

AGRO AGAPE CO.,LTD

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Problem/ Customer discovery: Farmers in Cambodia are facing difficulty to access market and high costly of production by use chemical fertilizers in their farm, which significantly impacts the climate by contributing to greenhouse gas emissions, primarily through the production of nitrous oxide (N₂O), a potent greenhouse gas far more impactful than carbon dioxide, which occurs during the manufacturing process and when fertilizers leach into the soil; additionally, the chemicals themselves can sometimes be direct greenhouse gases.

Business Description / Impact: The recycling of agricultural waste into biofertilizer using solar energy offers a sustainable and economically viable solution for enhancing soil health, reducing environmental impact, and promoting sustainable agriculture. We will evaluate the potential of the aerobic nitrogen-fixing bacterium *Azotobacter* to enhance the performance of our biofertilizer in order to reach our goals of,

- **Promotes Sustainability:** Decreases reliance on synthetic fertilizers, leading to a sustainable agro-ecosystem and protecting biodiversity.
- **Boosts Income:** Increases earnings for low-income farmers and women-led micro-businesses (coffee shops, mushroom sellers).
- **Supports Coffee Farmers:** Provides technical assistance and market access.
- **Innovates with Biofertilizer:** Uses coffee waste, mushroom byproducts, and cow herder byproducts to create biofertilizer, enhanced by nitrogen-fixing bacteria.
- **Reduces Costs & Improves Yields:** Lowers farmer costs by around 30% and enhances coffee quality and production

Customer Traction: 1000 small holder farmers families in 2027

Current Customers: 145 farmers

Business Model: The circular model from farm-to-table and back-to-farm service.

We install solar energy to enhance the whole production of **coffee and market share of locally grown coffee** (incremental innovation) to create a sustainable profit of revenue model to all stakeholders and build a sustainable agriculture sector and introducing recycling of organic coffee-derived waste into **biofertilizer** to further increase coffee production in remote parts of Cambodia; this cycle is beneficial for both the local **farmers** and the environment. It ensures increased coffee production and quality to support the strategy of market access for women micro-coffee shops to sustainable agro-ecosystem.

Management/Team: Our team with their diverse expertise and roles, forms a comprehensive framework for leading the business to success by providing strategic guidance, ensuring operational efficiency, maintaining product quality, managing financial health, fostering a strong workforce, executing projects effectively, and building robust customer relationships. In essence, their combined efforts provide the necessary leadership, oversight, and operational execution across all critical business functions, leading to sustained growth and profitability.

- *Advisory & Consultant team : Strong foundation team structure and KPI. We have key board members that can lead to a sustainable agri-industry that is self-sufficient in market share. They provide support for Communication, Performance management, Risk management and governance)*

- *Production: Our team has the technical ability to build fully functional products and has a clear understanding of the value chain and cost structures in our industry. They lead Production and Quality control.*
- *Finance: Developing costs of production & building the initial product cost-effectively, financing management and report.*
- *Operations: Our team has a clear model/ sales understanding of the market & strategy with NGO partners to develop communities. They lead Human resource and Project management*
- *Sales / Marketing: Team is clear & can identify customers segments and work more efficiently in customer care service. Our team involved with all stakeholders who work to develop communities to reach our target customers They lead Customer Relationship Management (CRM)*

Technologies/Special Know-how: We recycle agri-waste into **biochar** using a **Pyrolysis system** to generate natural gas to supply heat into own system and dryer to reduce the cost of operation. Our procedure to generate fertilizer from agri-waste is protected by patent number K007-902204823 from the Cambodian Department of Taxation. And **use of nitrogen-fixing bacteria to enhance the performance of our biofertilizer** is a significant portion of atmospheric nitrogen that is converted into ammonia, nitrate, and nitrite by soil bacteria. This objective relies on a collaboration between Prof **Christian Doerig** (our Board Advisory and CTO) with **(ITC) the Institute of Technology Cambodia, Phnom Penh**. The effect of added Azotobacter on the growth of various plants with then be determined, using Azotobacter-free fertilizer as a baseline control. The inclusion of nitrogen-fixing bacteria significantly enhances the efficiency of the fertilizer, we will first determine the minimum dose for reaching plateau-efficiency, and then will scale up the production of bacteria for inclusion in commercial batches of the fertilizer (industrial-level production will require additional funds; the present application covers only the initial feasibility/efficacy testing of Azotobacter supplementation of the fertilizer).

Markets: The Cambodia coffee market 90% consumption is imported. To bridge the gap between imported and local coffee, we develop the local coffee growing industry and have established a strategy for access to the market. In addition, we use coffee waste (husks) as a resource to generate biofertilizer that goes back to farmers at an attractive cost and providing our customers of products and services like,

- 1 **Biofertilizer & Distribution** – Promoting eco-friendly farm inputs to restore and rehabilitate farm management.
- 2 **Energy sourcing** – Promoting solar energy in the coffee supply chain and transforming agri-waste into energy for processing biochar as a carbon base fertilizer and supplying heat into dryer for coffee harvesting processing.
- 3 **Coffee bean** We boost coffee quality and quantity with farmers by offering rehabilitating farm management and contract market access.
- 4 **Farm Restoration & Management** – Include, Coffee seedling, Solar irrigation system and Biofertilizer with technical support.

Competition: Direct Competition with chemical Fertilizers

Cambodia's agricultural sector exhibits a strong reliance on imported chemical fertilizers. In 2021, significant volumes were sourced from Vietnam (\$207 million), Thailand (\$139 million), China (\$12 million), Japan (\$5.61 million), and South Korea (\$1.61 million). Key distributors in the Cambodian market include **Angkor Green**, which maintains partnerships with global multinational corporations such as **Yara International, BASF, and Syngenta. Nitrogen Chemicals & Fertilizer (Cambodia) LTD.** also plays a role, importing and distributing essential chemical compounds like Urea, DAP, NPK, and Kali. Additionally, the Haifa Group, a global fertilizer provider, offers a diverse range of water-soluble and controlled-release chemical fertilizers. The competitive dynamics within the Cambodian fertilizer market for coffee farmers are shaped by critical factors such as pricing, distribution, efficacy, and farmer adoption preferences. So, Key competition of AGRO AGAPE is providing sustainable profit to all stakeholders which is compared to our competitors, they have competitive profit among traders and local producers.
