



ICT Solutions from Farm to Meal: Sustainable Model Of Micro-Ecological Farming For Urban Populated Areas

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Introduction

- Current issue: Increasing world population, particularly in urban centres (from 50.46% in 2010 to 68.70% in 2050).
- Food and nutrition insecurity (safety and availability), stress lifestyle, poverty and unemployment are major phenomenon in increasing urban population.
- Lead to space shortage in urban areas.



Introduction

- Aim of our project - encourage farming and/or gardening in urban populated areas.
- Our concept is a new advancement toward feeding the populated urban areas and improve ecology of cities.
- Focus – micro ecological farming in urban areas.
- Micro urban farming *collectively* helps communities, regions and contribute to national food security programme.



Objectives

- ❑ Farming in the cities – not new. Been around for centuries.
- ❑ The major focus of this research is to revitalize urban micro-farming and ecological cultivation, improve food safety and promote plastic recycling.
- ❑ Objectives: to develop simple, affordable and replication system of micro farming in urban populated areas (e.g. homes, restaurants, schools).



Micro Ecological Urban farming



Problems:

- Not easy to assemble (Need crafting skills)
- Not portable
- Requires backyard (Not suitable where space is very limited)
- Affordability



Concept of urban micro farming for sustainability

- Easy/Ready to assemble
- Module assembly concept for versatility (size)
- In/out-door
- Low labour
- Accessibility
- Easy maintenance
- Plastic recycling
- Takes up small area
- Easy common watering system
- Wheels for mobility
- Affordable to EVERYONE



First model of vertical μ Farming

Concept: Portable vertical farming

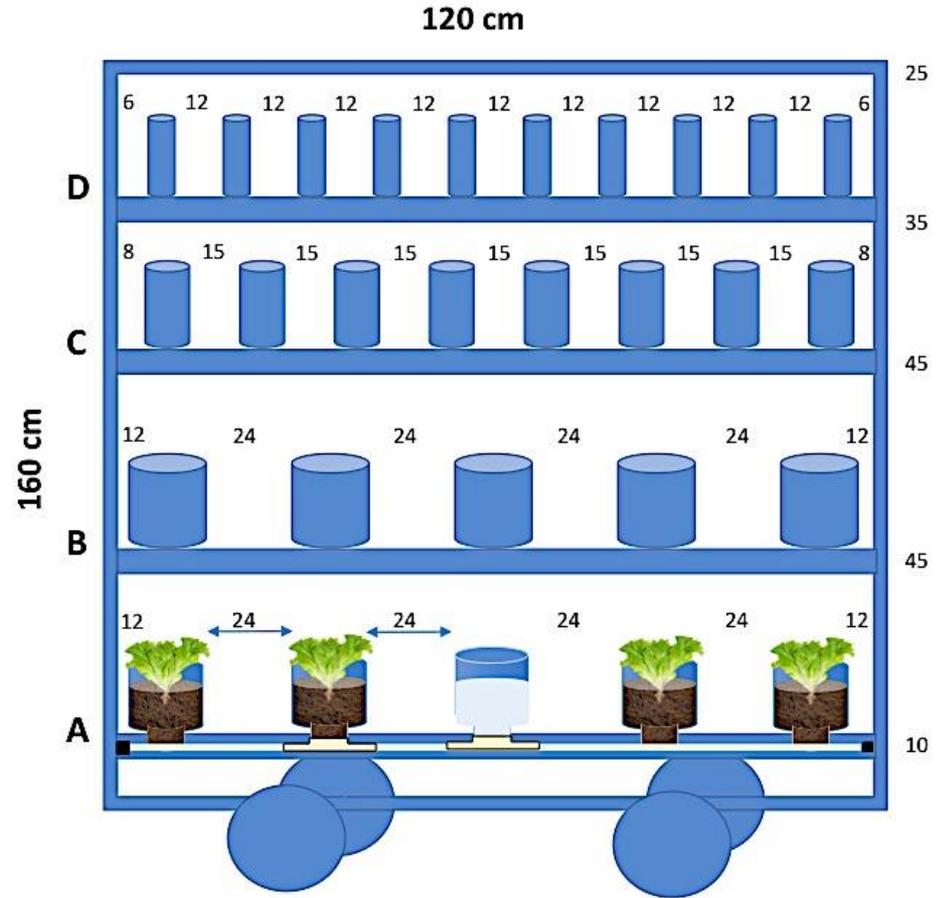
A vertical four section (level) plantation structure, 120 cm wide and 160 cm high frame.

Each section will be decorated with 4-10 empty recycled-plastic bottles of different sizes.

Each bottle will accommodate enough soil for a variety of cultivations according to the plant-size.

Additional bottles used for watering.

A single horizontal water-pipe for every level.



All the scales are in centimetres

A micro vertical plantation model for 25 sowings

Each level allows 8 bottles of 5L-sizes (section A and B); 7 bottles of 1.5-L sizes (section C); and 10 bottles of 0.5-L sizes (section D).



A way forward



Concept similar to IKEA furniture store.

The IKEA Concept starts with the idea of providing a range of home furnishing products that are affordable to the many people, not just the few.

Function, quality, design and value - always with sustainability in mind.

Our project:

- Design-your-own concept where each micro farm is highly unique and personal to the location to ensure everyone can afford
- Designed with different sizes, adaptable to fit indoor and outdoor environment and different locations.
- User-friendly and simple/ready to assemble
- For those with creative mind and spirit- appealing to the young generation



Future Development

Installation of smart features:

- Controllable/Automatic electronically (mobility, watering, temperature control and pH regulation)
- Employ mini-solar panel(s) for sustainable energy consumption.
- Auto warning system, mini alarm (sensor) system in case of any unexpected events.
- Nutrients' supply and monitoring
- Monitoring of pH, water and nutrient level through smart phones



Work Plan

Two-phased development plan:

- (1) An experimental phase - at UTB campus in order to optimize and validate the concept. A number of prototype models will be produced and a broad spectrum of vegetable varieties will be tested.
- (2) A translational phase - aimed to establish the practical implications in the society as whole. We are also looking to the commercialization potential of this concept, including additional upgrade and/or adjustments for the best efficiency and efficacy.



Connections scope

- Contribute to helping home owners - equip household with own farm.
- Work with engineers from various fields and also designers.
- New possibilities toward broader agriculture collaborations between SEA regions, utilizing ICT connection, for ecological agri-food strategies.



Conclusion

- ❑ The micro-farming solution has a great potential, suitable for climates in Brunei and also the rest of South East Asian Countries. Also achieve healthy (organic) agri-food production.
- ❑ Affordable system, covering some of domestic food supply that create stable food supply for own consumption – sustainability.
- ❑ Hope to progress towards food security at the most local levels.

“Urban agriculture is just now coming into its own. We haven’t even scratched the surface yet.”

James Brady

(Founder, Con10u2farm L³C)

Grow better than organic foods for healthier communities all over the world

THANK YOU