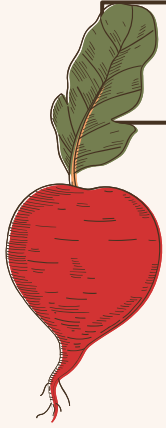


The image features a central white rectangular box with a thin black border. The box is surrounded by stylized illustrations of beets and green leaves. On the left and right sides, there are large, vibrant red beets with green leafy tops. Above the box, several green leaves are visible, and below it, the roots of the beets are shown. The overall composition is clean and modern, with a focus on fresh produce.

Peace: Saving Lives

Tackling Food Insecurity in Arusha,
Tanzania Utilizing Solar Ship
Technology

Our team



Kenechukwu Ezeifemeelu

Mechanical Engineering, New York University Abu Dhabi.

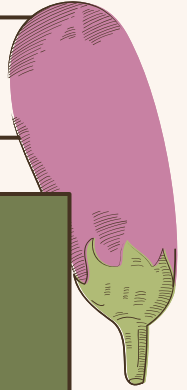
Interests: Basketball, Reading novels, Ice cream.



Kapala Sikapite

Medicine & Surgery, The Copperbelt University.

Interests: Sports, Cooking Shows, Reality TV



Saeed Alawadhi

Electrical Engineering, Khalifa University.

Interests: Video Games, Motorcycle Riding, Drawing.



Ashvini Karunakaran

Chemical Engineering, Toronto Metropolitan University.

Interests: Volleyball, Hiking.





Problem Description

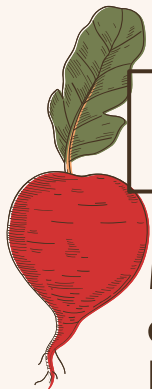


Undernutrition is one of the leading causes of morbidity and mortality in children below five years of age, particularly in developing countries.

Globally in 2015, about **162 million children under-five years of age were malnourished.**

In Africa alone, it was estimated that in the period from 2015 to 2016 around **39% of children under five-years were stunted, 28% were wasted and 3% were underweight.**





Why Tanzania? - Food Security Rank

Managed by The Economist, the Global Food Security Index is a dynamic scoring model that measures the food security in a nation based on core factors such as affordability, availability and quality. These scores are out of a 100.

USA (9th)
79.1

Tanzania (86th)
48.0

South Africa
(70th)
57.8

Canada (7th)
79.8

UAE (35th)
71.0

Kenya (90th)
46.8





Why Arusha?

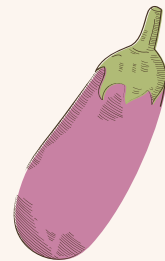


36%

Prevalence of
undernutrition among
children under 5 years in
Arusha

Reasons for High Food Insecurity and Malnutrition in Arusha:

- Inadequate infrastructure (e.g. bad roads, poor drainage systems for rain-water)
- Persistent flooding due to the bad roads
- Exploitation from Middlemen



Our Mission

Objectives

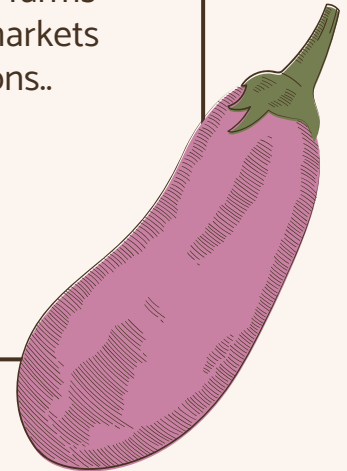
Our team aims to tackle the high rate of malnutrition among infants under 5 yrs in the Arusha district of Tanzania.

Our team plans to improve the livelihood of rural farmers in Arusha.



Solution

Powerstats will be used to transport specific nutritional agricultural produce from farms located in rural areas to markets in point of need locations..



Nutritional Food Items



Tomatoes

- ★ Good source of two crucial antioxidants for brain protection: lycopene and beta-carotene.



Spinach

- ★ Contains folates and antioxidants for healthy brain development.



