



MICS2024

# Mini plant factory establishment in schools for sustainable agriculture and nutrition enrichment

## Interim Report

November 20, 2024. Ulaanbaatar, Mongolia



01

# Review of the Past

Addressing Mongolia's Challenges Through Sustainable  
Solutions



# Enhancing health and life quality in Mongolia with vegetables

## Monglia's challengs

1

**Severe Climate**

2

**Meat Dominant Meals**

3

**Traditionally Established Habits**



**Veggie shortages harm health.**



**Innovative farming for climate.**



**Balanced diets for health.**



**Making veggies fun and accessible.**

# From Growing to Enjoying: Building a Sustainable Veg Culture

## #1 Producing



### Mini Plant Factory at School

- Introduce weather-resistant farming tech.
- Placing Mini Plant Factory (Vegetable-racks) at school



### Sustainable Mini Veg Value Chain



## #2 Eating



### School Meals & "Shokuiku"

- School-grown veg in lunches.
- Introducing "Shokuiku".



### Behavioral Change from Children



## #3 Disseminating

### Making Veg Enjoyable

- Creating Friendly and Tasty menus.
- Through Fun Digital Strategies.



### Veg Move from kids to others!!



02

# Current Progress and Collaboration

How We Are Turning Ideas Into Action



# Key Achievements in Current Progress

1

## ***Partnership with Yanmar***

- Completed preliminary cost estimation for equipment.
- Initiated planning for mini plant factory at school installation.



2

## ***Focus on Key Crops***

- Narrowed down to lettuce, spinach, and strawberry.
- Based on nutrition, feasibility, and demand.



3

## ***Pilot Schools Selection***

- Chosen two schools area: Ulaanbaatar and Ger district.
- Model schools for testing and scaling.



# Partnership with Yanmar: Supporting Mini Plant Factory Development



1

## *Role of Yanmar*

- Provide preliminary cost estimation.
- Collaborate on system design.

2

## *Next Steps*

- Finalize cost analysis and system design.
- Conduct pilot installation and technology testing.



Cost estimation from domestic facilities.



Yanmar offers adaptable cultivation tech.

# Key Crops Selection: Lettuce, Spinach, and Strawberry

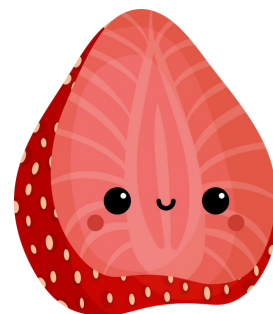
## 1 *Why these crops?*



Selected for **nutrition, feasibility, and demand.**

## 2 *Next Steps*

- **Pilot Mini Plant Factory operations** with selected crops.
- Develop cultivation techniques tailored to ensure crop adaptability.



**Spinach**

Iron, Vitamin A, Vitamin C

Rich in iron and vitamins, **highly nutritious.**



**Strawberry**

Vitamin C, Antioxidants

High in Vitamin C and antioxidants, **very popular.**



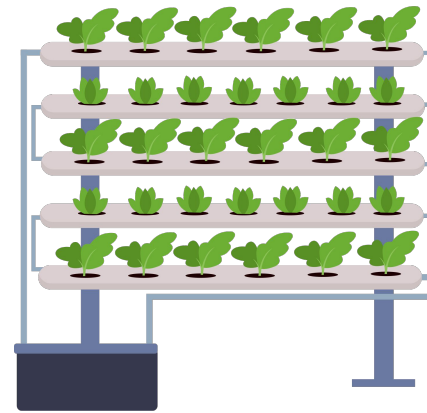
**Lettuce**

Vitamin A, Folic Acid

Versatile, **easy to grow,** and rich in Vitamin A and Folic Acid.



# Pilot Schools Selection: Ulaanbaatar and Umnugovi



## 1 Why these schools?

Chosen to test **urban and rural feasibility**.

## 2 Next Steps

- Install **Mini Plant Factories** in selected schools.
- Engage communities with **educational programs** and hands-on training.

## Pilot Schools and Areas

### 01 Ulaanbaatar

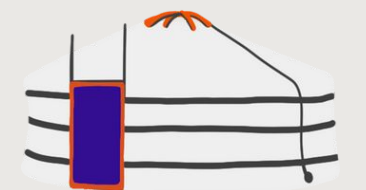


Harumafuji school etc.



