International Journal of Interdisciplinary Innovative Research &Development (IJIIRD)
ISSN: 2456-236X
Vol. 05 Special Issue 01 | 2020

Smart Agro-Robot

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ABSTRACT

This project presents an automated robot, named ' AGRO-ROBOT' , that can ease the work of our ' bread-yielders' . The Agro-Robot being a multipurpose robot, not only reduces the efforts required by the farmer, but also is a solution to the declining number of people opting for this occupation. A single bot can perform several tasks thereby greatly reducing the number of labors involved. The agro-robot has also served as a solution to the toils that a farmer faces and thus farming activities could be done with a click of a button. Another factor that has to be considered during the inception of the robot was the cost effectiveness to enable its availability to all Indian farmers. The agro-robot would enable a drastic increment in yield and set agriculture back as a major contributor to the wealth of the nation. Various researches and developments have been done in the area of agricultural robotics to assist the farmers at the field.

Keyword: - Raspberry Pi, Power Supply, Temperature & Humidity Sensor, Soil Moisture Sensor, Seeding Mechanism, Water Pump, Camera, Agriculture is backbone of India.

1. INTRODUCTION

India's record of progress in agriculture over the past four decades has been quite impressive. The agriculture sector has been successful in keeping pace with rising demand for food. The contribution of increased land area under agricultural production has declined over time and increases in production in the past two decades have been almost entirely due to increased productivity. Contribution of agricultural growth to overall progress has been widespread. Increased productivity has helped to feed the poor, enhanced farm income and provided opportunities for both direct and indirect employment. The success of India's agriculture is attributed to a series of steps that led to availability of farm technologies which brought about dramatic increases in productivity in 70s and 80s often described as the Green Revolution era. The major sources of agricultural growth during this period were the spread of modern crop varieties, intensification of input use and investments leading to expansion in the irrigated area. In areas where 'Green Revolution' technologies had major impact, growth has now slowed. New technologies are needed to push out yield frontiers, utilize inputs more efficiently and diversify to more sustainable and higher value cropping patterns".

At the same time there is urgency to better exploit potential of rain fed and other less endowed areas if we are to meet targets of agricultural growth and poverty alleviation. Given the wide range of agro ecological setting and producers, Indian agriculture is faced with a great diversity of needs, opportunities and prospects. Future growth needs to be more rapid, more widely distributed and better targeted. These challenges have profound implications for the way farmers' problems are conceived, researched and transferred to the farmers. "On one hand agricultural research will increasingly be required to address location specific problems facing the communities on the other the systems will have to position themselves in an increasingly competitive environment to generate and adopt cutting edge technologies to bear upon the solutions facing a vast majority of resource poor farmers".

1.1 Motivation

Agriculture is one of our most important industries, providing food, feed and fuel necessary for our survival. Over the past 40 years, there has been gradual fall in the contribution of agriculture to the GDP. This could be attributed to the present generation's lack of interest towards farming as there are other easier ways of survival over farming. Technology has found solutions for every problem, so the problem encountered in farming also can be addressed by the application of technology.

"Agriculture is the backbone of India". And yet we see that agriculturists, rather the farmers, happen to be the people who work the hardest, resulting in a rapid decline in the number of people opting for this job. The growing population demands an increased need for food.

1.2 Purpose and Scope

This project can be used to overcome some problems in agriculture. The rapid growth in the industries is influencing the labours situated in the villages to migrate to cities. This is creating the labour problem for the agriculture. The wages for the labour is also more. As the prices of commodities such as food grains, fuels, cloths and other essentials of daily life is increasing rapidly the labours demand for the more wages from the owners These factors influence the farmers interested in agriculture activity to leave their land uncultivated. By

implementing this project in the field of agriculture we can help the farmers in the initial stage of agriculture i.e. during the seeding and cultivating. This project can be a better substitute.
This project is very useful for the farmers who are intended to do agriculture activity but facing labour problem.

2. WORKING AND BLOCK DIAGRAM

Block diagram is easy to understand. Raspberry Pi is the heart of our project. The Raspberry Pi is the main controlling device which controls various operations of the agro-robots. The operations are like seeding, cultivating, sensing and sprinkling. The data is transmitted from Raspberry Pi to iot app.

