

Detailed analysis of complete lifecycle of agriculture which includes learning, Experiencing and through displaying ancient agricultural related works

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Abstract - The aim of the thesis to develop an integrated Community for Farmers and Farming in the delta region. To improve the economic status of suffering farmers. To develop supporting infrastructure to farming technology.

The architecture scope of work is to improve farming in horizontal and vertical (aquaponics) methods. The place where producers (as famers) and consumers (as non-famers) get to interact at a place is Called Agro-mall. The scope also includes infrastructure museum, research and development, and housing.

Key Words: Verticalfaming,agro mall,agriculture,organic products,community.

1.INTRODUCTION

Agriculture land is being used for construction in recent days; This Agro community concept helps to enhance agriculture. Selecting site in Thanjavur is because people from this locality are mostly from agriculture background. Thanjavur is "Rice bowl" of Tamil nadu and People in this location are well trained in agriculture-based works and practices. People nowadays are more interested in organic farming. The scope of study is to make awareness to the people about food and agriculture over the years. The current scenario of how the farmer is getting affected due to various factors such as land exploitation, lack of marketing and urban development over rural villages like ONG's pipelines. The measures to be taken in support of agriculture are developing new agricultural typology that is vertical farming; a mall for promotion that is Agro Mall and to create awareness to the society via implementing in museums and by research and development.

Agriculture today is widely dominated by Industrial methods. The main concern with the Agro community is that it has been masking the fundamental issues of unsustainable farming. The interrelationship between agriculture and architecture needs to be strengthened in order to sustain ourselves.

Agro community zones consist of 50% land farming and 50% of building structure Selected land is agricultural land which is going to be converted as non-agricultural land for the construction.

Vertical farming – a complete structure, which has majority positivity for the design seasonable vegetables, fruits and all major food products are produced here.

Museum is to display our traditional strength of our culture & Agriculture. Hands on workshop for our future generation, to create awareness of our current agricultural status. Display of crop varieties open spaces provided for traditional & agriculture

festivals to take place. Experience center for the public/visitors to get new experience on Agriculture.

Agro mall/market – A market space to sell all the products which is cultivated inside the site.

Vertical Farming – Organic products from this tower will be sent to agro market.

Agro Institute – this community cycle also consists of institute where public involve themselves in a short-term course of Farming. Public who are interested to take up learning farming can do the certified short-term course.

Housing for Farmers who are working in farming land makes use of it.

Research and Development zones for agriculture-based testing and research works.

2. METHODOLOGY

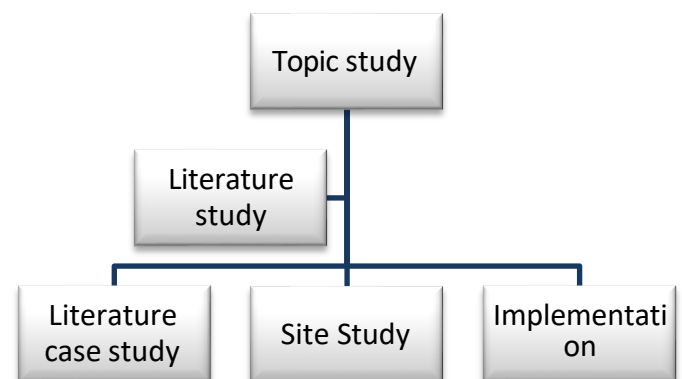
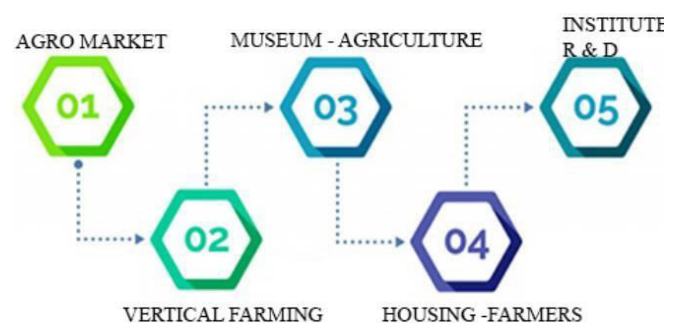


