

AN ECOLOGICAL STUDY IN ARANAYAKE LANDSLIDE, SRI LANKA FOR BIOENGINEERING PURPOSE

Nayani Dayarathne* and Pathmakumara Jayasingha

Landslide Research and Risk Management Division, National Building Research Organization, 99/1, Jawatta Rd, Colombo 05

**Corresponding Author Email: jpathmak@gmail.com*

Bioengineering application in landslide mitigation is a novel approach for landslide disaster risk reduction in Sri Lanka. Identification of local plants of the succession in landslides are considered for the selection of suitable plant species. A rapid and long-travelled landslide at Aranayaka, Kegalle district, Sri Lanka is one of the study locations for the above purpose. It has affected on the natural ecosystem on the slope causing loss of vegetation and degrading the top soil. The objective of present study is to investigate the ecological succession of 2.5 years old after the disturbance and identify the suitable plants for bioengineering applications.

Field survey was conducted to identify the plant species growing in both affected and non-affected area using 5 x 5 m quadrats. A total of 45 morphospecies belongs to 24 different families were recorded in the three zones of the landslide trail and 24 Kandyan home garden species in adjacent non-affected area. The woody component of the regeneration site is mainly composed of species like *Macaranga peltata*, *Trema orientalis*, *Mallotus tetracoccus*, *Alstonia macrophylla*, *Cipadessa baccifera*, *Ficus racemosa*, *Michelia champaka* and *Wendlandia bicuspidata*. