

## SUCCESSIONAL DEVELOPMENTS IN SOME HUMAN-IMPACTED AREAS AT KAMBURUPITIYA FOLLOWING THE NILWALA PROJECT

K.K.L.U. Aruna Kumara and R. Senaratne  
Department of Crop Science, Faculty of Agriculture,  
University of Ruhuna, Mapalana, Kamburupitiya.

A study on successional development at a human-impacted site was conducted at Kamburupitiya from June to October 1999. This site was previously maintained under agroforestry, but has been severely disturbed and its soil has been removed down to the bedrock in 1987, under the Nilwala project. Three such sites ( $12 \times 10^4$ ,  $2 \times 10^4$ ,  $1 \times 10^4$  m<sup>2</sup>) which are about 500 meters apart were selected for the study. The study involved characterisation of the physical and chemical properties of the soil and assessment of successional development. An undisturbed site was used as the control experiment.

Bulk density, true density and porosity of the soil were  $1.163 \text{ gcm}^{-3}$ ,  $2.14 \text{ gcm}^{-3}$ , and  $45.6 \text{ gcm}^{-3}$ , respectively, with a water holding capacity of 28.5%. The per cent of organic matter and N in the soil were 0.451 and 0.0088, respectively, whereas the corresponding values for the undisturbed site, were 1.214 and 0.095. The cation exchange capacity of the derelict sites was 4.71 m.e. per 100g of soil and had a pH value of 4.2. The corresponding figures for the reference site were 7.40 and 5.43, respectively. Plant populations in three sites were 15,902, 21,266 and 98,776 ha<sup>-1</sup>. Even after 12 years, only about 0.13-0.26% of plants had a girth exceeding 3 cm at breast height and only about 1% of plants had a height greater than 1m. Twenty one species occurred in three sites, which belonged to sixteen families, namely (in order of abundance), Graminae, Gleicheriaceae, Apocynaceae, Leguminosae, Verbanaceae, Rubiaceae, Burseraceae, Cyperaceae, Compositae, Malvaceae, Lauraceae, Periplocaceae, Melastomataceae, Euphobiaceae, Anacardiaceae and Rhizophoraceae. Of these species, about 75% were herbaceous while the rest were woody. *Alstonia scholaris* was by far the most abundant and dominant woody species followed by *Cinnamomum verum*, *Carallia brachita*. Even after 12 years of the disturbance, the biomass production of *Alstonia scholaris* was only  $9.5 \text{ gm}^{-2}$  or  $95 \text{ kha}^{-1}$ , showing an extremely successional development. Ecological implications of such a tardy successional development and human interventions required to facilitate and catalyse the natural successional processes are discussed.