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IMPLEMENTATION OF AGROVOLTAICS

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Abstract: The decline of agricultural land and the rapid development of technologies in the latest agricultural programs such as the NFT System, have presented a major challenge for farmers. The NFT system requires special attention to several parameters such as water temperature, water level, acid (pH), and nutrient concentration (PPM). Sadly, it's still controlled by mistreatment the manual manner, for example in controlling the nutrient concentrations has to be done many time in a day, so much time is wasted. To address these issues, we need a system that can be used and easily deployed and that should be affordable. We have built a hydroponic monitoring system and automation that can monitor using sensors connected to a small Arduino mega 2560 controller, Wi-Fi module and advanced features such as a web server with the Internet of Things, Web used as a visual interface system that allows the user to monitor and control Agrovoltaic farming The Agrovoltaic System is fully utilized by Solar power .So the project name is AGROVOLTAICS

Index Terms - Internet of Things; Agrovoltaics; Arduino mega 2560; ;pH sensor;PPM sensor;Temperature sensor

I. INTRODUCTION

Agricultural land area unit already reducing in country and even in the world. This happens because due to conversion of agricultural land into trade and fewer financial gain in agriculture. Currently, agricultural technologies have developed rapidly in urban areas, it is usually known as urban farming or urban farming. Urban farming or urban farming is a powerful response to cope with the decrease in agricultural land, the victimization of urban agriculture of unused or empty land in urban areas, such as roofs, balconies, terraces, even on the walls of buildings. one of the agricultural techniques used in urban agriculture is agrovoltaics. The agrovoltaics is that the system wherever agriculture is finished victimization phtovoltaic cell terribly with efficiency This year some aquaculture farming techniques have become widespread in urban farming practices. the aquaculture crop was planted using water and without using the soil as a means of planting it with stress on the nutrient needs for the plants.

II. OVERVIEW

he aim of all Agrovoltaics programs is to improve control and efficiency in crop production. In all cases, the area where the plants are grown is the limit on their production. In a typical outdoor production system, the plants are weatherproof and soil conditions. Moving crop production from ground-based systems to hydroponic systems is the first step in the process of producing a controlled environment that culminates in growing indoor systems such as those identified by direct indoor farming. Harvesting is also a major cause of change in soil-based growth, due to the need to increase producer efficiency due to increased labor costs and reduced availability and increased opportunities.

Agriculture is considered to be an important part of human life as it is a basic source of food in addition, some of the raw materials needed by man. It plays an important role in the country's economic development and improvement. It also offers great business opportunities to the general public. Development in the agricultural sector is crucial to improving the nation's financial situation. Sadly, many agricultural farmers still use conventional farming techniques that bring in lower yields and natural products. In any case, wherever robots were made and human beings were replaced using programmed tools, the yield had been improved and less diligent labor required. There is therefore a need to make it more realistic and to use modern transformation in the agricultural business sector to increase yields. A large part of the paper refers to the use of remote sensor programming that collects information from different types of sensors and then transmits it to the main server using remote connections. The information collected provides data on various environmental elements that alternately filter the framework. A look at the natural features is not enough and it eliminates the answer to improve crop yields. It requires robotization to take steps to produce a crop. There are a number of different components that influence efficiency at an astonishing rate.

III. MAIN OBJECTIVE

The main purpose of Agrovoltaic is to provide a good source of nutrients for efficient plants. Although technically not part of hydroponics, farmers often try to provide appropriate natural resources as well. Plant performance can be improved by controlling the weather and light. Using a greenhouse provides natural light while controlling the weather Using additional light can ensure a proper "season" for plant efficiency. Advances in light technology, nutrient delivery, and environmental management, will improve crop production and performance.Agrovoltaic plants are generally healthier than other plants grown in the ground, as they receive a balanced diet and are less likely to be exposed to pests and diseases of the soil.Apart from the use of herbicides, fungicides, and pesticides, the resulting product is healthy to eat. And agricultural workers are exposed to toxic chemicals, and labor costs are reduced.As Agrovoltaic systems reduce water and nutrient stress in plants, they grow faster and can be planted closer without starvation. Healthy plants also produce high yields. Complete crop conditions lead to complete crop production.Agrovoltaic systems save water by preventing evaporation and flow. Losses due to drought and floods are also greatly reduced. Areas where water is scarce or uncultivated land can grow crops using hydroponics.

