

E1-08: Solar radiation measurements in Sri Lanka

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The available solar radiation records in Sri Lanka are meagre. Regular measurements in a form directly applicable to heat-budget evaluation, have not been made.

T Okamoto (1976) indicated 3 sub standard Robitzch instrumented stations and 8 Campbell Stokes Sunshine Recording stations in Sri Lanka. He also attempted in 1976 to relate daily values of radiation and sunshine at 2 stations, but he concluded that although the relationship he obtained was significant, "it was not possible to read off absolute values of one from the values of the other".

Angstrom (1928) pointed out that it was possible to obtain a relationship for average values but not using daily values. The equation used by Lisle (1966) in New Zealand. $R/R_a = a + b (n/N)$ (where, R/R_a = ratio of radiation at the latitude, and n/N = ratio of normal sunshine duration to possible sunshine duration at the site). The result obtained using the Peradeniya data for the period 1967 to 1984 gives:

$$\frac{R}{R_a} = 0.260 + 0.488 \frac{n}{N}$$

Due to lack of direct solar radiation measurements in Sri Lanka, this study tries to improve a method using burnt area of Campbell - Stokes record cards. Length of the burnt line indicates period of light received and the width indicates intensity of light. Hence burnt area gives a rough estimate of direct solar radiation received during the respective day. This method can be used to find out early, values of direct solar radiation received from available burnt cards.

This study tries to find out the relationship between global solar radiation and burnt area of Campbell-Stokes records cards. It indicates: $R = 72.86 + 0.47 A$ where R = Global solar radiation in langleys; A = Burnt Area in mm^2