APPLICATION OF PRINCIPAL COMPONENT ANALYSIS IN RESPONSE OF SHOREA SEEDLINGS IN SRI LANKA

A PROJECT REPORT PRESENTED

BY

ABOOBACKER JAHUFER

to the

POST GRADUATE INSTITUTE OF SCIENCE
in partial fulfillment of the requirement
for the award of the degree of

MASTER OF SCIENCE

of the

UNIVERSITY OF PERADENIYA
SRI LANKA
2000

ABSTRACT

Title : Application of Principal Component Analysis in response of shorea seedlings in Sri Lanka.

Name of the Author : Aboobacker Jahufer.

Board of Study : Statistics and Computer Science.

Degree : M.Sc. in Applied Statistics.

Summary :

The main objective of this study is to find the growth performance of seedlings of seven rain forest canopy, dominant shorea species, in three different altitude namely low(125 m), mid(580 m), and high(1060 m) within the humid zone of Sri Lanka in Kalutara and Ratnapura district for a period of 24 months.

A research was carried out by Prof. I.A.U.N. Gunetilleke and Prof. C.V.S. Gunetilleke in (1989) to collect data from 1008 seedlings which were transplanted at three elevations. At the end of the experiment period only 308 seedlings were chosen at random for the analysis. The measurements of constituent parts such as stem weight, leaf weight, tap root weight, fine root weight, leaf number and total try mass of those randomly selected seedlings were recorded in the process.

Prof. I.A.U.N. Gunetilleke and Prof. C.V.S. Gunetilleke in (1989) analyzed the recorded data using the ANOVA and GLM procedure of SAS. Two way and one way ANOVA

models used with the natural log transformed data and square root transformed data, for each of the attributes of these constituent parts, to be measured separately to compare the performance of species grown at the three different altitudes.

In this study, all the constituent parts of one species are combined using the principal component analysis, and used this new variable to compare the performance of seven species grown at three different altitudes. That is, the altitude effects in the case of seven varieties, are main consideration in this study.

To analyze this combined and reduced response variable(data) ANOVA procedure of SAS was used. Tukey's studentized range method was used for multiple comparison of means among species and sites at the 5% level.