BIO4AFRICA

POLICY BRIEF

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Côte d'Ivoire

Hope for Rural Communities as Innovations Transforms Tons of Wastes into Useful Products and Income

By Daniel Kyalo Willy and Francis Nangayo

Summary

- Côte d'Ivoire faces challenges related to environmental pollution from plastics, scarcity of livestock feeds and soil degradation.
- There is a potential to tap into economic and environ- mental benefits through enhanced production and marketing of bio-based products.
- The Bio4Africa project is promoting Biochar production from crop residues such as cocoa husks, production of bioplastics from cashew apple juice and livestock pellets from crop residues.
- The development and commercialization of these technologies however faces challenges related to research and development, prohibitive tax regimes, poor coordination, inadequate capacity, weak enforcement of standards and discriminatory land tenure.
- This brief recommends policy options to address these challenges.

Background

The agriculture sector accounts for 22% of gross domestic product and more than 75% of exports in Côte d'Ivoire [1]. Despite this, the World Bank reports on a widening urban/rural gap and only a modest reduction in rural poverty over the past few decades. Annual production of agricultural waste is estimated at 17 million tons. If not well managed, these wastes become are an environmental challenge due to the pollution they cause in the rural and urban communities. Some of these wastes can be however converted to saleable products that can help to create a new source of income in rural settings.

Like other developing countries, Côte d'Ivoire faces the challenge of plastic pollution where more than 10% ends up in terrestrial and aquatic environments [2]. Compared with fossil-based plastics, bio-based plastics have a lower carbon footprint and exhibit advantageous materials properties [3]. Regarding soil fertility management in the country, it has been reported that most soils suffer from chemical and biological impoverishment due to succession without appropriate organomineral restitutions, the consequences of opening up new land through deforestation [4].

Development of the livestock sector in Côte d'Ivoire needs strengthening of the feeds sub-sector, and especially enhanced production of local feeds to address the challenge of high cost of feeds. Against this background, the Bio4Africa project initiated activities in the country to contribute in the development of the circular economy through the testing, development and deployment of biobased technologies.

Biobased technologies promoted in Côte d'Ivoire through the Bio4Africa project

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 resources 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. In Côte d'Ivoire, the project is promoting the installation of a Brazilian kiln for use in production of Biochar for water purification and soil fertility management; the production of bioplastics from cashew apple juice and needs and pelletising to produce livestock feeds.

Brazilian Kiln technology for Biochar

Cashew Apple to provide juice to be used in Bioplastic production

Biochar for soil conditioning

Biochar is produced through a process called Pyrolysis. This is a technique where green matter is subjected to combustion without oxygen at very high temperatures (approx. 450-600 0C) 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 (sequestration). Because of better management of crop wastes, this also leads top cleaner environment and environ- mental sustainability. The production will help combat deforestation, reduce the intensive use of synthetic fertilizers and improve access to clean water. The Bio4Africa project is already working with Kaptatchiva cooperative for the production of Biochar from Cocoa husks and its utilization for the soil fertility management in Cocoa fields.

A **bioplastic** can be defined as a polymer that is manufactured into a commercial product from a natural source or renewable resource [5]. Bioplastics from natural raw material present a biodegradable alternative to conventional petrochemical-based plastic and are environmentally safe and reducing dependency on fossil reserves. Polymers of biomass such as cellulose and starch are used as a starting material for the conversion of polylactic acids (PLAs), thermoplastic starch, and cellulose acetate (CA). In Corte d'Ivore, bio plastics will be processed from cashew apple juice.

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.

Challenges in the Bioeconomy of Côte d'Ivoire

Bioeconomy stakeholders in Côte d'Ivoire have identified the challenges that are hindering the production and marketing of biobased products. Addressing these issues that need urgent interventions to enable communities in Côte d'Ivoire access full benefits from the Bioeconomy. The following are the key issues:

1. 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.
2. Due to **limited awareness**, there is low adoption of products from biobased technologies such as biogas and briquets.
3. **Limited access to credit facilities** for investors seeking to venture into renewable energy and the production of biobased products hinders market entry.
4. **Weak linkages and limited cooperation** between different ministries and across Ministries and stakeholders engaged in the bioeconomy hinders effective implementation of important activities such as research and development among others.
5. The Land tenure that limits access to land by disadvantaged groups such as **women and youth** to produce bi-obased feedstock.
8. Generally, **quality standards for Biobased products** are limited and where standards are existing, their enforcement remains a challenge, due to capacity issues.
6. 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.

Recommendations

Towards addressing the challenges to facilitate the development of the bio-economy and commercialization of products emanating from the biobased innovations, the following options are relevant:

- Implementation of fiscal incentives to the private sector such as tax exemption, reduction of custom duties charged on renewable energy equipment and subsidies to private sector players investing in the bioeconomy.
- Facilitation of access to credit facilities through instruments such as establishment of an investment bank for development projects, establishment of a development fund dedicated to biobased initiatives, establishment of credit guarantee schemes and low interest loans to investors in biobased businesses.
- Awareness and senitization campaigns by the Government and partners to encourage the utilization of biobased products among users as well as showcase investment opportunities in the bioeconomy the private sector. Awareness creation on financing opportunities through carbon credits is also needed to ease financing constraints.
- Redefining of the cooperation policy between different ministries in the framework of development to enhance synergies and eliminate duplication of mandates and enhance efficiency. This could also be strengthened through strengthening of partnership between researchers, the private sector and the government
- Inclusion of agricultural parcels in urban planning to facilitate low cost access to raw materials and design mechanisms for long term lease of land. Focus should also be on securing land tenure through establishing land titles and certificates of ownership, eg: ACD)
- Capacity enhancement for public institutions involved in research and innovation in renewable energy and the bioeconomy in general to encourage local manufacturing of equipment as well as strengthening of the capacities of existing structures such as the Ivory Coast - Agence nationale d'appui au développement rural, ANADER (National Rural Development Support Agency).

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For more details please contact:
Dr. Daniel Kyalo Willy / Dr. Francis Nangayo
African Agricultural Technology Foundation, ILRI Campus
PO BOX 30709, 00100, Nairobi
D.willy@aatf-africa.org / f.nangayo@aatf-africa.org
https://www.aatf-africa.org

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