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# A Review on Fabrication of Smart Solar Dryer by Using IoT

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**ABSTRACT:** In agriculture field solar dryer is used for drying agro products such as seeds, onion, tomato, tea, coconut, turmeric etc.,. The solar drying systems utilizes solar energy to heat up air and to dry the food substances loaded, which is beneficial in reducing wastage of agriculture product and helps in preservation of agriculture products. Temperature sensor is one of the fastest growing and most widely used sensors in industries. Temperature and time play a vital role in solar dryer, to maintain the temperature and drying time. IoT is implemented to reduce man power in solar dryer. IoT prime focus is to provide smart and seamless services at the user and without any interruption. Internet of Things comprises various devices which can connect to internet and exchange information with one another and sends information to the use. We have developed temperature is adjusted automatically as per the given input values. The data is stored in the cloud storage.

**KEYWORDS:** Internet of things, Solar panel, Tunnel dryer, Temperature sensor

## I. INTRODUCTION

Solar dryer is used to drying the food products that are used in our daily life. Generally, Drying process is used to preserve the food from various damages and it stores for long period. Over drying also affect the quality of the product and it become waste. Tunnel solar dryer is commonly used for drying the products.

## II. LITERATURE SURVEY

Vinayak H.Deokar [1] et al in 2020 said that, the real-time monitoring and controlling through the IoT proved a better solution for system monitoring. The number of sensors data like different temperatures in dryers, in and out air humidity, the weight of drying products, airflow, water flow, voltage, and current for every 20 seconds time. Controlling the blower on-off for over reducing the moisture content proved good results and god quality of the product was maintained. As all data is stored at cloud storage performance on a particular period can be checked whenever required.

A.R.A.LAli [2] et al in 2019 said that, the IoT solar powered smart farm irrigation system. An IoT based renewable energy system for smart irrigation was developed. Farmers can operate the system using three different operation modes. The fuzzy logic algorithm was developed to analyze the environmental and soil condition to decide when it should irrigate the farm. The remote monitoring website makes the system very accessible, and it can be monitored through the web via computer or mobile phones.

Sonu Sharma [3] et al in 2021 said that, the effect of hot air drying and direct solar drying on drying kinetics and properties of turmeric. Thermo gravimetric analysis confirmed lesser weight loss of curcuminoids. Hot air drying and direct solar drying methods have been used in various shapes and sizes. The variation in micro structure improve several physical properties during food drying. The instantaneous weight of turmeric was qualified at every 30 min interval with weighing balance until it becomes constant.

Ajit Kumar Singh [4] et al in 2020 said that, the arduino based agricultural systems is able to collect the information about main environmental parameters such as temperature, humidity, pH inside the greenhouse. A chance to use maximum solar energy resources and hence thus contributing a greener environment. The whole system is advanced, reliable and convenient.



Ravi Hosamani [5] et al in 2013 said that, the concept of solar based temperature controlled fruit drying system. This system requires lower space and minimal installation timer, less time to dry the product is durable with minimal maintenance, fruits in a single unit.

Ms. Priyanka S dhere [6] et al in 2019 said that, the solar powered pump is a pump running electricity generated by photovoltaic panels. Excess amount of heat is generated at back side of solar panel. Due to this efficiency of solar panel will decrease, to avoid this heat is utilized for another application is called dryer. IoT based water pumping system will allow the user to remotely control operation and dryer will maintain accurate conditions are required.

Jose O. Payero [7] et al in 2017 said that, the low cost internet of things system for monitoring soil water potential using watermark 200SS sensors. The system periodically collect data from four watermark 200SS soil moisture sensors installed in farm and automatically send the data to website using radio and wireless communication. The system was developed using open source electronics and software and using an open source internet of things platform to host and display the data.

Louis Anton A. Cruza [8] et al in 2019 said that, the low- cost air quality data acquisition IoT- based system using Arduino Leonardo. Using internet of things, the data that the system gathers can be accessed through the internet. Moreover, the system assesses the obtained data through a comparative analysis with the AQI. Moreover, it is suggested to use a cheaper and more efficient module for the utilization of IoT.

S. Jai Shankar [9] et al in 2015 said that, experimental studies on modified solar dryer. The solar operating conditions, the stone type dryer has high heat gain and absorber plate temperature compared to conventional one. The overall efficiency for conventional and stone dryer for the particular mass flow rate is 10.97% and 13.88%.

Sangeetha Kumari M [10] et al in 2020 said that, the solar powered IoT based smart garden/agriculture. The main idea is to adapt current technology instead of our old system so that the latest automated system provides water for farming, home, gardening, etc., could be activated.

AnamJavaid [11] et al in 2020 said that, the model selection of collector efficiency in solar dryer using hybrid of LASSO and robust regression. Collector efficiency of solar dryer was used as a dependent variable with time, inlet temperature, collector average temperature and solar radiation as independent variables. Hybrid of the least absolute shrinkage and selection operator and robust regression.

Ramadhani Bakari [12] et al in 2014 said that, the effect of glass thickness on performance of flat plate solar collectors for fruit drying. Performance of solar collector is affected by glaze transmittance, absorptance, and reflectance, which results into major heat losses in the system. The effect of thickness of glazing.

Satya Prasanth [13] et al in 2006 said that, the energy management in an automated solar powered irrigation system. The development has been driven and defined by greatly different climates, cultures and technologies. It is mainly to develop requirement of water for agriculture in the remote village.

Nagaraj Roa S [14] et al in 2020 said that, the IoT based irrigation system powered by solar energy. Solar powered IoT based irrigation system for paddy fields to have an insightful approach for overcoming labour- intensive work and also to track the water management system. The control unit is the heart of the system. It consists of an Arduino UNO.

Omkar Shirke [15] et al in 2014 said that, the solar based automatic irrigation system. To harness maximum available solar energy by tracking the sun and modernize the agricultural industries at a mass scale with optimum expenditure. System improved by adding temperature sensor and dissolved solid sensors. Control system can be used.

Vibhute .A.S [16] et al in 2018 said that, the review of temperature conditioning for solar dryer. Presently solar dryer energy is preferred to generate heat and produce electricity. Two types of solar dryer they are direct and indirect solar



dryer.

Aravind [17] et al in 2016 said that, the development of smart solar irrigation system. It deals the automatic solar radiation tracker the could be used for agriculture purpose making use of sensors as the control system. It is renewable energy and most helpful to farmers. It is a hybrid hardware/software prototype. The system will be implemented for irrigation purposes.

PratikshaDevkr [18] et al in 2019 said that, the automated irrigation system using IoT. Traditionally, farmer use irrigation system which is manually controlled, in which the farmers irrigate the land at regular intervals. This system consume more water hence results into water wastage. An automatic system which will monitor and control the water requirements in the field. Installation of the system is very easy. It ensures uses microcontroller which reduce the power consumption.

### III. CONCLUSION

From this review the following conclusions are made,

Drying of the product takes more time in normal days, when there is no available heat flow in the chamber heater is turned ON to keep the environment at constant. Monitoring through the IoT will provide a better solution for solar dryer system. In an IoT all data will stored at cloud storage system performance on a particular period can be check when required.

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