Project Report

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PPM PROJECT

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Project Report

URBANSEED

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INTRODUCTION

Have a look after two International reports

CASE 1:

Adults in urban India consume much more fat than those in rural areas, found the latest survey by the Indian Council of Medical Research and National Institute of Nutrition. Adults in India's urban centres consumed 51.6 grams of fat per day per head on average. The volume was 36 g in rural areas, according to the survey report What India Eats.
Rural India reporting a significantly lower prevalence than urban areas:

-> Abdominal obesity — 18.8 per cent (rural India) vs 53.6 percent (urban)

-> Being overweight — 16.6 per cent (rural) vs 31.4 percent (urban)

-> Obesity — 4.9 per cent (rural) vs 12.5 per cent (urban)

CASE 2:

Urban Malnutrition Around The World

Country	% Of Urban Children Under 5 Who Are Underweight
India	34
Bangladesh	28
Pakistan	25
South Africa	12
Brazil	2
China	1

(Source: UNICEF; Note: Data for India from 2005-06, Bangladesh 2011, Pakistan 2012-13, South Africa 2003-04, Brazil, 2006-07 and China 2010)

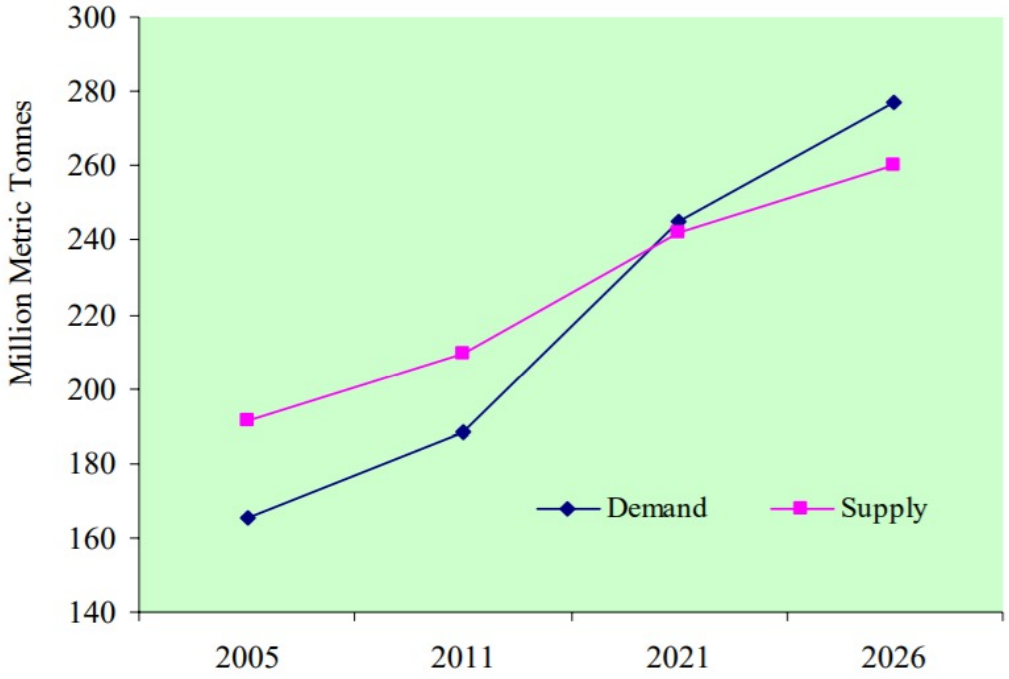
From the above two conclusions, we can see that:

India still faces the burden of undernutrition, and the prevalence of obesity is steadily increasing. There is a high prevalence of underweight coexisting with an increased prevalence of obesity in India. The rising prevalence of obesity, coexisting with undernutrition is a significant health challenge in low-income and middle-income countries like India.

