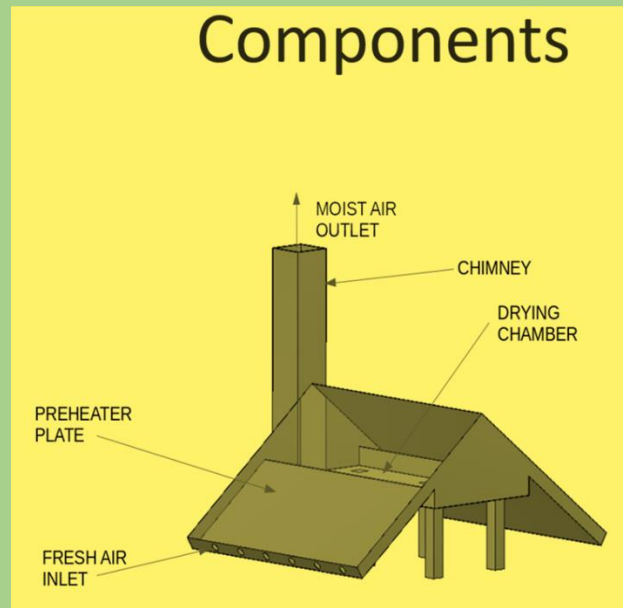
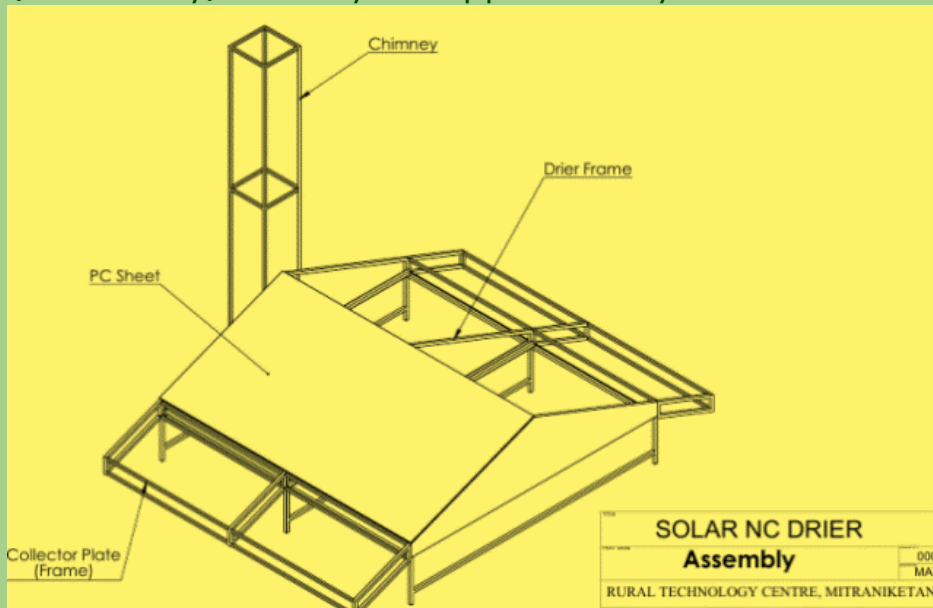


Mitraniketan has developed a performance enhanced natural convection solar dryer for value addition based micro enterprises. We aimed for a low-cost dryer with more drying efficiency. The focus of technology development is the performance improvement of solar dryer in natural convection. The reason behind developing the **improved solar dryer** is the high humidity found in Kerala which make existing dryers less effective and have high cost. The cost of a 2-sq meter (double tray) solar dryer is approximately ₹ 26000.



The dryer works based on increasing air temperature and thereby increasing its moisture holding capacity and also based on its improved air flow. We have incorporated two features in the existing tunnel design: (1) Pre-heater: Pre-heater plates are flat plate solar collectors with darkened substrate and transparent top to harvest maximum amount of heat. Increasing inlet air temperature causes drop in relative humidity. Heating will be carried out in both preheater and in the drying chamber. (2) Solar chimney: to improve airflow in and out of the drier unit, a chimney is introduced at one side of the tunnel which creates a draft. The air intake holes in the pre-heater collect fresh air in the main drying chamber. The Dryer is fabricated with mild steel square tubular sections of 20x0x1.4mm.

The transparent panels of the pre-heater, drying chamber and chimney are made from transparent poly carbonate sheets. Two batches of chopped tapioca (12 kg each) were kept inside the drying as well as in the open sun for trial. Tested the dryer using chopped tapioca weighing 12 kg and is dried in 24 hours (from 3 sunny days) with no moisture. Its weight comedown to 5.5 kg and the quality was high in terms of colour and cleanliness than open sun drying.



Comparison on time required for dehydration of different crops using different drying methods

Comparison on total hours Energy required for dehydration of BANANA

Different type of drying	Humidity Average	Average temperature	Total hours for dehydration
Open sun drying	85 %	34.1°C	8 hours
Mitraniketan solar dryer		52.4°C	6 hours
Electric tray dryer		60.0 °C	4 hours



Comparison on time required for dehydration of Tapioca/Cassava (Tuber crop)

Different type of drying	Humidity	Average temperature	Total hours for dehydration
Open sun drying	88.5 %	38.1°C	10 hours
Mitraniketan solar dryer		55 °C	7 hours
Electric tray dryer		60.0 °C	6.5 hours



Comparison on total hours required for dehydration of Garcinia

Different type of drying	Humidity Average	Average temperature	Total hours for dehydration
Open sun drying	82 %	34.7 °C	14 hours
Mitraniketan solar dryer		52.2 °C	10 hours
Electric tray dryer		60.0 °C	8 hours



INFORSE South ASIA

International Network for Sustainable Energy

INFORSE

International Network for Sustainable Energy

INFORSE Background

International Network for Sustainable Energy (INFORSE) is a worldwide network with 140 Non-Governmental Organisations working in almost 60 countries to promote sustainable energy and social development. The Network was established in Rio de Janeiro in 1992. INFORSE follows and influences sustainable energy issues in international negotiations and is accredited to the UN Economic and Social Council (ECOSOC) since 1998, and United Nations Framework Convention on Climate Change (UNFCCC) since 2002.

To bring together experiences from different regions and strengthen INFORSE members, INFORSE is carrying out the "Synergies Across Continents" project as a training platform for promotion of local sustainable energy solutions. INFORSE South Asia is working on the issues of INFORSE within the South Asian region, hosted by **Integrated Sustainable energy and Ecological Development Association (INSEDA)**, New Delhi, India. **Mitraniketan**, Kerala, India, as a member of INFORSE South Asia is doing advocacy for solar dryer developed by Mitraniketan on a non-profit basis to create awareness among rural communities through various Government and NGOs institutions in South Asia. Mitraniketan has Special consultative status with the UN Economic and Social Council (ECOSOC) since June 2023.

www.inforse.org

www.inseda.org

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