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CONCLUSION & FUTURE SCOPE

CONTENTS

6.1. CONCLUSION

Tea gardens are spread over very vast area; this makes the task of monitoring and caring for plants a challenging one. Therefore the mandatory task of watering tea plants demands large amount of water, electric power and manpower. Moreover, water requirement of soil for different areas in tea garden are different. The inaccurate information about amount of water required for different plots results in insufficient and excess distribution of water in different plots; which in both cases is harmful for plants. It is evidently wastage of water and electrical power in tea gardens, happening in areas as vast as tea gardens, results in huge wastage of natural resource and energy. Moreover, till date, there has been no tool developed that monitors the health of garden soil; no attention has been paid in soil condition of tea garden which directly affect the quality and productivity of tea estate. Therefore an intelligent platform with facilities for statistical analysis; of soil condition in the past will positively drive the decision making process, in long term planning, in favor of tea industry.

In this proposed study, the technique is designed to operate automatic irrigation system for tea plants on the basis of the soil moisture. Depending upon the soil moisture of the tea garden the system will decide to supply proper amount of water to tea plants. This is for proper utilization of the water which is one of the natural resource. This study also presents the challenges, significance and advantages of Effective Watering System in tea gardens. Its approach in keeping track record of soil health, with key parameters as soil moisture value, will help agricultural scientists in suggesting progressive measures in favour of both plants and soil. It describes the role of key components in development of such system for tea gardens. Its application in real life will reduce production cost, enhance productivity and introduce automation in tea gardening. However this system can also provide a platform with multiple functions like data logging, GSM based and web based monitoring system.

6.2 FUTURE SCOPE OF THE STUDY

A data acquisition system is designed and developed through this study to use in tea gardens to fulfill some tasks smartly instead of manual and conventional ways. This thesis will cover three major parts of that data acquisition system to be used in tea gardens. These three major parts are responsible to perform three major tasks, namely recording, monitoring, and controlling of soil moisture present in the tea garden. The distinct scopes to be extracted from this study are drawn below:

1. The constant monitoring facilities of the system will give scope to preventive the role from future draught situation hence may be used in draught control.

2. The ability of recording data of the system leads towards some other research fields with reference to level of soil moisture and its effects on the tea plants.

3. Using the system gives growers more control over their irrigation by delivering accurate data on field and crop conditions, thereby lowering their costs and raising their yields (and in theory, earning a higher profit from their operations). The access to real-time data on the state of the plants and the levels of moisture in the soil, right from a Smartphone or browser, allows users to control and monitor their system for optimal irrigation scheduling.

4. A GSM unit that sends whole day summary of data acquired to the concerned person in-charge of tea estate through an SMS and its also notifying the indication of not working node of the system.

5. The Data Acquisition system may be applied to other plant species to understand various relations with productivity.

6. The Data Acquisition system can be used to monitor and control soil parameters other than soil moisture using appropriate sensor as per requirement

7. Soil parameter like NPK detection in soil may also be achieved with Data Acquisition system.

8. Pest control system may be achieved because DAS is capable in sensing, storage and data processing with Web based program.

9. Production forecast may be developed using the productivity-soil moisture and temperature relation obtained from this research with yearly data, precision will be as high as amount of data increases.

10. Using AI, the system can be trained more precisely using collected data from data acquisition system.

6.3. MAJOR CONTRIBUTION OF THE THESIS

1. Design a model of WSN

2. Design a database which handled the sensor collected data from the field.

3. Design a GUI for user, from which user can communicate easily with the hardware and software.

4. Design a World Wide Web based monitoring and controlling system.

5. Analysis of protocol available for low energy power consuming protocols and fast transferring in the scope of wireless sensor network.

6. Analysis about the correlation between productivity of tea and different parameters of tea production.

6.4 RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made for future research

- This study has demonstrated the importance of monitoring and control of parameters used to utilize the optimum level of production with tea plants.

- Further green house environment experiments are required to study about effects of temperature on productivity for different species of tea plant.

- The analysis performed so far, the conclusion and solutions associated with this research need to be communicated to growers, manager and owners of tea state so they can reap the benefits.

- Efficient watering techniques should be explored and adopted if applicable as old techniques used for tea gardening water has not utilized the maximum productivity.