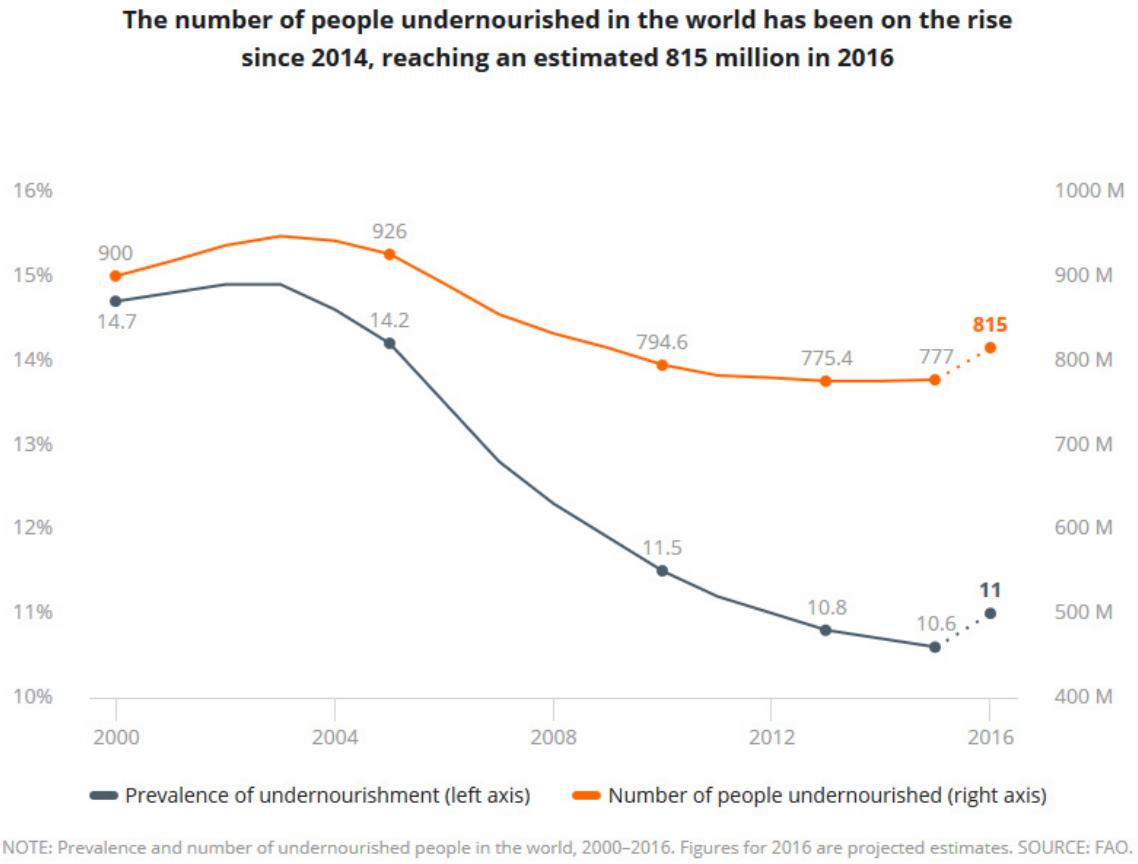
This directly or indirectly depends on the quality of food that is available to the people. As the population is increasing rapidly, we can see that the need for food has increased significantly.

let's have a look at the supply and demand curve of the food cereals in India:

Figure 3: Future Supply and Demand Balance for Total Cereals in India



The demand for food will increase by a greater rate than the supply, if the population keeps rising the same way. Also, the number of undernourished people will increase if the food supply didn't grow.



NOTE: Prevalence and number of undernourished people in the world, 2000–2016. Figures for 2016 are projected estimates. SOURCE: FAO.

Yes there was a decrease in the undernourished people, but that was due to the overuse of fertilizers and pesticides that for a short period had helped us in controlling the hunger index but now as the population is increasing more rapidly, how do you think we will satisfy the appetite if not by using new techniques for agriculture?

For sure, we will need new technologies, and one of such technology is aquaponics and hydroponics:

Aquaponics is a cooperation between plants and fish, and the term originates from the two words aquaculture (the growing of fish in a closed environment) and hydroponics (the growing of plants usually in a soil-less environment)

Hydroponic System is a system of growing crops without soil, often called **soilless farming**. The plant roots grow in a liquid nutrient solution in the hydroponic system or inside moist inert materials like Rockwool and Vermiculite. The liquid nutrient solution is a mixture of essential plant nutrients in the water.

How can we say we are going on the right track regarding the answer?? This might help:-

According to the UN reports on the global population, plants grown in hydroponic systems have achieved a 20%–25% higher yield than the traditional agriculture system, with its productivity being 2–5 times higher. Also, due to controlled environmental conditions, climatic changes can be balanced with the help of these systems, thereby not affecting the annual crop production. CEH techniques directly affect the crop harvest cycle. Since climatic changes show a minimal effect on such systems, crops can be produced all year round, increasing the produce.

