



# Peace: Saving Lives

Tackling Food Insecurity in Arusha,  
Tanzania Utilizing Solar Ship  
Technology

# Our team



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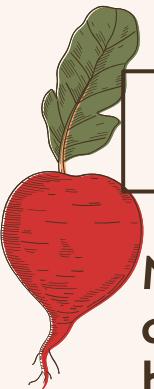
*Interests: Volleyball, Hiking.*

## 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

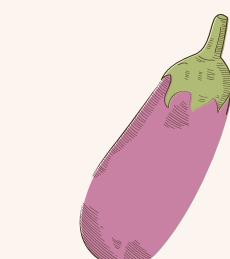
South Africa  
(70th)  
57.8

Canada (7th)  
79.8

UAE (35th)  
71.0

Kenya (90th)  
46.8

# Why Arusha?

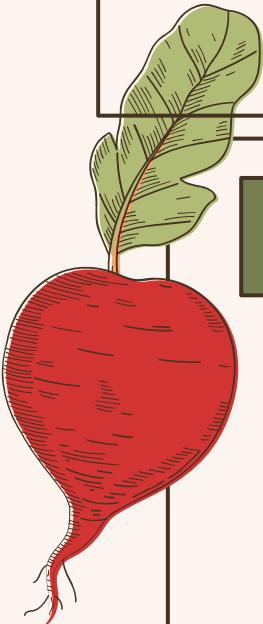


36%

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.



## Cabbage

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



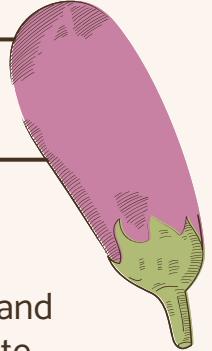
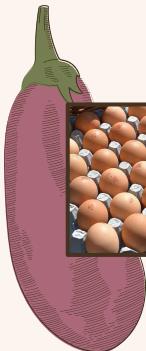
## Beans

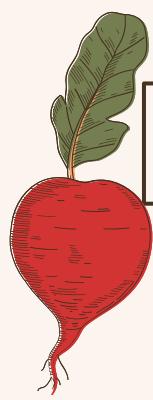
- ★ Rich in protein, minerals and iron that aid brain development.



## Eggs

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





# Seasonal Variation of Food Items

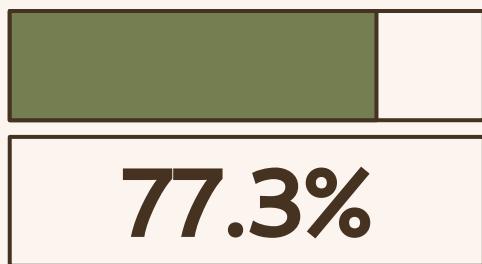
Jan	Feb	Mar	Apr
Cabbage, Eggs	Spinach, Cabbage, Eggs	Spinach, Eggs	Spinach, Eggs
May	Jun	Jul	Aug
Spinach, Eggs	Eggs	Spinach, Cabbage, Tomato, Eggs	Spinach, Cabbage, Beans, Tomato, Eggs
Sept	Oct	Nov	Dec
Cabbage, Beans, Tomato, Eggs	Cabbage, Eggs	Cabbage, Eggs	Cabbage, Eggs



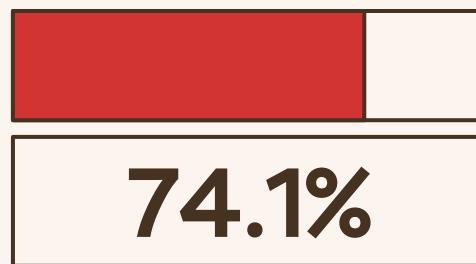
## Point of Need - Ngorongoro Ward

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

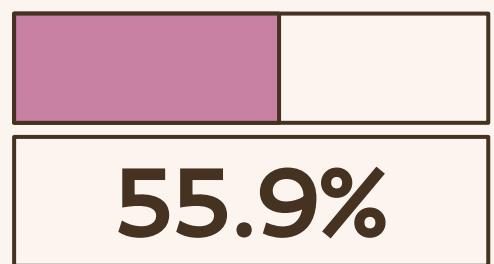
**Results of the Household Food Insecurity Access Scale (HFIAS):**



