

Autonomous Hydroponics Greenhouse Prototype

Grow Green!

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PROBLEM STATEMENT

Due to an increase in global population, climate change, soil degradation, and water shortage, food scarcity is a major issue and hydroponics is our answer to it.

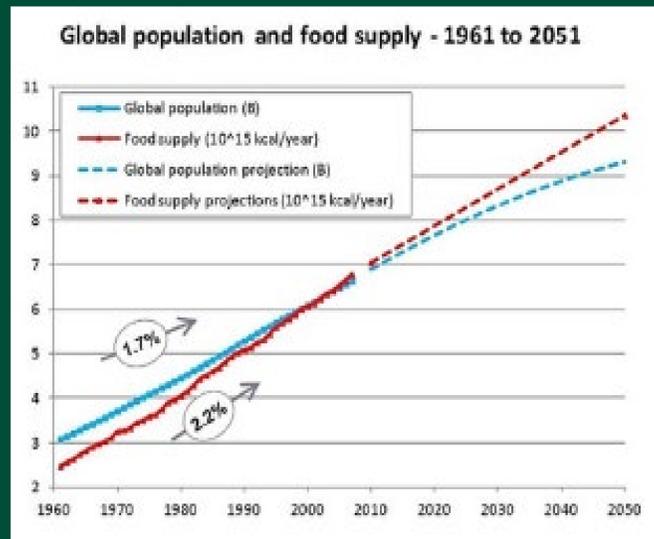


Figure 1: Global Population vs Food Supply



Figure 2: Benefits of Hydroponics

BACKGROUND

Currently, the planet is facing concerning issues such as climate change, non-arable land, increase in population; therefore an increase in demand for food. In order to address these issues, our system will use hydroponics system to grow healthy and organic food without soil. Our system will be autonomous and will use artificial light. It will be able to grow food anywhere, anytime.

SUMMARY OF WORK

The system uses several features to autonomously work to grow plants in a safe environment. We are using LED lights and are able to change its intensity. The humidity sensor sends data to the raspberry pi which in return turns the fan on when needed. Chiller is used to cool and heat the water when needed. The TDS and PH sensors let the system know when to add nutrients and to control the PH. There is code for features that can be changed based on the need of the plant. All of these features work together and use data to optimize the growth of a plant.



Figure 2: Autonomous Hydroponics Aquarium

IMPACT ON COMMUNITY

- Help grow healthy and organic food anywhere, anytime.
- Helps save water and other resources such as land.
- Produce enough food to meet the demand of the growing population.
- Controllable environment for growing the best product