Eggs

- ★ Contains choline, a nutrient that is crucial for brain health and development.



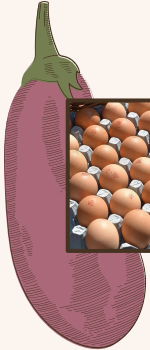
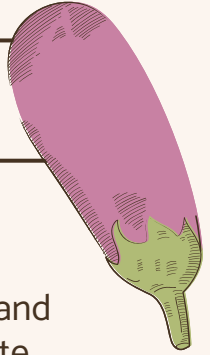
Cabbage

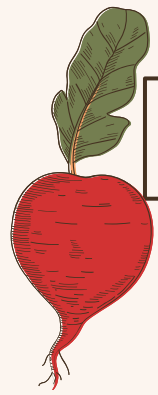
- ★ Contains Vitamin K, iodine and anthocyanins which promote mental function and focus.



Beans

- ★ Rich in protein, minerals and iron that aid brain development.





Seasonal Variation of Food Items

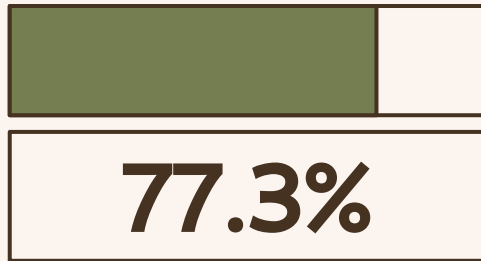
Jan	Feb	Mar	Apr
Cabbage, Eggs	Spinach, Cabbage, Eggs	Spinach, Eggs	Spinach, Eggs
May	Jun	Jul	Aug
Spinach, Eggs	Eggs	Spinach, Cabbage, Tomato, Eggs	Spinach, Cabbage, Beans, Tomato, Eggs
Sept	Oct	Nov	Dec
Cabbage, Beans, Tomato, Eggs	Cabbage, Eggs	Cabbage, Eggs	Cabbage, Eggs



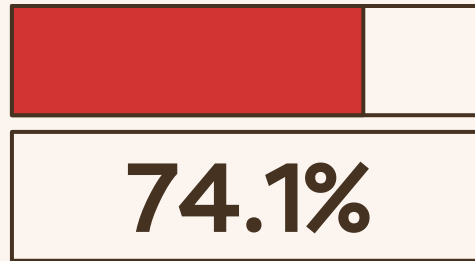
Point of Need - Ngorongoro Ward

Focus Point of Need: Nainokanoka ward within the Ngorongoro Conservation Area (NCA).

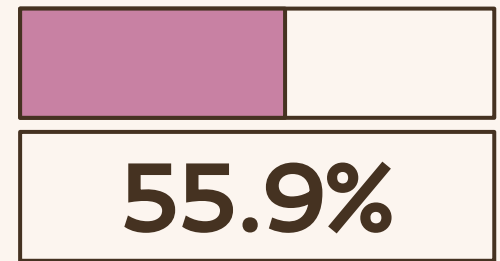
Results of the Household Food Insecurity Access Scale (HFAS):



% of households that experience anxiety and uncertainty about food supply



% of households that experience insufficient quality in terms of variety and preferences



% of households that experience insufficient food intake

High Food Insecurity in Ngorongoro

1



Infant Global Acute Malnutrition in Ngorongoro District is categorized as a “**very high/critical**” public health concern.

2



Cattle-related produce (e.g. meat and milk) are culturally valued. As such, nutritional food items such as eggs and vegetables are often neglected.

3



Government prohibits crop cultivation within the NCA to preserve wildlife. Hence, communities are reliant on crops from neighboring districts

Role of Tourism Sector



Wildlife and Government

Tanzania is known around the world for its variety of wildlife as it is Africa's largest animal population. The government is focused on tourists, which leads to eviction of people from locations such as the NCA.



Programs

Other tourism programs could be put in place to replace wildlife conservation. One potential program would be allowing tourist to access and even lend a hand in local farms.



Points of Surplus - Farming Regions

Migombani Village


Over 70% of households are engaged in agriculture.

