AI-Driven Precision Hydroponics Water Management

NATIONAL CENTRE FOR AGRICULTURAL MECHANIZATION (NCAM), ILORIN

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SUBMITTED TO: NASENI – RESEARCH COMMERCIALIZATION PROGRAMME

IMPLEMENTATION PERIOD: 24 MONTHS | FUNDING: ₦96,000,000

The Problem

Nigeria's vegetable producers face water scarcity, high input costs, and unreliable rainfall. Conventional irrigation systems cause over/under-watering and wasted nutrients. Most hydroponic systems are imported, costly, and unsuited to local conditions.

The Solution

An integrated AI-based hydroponics system using sensors, data analytics, and automation. Combines AI, IoT, and modular hydroponics for efficient water and nutrient control. Expected performance: 90% water savings, 25–30% yield increase, 20–25% cost reduction.

How It Works

1. Sensors Collect Real-time Ph, Ec, Temperature, And Humidity Data.
2. AI Predicts Irrigation And Nutrient Needs.
3. Pumps And Valves Adjust Automatically.
4. Farmers Monitor Via Web/Mobile Dashboard.

Market Opportunity

Nigeria’s controlled-environment agriculture market projected > ₦100B by 2028.

Target users: Urban farms, SMEs, cooperatives, state programs, and research institutions.

Affordable and locally supported, ideal for Nigerian agritech.

Business Model

Revenue Streams:

- Hydroponic kit sales (₦1.5–3M/unit)
- AI dashboard subscriptions (₦100k–₦250k/year)
- Training and consultancy
- Data analytics services
- Licensing partnerships

Competitive Advantage

Imported systems: Costly, fixed-schedule, limited data.

Our system: Locally designed, AI-driven, real-time data analytics, modular, and affordable.

Financial Projection (2 Years)

Year 1: Revenue ₦55M | Cost ₦35M | Profit ₦20M

Year 2: Revenue ₦120M | Cost ₦60M | Profit ₦60M

Breakeven: End of Year 2 | ROI: ~150% (5-Year Projection).

Impact and Sustainability

90% less water, 25% less fertilizer, 30% higher yield.

Creates 50+ skilled jobs, supports local fabrication, promotes solar-powered farming.

Contributes to NASENI’s innovation and green economy goals.

Call to Action

Funding: ₦96,000,000

Deliverables: Prototype, commercialization plan, patent filing, 50 trained beneficiaries, demo farms.

Partner with NASENI to scale indigenous smart-farming innovation.

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