Fig -1: Design sequence



Flowchart: Inter connectivity

3. BACKGROUND WORK

NET CASE STUDY 1

NATIONAL AGRICULTURE MUSEUM

National Agricultural Science Museum (NASM), situated in the National Agricultural Science Centre campus of ICAR in New Delhi, is the first of its kind in the country. The museum traces the development of agriculture in India from prehistoric times to the present technology of agriculture in our country, with a futuristic projection. The museum has 150 exhibits which are displayed in 10 major sections viz. Six Pillars of Agriculture, Agriculture in Prehistoric Era, Indus Valley Civilization, Vedic & Post Vedic Era, Sultanate & Mughal Era, Advent of the British, Advancement of Agricultural Sciences in Independent India, Global Issues related to Agriculture, Towards a Food-Secure Future, and Children's Section.

DEMERITS: -

- Proper parking facility was not there for visitor, ASI building was used for parking.
- Only front façade was articulated, rear façade was only plastered.
- Placement of toilet was not proper; entry was from the landing of staircase.
- Fire exits were hidden and in case of emergency it is difficult to come out of the place.

NET CASE STUDY 2

AGRO MALL ROHTAK – HARYANA

Constructed Haryana State Agricultural Marketing Board has developed Agro Mall at Rohtak with its estimated cost of Rs. 89.53 Crores, Panipat with its estimated cost of Rs. 40 Crores, Karnal with its estimated cost of Rs. 80 Crores.

- These Malls is first project is of its own kind where agriculture related products will be on sale. There is a provision of shops, Showroom, Food court/Hall & PVR of difference sizes.
- Since Rohtak, Karnal & Panipat is rich agricultural belt of Haryana, so Government of Haryana have decided to set up such a Mall in this towns.
- The Mall have a huge central atrium which connects to all circulation corridors. It will be storied high having capsule lifts, escalators and bridges.
- The buildings are equipped with lifts, escalator and staircases and a ramp for vertical circulation.
- Special care has been taken to make the building disabled – friendly.

NET CASE STUDY 3

VERTICAL FARMING SYSTEM:

Advantages of vertical farming

1. The first and the major advantage of vertical farming is producing extremely high yields per available land or area.
2. Producing the food throughout the year without the risk of vagaries of nature of nature like floods, heavy rains, uneven rains, hail and snowfall, drought, dry spells, extreme high temperatures, cold waves, epidemics of pest and diseases, etc.
3. It reduces the cost over transporting loads of food grains from rural area to urban area and reduce the spoilage occurring therein. Fossil fuel consumption in transporting the farm produce to cities from village places is also reduced to a greater extent.
4. Vertical farming uses 70 to 95 % less water compared to traditional farming
5. 90% less or no soil is needed in vertical farming and thereby no pest and disease infestations.
6. Pesticide free or organic food is produced as there is no use of pesticides.
7. Due to reduced food supply chain, consumers get the fresh produce with all its original nutrient qualities.
8. High productivity per unit area i.e. almost 80% more harvest per unit of area in vertical farming.
9. It will lead to greening of the urban areas and help to reduce the rising temperatures and mainly the air pollution in cities.

Disadvantages of vertical farming

1. Initial High cost for establishing the vertical farming system is the major problem. It will include the cost erecting the structures along with its automation like Computerized and monitoring systems, remote control systems and software's, automated racking and stacking systems, programmable LED lighting systems, climate control system, etc.
2. High energy cost as growing plant is entirely with artificial lights.
3. The excess nutrients used in vertical farming may interfere and contaminate the main urban water system if not taken care of.
4. LED lighting systems emit heat though small amount will create problem of maintaining the temperatures especially in summer months and may overload the air conditioning systems which will again incur high energy cost.
5. Lot of garbage, plant residues, etc. will be generated around the buildings with vertical farming which needs to be dispose of properly.
6. Skilled workforce will be unavailable initially and will need to be trained.

NET CASE STUDY 4

MARKET STUDY - KOYAMBEDU MARKET

1. One lakh people visit - 300 acres market
2. Generate 150 tons of organic waste -everyday
3. Not all the waste is cleared
4. Only 70-80 % garbage generated by over 3000 shops – cleared said by merchant chandran, rest of it rots for days.
5. Ramky Enviro Engineers Limited, the private agency engaged for solid waste management, did not have enough workers on the ground.
6. Nearly 230 workers collected garbage and cleaned the road in two shifts of 12 hours each.
7. Shortage of manpower during rainy season - clear rainwater
8. bio-methanation plant that would generate 2,500 units of electricity from 30 tons of vegetable waste is lying unused due to damages to the equipment.
9. An acre of land near the flower market was assigned for a compost yard but the project did not take off.

