

# Evaluation of Solar Thermal Drying Potential with Respect to Selected Food Items in Sri Lanka

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Supervised By:  
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This Dissertation paper contains no material, which has been accepted for the award of any other degree or diploma in any University or equivalent institution in Sri Lanka or abroad, and that to the best of my knowledge and belief, contains no material previously published or written by any other person, except where due reference is made in the text of this Dissertation.

I carried out the work described in this Dissertation under the supervision of Prof.R.A Attalage.

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## ABSTRACT

This study was undertaken with the objective of subjecting the total energy consumption, financial viability, throughput and saving in conventional energy consumption in the two drying technologies of open sun drying and solar dryer technology to comparative analysis. Selected food material identified for trial purposes were categorized in terms of spices, fish and vegetables. This study was confined to specific areas and specific solar dryer:(Saviru).

Open sun drying and solar dryer technologies were employed. Findings of the study are summarized. Compared to the open sun drying methods there is an increase of over 35.5% of the throughput when unutilized solar thermal energy was used for selected items. Unit production cost drop to between 17.3% to 54.2% giving a saving ranging between Rs 54,000/= to Rs 366,300/= in labour cost in terms of different varieties of food. It has also been found that the increase in average monthly profit ranging from Rs 16,000/= to Rs 69,186/= might be earned. Apart from the above, the payback period on the investment has been calculated to be between 21 and 88 days. Saving in energy through the solar potential and the conversion of these potentials to conventional sources of energy like diesel, biomass and electricity has been calculated. According to the present study financially viable food items for drying were identified. It is hoped that these findings might prove helpful to those interested in pursuing solar drying on a commercial scale. The conclusions of the study indicate that solar energy should be utilized in the food drying process wherever viable.

**Key words:** solar thermal energy, open sun drying, solar dryer technology, food drying, Saviru dryer

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