### 02 Umnugovi

Khanbogd area



03

# Sustainable Model and Vision for the Future

Balancing Costs, Scaling Up, and Expanding Impact



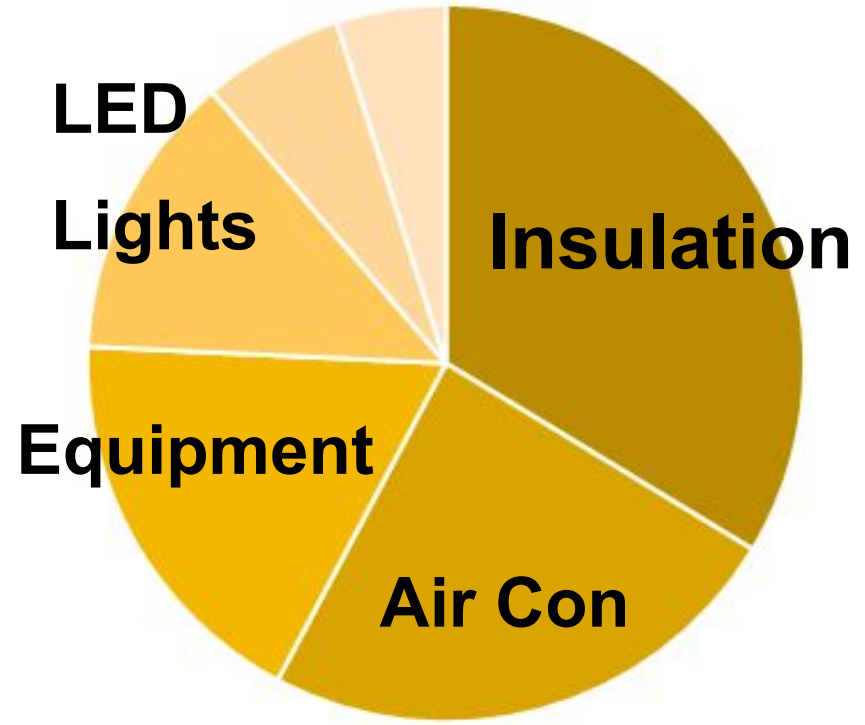
# Cost Breakdown: Capital and Operating Expenses

## Cost Overview for One School

**CAPEX**

**¥ 5,790,850**

Insulation Panels	¥1,950,000
Air Conditioning	¥1,396,200
Equipment Parts	¥1,040,000
LED Lights	¥748,800
Miscellaneous	¥369,850
Cultivation Racks	¥286,000
<b>Total amount</b>	<b>¥5,790,850</b>

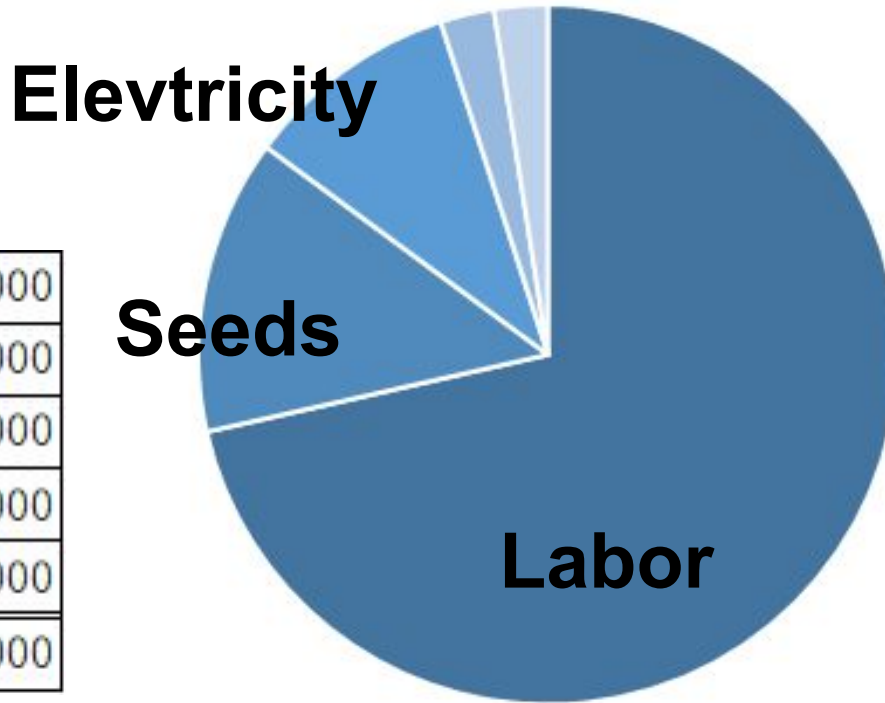


**Insulation Panels and Air conditioning account for 57% of initial costs.**

**OPEX**

**¥ 403,300**

Labor	¥288,000
Seeds	¥55,000
Electricity	¥40,000
Culture Media	¥10,000
Fertilizer	¥10,000
<b>Annual running costs</b>	<b>¥403,000</b>