But is it that simple to expect farmers to switch to the new technology for farming? Perhaps no, so here we are with the solution.

Urbanseed

A company that will bring the new tech in India, whose products are grown using the vertical farming method that too by using aquaponics and hydroponics, we will supply more nutritious products, grown organically (anything not grown in soil is not considered to be an organic product is a critic against aquaponics and hydroponics) but growing food without fertilizers or other chemicals will have the same effect of less contaminated food with high nutrient content. Still, the quality of the food is the only problem that we are facing?? See the conclusion of another report below

> The proportion of the world's population living in cities is increasing dramatically.
>
> It is predicted that by 2030, the worldwide population of urban dwellers will be nearly 5 billion, and by 2050 it may reach 9 billion. Therefore, in order to deal with the challenges of rapid urbanization, urban agriculture is in demand nowadays.

Vertical farming, unlike traditional farming can be done in urban areas too. Let's have a detailed look

The evolution of vertical farming in the economy:

- The Source of food security for the rising population every year.
- To Combat environmental issues like pollution.
- Providing healthy food to the growing population
- It Maintains balance in the ecosystem.
- Farmers can grow a greater number of crops around the year
- Recycling of organic wastes becomes easy along with less requirement for water
- Fertilizers and pesticides are not used in the cultivation which improves the productivity of crops
- Create job opportunities for the overwhelming population of the country
- It promotes the green industry and technology

Feeding urban communities

· As we work in the urban areas the parts of the food system would be less dependent on transport from rural areas to urban centers, thereby decreasing some of our fuel emissions.

· In the future, if vertical farming perfectly works it solves the problem of the demand for more food as well as for more land to grow food.

·Vertical farming can reduce the transportation costs due to its adjacency to the buyer; planned production of herbs and their growing conditions can be enhanced by adjusting the temperature, humidity, lighting conditions, etc.

·One of the biggest perks of vertical farming lies in the fact that it follows a Hydroponic growing process whereby only 10% of the water is used.

· In India, vertical farming has been introduced in recent times. By 2050, around 68% of the world population is expected to live in urban areas, and the growing population will lead to an increased demand for food.

Uniqueness in vertical farming

There are four steps that makes vertical farming unique are:

1.Physical layout

2. Lighting

3. Growing medium and

4. Sustainability features.

·The primary goal of vertical farming is producing more agricultural yield per square meter.

·Secondly, a perfect combination of natural and artificial lights is used to maintain the perfect light level in the room. The more optimized wavelength of light produces a better yield.

·Instead of soil, aeroponic, aquaponic, or hydroponic growing mediums are used.

·It reduces the use of water and land and decreased waste and CO2 emissions could already be helpful in mitigating climate change where it becoming more widely explored.

·There are many critics of vertical farming who argue against the large amount of energy needed to produce large crops, whereas the sun is free.

BENEFITS

Uses Space Optimally

We can design and build these farms in practically all kinds of locations and climates, and still be assured of cultivating crops regardless of temperature extremities or adverse weather conditions.

Less Use Of Water In Cultivation:

Vertical farming allows us to produce crops with 70% to 95% less water than required for normal cultivation.

Increased Production of Organic Crops:

As crops are produced in a well-controlled indoor environment without the use of chemical pesticides, vertical farming allows us to grow pesticide-free and organic crops.

Increased And Year-Round Crop Production:

Vertical farming allows us to produce more crops from the same square footage of the growing area. Such that 1 acre of an indoor area offers equivalent production to at least 4-6 acres of outdoor capacity.

Energy Efficient

Vertical farming is also a highly energy-efficient process.It uses LED Lighting for the nourishment of plant.We can also transfer the excess energy to your respective power grid and save some extra money.

Larger Produce

The biggest benefit of vertical farming is the fact that it helps produce more crops in general. As we already know, this mode of farming enables cultivars to produce crops consistently in a small area. Interestingly, it also boosts the amount of produce.