Target foodstuff produced: Eggs.

Selela Village

Over 50% of households are engaged in agriculture.

Target foodstuff produced: Beans, Leafy Vegetables, Cabbage, Tomatoes.



Rhotia Village

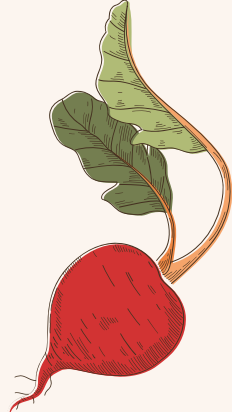
80% of residents depend on farming for their living.

Target foodstuff produced: Beans, Lablab Bean (*Dolichos lablab*), Eggs.

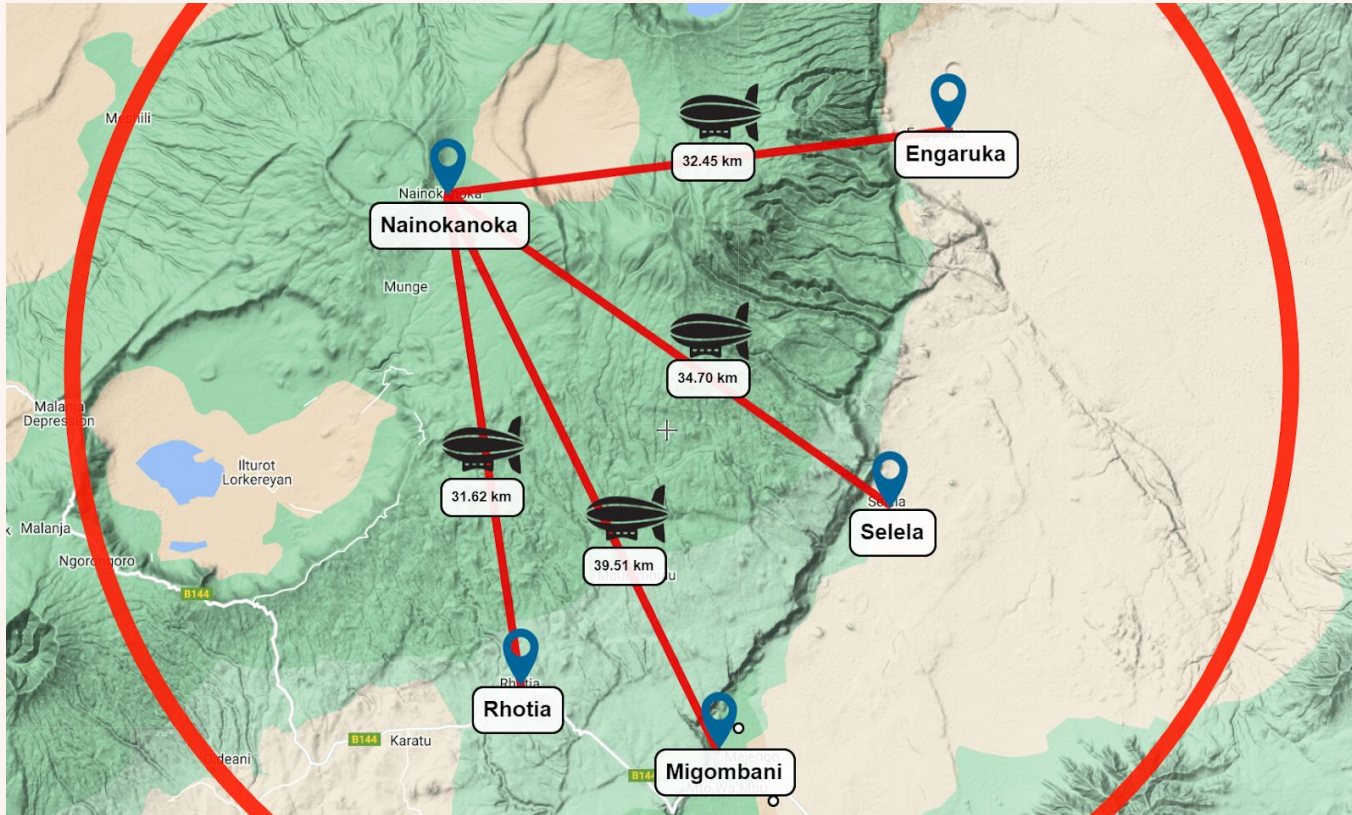
Engaruka Village

Highly developed agricultural area using irrigation from the Engaruka River.

