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MATRIC NUMBER: 18/ENG08/007

DEPARTMENT: BIOMEDICAL ENGINEERING

COURSE CODE: AFE202

**ASSIGNMENT TITLE: ASSIGNMENT ON FOOD PRODUCTION AND HEALTH
AWARENESS**

Question

Prepare a business plan on a chosen agricultural enterprise following the guideline in the note.

Spiral bind and submit upon resumption. Minimum of five pages, times new roman size 12 with double spacing. Send the soft copy to me to view

A BUSINESS PLAN FOR THE DEVELOPMENT OF HYDROPONICS (A METHOD OF GROWING PLANTS IN A WATER BASED, NUTRIENT RICH SOLUTION) IN TITANIA HARDING-UDOH'S FARM, UTAKO, FCT, AND ABUJA.

The undersigned reader acknowledges that the information provided in this business plan is a confidential intellectual property; therefore the reader agrees not to disclose it to a third party without the express written permission of the promoters of the proposed business.

It is acknowledged by the reader that information furnished in this business plan is in all respect confidential in nature, other than information which is in the public domain through other means and that any disclosure or use of same by the reader, may cause serious harm or damage to the promoters of the proposed business.

Upon request, this document is to be immediately returned to the promoters of the proposed business

Signature:

Name:

Date:

CONTENTS OF THE BUSINESS PLAN

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Project Description

The project aim is to carry out intensive and high turnover production, off a small area, while providing work and leadership experience for local women and men.

Hydroponics is a method of growing plants in a water based, nutrient rich solution. Hydroponics does not use soil, instead the root system is supported using a stationary medium such as perlite, Rockwool or clay pellets. The basis of hydroponics is to allow the plants roots to come in direct contact with the nutrient solution, while also having access to oxygen, which is essential for proper growth.

Growing with hydroponics comes with many advantages, the biggest of which is a greatly increased rate of growth in the plants. With the proper setup, the plants will mature up to 25% faster and produce up to 30% more than the same plants grown in soil. The plants will grow bigger and faster because they will not have to work as hard to obtain nutrients. Even a small root system will provide the plant exactly what it needs, so the plant will focus more on growing upstairs instead of expanding the root system downstairs.

A hydroponic system will also use less water than soil based plants because the system is enclosed, which results in less evaporation. Hydroponics also is better for the environment because it reduces waste and pollution from soil runoff.

The proposed project will create economic opportunities, impact positively on the people and the environment and help conserve scarce foreign exchange. The project will create market access, improve income of farmers and contribute significantly to food security. It will also generate satisfactory returns for sponsors and investors.

Sponsorship, Management, Technical Assistance

SPONSORSHIP -The project is sponsored by Omolayo Harding-Udoh (my mother), someone who inspires me and founder of the farm, which was then passed on to me and my brother. My family is promoting the productivity of this method, to increase economic opportunities, mass production, help improve exchange rates between Nigeria and other countries

MANAGEMENT-The management will comprise of a democratically elected Board of Directors at the apex of the farming organization structure. This will be made up of shareholders and member of the organization who have stake in the survival, growth and profitability of the business as well as distinguished agribusiness professionals of proven integrity and vast experience in the project area. The prime objective of the board will be to give strategic directions and policies that will ensure long term success of the organization. The board will ensure that the organization complied with all standards set by regulatory authorities.

TECHNICAL ASSISTANCE the hydroponics systems, hydroponic nutrients, an inert hydroponics medium, a light source, time and plants will be gotten from a few contracted engineers, agronomists and a biologists to help aid this project

Market and Sales

The project is expected to begin production within 8 months from start of the first tunnel being erected. Short-term and long-term funding to finance the purchase of a new farm/expansion of the original farm and development costs of the project. This will cover startup expenses and first year loses. It is estimated that the organization will begin to make a profit in year 2 of operations.

Competition analysis

At present there are very few big growers, minimizing the competition.

The advantage of hydroponics on a large scale is the availability to produce vegetables all year round in large quantities. This immediately becomes a positive factor with major retail outlets and exporters.

Tariff and Import Restriction

Forex restriction on food importation and zero duty on imported agricultural equipment will favour the project under consideration.

Market Potential

There is a strong demand for the biggest, juiciest plants you can possibly imagine, hydroponics is the right choice, due to the fact that when monitored carefully, it is extremely beneficial and it still supports production and trade within Nigeria.

Profitability

Hydroponics is the growing of high-quality vegetables in high-tech, multi-span greenhouses. The produce is grown in 15L bags with a medium used to support the root system. The plants are automatically fed nutrients through irrigation systems. The plants are grown in the best suitable growing conditions, which allows each plant to produce the maximum fruit possible.

Instant turf will be grown out in open field production. The turf will be irrigated via overhead spray units, using the run-off fertilizer from the multispeed tunnels. This fertilizer is highly effective and will provide all the requirements the instant turf will require. The turf will be cut and sold by the square meter, and is harvested with a sod cutter. The company will concentrate

on the production of tomatoes, peppers and cucumbers in the tunnels, and in time will pursue more selective vegetables and the fresh cut flower market

Weather, biological, chemical, physical and environmental factors such as temperature, sunlight, water, air, soil conditions will not affect this method of farming because it is indoors(through the use of glasshouses).

