

# Project Overview

## Title:

**“Tech Against Waste: A Data-Driven Framework to Reduce Food Waste Across Nigeria’s Food System”**

## Summary:

Food waste remains a critical barrier to food security in Nigeria, with losses occurring from production to consumption. This project seeks to understand, quantify, and propose technology-enabled solutions to reduce food waste across the Nigerian food system. Using real-world data from supply chains and households, it combines data analysis, predictive modeling, and system design to build a comprehensive framework for reducing food waste. The final output includes a dashboard, predictive model, and pilot-ready concepts designed to guide policy and real-world implementation.

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## Revised Research Objectives

1. **To analyze the current state and patterns of food waste in Nigeria**, across both supply chain and household levels.
  2. **To identify the critical drivers** of food waste at each stage — from production and distribution to consumption.
  3. **To evaluate the potential of digital and information technologies** (e.g., sensors, mobile apps, predictive systems) in reducing food waste.
  4. **To develop a data-driven prototype system** that uses real-time data to predict, track, and optimize food waste outcomes.
  5. **To propose actionable, scalable solutions** that can be piloted or adopted by policymakers, agri-tech firms, and local governments.
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## Revised Research Questions

1. What are the most significant stages and causes of food waste across the Nigerian food system?
  2. How can behavioral, environmental, and logistical data help predict food waste in specific regions or populations?
  3. What role can digital and information technology play in mitigating food waste at different levels (e.g., household, distribution, retail)?
  4. How feasible are these tech-driven solutions in Nigeria, considering infrastructure, cost, and user behavior?
  5. What data-driven systems can be designed to support real-time decision-making and waste reduction?
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## Dataset Plan






### Primary Datasets (to be analyzed and possibly combined):

| Dataset  | Purpose   | Source                                 |
|--|---|--|
| <b>World Bank Food Smart Diagnostic (Tomato &amp; Maize)</b> | Analyze inefficiencies, loss hotspots in supply chain       | World Bank                             |
| <b>Lagos Household Food Waste Study</b>                      | Study household behavior, quantities, and causes            | ResearchGate / University publication  |
| <b>GAIN Nigeria Food Systems Dashboard</b>                   | Contextualize food system data, visualize regional patterns | Global Alliance for Improved Nutrition |
| <b>FAO Food Loss and Waste Databases</b>                     | Cross-check estimates, global comparison                    | FAO                                    |
| <i>(Optional)</i> IoT Sensor Data from Enugu Study           | Show tech use in tracking food spoilage                     | Published academic study               |

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| (Optional) Hugging Face /<br>Open Datasets on Smart Food<br>Monitoring | Simulation input for<br>prototype development | Hugging Face<br>Datasets |
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## Planned Outputs

-  Exploratory Data Analysis (EDA) notebook(s)
  -  Dashboard in Power BI or Streamlit showing waste points, patterns, predictions
  -  Predictive model for household waste amounts and supply chain loss risk
  -  System design doc or prototype: a simulation or working model for intervention
  -  Policy brief with pilot proposals + feasibility assessment
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## Implementation Vision

The final goal is to deliver:

- Insights policymakers and NGOs can act on
  - A tool or framework agri-tech startups can adopt or extend
  - A case study that can inspire further funding, partnership, and research
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