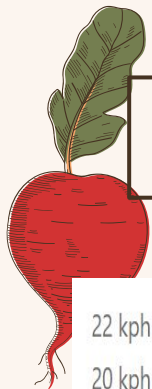
Target foodstuff produced: Lablab Beans (*Ngwara*), Cabbage, Tomatoes.



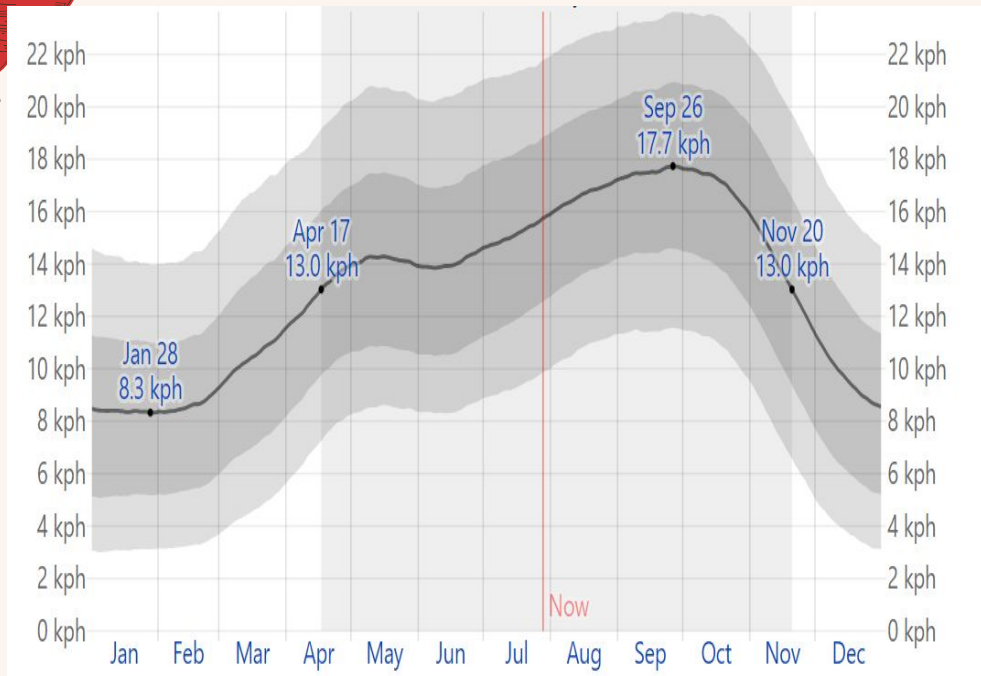
Proposed Flight Map



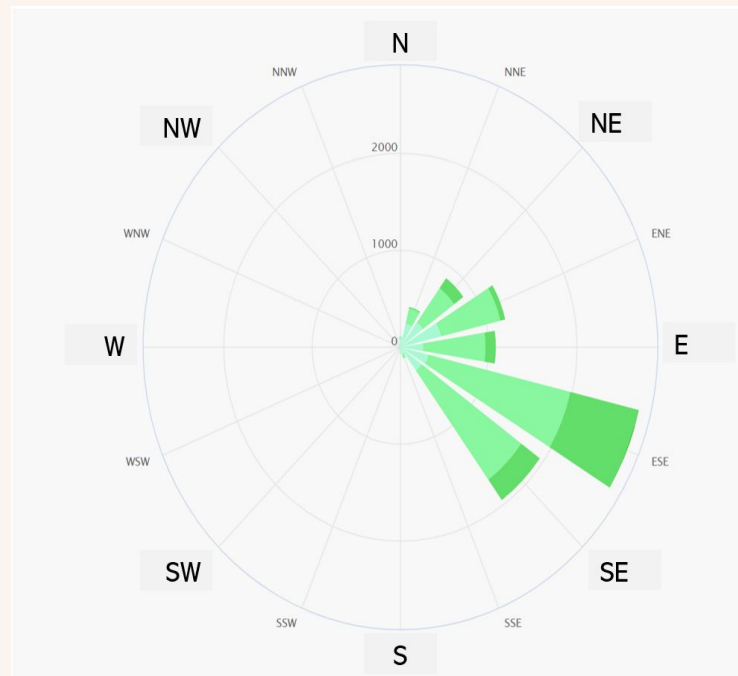
Note: Outer bold red circle demarcates our the target regions in Arusha with a 40 km radius.