INFERENCE

1. With above mentioned reasons the organic product from site will be in high demand among the people.
2. Since Thanjavur is traditional & historical sites available zone
3. This zone explains “Tamil nadu agriculture methods, its process,
Detail in it and it enhances our culture tradition for our future generation to learn from it.
4. People visits this community to get transparent food production, to gain knowledge of the manufacturing process and learn through the short-term course.

Vertical farming is definitely a solution to critical problems in Indian farming like lack of

Supply or oversupply of farm produce, overuse of pesticides, overuse of fertilizers,

Deteriorating soils and even the unemployment. But there are challenges like acceptance of vertical farming by Indian farming community. Indian farmers are facing various problems like lack of electricity supply throughout the Day, assurance of minimum support prices, no control over market glut, water scarcity, etc. The initial huge cost of infrastructure for a large-scale farm is a major hurdle for implementing vertical farming in India. Vertical farming in India has to face other challenges like public awareness, inclusiveness of farming community, technical know-how, cost incurred in managing and mainlining the vertical farm systems, and also its economic viability.

4. EXPERIMENT ANALYSIS

SITE ANALYSIS – Thanjavur Strength

1. The farmers in the district are very progressive and innovative in adopting modern technologies and crop varieties.
2. The district is one of the leading districts in the state in terms of production of many crops such as paddy, sugarcane, pulses and coconut.
3. Presence of Tamil Nadu Rice research Institute, Livestock Research Station and Paddy Processing Research Center.
4. In view of high level of urbanization with about 34 per cent of the total population in the district living in urban areas, the district has a good local market for its agricultural commodities especially fruits and vegetables.

Weakness

1. Irrigation needs fulfilled by River Cauvery, which is a center of long-standing dispute between the riparian states of Tamil Nadu and Karnataka.
2. Limited availability of groundwater.
3. Increasing scarcity of labor due to sharp increase in migration from rural to urban areas.
4. Mono - cropping of paddy, which has rapidly deteriorated the soil health.
5. Sub divided and fragmented holdings limit the farm mechanization process.
6. Siltation of canal systems.

Opportunity

1. Opportunities to promote new crop varieties and new technologies such as System of Rice Intensification and precision farming.
2. Opportunities to introduce water-saving technologies under canal irrigation systems
3. Further expansion of area under Palm oil trees, Maize and medicinal plants.
4. Dry land agriculture has a good potential in this district by appropriate combination of crops, tree crops and livestock enterprises.
5. The traditional sylvipasture system that combines sheep rearing with naturally growing trees such as Subabul could be further improved with a range of quick-growing tree species and sheep breeds.

Threat

1. River water disputes
2. Increasing scarcity of groundwater is a major threat to expansion of irrigated agricultural production.
3. The traditional animal breed known as “Umbalachery bulls” native to this district and known for their draught power is on the decline, which is a major threat to the sustainable farming systems in the district.
4. Declining interest among farmers in continuing with agriculture profession due to increasing employment Opportunities in non-agricultural sector and increasing risk in crop production coupled with stagnation in productivity and profitability of many crops.

தஞ்சாவூர்		
Agro Community	42 acres	population
Farming Land	21 acres	flow
Agro Market	3500 sq m	300,1000
Agro Museum	7000 sq m	100,500
Vertical Farming	14536 sq m	100
Farmer Housing	2100 sq m	100
R & D	2500 sq m	15
Institute	2500 sq m	15
Total Built up area	32, 136 sq m	
OSR 10%	4.2 acres	
Total ground coverage	12900 sq m	

Fig -2: Design Program analysis



Fig -3: Site plan – Agro Community

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4. CONCLUSION

Agro Community in Thanjavur Will Be Complete Lifecycle of Agriculture. In Which Public Can Gather for Essential Needs, A Place to Learn About Farming, A Museum to Know About Cultural, and Heritage of Agriculture Facts from Early Era. Different Types of Farming System in Which Vertical Farming Yields Different and Enormous Varieties of Products. Market Space in Site Will Be Over Crowded On Weekend For The Food Zone Which Is Merged Along Market area.

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