IV. LITERATURE SURVEY

Hydroponics is to Grow a plant that uses water and without using the soil. NFT system is one of the categories of hydroponic cultivation. The NFT system continuously flows the nutrients dissolved in the water used in the Plants to provide nutrient solutions, through the root of the plant to a relentless depth inside the planting vessel. This nutrition flows into the receptacle through the root of the plant and then returns to the mixing tank, as in this study, , the system implemented in agriculture with the hydroponic NFT model. The NFT is one of the many hydroponic systems used by farmers to grow crops. NFT is popular with both commercial and home hydroponic farmers for many reasons

V.METHODOLOGY

The methodology section outline the plan and method that how the study is conducted. This includes Universe of the study, sample of the study,Data and Sources of Data, study's variables and analytical framework. The detailsare as follows;

3.1Estimation of TDS

Basically, the Agrovoltaic system uses water to circulate the nutrient solution to the roots of the plants in the system. The most commonly used nutrient solutions or fertilizers for hydroponics are micro nutrient and macro nutrient solutions. Fertilizer must be mixed between both hydroponic solutions. A ratio 2 solution is one-to-one. Then pour the mixed fertilizer into 1 liter of water. If the tds level of the nutrient solution is low, it is necessary to fill it with mixed fertilizer. It helps maintain the concentration of nutrients in the planting tray. For mixed system nutrients, strains A and B are continuously adjusted for plant uptake. Strain A and Strain B should be mixed at the appropriate concentrations for each culture. The combination of both mixed water is commonly referred to as a nutrient solution.Macro nutrient include P (phosphorus),C (carbon),S (sulfur), H (hydrogen), O2(oxygen),N(nitrogen),K (potassium), S (sulfur),Ca (calcium), and Mg (magnesium). Micro nutrients include Zn(zinc) Fe(iron),MN (manganese),Cu (copper), B(boron),Mo (molybdenum), Cl(chlorine), and NI(nickel).TDS is the indicator of the nutrient. Relationship between TDS and pH of the Agrovoltaic nutrients solution is investigate in. Plant fertilizer inside the fundamental tank, regulate the nutrient solution through calculating the TDS and pH equation and manually fill in milliliter (ml.). here we use arduino mega 2560 microcontroller to control the TDS and pH conditions of a Agrovoltaics system based on the concept of net environment of factors (IoT). The experiment is primarily based on a proportional small-scale procedure which includes a manage tank 4 field (nutrients , acid , and alkaline ,Ro Water) anda mixing tank with adjustable go along with the go with the flow pump . The TDS and pH value will continue to be within the described variety. based totally at the particular input limit. . The TDS and pH policies will stay in the defined variety. based at the special input variety. The time had to recover the TDS and the pH from the out of doors to the range is about 15 minutes. in this challenge the pH stage in the water answer can be routinely monitored and managed by way of the Arduino and measured by means of the sensors. If the pH degree starts off evolved to exchange, then the gadget will adjust the pH degree to the appropriate solution.

3.2 Scope of Project

Agrovoltaics has the potential to sustain much of the world's population and to allow third world countries to feed their own people, even in areas where soil and water are scarce. Technology can also be used as an important source of food production in areas where space is scarce.Agrovoltaics is becoming an important practice for plant growth with minimal resources. This is a continuous process that can change the way we plant crops in the near future.The main purpose of agrovoltaic is to provide a good source of nutrients for plants to function properly. Although technically not part of Agrovoltaics farmers often try to provide the right natural resources as well. Plant performance can be improved by controlling the weather and light. Using a greenhouse provides natural light while controlling the climate
The benefits of this type of farming are many. Few of them are;

- 50% faster growth compared to soil
- Can be harvested throughout the year
- Constant availability of nutrition for the plants
- Doesn't need any herbicides or pesticides
- Water that is used in this system stays in the system itself which can be reused
- Less landmass is required as it doesn't need any soil
- Can grow indoors and outdoors throughout the year
- No weeding required
- More plants in less area
- If we see the benefits, these are perfect for an environment which doesn't have suitable conditions like soil, soil nutrients, minerals, etc.

Fig:Agrovoltaics

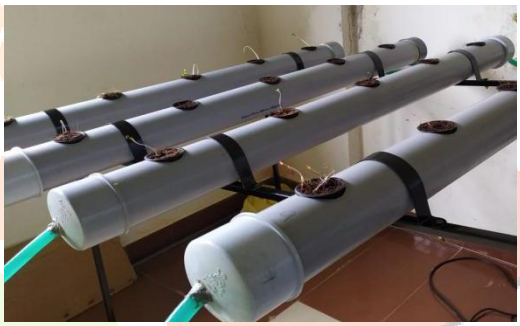

Fig:Agrovoltaic structure

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