TLR - Wind Pattern

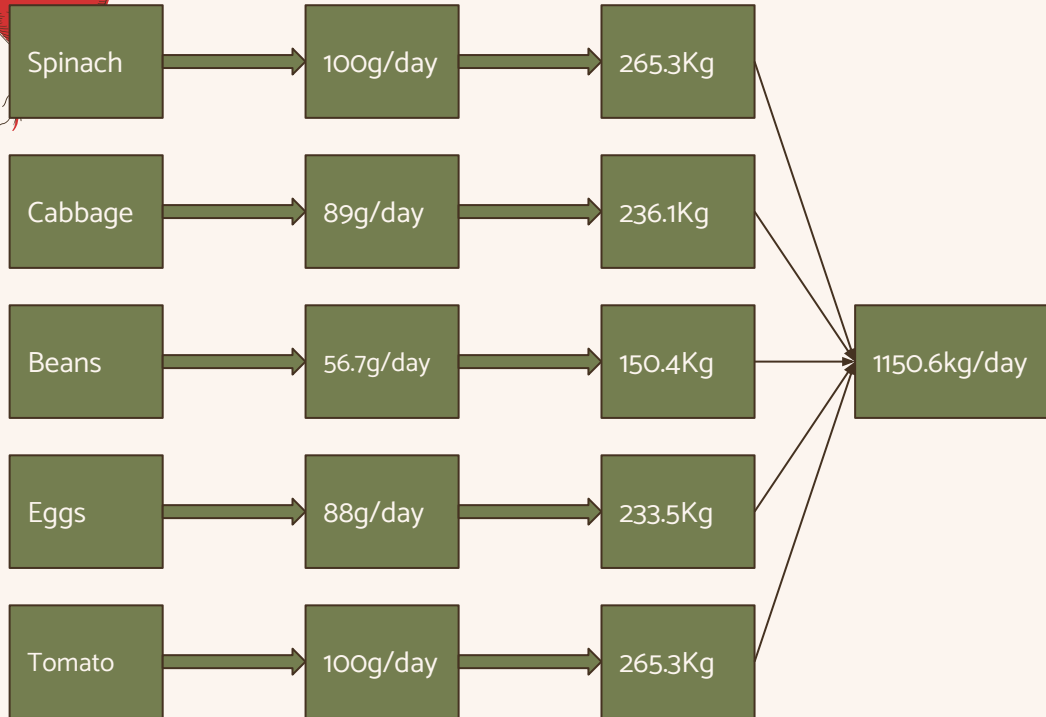


Monthly Average Wind Speed in Arusha



Yearly Wind Direction Pattern in Arusha

TLR - Cargo Weight



17%

% of Tanzania
aged 0-5 years
old

Est. Population
of Nainokanoka

15606

**~2653 infants in
target region**

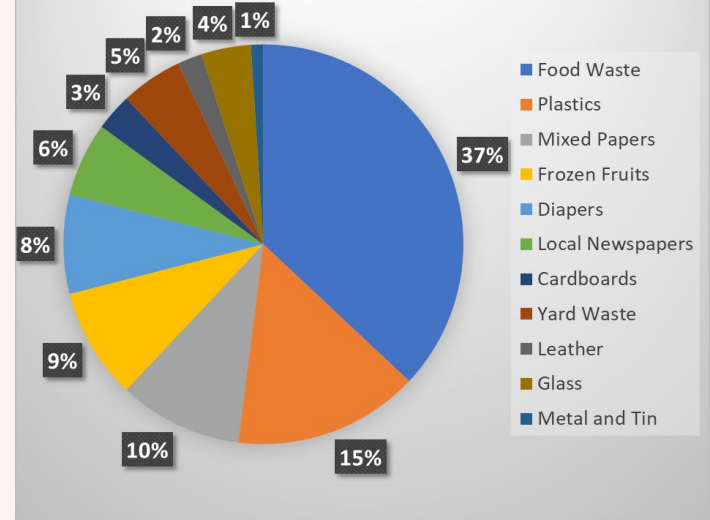
Waste Management Project

Buoyancy Problem - We need to ensure that the airship has a similar weight on its return trip after dropping off its cargo.

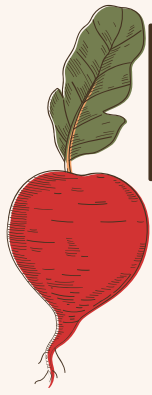
Proposed Solution

- ★ On return, airships should be loaded with food waste from markets.
- ★ Farmers in rural areas could use this organic waste to make simple compost pits.

