

About the Project

The Extent of mankind is strongly rooted in principles like social living,dependence and co-existence. No man is an Island. The key of all the civilisations were community living along a resource. As time lapsed, population grew and people started to doze off to other places irrespective of an availability of a natural resource. This led to dependency of one community on another. Even when this proves to be a convenient cycle, this mutualism may not always come in handy as many of our essential supplies wouldn't be accessible to the entire state if one of the state borders were to close off.

Amidst the coronavirus we've come to realise that society may not be as far off in advancement as we thought it would be. While being interdependent is one of the crucial aspects of human existence. It can also be a disadvantage in many cases. Since it is something that might hinder our growth if our dependent sources were to collapse. So that is where self sufficiency comes into play. It might seem far off from reality to assume that it isn't safe to be dependent on neighbouring communities as the flow of goods doesn't ever cease to make it into our own communities. But that isn't always the case as we saw with the Coronavirus pandemic. And to future proof our lifestyle it is essential to make self sufficiency a huge priority.

Self depency is not something which is confined only to the economically confined or well off communities of the society. It is unquestionably the key privilege of any common man; prominently in the case of food. We use Hydroponics as a means to bridge a big gap in the differences in interdependency and self sufficiency as it is one of the easily adaptable and is of high harvesting value.

Hydroponics can be implemented anywhere whether it be urban, rural, flat, villa's, landscapes or terrace-tops. This can also be easily used in settlements with very little to no gathering space, on balconies of houses and also in apartments where they have no balconies. It is a very versatile and economic solution that can be implemented in any household.Hydroponics being a culture which tackles cramped up and water unavailability conditions and a low maintenance option, makes it equally noteworthy in both urban

contexts where maximum utilisation of land is done and in rural areas where affordability is a key factor.

Methodology

Empathic Response

During our Conversations with the residents of the site, they expressed how hard it was for them during the pandemic. Most of them being daily wage workers created an unemployed condition during the lockdown.

“We had to stay at our houses just like any other citizen, but being jobless made the situation worse and markets being a bus ride afar did not help it either.” – Said one of the residents of the community. This paved for us to think of a versatile gardening solution. “There are many housewives amongst us. If gardening does not require skilled labour, it can be easily managed by them. And if it does not require too much attention and maintenance, we can also take part in the process.” – was the response of a daily wage worker of the locality. This zeroed our options to hydroponic agriculture.

Observations

- The site is a rural sector that lacks facilities like proper access networks.
- The residents have electricity but at times water availability is threatened.
- Most of the residents are families with the men doing daily wage works and most of the women staying at home.
- One of the biggest opportunities of the site was the availability of free space, which the residents also wanted to come as handy.
- So we’ve attempted to bring up a system of hydroponics in the space we're guarding can be done along with the community space.

Stakeholders

Beneficiaries

Initially this project was a way to showcase how this idea can be implemented in all the various households in different urban and rural environments. The product and design being versatile and flexible, we have tried to implement in a rural area who were in utmost need of such a concept. Pulaparakunnu colony, located in Meppayur panchayath, a small township in Kozhikode belonging to Sambhava scheduled caste community was selected. Most of them are wage workers whose daily income ranges from 500 to 750₹. There were almost 11 such families living in the plot. The families, who have been living in the colony for generations, have been denied all basic facilities. There is no electricity. They had no access to water and had to travel to neighbouring places for clean water. Currently the houses are reconstructed under the initiative of the Panchayat. The residents consider this a huge progress as it would transform their way of living.

During COVID-19 most of them had lost their job or couldn't find work and it has been very hard for them to get their daily needs sorted. They had struggled a lot financially to buy everyday supplies and even when they did manage to get proper funds transportation was a huge issue. People struggled to go to shops and markets as they had to take a bus or auto to get there since none of them have their own personal vehicles. And when public transportation was halted at the beginning of the lockdown they struggled to meet their essential supplies.