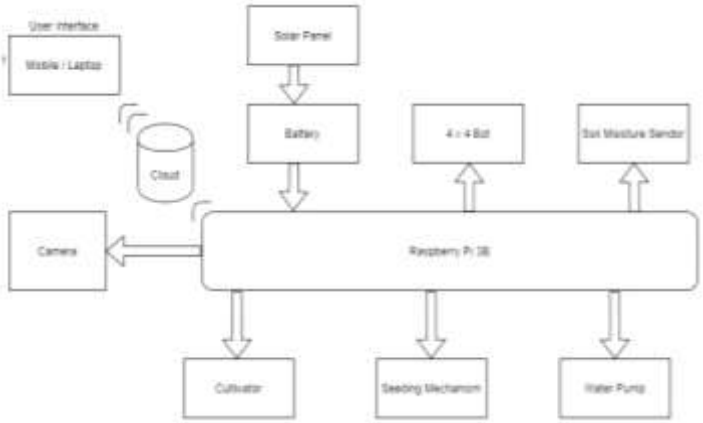

Fig -1: Block Diagram

2.1 IOT App Screen

We designed app using the MIT app inventor. It shows all the functions and operation panel on the mobile or laptop.

Fig -1: IOT App Screen

2.2 Seeding Mechanism

The dropping of seed is done using the DC motor seed sowing mechanism. For this, we are using this special slotted wheel connected to a shaft of the DC motor. The seeds falls through the funnel from the top of the seed storage tank. The slots in mechanical slotted wheel is wide enough to contain the space for occupying the seed. The user can give a command as and when required to the Raspberry Pi via his android phone which will then turn on the motor to start the seed sowing operation.

- Cultivating
- Seed Distribution
- Irrigation
- Plant Monitoring

3. FLOWCHART

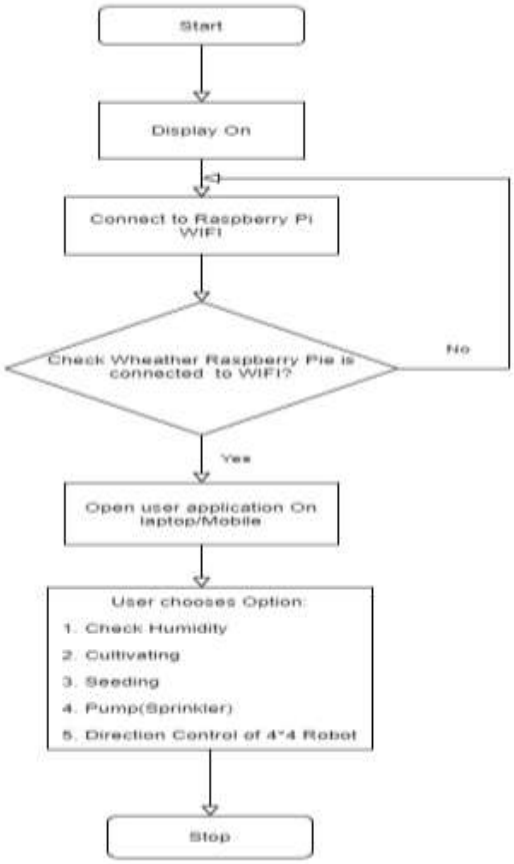

Chart -2: Flowchart

3.1 Operation

Start.
We have to start total display.
Connect Raspberry Pi with Wi-Fi.
Check the condition.
If it's connected to Wi-Fi then go further if not then go back.
Open the user application on laptop or mobile
Open the operation panel.
Now we can operate any function with the help of operation panel like checking humidity, cultivating, seeding, pump sprinkler, direction control of robot.
Stop.

4. CONCLUSIONS

This project will overcome some problems in agriculture. The rapid growth in the industries is influencing the labours situated in the villages to migrate to the cities. This is creating the labour problem for agriculture. The wages for the labourers is also more. As the prices of commodities such as food grains, fuels, cloths and other essentials of daily life is increasing rapidly the labours demand for the more wages from the owners. These factors cause the farmers interested in agriculture activity to leave their land uncultivated.

The smart agrobot can be controlled by the user via internet. The agrobot will perform various operations. The agrobot senses the moisture of soil as and when needed by the user from different positions in the farm.

5. ACKNOWLEDGEMENT

We express our sincere gratitude towards the faculty members to make this project work successful. We would like to express our thanks to work guide Mrs. Shweta Suryawanshi for her whole hearted co-operation and valuable suggestion, technical guidance throughput the project work.

Special thanks to our HOD Mrs. Priya Charles for kind official support given and encouragement. We are so thankful to our project coordinator Mrs. B. Lakshmiprabha and Mrs. Sandhya Shinde for their valuable guidance.

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