**Labor costs dominate the annual expenses at 71%.**

• Estimates are based on the case of installation **in Japan and may vary for Mongolia.**

• Facility size: 13m<sup>2</sup>, Cultivation rack: 2.5m x 3 rows x 3 columns

# Building Financial Sustainability

## Funding Options

### 1 Crowdfunding



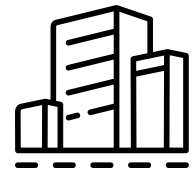
- Use Japanese platforms.
- Highlight project impact.

### 2 Grants & Subsidies



- Govt./NGO support.

### 3 Corporate Partners



- Leverage CSR initiatives.

**Key: Diverse funding reduces risk.**

## Revenue Model

### 1 Vegetable Sales



- Local markets & B2B.

### 2 School Lunch



- For nutritious meals.

### 3 Cost Sharing



- Use school facilities.

**Key: High initial cost, but long-term gains ensure sustainability.**

## Next Steps:

- Analyze funding options.
- Pilot revenue models with schools.
- Explore additional resources.

# Size of Market

Veg Market  
Lacking in Mongolia  
**¥ 53.8B**

School Meals Veg Market  
**¥ 3.7B**

Current Target  
(40% of SAM Market)  
**¥ 1.5B**

TAM

Scale further with regional greenhouses.



