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**GRASS COMPETITION AND HERBIVORES COMPETITION
ON SURVIVALS AND GROWTHS OF TRANSPLANT
SEEDLINGS ON DEGRADED GRASSLAND AREAS**

A PROJECT REPORT PRESENTED BY

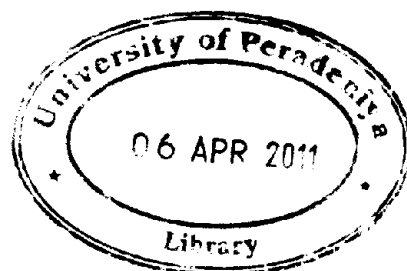
P.M.S.A. RUWAN

to the Board of Study in Statistics and Computer Science of the
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**GRASS COMPETITION AND HERBIVORES COMPETITION ON
SURVIVALS OF TRANSPLANT SEEDLINGS ON DEGRADED
GRASSLAND AREAS**

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The Tropical Rainforest is earth's most complex ecosystem in terms of both structure and species diversity. Within the last decade the number of tropical rain forest areas all over the world has been getting reduced rapidly due to the deforestation (cutting down trees). One of the actions taken to develop forest area is afforestation (planting trees). The Knuckles Forest Reserve (KFR), located in the central uplands of Sri Lanka is one of South Asia's premier sites for conservation of montane tropical forest habitats. The KFR mainly consists of two regions namely buffered zone and core zone. Changes in buffered zone in the knuckles forest area are highly affected on sensitivity of core zone of the KFR. The original vegetations of this buffered zone were largely lower montane rain forest, which survives in small fragments is failed to colonize 40 years after the abandonment of the tea cultivation. As a rule of thumb, such degraded areas are colonized within 10-15 years. Therefore the ultimate aims and objectives of this analysis are to find out biotic factors which cause reduction of survival and growth rate of tree seedlings in this degraded grassland areas and to suggest a suitable seedling which has higher survivability and fastest growth rate in this buffered zone.

This research focuses only on three biotic factors which are namely root competition, shoot competition and herbivore effects. In order to check these assumptions, a transplant seedlings experiment was conducted by controlling either one or more competition/effect. Each combination was tested on four selected tree seedlings with each having 16 replicates. Selected species are namely *Macaranga*, *Symplocos*, *Eugenia* and *Euphoria*. After every three months each and every planted seedling was observed and if it survived, height was measured, otherwise marked as dead. Descriptive Statistical techniques such as Pie Charts, Bar Charts, Box Plots and Histograms were used to represent data graphically. Conclusions were made by using

several statistical inference techniques namely Log Linear Models, Logistic Models, Correspondence Analysis, Analysis of Variance and Analysis of Means. Results of this experiment suggest that root competition is highly affected on survivability of transplant seedlings. Also root competition and interaction between root competition and shoot competition, interaction between root competition and species are significantly affected on growth of transplant seedlings in degraded KFR. Further results reveal an overall *Symplocos* has higher survivability as well as fastest growth rate in degraded grassland irrespective of biotic level (i.e. whether competition is present or absent). Therefore out of these four selected species *Symplocos* is the best suited species to plant in degraded grasslands.