% 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

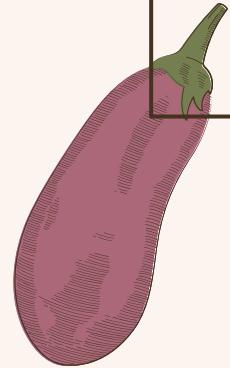


## Wildlife and Government

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.

## Rhotia Village

80% of residents depend on farming for their living.

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

## Selela Village

Over 50% of households are engaged in agriculture.

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

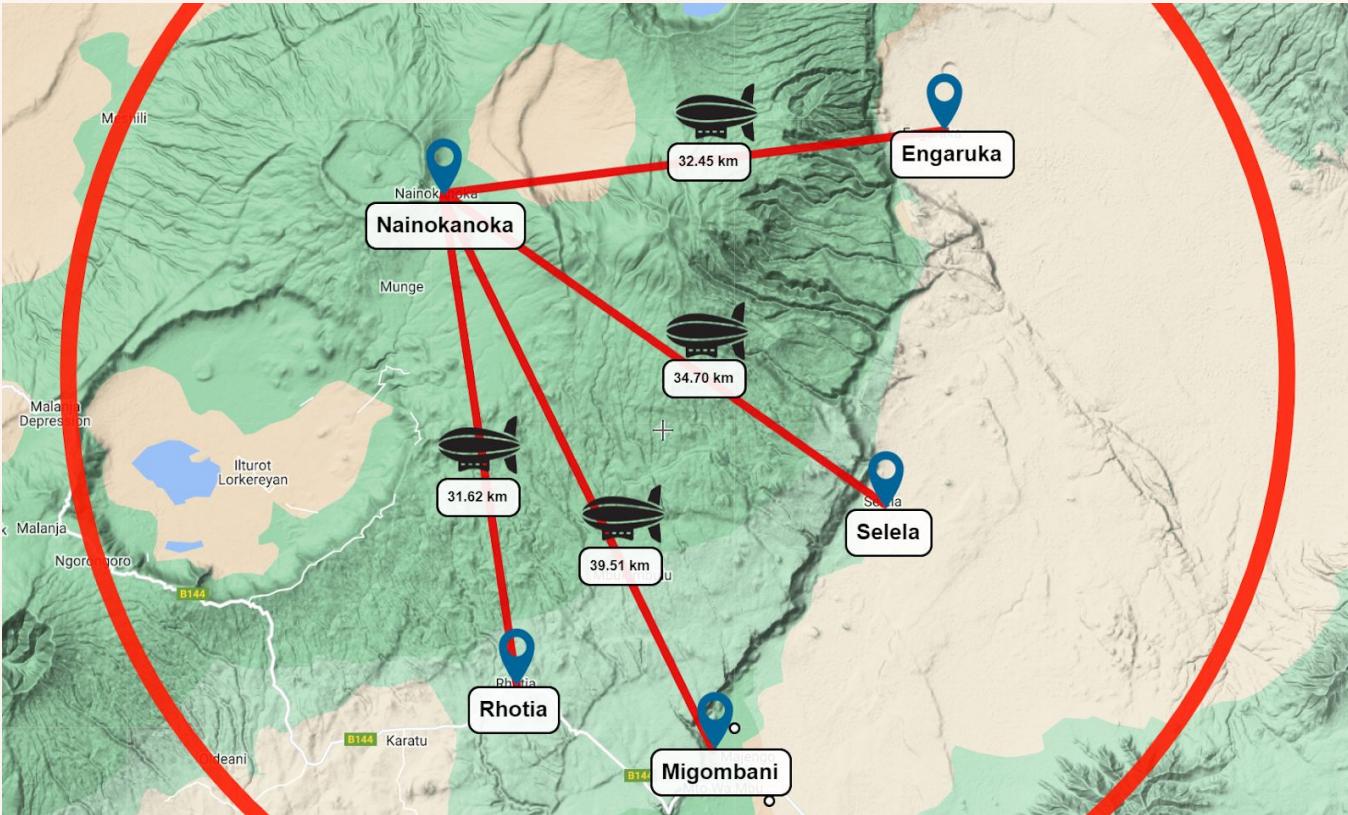
## Engaruka Village

Highly developed agricultural area using irrigation from the Engruka River.

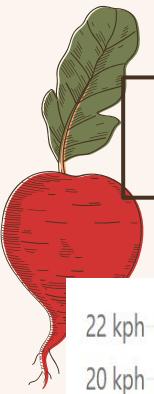
Target foodstuff produced: Lablab Beans (*Ngwara*), Cabbage, Tomatoes.



