

Federal Polytechnic Ilaro Smart Farm Initiative

**ENHANCING AGRIBUSINESS WITH SMART HYDROPONIC:
A TECHNOLOGICAL APPROACH TO TOMATO &
VEGETABLE FARMING**



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A TECHNOLOGICAL APPROACH TO TOMATO AND VEGETABLE FARMING

Prepared by: Smart Hydroponics Group, FPI **Date:** October 2025

PROJECT TEAM

Name	Role	Expertise
ENGR. DR. S. D. OLUWAGBAYIDE	Principal Investigator	Machine Design & Fabrication
ENGR. M. A. OKUSANYA	Co-Investigator	Renewable Energy & Automation
ENGR. C.B. OGUNLADE	Technical Coordinator	Waste Recycling & Environmental Engineering
ENGR. F.E. AGBONGIABAN	Fabrication Engineer	Welding & Machining

This business pitch outlines a sustainable, technology-driven hydroponic farming model designed to increase productivity, reduce resource use, and empower local Agripreneurs.

EXECUTIVE SUMMARY

This project establishes a smart hydroponic farm for tomatoes and vegetables using IoT-based environmental and nutrient monitoring. It ensures sustainable, year-round production with minimal water use while creating jobs and empowering youth. The venture expects breakeven within 12–18 months and ROI of 25 - 40% per annum.

OBJECTIVES

1. Build and operate a smart hydroponic farm for tomatoes and greens.
2. Achieve high yields and quality with reduced resources.
3. Train youth and agripreneurs in modern hydroponics.
4. Supply market-demanded produce, reducing imports.
5. Attain financial sustainability within 2 years.

PROBLEM & SOLUTION

Conventional farming faces water scarcity, climate instability, and soil degradation. Smart hydroponics offers a controlled-environment solution using automated pH/EC control, climate monitoring, and 90% less water use, ensuring consistent quality yields.

MARKET & ADVANTAGE

Target markets include urban consumers, hotels, supermarkets, and exporters. Advantages include precision farming via IoT, sustainability, consistent quality, and skill development.

FINANCIAL HIGHLIGHTS

Estimated startup cost: ₦50,000,000 Revenue from produce, training, and consultancy. Breakeven: 12 – 18 months | ROI: 25–40% per annum | Gross margin: 50–60%.

IMPACT & SUSTAINABILITY

- Environmental: 90% less water, zero soil use.
- Economic: Job creation, import substitution. Social: Youth empowerment, innovation in agribusiness.

TIMELINE

- Phase 1: Feasibility & design (Months 1–3)
- Phase 2: Construction & setup (Months 4–6)
- Phase 3: Pilot cycle (Months 7–9)
- Phase 4: Training & scaling (Months 10–12)
- Phase 5: Expansion & export (Year 2+)

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Funding Request: ₦50 Million

A large indoor hydroponic greenhouse with multiple rows of plants growing in white channels. The plants are lush green, and the structure is covered with a transparent plastic or glass material, supported by a metal frame. The plants are arranged in long, straight rows, and the channels are supported by a metal frame. The plants are growing in a nutrient-rich solution, and the environment is controlled for optimal growth.

S/N	COMPONENTS
4	FLEXIBLE CUPS
3	METAL LINK
2	HALLOW PIPE
1	SUPPORTED FRAME



Other Hydroponic Structure Design to Empower Local Agri-preneurs.