Technical Feasibility

We are implementing our project using best international practices, sustainable production and due consideration for the environment.

Government Support and Regulation

The project supports foreign exchange and import reduction conservation of government. It creates economic opportunities, market access, and improved income for farmers and support food security objective of government. Hydroponics is an excellent choice for all types of growers. It is a great choice because it gives you the ability to meticulously control the variables that effect how well your plants grow. A fine-tuned hydroponic system can easily surpass a soil based system in plant quality and amount of produce yielded.

Project Timeline

The project will be completed within 8 months preferably between August, 2020 to April, 2021

Estimated Project Costs

Fixed Cost

The operation will utilize:

1. Six large greenhouses enclosing the vegetable area
2. irrigation, fertilization, temperature control and water treatment devices
3. outdoor production of instant lawn
4. pack houses and washday facilities
5. business office building
6. An additional portion of the operation will be the growing of instant lawn. Local landscape operations have trouble with meeting the demands of instant turf supply, and the company has recognized the need in the market.
7. The company plans to supply the local nurseries and landscapers with top quality, premium garden lawn.

Infrastructure	QTY	₱	K
Large Greenhouses	6	7,300,000	00
Irrigation, fertilization, temperature Control and water treatment devices	20 each	4,000,000	00
Formation of Lawns	1 Hectare	1,050,000	00
Utility buildings	Required no. = 3	6,000,000	00

Wash bay facilities	40	3,500,000	00
Total	-	21,850,000	00

Equipment's

- The Reservoir-The reservoir used in hydroponic systems holds the water that in turn holds the nutrients to be supplied to the plants. As the most basic component of any hydroponic system, the reservoir holds the water that is needed to keep the plants awash with moisture and minerals.
- Water Pump-To supply the plants with the water and minerals they need to survive, we need to get your hands on a reliable water pump. The two main types of water pumps are submersible and non-submersible. The former is installed in the nutrient solution while the latter needs to be installed outside the solution. Water pumps are also classified according to their output in Gallons per Minute (GPM) or Gallons per Hour (GPH).
- Timer-In most hydroponic systems, except the most basic ones, a timer is required to assist with the regulation of a number of essential functions. For instance, a timer can be used to regulate watering, ventilation and lighting cycles.
- Lighting-To enhance the growth of the plants, we need to have the right grow lights. It is important to mention at this point that even though fluorescent lights can be used to

supplement natural light, they cannot, on their own, provide the spectrum of light needed by plants. Metal Halide and High Pressure Sodium Lights were developed to emit a spectrum of light that mimics the quality of light emanating from the sun. Metal Halide lights are the closest we can get to sunlight. They produce more a higher proportion of blue light that is great for supporting vegetative growth. High pressure sodium lights on the other hand produce light that covers more of the red-orange spectrum. They last longer, burn brighter and consume a lower amount of energy than their metal halide counterparts, even though they produce a narrower spectrum of light. For the best results, it is recommended that we combine the use of both types of lights to provide light that is as close as possible to the full spectrum of sunlight. Furthermore, we can use light reflectors and movers to cover a wider space with fewer lights.

- Growth Media-Soil has no place in hydroponics; inert, non-organic materials are used in its place. The growth media is used to support the plant as it grows. The medium chosen should in addition to anchoring the plants, facilitate proper drainage and aeration of the roots. Polyurethane foam, perlite, bark, gravel, vermiculite and coconut fibre are some of our main options here. The right growth medium should be dense enough to anchor the plant but not so much that it hinders the circulation of air and the nutrient solution. The particles of the medium should be able to hold moisture and nutrients long enough to allow the roots absorb the necessary level of nutrients in between flooding. Finally it should be sterile to prevent the propagation of diseases, pests and parasites.
- PH Test Kit-You need to maintain the pH balance of the nutrient solutions to have any chance of growing a healthy hydroponic garden. Even though some plants may be able to

grow healthily at a lower or higher pH level, it is recommended that we keep it at between 6 and 6.5. This means that we have to acquire a pH test kit. Of all the hydroponic equipment discussed above, these kits are the most affordable, but also among the most important.

EQUIPMENTS	QTY	₦	K
LARGE RESERVOIRS	4	4,500,000	00
LARGE WATER PUMPS	6	3,000,000	00
TIMERS	6 FOR EACH SETUP	500,000	00
LIGHTING	30	5,000,000	00
GROWTH MEDIA	50	10,000,000	00
PH TEST KITS	10	250,000	00
TOTAL	-	23,250,000	00

Funding Mechanism

Where possible equity investor are to provide equity for working capital or otherwise secure loan at the rate of 20% through the Bank of Agriculture, Bank of Industry and Commercial banks.

Conclusion

The project is extremely practical and viable. It is recommended for funding.