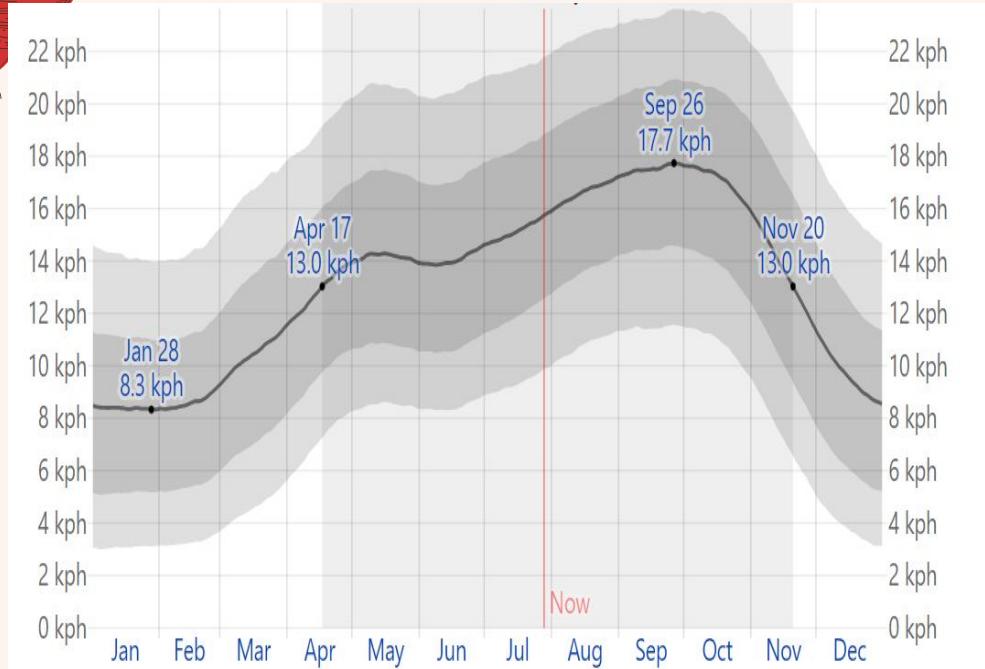
# Proposed Flight Map



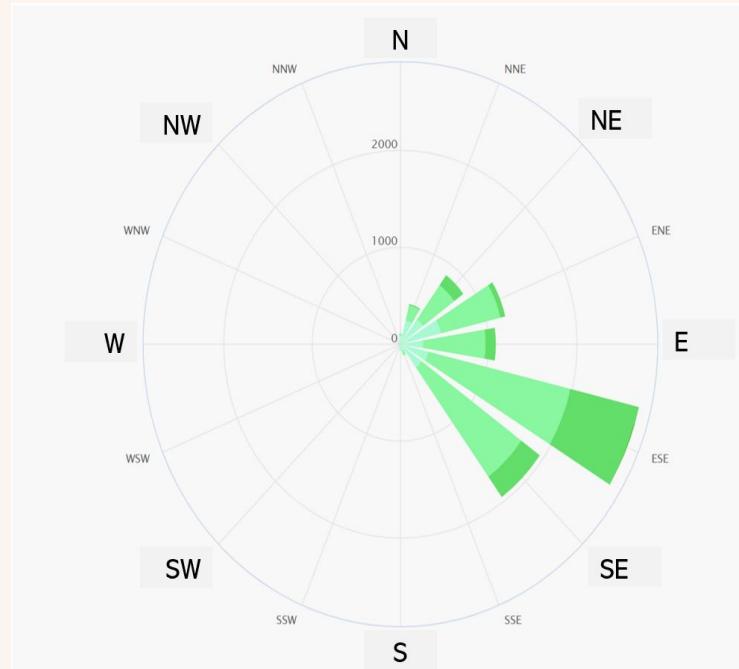
**Note:** Outer bold red circle demarcates our the target regions in Arusha with a 40 km radius.



