

# Optimizing Food Distribution to Reduce Wastage to achieve Zero Hunger

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# The Problem Statement

Using Nigeria as a case study, different factors contribute to the issue of hunger, such a high rate of unemployment and indulgence of youth to farming.

But we came to discover one other main factor which is WASTAGE. Wastage of available food produce seems to be rampant, thereby:

- Discouraging the Farmers/sellers
- Encouraging the selling of spoilt produce to buyers at the expense of health

We also came to discover that, different factors contribute to the wastage of food produce, such as:

- Information
  - Lack of Information on Demand of such food produce can lead to overstocking or understocking of food produce by farmers/sellers
- Storage
  - Food produce (especially Fast perishable produce) are not meant to stay so long in the storage, or overdue their period sustainability before being consume
- Distribution
  - Improper distribution of food produce per region: Buyers from region A purchasing produce from sellers in region B, while such produce exist in region A.

# Proposal Overview

- We aim to solve the issue of Food Wastage and Proper distribution of Food supplies, with the aim of achieving Zero hunger.
- By controlling food wastage we also aim to eradicate the purchase of spoilt farm produce
  - While also achieving Zero Hunger, we want to make sure quality produce are distributed
- In this work we proposed different means such as Newsvendor model for controlling the factors that initiate wastage.
  - Newsvendor model is a mathematical **model** in operations management and applied economics used to determine optimal inventory levels
- We also proposed a system similar to Kudu, to recommend sellers to buyers with the aim of minimizing wastage
  - Kudu is an Agricultural MarketPlace Platform, use to find potential trade for farmers/sellers

# Proposed Solution

Similar to kudu, our proposed system is design to recommend sellers to buyers but with the aim of minimizing food wastage.

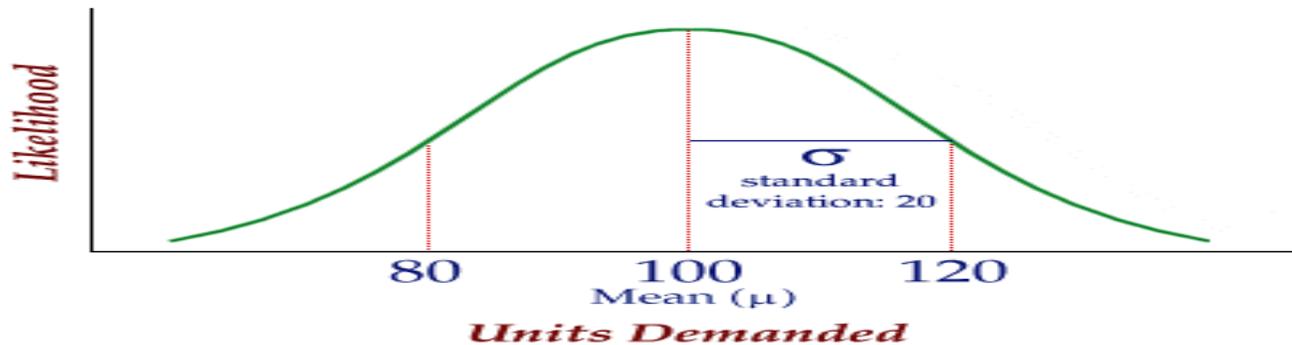
In order to minimize wastage, while also recommending a seller to a buyer, different factors are considered, such as

- Estimate of the storage time for the food produce(fast perishable produce), before it get spoilt.
- The proximity of the buyer to the seller

We also proposed some techniques to control the above factors, they are;

## News vendor Model:

### The News vendor Model: Likelihood of Selling N Units



**First-come-First Serve:** For non-perishable farm produce, the sellers of such produce are recommended base on the first to publicize their produce on the platform

**Proximity:** Each sellers and buyer are clustered to regions, this is to prevent the buyers from purchasing produce outside their region, Hence, preventing wastage in such region.

## System Design

The platform design is similar to kudu, the sellers interact with the platform via USSD and SMS, while the buyer interact via the web interface.

The sellers are expected to submit information about:

- the quantity of farm produce
- The harvest time/purchased time
- Name of produce
- Price of produce

The seller's location is obtained while registering them on the system