDA) due to resource and capacity issues.
5. The enabling environment regulating the bioeconomy is still weak and needs alignment.
6. There is lack of sufficient incentives for women and youth to venture in biobased related businesses. Land tenure that emphasizes on land ownership and control by men disadvantages women and the youth them.
7. Lack of technical advice and advisory services to support acquisition and maintenance of new and advanced equipment and tools to shift to more innovative approaches.
8. Local research entities including Universities lack sufficient resources and capacity to engage in long term research in biobased innovations. The Curriculum of most universities also doesn't have sufficient orientation towards support of biobased Universities.
9. There are weak linkages between actors in the bio-economy that are necessary for enhancing complementarities in research and development as well as commercialization of biobased innovations and products.



Recommendations

- There is need to align Ghana's trade initiatives and policies with the African Continental Free Trade Agreement (AfCFTA) to enable the private sector benefit from the provisions that could reduce the cost of importation of equipment and trading of their products regionally.
- Need for awareness creation among private sector companies and users of biobased products. This can be supported by technology demonstrations and setting up of technology parks.
- Establish relevant bi-laws, regulations and guidelines to facilitate commercialization of biobased technologies.
- Government programmes to incentive women and youth to engage in Biobased enterprises.
- Enhance the enforcement of quality standards by Ghana Standards Authority (GSA), Environmental Protection Agency (EPA) and Food and Drugs Authority (FDA). GSA should be sufficiently resourced to play its role effectively. Set up sufficient standards for emerging biobased products in the context of Ghana's and ISOs.
- Establish mechanisms to Foster collaboration between actors in the biobased sector players including market linkages a d establishment of common interest platforms.
- Create Incentives for the private sector including tax exemptions and subsidies to incentivize investment
- Enhance research and development to boost local solutions including research grants to local R&D partners.
- The Fiscal incentives in the sector including duty exemptions spearheaded by Ministry of Food and Agriculture (MOFA) and Ministry of Finance (MoF).
- Capacity building on Biobased technologies including adoption of Biobased focused curriculum in institutions of Higher learning.

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