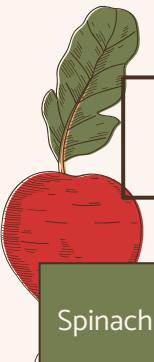
# TLR - Wind Pattern



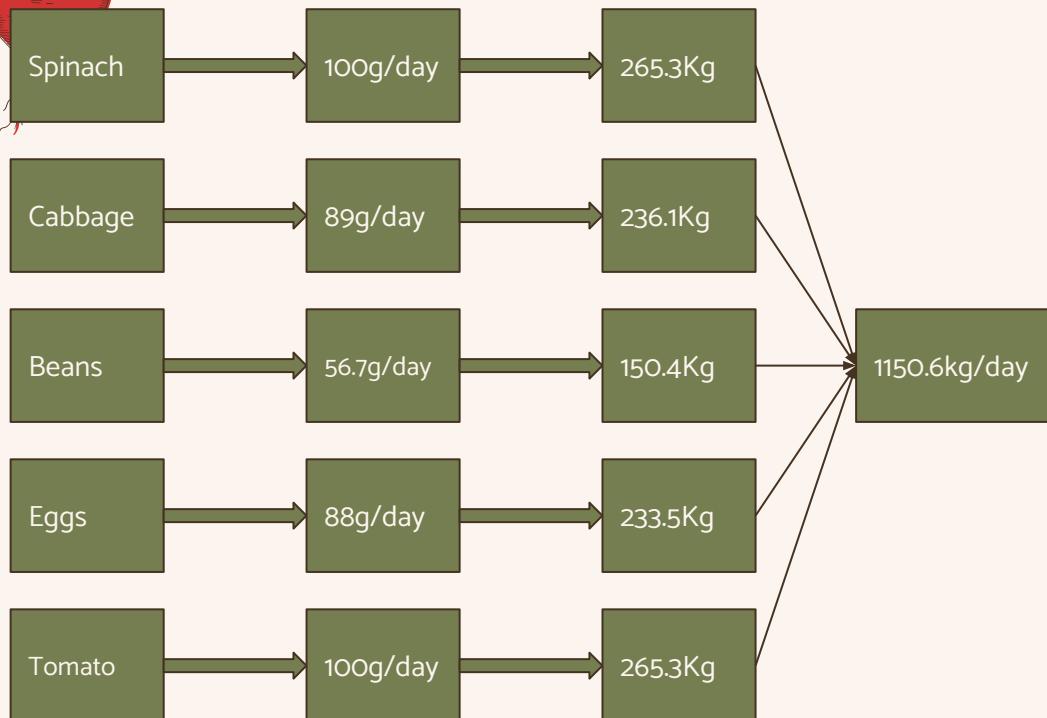
Monthly Average Wind Speed in Arusha



Yearly Wind Direction Pattern in Arusha



# TLR - Cargo Weight



17%

% of Tanzania  
aged 0-5 years  
old

Est. Population  
of Nainokanoka

15606

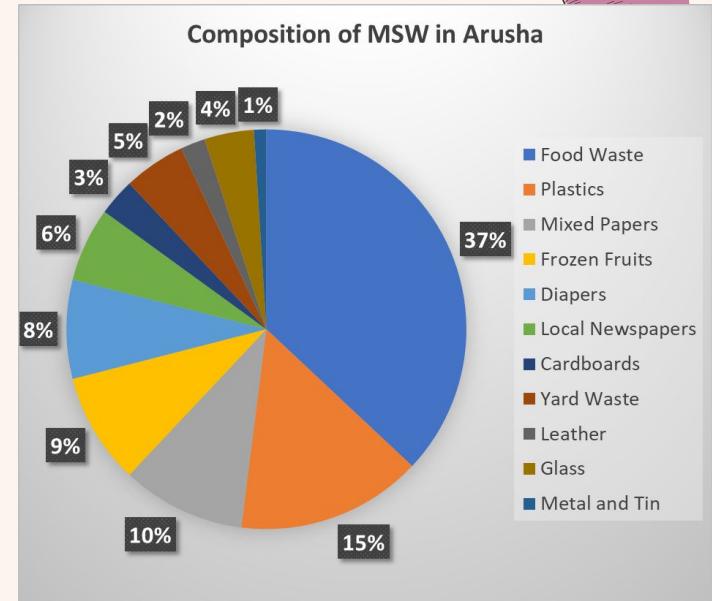
~2653 infants in  
target region

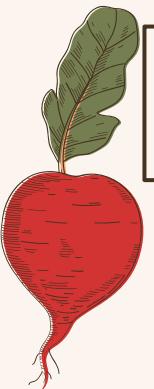
