

## PROJECT SUMMARY

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| <b>Ref No.:</b> MRIC/IBG3-RI-A008                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Title:</b> BioBox: Growing leafy green in a controlled environment merging hydroponics and aquaponics (Bio Box) |
| <b>Local Business:</b> Narrainsamy Florent Richard Auguste                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                    |
| <b>Project Leader</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                    |
| Mr Florent Richard Auguste<br>Narrainsamy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Narrainsamy Florent Richard Auguste                                                                                |
| <p style="text-align: center;"><b>TECHNICAL ABSTRACT</b></p> <p>The Biobox project aims to transform a 20ft shipping container into an indoor, climate-controlled hydroponic system powered by a hybrid solar setup. This innovative approach merges hydroponics with nutrient-rich water from an existing aquaponic system, reducing the need for synthetic fertilizers while promoting sustainable, pesticide-free food production. The aquaponic water, naturally enriched by fish waste, provides essential nutrients to the plants, enhancing growth and yield in the hydroponic setup. The hybrid solar system ensures uninterrupted operation, maintaining optimal temperature, humidity, and lighting conditions year-round even during power outages. This closed-loop system maximizes resource efficiency, reduces water consumption by up to 90% compared to traditional farming (Somerville et al., 2014), and lowers energy costs. By combining aquaponics and hydroponics, the Biobox creates a sustainable, resilient food production model, ideal for regions like Rodrigues, where drought, rising temperatures, and reliance on food imports threaten food security. The project represents a scalable, eco-friendly solution to local food production challenges, promoting climate resilience and circular economy principles.</p> |                                                                                                                    |
| <b>Key Words:</b> Controlled environment Bio Box                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                    |