COMPARISON OF SATELLITE RAINFALL ESTIMATES AND STATION OBSERVATIONS

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Abstract

Sri Lanka has invested heavily on irrigated agricultural infrastructure during the past few decades. Therefore it is imperative to ascertain with significant reliability the fluctuations in the quantity, intensity and the spread of the rains.
Real-time estimates of rainfall play a major role in natural resource management and yet it is very difficult to obtain this data from normal sources. Satellite technology has now developed so much so that it is now possible to obtain estimations for rainfall. Thus, to by-pass the obstacles found in obtaining real-time estimates for rainfall, using satellite data is rapidly becoming famous. The major objective of this study therefore, is to assess the reliability of the obtained satellite data. This reliability of the rainfall estimation from satellite sources can be assessed by comparing the observed data with satellite rainfall products.

Sri Lanka is a valuable test location as the data availability is very high. In addition to this, this region comprises of a year round rainfall. Being a tropical country in the South Asian Indian Ocean, the validation of the data contributes heavily towards the ocean circulation, ITCZ, orographic rainfall, cyclones/depressions etc.

For this study, *Rain Fall Estimates* - Satellite rainfall estimates resolution at 0.1x0.1 degrees grid (~ 10 km) is used. There are over 400 stations that maintain rainfall observations. Out of these, this study used data of 37 stations. This is also known as *Rain Gauge Data*. The study analyses these data in an exploratory, correlational, spatial interpolation, and a variety of skill measures were tested throughout the study.

As a result out of 37, **4 stations** give a correlation coefficient of **0.7** and 14 stations shows a correlation coefficient of **0.5**.Only 2 stations have correlation coefficients **below 0.3**. The spatial variation in correlation is shown in the map. The correlation between the two data sets gradually improves towards 2005.

Through the results obtained it can be deduced that there is a good correspondence between the satellite estimates when compared against station values. The mean of the satellite estimate is on average lower by about 20% from the observed. The correlation value lies between 0.3 and 0.7. The coastal areas have higher correlation and the mountains areas lower correlations as may be expected – especially with the comparison on data 10 km grid with a mountain station. However, this value is satisfactory enough for practical use.