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INCOME AND EMPLOYMENT GENERATION BY NON- CONVENTIONAL ENERGY SOURCE, SOLAR ENERGY WITH THE HELP OF SOLAR DRIER

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ABSTRACT

Greenhouse effect is used to tap the heat inside the solar drier. This heat utilized to heat the air of air heater. Continuous supply of heated air in the drying chamber is maintained. As it work as air dryer and no direct sunlight fall in the food materials. The vegetable and fruits are available plenty in seasons, prizes are also low. If vegetables, fruits, candy, mango bar are dried in indirect solar drier their shelf life will be increased by al least for six months. They are also available in off season and fetch high value so that earned is 30% to 50%. Hence solar energy can be very good source of income and employment generation in India.

Kywords: Air Heater, Food Preservation, Solar Energy, Solar Drier,

I. INTRODUCTION

The availability of solar energy is in abundance in Chhattisgarh. This solar energy can be used for income and employment generation by developing solar equipment such as indirect solar driers and solar cooker.

As such in India 33000 million tons fruits and vegetables produced every year. About one third of this production is wasted due to lack of proper handling, value addition, preservation, marking and storage facilities. This situation is worse in the rural areas where the storing facilities are negligible.

To deal with such situation one option that has immense opportunity is solar food processing through drying and dehydration. Fruits and vegetables contents 70%-95% of water (moisture), micro organism can grow only at certain level. Hence by removing water to below that level, fruits and vegetables can be preserved for long periods. This can be accomplished efficiently by drying in indirect solar dryer by using hot air under controlled condition of air flow, temperature and relative humidity.

In Chhattisgarh solar energy is available in plenty and almost without cost. It can be used for drying various items to produce value added products. For generations, villagers are using traditional practices to prepare food products. But as health and hygiene consciousness is increasing every day, people are looking for eatable, not dried directly under the sun. In this direction sola drying through indirect cabinet drier could play a very critical role.

II. SOLAR DRIER

Direct type: In direct type of drier where in the material is exposed to solar radiation and by energy absorption and air circulation, the moisture is vaporized and thrown out in to the atmosphere. This unit is known as solar cabinet drier.

In direct: In this case drying is indirectly accomplished by use of solar heater of a type which furnishes hot air to separate drying unit.

The combination of these two primary types of solar drying system can be used.

Fig. 1: Solar Drier

III. DATA OF CONSTRUCTION OF SOLAR DRIER

1. Cover :- glass or plastic sheet 4 mm to 5 mm thick
2. Absorber plate:- 1 mm to 2 mm aluminum sheet painted with black board paint or 0.2 mm selective coating copper plate or any black plate which can absorb solar radiation.
3. Insulation:- 5 cm to 8 cm thick mineral wool or glass wool.
4. Size of collector :- 1 m^2 to 2 m^2
5. Collector tilt:- (i)September to March (φ+10˚) to (φ+15˚) ,(ii) March to September (φ-10˚) to (φ+15˚), where φ = Latitude of that place, for Durg φ = 21˚

IV. GENERAL METHOD OF PREPARING VEGETABLES AND FRUITS PRODUCTS BY SOLAR FOOD PROCESSING TECHNOLOGY STEPS

1. Selection of raw material (fruit or vegetables)
2. Grading of raw material
3. Cleaning and wasing of raw material
4. Cutting ino required size of pieces
5. Pretreatment
6. Drying in indirect type cabinet solar dryer
7. Packing of food product

The process of pretreatment varies for different vegetables and fruits product. Similarly temperature of drying and time of drying also varies for different solar food.

V. THE ADVANTAGES OF SOLAR DRIER'S

(a) Safety and hygiene

1. Free from insect and bird contamination
2. Clean and dust free product

(b) Quality

1. More uniform in color, texture, appearance of the product
2. Evenness in drying
3. Moisture control to optimum levels
4. Nutrient retention especially beta carotene
6. Yields high quality, export worthy items
7. Products withstand quality tests
8. Long shelf life to the products

(c) Economics

1. Suitability for small, cottage, medium and large commercial scale production
2. Facilitates self-employment
3. Promotes income generation

VI. CONCLUSION

Vegetables and fruits can be preserved for some month and availability of fruits and vegetables in off season can fetch higher price. Similarly value addition can also be done in some fruits like Mango pulp by making Mango bar. This will fetch higher price in off season. We can conclude that Solar drier can be used for income and employment generation of unemployed youth.

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