Sundaresan (Point of contact within the community)

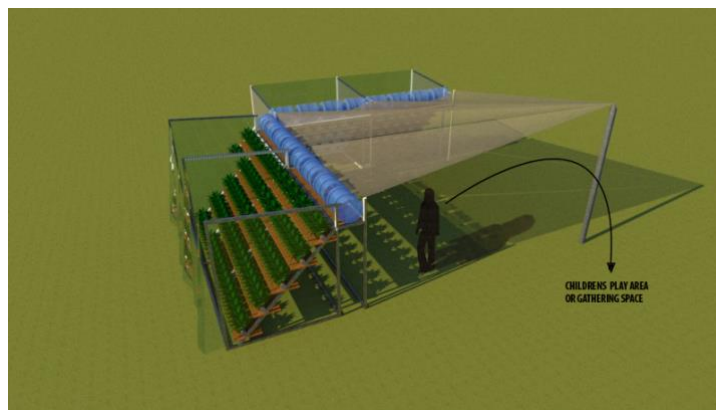
Mr.Ahammad K.P (Mentor)

Panchayat secretary (Authorized Personnel)

GramaPanchayat Meyppayur, Perambra

Site details

The site comprises 11 houses in 44 cent in addition to 20 cent of free space . Apart from the beneficiaries being in need of a solution,The site felt apt to represent possible methods in which hydroponics can be carried out. And since the residents are financially struggling it makes it possible to convey that the system can be installed even in the economically weaker section and how it can be adapted to a community as well as how an individual can reap welfare.Availability of free space creates an opportunity to experiment hydroponic farming in an open gathering space as well as adjacent to a house.



Design

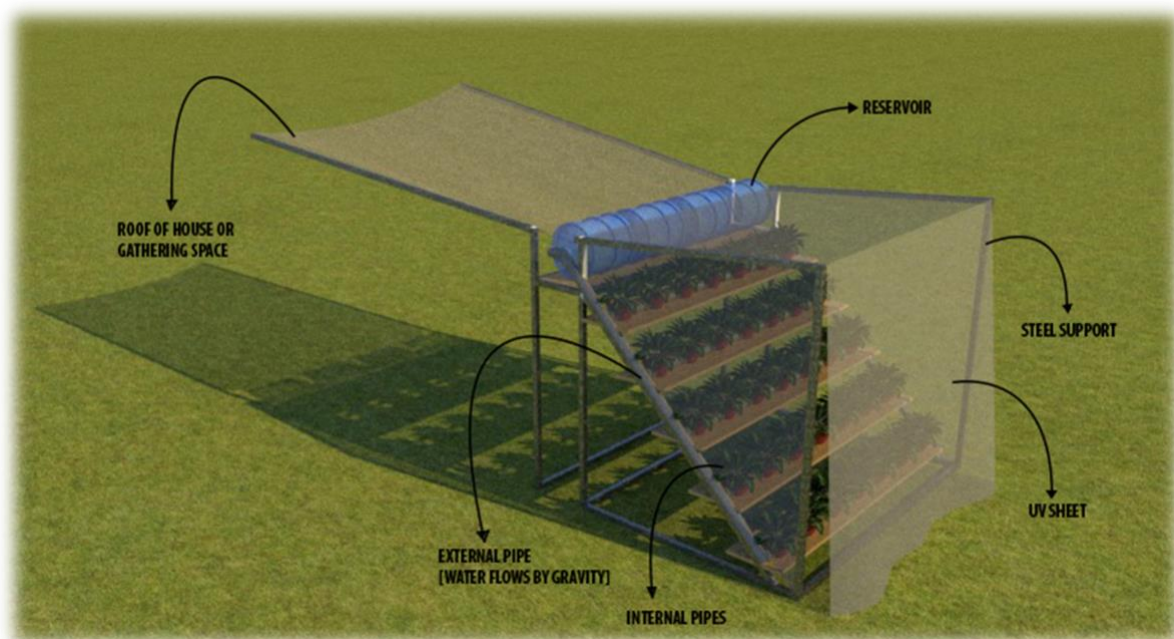
Concept

Based on our observations of the site, we attempted to bring up a system of hydroponics, where gardening can be done along with the community space. This would turn out to be a solution to lack of attention towards gardening that can hinder the harvest and success of the project. This project was inspired by a hydroponic terrace farming done in the neighbourhood. It was easy to set up and required maintenance only once every 3 months. It yielded a lot of harvest which is sufficient for 2 families.

As Hydroponics only utilize almost 20 times less amount of water than normal gardening, only an essential amount of water is utilised. Since it is easy to look after and maintenance is low, most of the residents can get involved in the process. Hydroponics is easy to set up so no skilled labor is required. Also in the said plot, due to house reconstruction there is more availability of raw materials and waste materials which can be used in the creation and implementation of hydroponic farming. Thus construction cost can be reduced drastically.

