DEVELOPMENT OF A SOLAR ENERGY OPERATED FISH DEHYDRATOR FOR THE LIVELIHOOD SECURITY OF FISHERWOMEN OF SOUTH ODISHA

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Abstract

Fisherwomen traditionally dry fish in open, often in unhygienic conditions. It results in poor price realization from the market. Application of solar drying technology has the potential for higher value addition of fish products. Accordingly, a solar dryer has been designed and fabricated considering various system parameters such as inlet temperature of air, humidity, moisture carried by air per minute and outlet temperature of air. This dryer is being used by the fisherwomen in coastal area of south Odisha which is involved in technology based and market linked sustainable livelihood security of fisherwomen. The dryer has been designed with a capacity of 20 kg/day fish and is manufactured with aluminium sheet and SS304 grade stainless steel perforated trays. The solar drying device comprised of an enclosed means, a drying room, plurality of perforated holders for holding of drying material and a plurality for air blowing means powered by solar energy in order to provide effective removal of moisture. The perforation over the food holders is circular and the holders are spaced at an equal distance from each other within the drying room to facilitate effective air circulation. The air blowing through fan is used to increase the rate of moisture removal and circulation of heated air in the drying room. The entire drying operation takes place by means of direct solar energy falling over the dryer. It was delivered at Markondi village almost 30 KM from the city of Berhampur, sponsored by Voluntary Integration for Education and Welfare of Society (VIEWS), a development organisation working for the livelihood security of fisherwomen of South Odisha.

Keywords: Fish dehydrator, livelihood, fisherwomen, perforated treys

Nomenclature

M_w =Mass of water to be removed

M_p = Mass of product

M_i = Initial water content in percentage

M_f = Final water content in percentage

ϕ = Relative humidity

P_v = Partial pressure of water vapour

P_{vs} = Partial pressure of water vapour when the air is fully saturated

P_t = Atmospheric pressure

W_1 = Specific humidity at inlet of dryer

W_2 = Specific humidity at outlet of dryer