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DEPARTMENT: MECHATRONICS ENGINEERING

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PROJECT TITLE: PRODUCTION OF IRRIGATION TECHNOLOGY

PROJECT ANALYSIS:

This project would involve a business enterprise that produces various devices used for irrigation purposes and hire people to help install and operate the devices that will be install in the farms. The devices such as smart irrigation controllers and rotating sprinkler nozzles and other recently developed irrigation technology would be provided by the company to the clients. The project team would comprise of agricultural engineers, mechatronics engineers, electrical engineers, mechatronics engineers, financial analyst, maintenance engineers, and marketing strategist

APPRASIAL

The total budget for the project is a total of 240 million naira because the project would involve building of the latest technology for irrigation and farming purposes by a set of highly skilled team to provide the best services for the clients. The cost for land and labor is also calculated with the general budget and also the cost for advertisement. Implementing drip irrigation can cut water consumption by as much as 60% while increasing yields. While there is an initial investment in the system, particularly when solar powered pumps and electronics are employed, the cost savings can provide a return on the investment. New irrigation systems which use pressure compensating (PC) drippers require less pumping power, further lowering energy costs and making solar. Additionally, taking advantage of smaller pumps powered by solar technology means farms large and small are drawing less power from the grid and able to maintain operations even during power blackouts. Cost savings coupled with more consistent and higher per acre yields are enough incentive for most operations. Being environmentally friendly by conserving resources is an added bonus.

IMPLEMENTATION/MONITORING

In order to build the devices, System response tests were carried out to determine the time taken for the system to irrigate potted samples of different soil types having different levels of dryness. The results obtained showed that sandy soils require less water than loamy soils and clay soils require the most water for irrigation. Factor such as the reason irrigation is applied to avoid water deficits that reduce crop production, achieving higher water use efficiency and productivity would be considered in building the equipment. Integration of existing irrigation technologies and various technology to implement at farm scale a flexible and reliable precision irrigation platform that can be directly applicable on a wide range of soil and climate condition and on the most relevant water demanding crops. The materials used would be strong and durable so they can be used for a long time. An assess to the increase of water productivity resulting from an overall less use of fresh water to irrigate crops and better adaptation of farming and irrigation practices to climate change would also be considered in the building of the devices. In order to achieve maximum advantages, the development of a holistic and structured precision irrigation platform which would offer farmers flexible crop tailored irrigation scheduling protocols for their specific fields taking into account spatial variability management. During the irrigation season the consortium monitored soil moisture before and after each irrigation intervention, the amount of water applied for each irrigation intervention and the yield obtained in all experimental fields. Additional information on crop prices and unit irrigation costs from each experimental site was collected. Changes and advances in the irrigation industry have led to new technologies that bring drip irrigation’s benefits within the reach of farmers everywhere. As such, manufacturing of drip systems will need to stay on top of the latest technology in manufacturing to keep up with increasing demand while still producing a high quality product. Drip irrigation is particularly useful in drought-prone regions to help minimize water use while still growing healthy crops. Water is pumped along thousands of feet of pipe and fed from drippers directly to the plant only where it’s needed which helps prevent weeds from getting adequate nutrients. Growers control the amount of water and fertilizer delivered by optimizing both the flow rate and type of the dripper at a specific plant and by incorporating smart technology to monitor local conditions .So drip technology would be adapted to the irrigation system.

EVALUATION

This project would help to make farming easier and improve farming and ensure proper growth of plants. This project would be structured to support PI application through data acquisition, system controls and evaluation mechanism enabling full decision for end users at farm scale. These devices would integrate multiple state of the art irrigation technologies and strategies as well as newly adapted devices leading to further increased water productivity. The flexible, cost effective, ease of use, minimal maintenance of the system and often increase in crop yield would boost its acceptance and uptake by the end users. In addition as benefit the system would also enable the reduction of fertilizer use, further supporting sustaining use of natural use and adaptation of agricultural practices to climate change. Further, smart systems can incorporate local information via weather reports and soil sensors to deliver water in a timely fashion and ensure plants are not over watered. These systems minimize soil erosion or compaction by delivering water over time and allowing it to seep through the soil.