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## Investigation on the Performance of Solar Tunnel Dryer during Rainy Season for Cocoa Beans Drying

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### Abstract

*In order to help Indonesia cocoa farmers, a solar tunnel dryer had been designed and manufactured. The capacity of the dryer is 500 kg cocoa (wet beans) per batch. The solar tunnel dryer was designed for the use in the dry season with daily solar radiation of 520 W/m<sup>2</sup>, but the investigation was conducted to determine its performance in the wet season with solar radiation of 116-798 W/m<sup>2</sup>. The mean value of the solar radiation in the wet season was 340 W/m<sup>2</sup>. It was found that the thermal efficiency based on the mean value of solar radiation was 31%, the highest temperature in the tunnel dryer was 58.2°C; with mean drying temperature of 38.6°C ± 3.4°C. This condition shows that the temperature was in the range of cocoa beans drying temperature. Therefore, as a conclusion, this dryer equipment could be used during wet or rainy season. The investment and operation cost for the tested solar dryer was relatively low.*

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