FORECASTING THE SOUTHWEST MONSOON RAINFALL IN SRI LANKA

by

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Forecasting the Southwest Monsoon Rainfall in Sri Lanka

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ABSTRACT

Monsoon is a product of many inter-related climatic variables. As such, it is not easy to develop a simple statistical model for long-range forecasting of monsoon rainfall. However, an attempt has been made here to develop a regression model to forecast the southwest monsoon rainfall of Sri Lanka by utilizing some measurable climatic variables known to be related to south Asian summer monsoon circulation. The variables, we selected are global in nature and at the same time are physically linked to the south Asian monsoon circulation. These variables cannot be treated in isolation as they are inter-related to each other at varying degrees according to climatologists.

The source of data on rainfall of Sri Lanka is the Meteorological department of Sri Lanka. The data on predictor variables were collected from websites.

In this study, a statistical model was built using Correlation analysis and Regression analysis specially the stepwise regression. Our final prediction model is,

$$RF = 1270 + 14.4 *[DApr-] + 0.0187* [SNov-]^3 - 22.8 *[ENov-]^2 - 0.0378*[SAug-]^3$$
$$- 8.59 *[DSep-] - 8.45* [EFeb]^3 + 83.0* [ESep-] + 3.61* [TJan-]$$

where RF is the total southwest monsoon rainfall in Sri Lanka calculated as a weighted average of district rainfalls and the predictor variable details are given in *Table 4.1.*

Using this model the forecast for the coming southwest monsoon rainfall in Sri Lanka (May to September) can be given by the end of February since it is the most recent predictor variable used in the model. The R-square adjusted value of the model is 90.8%.

Chapter 1

Introduction

The objective of the study is to develop a model to forecast the amount of southwest monsoon rainfall in Sri Lanka. The southwest monsoon season of Sri Lanka is from May to September. The southwestern parts of the island and the western slopes of its central highlands, generally known as 'wet zone', mainly get the rainfall from the southwest monsoon.

Agriculture of the wet zone is mainly dependant on the southwest monsoon rainfall. High monsoons as well as weak monsoons show a reduction in crops. For good crops in the wet zone, a certain normal level of monsoon rainfall is needed. Further, some of the major hydropower stations are located in the western slopes of the central highlands. Forecasting the southwest monsoon rainfall in advance is of importance for taking decisions regarding how much of power should be generated using the thermal power stations, particularly in times of weak southwest monsoons. For the construction sector also, predicting the amount of rainfall is of importance particularly before starting large projects. For the purposes mentioned above, Forecasting as to whether the rainfall would be normal, below normal (weak) or higher than the normal would suffice.

Forecasting the weather parameters for a future period beyond 10 days up to a season is called long-range weather forecasting. Today, long-range forecasting of monsoon rainfall at various places of the world is a popular research area falling within ambit of long-