ABSTRACT

In the Chhattisgarh state of India, the Bastar region is famous for its various forest produce collected by local inhabitants. These collected forest produce are dried in open sun drying. This chapter presents the design and analysis of solar dryer which is simple in construction and a low-cost dryer. The construction of the solar dryer will be made of galvanized mild steel sheet absorbing the sun’s radiation. The hot air will be taken out through a wind turbine ventilator at the top to maintain the required humidity level in the solar dryer. The analysis shows that the temperature inside the solar dryer is evenly distributed. The suggested solar dryer will reduce the drying time of the forest produce.

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INTRODUCTION

As per FSI (Forest Survey of India) the state of Chhattisgarh is divided in the main three agro-climatic zones (Forest Survey of India, 2011). They are the Chhattisgarh plains, Northern hills of Chhattisgarh and the Bastar plateau. The Bastar plateau is divided in 7 districts. They are as Kanker (North bastar), Koandagaon, Narayanpur, Jagdalpur (Bastar), Dantewada (South Bastar), Sukma and Bijapur. This area is having large forest cover. The forest in this region include variety of forest that is very dense, moderately dense and open forest scrub. The local inhabitance collect the forest produce as per the season .There are nearly 41 forest produce is collected shown in Table 1(District Forest Office Dantewada, n.d.). The many of useful part of this collected forest produce is dried in open sun and then traded. The different part of forest produce mainly are fruit, seed, food pulp, flower seed, the hole part (accept root), leaf, rhizome, hole part (including root), root and bulb(Tapas & Sharma, 2014). In the shown Table 1 twenty eight items are collected on a large quantity and perfectly giving opportunity for solar drying.

IMPORTANCE OF SOLAR DRYING

These forest produce is collected and dried in open sun. The open sun drying (OSD) is a traditional method having disadvantage as delayed drying, contamination by birds, insects etc, less hygienic, less clean, inferior quality product, uneven drying, more nutrient loss, space required is higher, low profit margins, drying possible only on sunny days, poor sensory qualities to products – appearance /color and textures and above all it is certainly not a good manufacturing practice (Sharma et al., 2009). The use of solar dryer improves the open sun in five important ways such as faster rate, more efficiency, more hygienic and healthier product (Aware & Thorat, 2012).

CRITERIA OF SOLAR DRYER FOR BASTAR REGION

For the selection of solar dryer the main selection criteria are (Visvale, 2012):-

- Ease of design
- Can handle small and medium quantity of forest produce
- Assemble with easily available materials
- No use of electricity
- Less Cost