

SMART WAREHOUSE MANAGEMENT AND IRRIGATION CONTROLLED SYSTEM

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ABSTRACT

In India most of the population (70%) depending on agriculture. Nowadays farmers are facing huge losses due to some storage requirements which are not being fulfilled and due to lack of access to affordable system in order to solve this problem only one solution that, smart agriculture by adding new technological methods. This project includes smart warehouse management and monitoring farming field, which includes temperature maintenance, humidity maintenance and theft detection controlling of this operation will be through any remote smart device.it deals with the proper usage of agricultural warehouse facilities and implementing new ways to increase the shelf life of agricultural produce leading to better financial stability to farmers who are currently having lots of problem during cultivation

Keywords:*Agricultural monitoring and controlling, Mobile application, RFID technology, Warehouse management system.*

1. INTRODUCTION

Agriculture, which is the backbone of Indian economy contributes to the overall economic growth of the country and determines the standard of life for more than 50% of the Indian population. It contributes only about 14% to the overall GDP but its impact is felt in the manufacturing sector as well as the services sector as the rural population has become a significant consumer of goods and services in the last couple of decades.

Wastage of food running into thousands of cores of rupees every year is nothing less than a crime in a country such as India where more than one-fourth of the population is below poverty line and where millions go hungry day after day.

The losses are not only from warehouse but in farming field also like inadequate supply of water of required plants, trespass of animals/humans into the farming field and also fire incidents etc.,

Nowadays goods are stored as per scientific methodology to protect them against quantitative as well as qualitative losses occurring due to unavoidable circumstances such as temperature, humidity, fire incidents,

theft, pest attacks, etc .In these days most of the work is automated with the help of computer and mobile phones with latest technologies. Here our main purpose is to observe , control and monitor the warehouse atmosphere and farming field thus making the user to manage the data in real time.

2.LITERATURE REVIEW

At present India has a total agriculture warehousing capacity of 90 MMT to store and conserve large quantities of produce with state agencies owning 41% of the capacity and the balance being distributed among private entrepreneurs, co-operative societies, farmers, etc. Though the storage capacity has increased at a rate of 6.7% CAGR during the last decade, 20-30% of the total food grain harvest is wasted due to lack of availability of regional imbalance in warehouses, lack of adequate scientific storage and inefficient logistic management in the country.

Generally, at the time of harvesting, the price of agricultural commodities tends to be lower because of positive supply situation and farmers often do not get adequate price for their produce. By depositing their produce in a registered warehouse and farmers can use it as collateral for obtaining short-term borrowing in their working capital requirement for the current sowing season from banks. Further, when the prices become favorable, the farmer can sell the same, repay the loan and get a better income.

Existing Surface storage structures: Food grains in a ground surface structure can be stored in two ways - bag storage or bulk storage. For this the ambient temperature is not maintained. Entry is made manually and there is no security mechanism to prevent theft of food grains. There is no flood prevention mechanism at places in the event of floods there will be huge loss of crop.

3.METHODOLOGY

The main objective of the project is to minimize the loss of Crops at storage place and on farm field and also reduce the water wastage during irrigation. Hence system is divided into two major portion.

3.1 Warehouse Management system



Fig 1. Block diagram of warehouse management system

3.1.1 Security module:

Theft of crop sacks from Warehouses is also a problem in big storage place where continuous human monitoring cannot be done. Hence login cards will be provided to authorized persons by owner through RFID tag and RFID reader to enter the warehouse.

In next level sacks entry is registered at the entrance and a database is maintained based on the type of crop and its expected shelf life is created. Each sack is allotted to a farmer provided with a finger print authorization to open the rack and mobile notification is provided through mobile app When there is an unauthorized exit of sacks

3.1.2 Weight monitoring module:

A load cell is placed on the bottom of the rack .The load cell is used to constantly monitor the weight of the crops. It also has a rack load capacity indicator which indicates if the weight exceeds the maximum capacity of the rack. all the environment condition in racks and weight of sacks provided with a notification through mobile app to the farmer and manager of warehouse

3.1.3 Humidity and Temperature management:

Based on the types of crop to be stored, individual racks are allotted where the required ambient temperature and constant humidity is maintained. Different food crops require different temperatures and humidity in order to ensure it stays fresh for longer periods of time. Implementing an option where the temperature and humidity can be varied through sensors. Whenever the humidity is high and the temperature is low, the humidity can be brought down and temperature high by using heating coils and vice versa can be done using cooling fans.

3.1.4 Insect Repellent:

To prevent the crops from any damages or losses due to insects or pests, an insect/pest repellent buzzer kit is used. This buzzer kit creates a vibration that repels off the pests and insects at a particular frequency range.

3.1.5 Fire Alarm System:

Fire accident is detected and buzzer alert is provided automatically. Water sprinklers are turned ON to extinguish the fire automatically After sensing fire. Also the authorised persons are notified on their mobile app.

3.2 Smart Irrigation System:



Fig 2.block diagram of farming field control

3.2.1 Motion Detection System:

To detect the motion at the fenced area so that trespass of animals / humans can be detected. Buzzer alert will be provided when motion is detected. Mobile app will provide notifications.

3.2.2 Soil Moisture:

According to soil moisture level, water sprinkler will be controlled automatically. This avoids the wastage of water supply at wet land when supply is intended to dry part land, as all sprinklers are turned ON at once. Hence this module only turns ON the sprinkler which is nearest to the dry part land, other sprinklers near wet land remain OFF automatically.

3.2.3 Water Sprinkler Turner:

Farmer can set the crop type according to which water supply can be managed. Amount of water supply can be turned, so that crop loss due to exhaust water supply can be eliminated.

3.2.4 Fire alarm:

Farm field fire accidentally detected, sprinklers are turned on automatically. Then authorized persons are notified through mobile app. Buzzer alert is provided automatically.

4.EXPERIMENTAL RESULTS:

The proposed system gives a more convenient and organized way to increase the productivity of an agricultural warehouse without much expenditure and in-turn increase the longevity of the crops. The warehouse shall be added with a fire safety unit if the stored crop has tendency of fire damage. By mobile application provided it will be more helpful for farmers to know about their crops condition and it provided with more security in warehouse using fingerprint and RFID reader. This project has a lot of scope for wide adaptation because it is easy to implement and is alterable based on the need.



Fig. mobile application and proposed outcomes

5. CONCLUSION:

After the literature review and an initial study on agricultural storage practices in India, it can be concluded that this agriculture farming field and warehouse management system would help farmers save their produce in a more economical and feasible manner. This system can be implemented on existing warehouses. It also helps in curbing down the grain or food shortage problems faced by the nation. If this system is implemented on a nationwide scale India would become the top agricultural exporter in the world.

Warehouse performance indicators should be introduced to check the efficiency of the warehouses which should include quality parameters such as ability to control wastage, pest control measures, provide wide range of testing, grading and certification services which can help in ascertaining the value of the commodity deposited and bring transparency among all interested entities.

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