Composition of MSW in Arusha



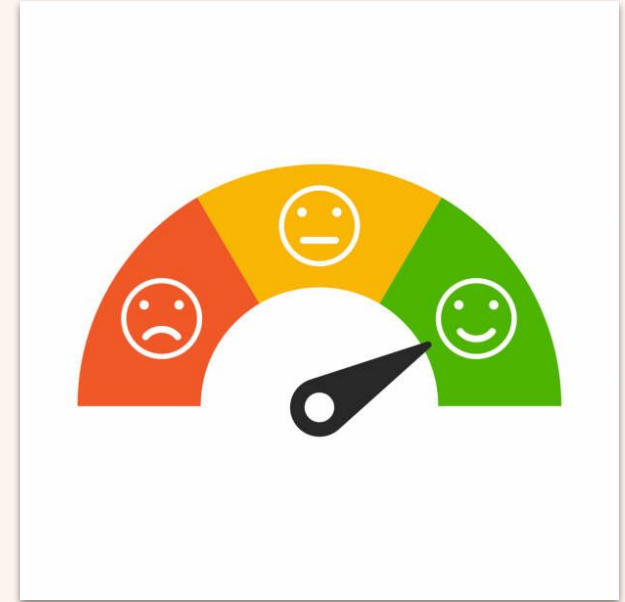
Composition of Municipal Solid Waste in Arusha, Tanzania

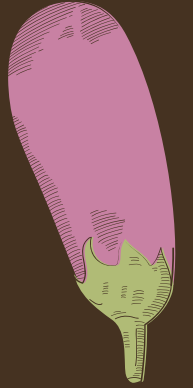


Ensuring Project Goals

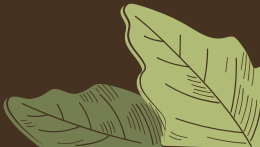
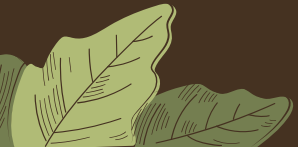
Monthly surveys would be carried out amongst:

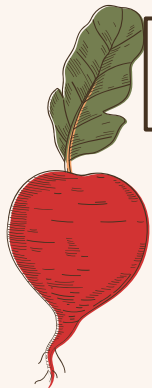
- ★ **Target Infants:** to measure significance of program on infant nutrition and development.
- ★ **Farmers:** to identify possible improvement in quality of life.





Questions?





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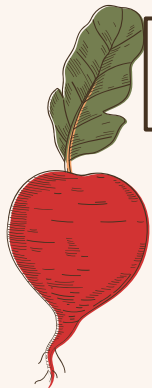
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