**Kosmos Innovation Center 2024 AgriTech Challenge Classic.**

Business Concept Note

Team name: BLOOMATECH

List of Members

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**Background of Proposed Business (Research)**

The cassava value chain presents significant opportunities for innovation, particularly in the use of cassava starch as a raw material for producing adhesive products. Cassava, a versatile root crop native to South America and widely cultivated in Africa, has become a crucial agricultural commodity in countries like Ghana. According to the Food and Agriculture Organization (FAO), cassava production in Ghana was approximately 22 million metric tons in 2022, with the country being one of the top producers globally (FAO, 2023).

Cassava starch, derived from the tuber through processing methods such as grating and fermentation, has valuable properties that make it suitable for various industrial applications. In particular, its potential as a key ingredient in adhesive formulations for plywood workers, plumbers, and other industries offers a unique business opportunity. The adhesive industry, which includes construction, woodworking, and plumbing sectors, is projected to grow significantly. According to Grand View Research, the global adhesive market was valued at approximately USD 53 billion in 2021 and is expected to expand at a compound annual growth rate (CAGR) of 5.5% from 2022 to 2030 (Grand View Research, 2022).

The adhesive properties of cassava starch can be enhanced by combining it with certain substances that ensure its effectiveness. Key additives to consider include cross-linking agents such as borax, which improves the adhesive’s strength and durability, and plasticizers like glycerin, which enhance flexibility and workability. Borax, a naturally occurring mineral, has been used in adhesives for its ability to create stronger bonds and improve resistance to moisture and temperature fluctuations. Glycerin, a byproduct of biodiesel production, acts as a plasticizer to enhance the adhesive’s flexibility and performance (Journal of Applied Polymer Science, 2021).

The approach of sourcing raw cassava starch from gari processing companies, rather than processing cassava directly, aligns with a strategic business model that focuses on leveraging existing supply chains and processing capabilities. Gari processing companies, which already handle large volumes of cassava, are well-positioned to supply high-quality starch in bulk. This method reduces the need for extensive infrastructure investment in cassava processing and allows the business to focus on formulating and marketing the adhesive products.

By tapping into the established gari processing sector, the business can ensure a steady supply of cassava starch while contributing to the value-added processing of this agricultural commodity. This approach not only supports the local economy by creating new industrial applications for cassava starch but also aligns with sustainable practices by utilizing existing resources and reducing waste.

The integration of cassava starch into the adhesive market presents a promising avenue for innovation and growth. With a growing demand for environmentally friendly and cost-effective adhesive solutions, leveraging the natural properties of cassava starch and enhancing its performance with appropriate additives positions this business as a forward-thinking player in the adhesive industry.

**Problem statement**

In Ghana, while cassava production is substantial, its starch is mostly confined to gari production, leaving a significant opportunity untapped. The adhesive industry currently depends on expensive, synthetic adhesives that pose environmental concerns. This gap presents a chance to create a cost-effective, eco-friendly adhesive from cassava starch, sourced from gari processors, thereby meeting industry needs and supporting local agriculture.

**Business Solution**

To develop a sustainable adhesive using cassava starch sourced from existing gari processors, eliminating the need for new processing infrastructure. The formulation will be enhanced with borax for strong bonding and glycerin for flexibility and resistance. This approach offers an eco-friendly, cost-effective alternative to synthetic adhesives, benefiting both local agriculture and industrial users.

**How it works**

- Sourcing: Cassava starch is obtained from established gari processing companies, which handle large quantities of cassava. This provides a consistent supply of high-quality starch without the need for additional processing infrastructure.

- Formulation: The cassava starch is mixed with cross-linking agents like borax and plasticizers such as glycerin. Borax enhances bonding strength and durability, while glycerin improves flexibility and resistance to environmental conditions.

- Production: The formulated adhesive is manufactured in bulk, adhering to quality standards. This involves blending the ingredients and ensuring the final product meets industry requirements for performance.

- Distribution: The adhesive is packaged and distributed to industries such as construction, woodworking, and plumbing. Marketing efforts highlight its eco-friendly and cost-effective benefits.

- Feedback and Improvement: Continuous monitoring and feedback from users help refine the product and improve the formulation and production processes as needed.

**Innovation**

- Utilizing Underused Resources: Leveraging cassava starch, a byproduct of gari processing, transforms an underutilized agricultural resource into a valuable industrial product, reducing waste and maximizing the value of local crops.

- Eco-Friendly Formulation: Developing an adhesive that uses natural, renewable materials instead of synthetic chemicals addresses environmental concerns, offering a biodegradable and less toxic alternative.

- Local Sourcing and Production: By sourcing starch from local gari processors and utilizing existing supply chains, the business supports local agriculture and reduces production costs, making the adhesive more accessible and sustainable.

This innovative approach not only provides a sustainable adhesive solution but also supports local economies and environmental sustainability.

**Collaborators and Partners**

**1. Kosmos Innovation Center:** Provides funding, mentorship, and business development support to scale the adhesive production and enhance market reach.

**2. University of Ghana:** Offers research expertise and facilities for developing and testing the adhesive formulation, ensuring high-quality standards and innovation.

**3. Ghana Standards Authority (GSA):** Essential for certification of the adhesive product to meet national quality and safety standards.

**4. Ghana Industrial Research and Development Institute (GIRDI):** Supports research and development efforts, contributing to product innovation and process optimization.

**5. Ghana Agricultural Association:** Collaborates on sourcing cassava and integrating the adhesive into agricultural practices, promoting local resource use and sustainability.

**6. Ghana Export Promotion Authority (GEPA):** Assists in identifying export opportunities and expanding market reach beyond Ghana, helping to grow the business internationally.

**7. Ghana Chamber of Commerce and Industry (GCCI):** Provides networking opportunities, business development resources, and advocacy support for local industries.

**8. Ministry of Environment, Science, Technology and Innovation:** Facilitates regulatory compliance and supports the environmental sustainability aspects of the adhesive production.

**9. Local Gari Processing Companies:** Provide a steady supply of cassava starch, ensuring consistent raw material availability and fostering local industry integration.

**10. Eco-friendly Packaging Suppliers:** Ensures that the adhesive is packaged sustainably, aligning with the environmental goals of the business and enhancing its market appeal.

**Certifications**

- Ghana Standards Authority (GSA): For product quality and safety certifications.

- Environmental Protection Agency (EPA): For compliance with environmental regulations and sustainability practices.

**Team Members**

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