SAM

Expansion to schools in the ger districts

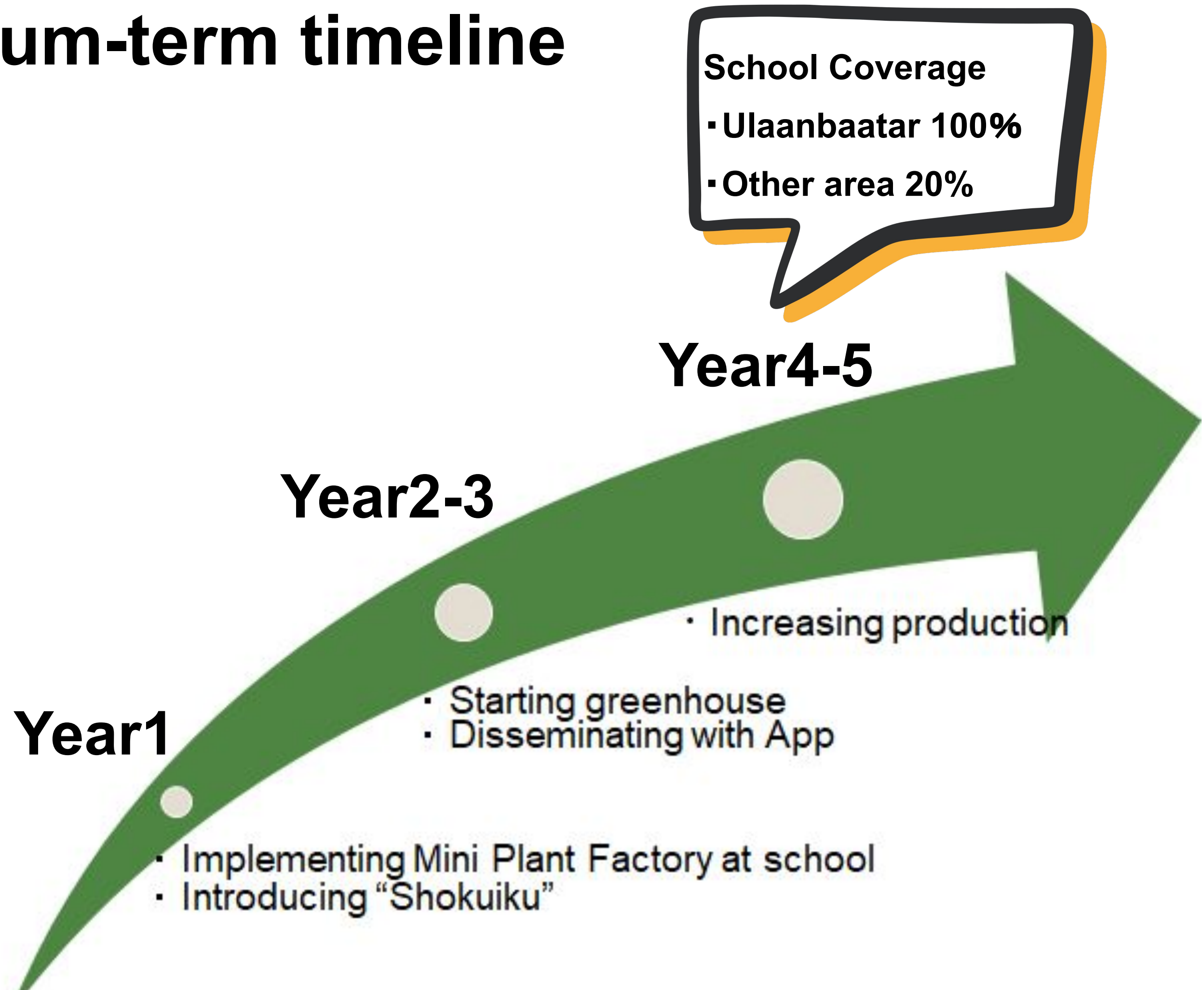


SOM

Expansion centered on schools in Ulaanbaatar



# Medium-term timeline

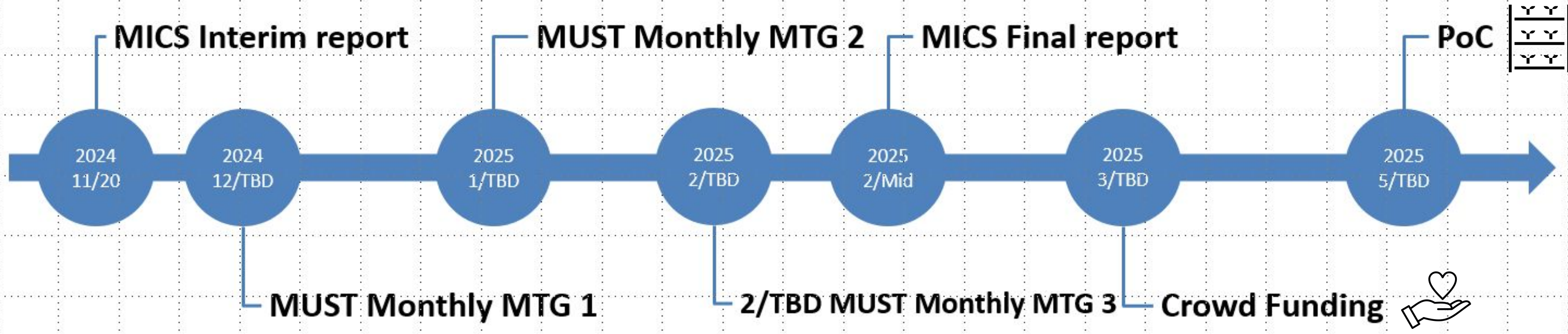


## The Creation of New National Healthy Habits



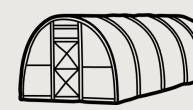
# Upcoming Schedule

Dec~Jan Visit Mongolia\*TBD



## Key Action Items

1. **Plan Mongolia Visit:** Coordinate with Hambogd Foundation.
2. **Assess Funding:** Initiate crowdfunding and secure grants.
3. **Site Survey:** Complete Mini Plant Factory with Yanmar.
4. **PoC Setup:** Implement and test with schools.
5. **Refine Strategy:** Develop scalability plan with greenhouses



# Our Team

## Strategy

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**PROFESSOR  
KATSUHIRO  
SATO**



## Technology

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**PROFESSOR  
CHOIJIL  
BAASANDASH**



## Nutrition

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**TSOLMON  
SONINKIHISHIG**



## Medical

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**SHIGEYOSHI  
KIJIMA**



## Agri-biz

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**SHIGERU  
NAKASHIMA**



## Finance

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**YUTAKA  
ABE**



## Biz development

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**RYO  
YAMADA**



## Law

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**AKINORI  
MIMA**



## Logistics

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**SUMI  
KIMURA**



## Contents creator

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**ATSUSHI WADA**



## Marketing

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**MASATAKA  
SHIMADA**



**ERIKA  
SATO**



**YUKIKO  
SONOKAWA**





# Supporters Our Team

## EMBASSY OF THE MONGOLIAN



Ambassador of Mongolia to Japan,  
Banzragch Bayarsaikhan

## YANMAR GROUP



Yanmar Holdings Co., Ltd.  
Yanmar Energy System Co., Ltd.  
Yanmar Green System Co., Ltd.

# Thank You

Aspiring for vegetables to become a staple, enriching the lives of the people in Mongolia.