# Waste Management Project

**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.

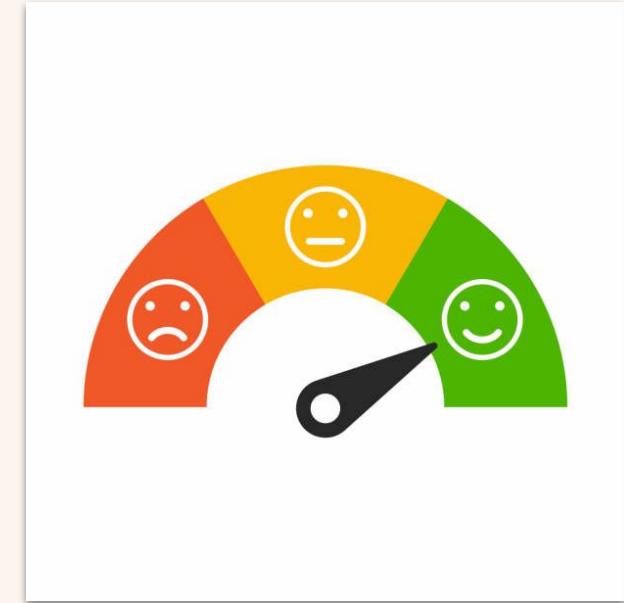




# Ensuring Project Goals

Monthly surveys would be carried out amongst:

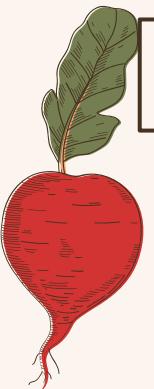
- ★ ***Target Infants:*** to measure significance of program on infant nutrition and development.
- ★ ***Farmers:*** to identify possible improvement in quality of life.





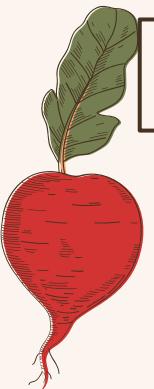
# Questions?





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