Seems to be a great idea isn't it but is it possible?? Let's have a look at the feasibility aspect

Feasibility Aspect

Requirements:

- Land of size > 5 acres
- LEDs
- Proper infrastructure
- Skilled workers
- Engineers to handle the aquaponics and hydroponics
- Permission from government
- Good water supply and nutrition supply

Feasibility:

- Though 5 acres of land would be easily available but considering the location we are choosing we can take the land on lease in extreme cases to cut down the initial cost.
- LEDs are easily available and in the future, it is going to be easier to acquire them.
- Infrastructure is manageable if the funding is enough, though it will be the most difficult part of the process but is doable with proper planning and funding.
- As the idea is new, so are the skills required for the work. We in the starting phase have to give proper training to all the farmers how the things are to be done. With the training of around 3 months will do the work. Expensive but feasible.
- We cannot compromise on the quality of engineers we want for the work so it will be expensive but in India, we will find the talent for sure for doing the work.
- Taking care of the fact that our technique is environment friendly and beneficial for the food supply of the country getting permission from the government will be easy.

- We are going to produce in urban areas which ensure that water and nutrition supply will be fulfilled for sure.

At first glance, it seems to be expensive, but we have to justify that being expensive does not always mean losses, at least in the long run:
Fixed cost and revenue are not assumed by us. It was given in various sites and research papers. We have used them because while implementing we might need some other things that we have not considered while planning so to be on the safe side and to give correct information we have used available data.

- ➔ One time cost is the installation cost of the equipment
- ➔ Fixed cost every year comprised of building rent and other such things
- ➔ Variable cost is the labor wages, electricity, and water bills(it increases 10% every year), as you have already guessed who's the culprit, inflation.
- ➔ Total cost = fixed cost + variable cost
- ➔ Total revenue is the estimated revenue every year which will increase at a rate of 25% a year, yes, businesses with a huge impact on society can grow with such a rate probably even at a higher rate
- ➔ Profit/loss = total revenue - total cost
- ➔ Business net status is profit loss considering the one time cost
- ➔ Highlighted in green borders represents the break-even point

Cost and Revenue

year	one time cost (averaged)	fixed cost every year	variable cost every year	total cost	total revenue	profit/loss	business net status
1	8000000	10000000	5000000	15000000	10000000	-5000000	-13000000
2	4000000	10000000	5500000	15500000	12500000	-3000000	-16000000
3	2666666.667	10000000	6050000	16050000	15625000	-425000	-16425000
4	2000000	10000000	6655000	16655000	19531250	2876250	-13548750
5	1600000	10000000	7320500	17320500	24414062.5	7093562.5	-6455187.5
6	1333333.333	10000000	8052550	18052550	30517578.13	12465028.13	6009840.625
7	1142857.143	10000000	8857805	18857805	38146972.66	19289167.66	25299008.28
8	1000000	10000000	9743585.5	19743585.5	47683715.82	27940130.32	53239138.6
9	500000	10000000	10717944.05	20717944.05	59604644.78	38886700.73	92125839.33
10	333333.3333	10000000	11789738.46	21789738.46	74505805.97	52716067.51	144841906.8
11	250000	10000000	12968712.3	22968712.3	93132257.46	70163545.16	215005452
12	200000	10000000	14265583.53	24265583.53	116415321.8	92149738.3	307155190.3
13	615384.6154	10000000	15692141.88	25692141.88	145519152.3	119827010.4	426982200.7
14	571428.5714	10000000	17261356.07	27261356.07	181898940.4	154637584.3	581619785

15	533333.3333	10000000	18987491.68	28987491.68	227373675.4	198386183.8	780005968.7
			Total cost ~>	308862408.5			

OPPORTUNITY COST

For opportunity cost, we have considered a stable interest of 8% on investment it may be from the share market or bank or other such institutes As we are calculating for 15 years an 8% compound interest rate is hard to get except at the share market in some scenarios. There are no other opportunities except some other businesses.

year	*total cost*	*opportunity cost calculation*	*overall net status*
1	15000000		
2	15500000	16200000	-32200000
3	16050000	34236000	-50661000
4	16655000	54308880	-67857630
5	17320500	76640990.4	-83096177.9
6	18052550	101478409.6	-95468569.01
7	18857805	129093436.4	-103794428.1
8	19743585.5	159787340.7	-106548202.1
9	20717944.05	193893400.3	-101767561
10	21789738.46	231780251.9	-86938345.07
11	22968712.3	273855589.6	-58850137.59
12	24265583.53	320570246.0	-13415055.75
13	25692141.88	372422695.9	54559504.75
14	27261356.07	429964024.9	151655760.1
15	28987491.68	493803411.4	286202557.3

The first row in the second and third columns is blank as we considered that the opportunity cost we will get will be after one year.