This will be implemented in attachment to houses as well as in the gathering space of the entire community. The farm would be part of the gathering space, not a separate aspect to it. It will be attached to the children's play area as it encourages more involvement of all ages and fosters the care of the community.

An advantage of hydroponics that the community would benefit a lot is that these require very little maintenance and they don't need to worry about it when they go about their daily wages implement



Design Implementation

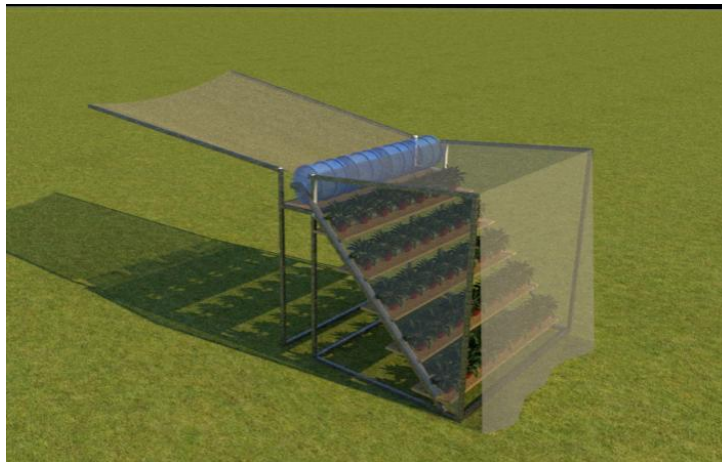
- The project can be built either as stand alone, prefabricated or built attached to a house.
- The roofing sheets are sloped to create maximum water yield for rainwater harvesting.
- Reservoirs placed at top to maintain pressure to pipes below.
- Internal pipes are placed at a zigzag manner so as to ensure consistent water runoff to all levels.
- Greenhouse effect created ensures maximum yield.
- U.V. sheets are placed so that it can be removed to provide access to harvest.

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- Adjacent space can be used as a common space of community gathering .
 - The setup can be placed adjacent to houses such that runoff water from house roof can be drawn into the reservoirs.
 - Grow bags used instead of generic plant pots to save on cost and weight.
 - Modular expansion enables larger yield.
 - The structure is oriented so as to maximize sunlight.
 - The sloped placement of plants ensure that no plant shades another plant.



Design specification

- Slope created using steel rods of 3m and 2.5m welded together
- It is further depressed to the ground to provide rigidity and strength to the structure
- The U.V. sheets are clipped to the rods with attachments for easy removal
- The roofing sheets are held by steel rods or low strength pipes protruding from the reservoirs
- Glass wool suspended from plant bags to adjacent pipes to ensure constant and maintained water flow to the plants



Maintenance

- Cleaning of U.V. sheet required every 2 months.
- Void under the structure to be cleaned regularly.

Cost Breakdown

S. NO.	DESCRIPTION	QUANTITY	TOTAL COST
1	Hydraulic hinges (for roofs structure)	4	2340
2	PVC pipe	27	10800
3	Hinged supports	36	2050

Materials Attained from Waste

4	Roofing for shade (recycling old flex sheet)	600sqft	-
5	Crates (the unloaded supply crates)	as required	-

MISCELLANEOUS 5000

ESTIMATED TOTAL COST 15190

Impact

After their basic issues were brought to Authorities attention,most of the problems were rectified. In addition to these, hydroponics would further elevate their living conditions. Instead of dividing the garden amongst the residents,together they can create a better output and inturn can enhance the community relations. When such a project is implemented on the scale of a community it transforms their way of living. Making it extremely easy to cover their essential supply of vegetables without any effort. Small scale hydroponic farms show great potential for the future of our society. The vegetations being cultivated by themselves, they are freed from threats posed by pesticides and fertilizers.One of the major essentials is food and itself being available at their own place, makes it easier and more cost-effective for them.

Conclusion

This concept was developed as a need for a drastic change in not just this community in particular but also in our society as a whole. If Every person had their own personal garden it would only provide a plethora of benefits to individuals or to the entire community. The cost of living drops as the essentials are covered making them able to spend their hard earned cash on whatever else they need improving their quality of life.