For year two opportunity cost is 16200000 that is what we have if we have invested 15000000 in the stock market for a year
In year three opportunity cost is 34236000 which is (16200000+15500000)*1.08 …… Increase by 8%
Overall net status = business net status - opportunity cost.

INTANGIBLE COST

To have a positive image in the society when we are well established so that at that time we can set aside a budget of 1cr Rs every year on things like helping in afforestation and giving free food to the really needy ones…… we will do this after our overall net status is positive that is after we have earned more than the opportunity cost can give us.

year	*intangible cost*	*net status after intangible cost*
1	0	
2	0	-32200000
3	0	-50661000
4	0	-67857630
5	0	-83096177.9
6	0	-95468569.01
7	0	-103794428.1
8	0	-106548202.1
9	0	-101767561
10	0	-86938345.07
11	0	-58850137.59
12	0	-13415055.75
13	10000000	44559504.75
14	10000000	141655760.1
15	10000000	276202557.3

For sure the investment is huge and the waiting time is longer than any standard business plan but this is going to be a revolutionary idea which in any case from the 13th year will be profitable and the profit will increase greatly afterward considering the new intangible cost and for sure we can have advertisement.

SWOT analysis

Strengths What do you do well? What unique resources can you draw on? What do others see as your strengths?	**Weaknesses** What could you improve? Where do you have fewer resources than others? What are others likely to see as weaknesses?
A vertical farm producing 100 thousand pounds of leafy greens per year. Promising to increase crop yield as much as 70 times compared to traditional field farms without using insecticides or fertilizers. Investors and local authority's belief in the Company's work and vision by awarding incentives, grants, and tax credits.	When the costs are high these will be compensated by a high selling price to create profit. The moist sanitized air that envelops the R&D lab is missing one ingredient: the earthiness that permeates any agricultural operation. Food that is not grown in soil may not be palatable to many, even those who are opting for organic substitutes.
Opportunities What opportunities are open to you? What trends could you take advantage of? How can you turn your strengths into opportunities?	**Threats** What threats could harm you? What is your competition doing? What threats do your weaknesses expose you to?
Products are free of pesticides and fertilizers to attract customers who buy organic produce. Vertical Farming promises about the new jobs and also gives great opportunities for new investors. Able to develop the 'NICHE' market. Year-round business from the production benefiting consumers with year-round availability of leafy greens irrespective of climate adversities.	Vertical Farming can face social barriers that "People believe food is made from chemical but not naturally grown." People can see the greenhouse effect as a threat to Vertical Farming Opposition by an agricultural labor union.

RELATED SCHEMES

In India, the central and state government have subsidized the capital costs for farmers willing to spend on hydroponics. Also, the exact subsidy appropriate is various for each state. Recently the Maharashtra government has rendered a 50% subsidy to farmers to adopt hydroponics for growing animal fodder-Hydroponic Farming. Similarly, the subsidy has been prepared for each state separately by the National Horticulture board.

How to get subsidy for Hydroponics
In India, the central and state government have subsidized the capital costs for farmers willing to invest in hydroponics. The exact subsidy applicable is different for each state. Recently Maharashtra government has provided a 50% subsidy to farmers to adopt hydroponics for growing animal fodder.

Poly house

- Central Bank of India:
CBI provides financial assistance under its Poly House, Green House, Shade Net House Scheme. Loans are provided up to 80% of the project cost and up to a maximum of Rs.5.00 crore. For SHGs and JLGs, the maximum loan will be Rs.20 lakh and Rs.5.00 lakh respectively. Repayment options provide a maximum of 7 years including a moratorium period of 3 to 12 months.

Subsidy pattern for greenhouse farming in India:
The Regulatory body in India for greenhouse farming is NHB (National Horticulture Board). NHB provides a subsidy of 50% on a project of 112 lakh maximum ceiling per beneficiary.

GAIC (Gujarat Agro Industries Corporation) provides a 6% subsidy on loan interest to a maximum limit of 4 lakhs.
NHM (National Horticulture Mission) provides 50% subsidy up to a maximum limit of 50 Lakhs.
Apart from the above, for every state, there is a facility provided by the SHM (State Horticulture Mission), which provides an additional subsidy of 15 - 25 % on the 50 % provided by NHM.
All the above subsidies can be availed by any farmer or entrepreneur, however under a single beneficiary name only.

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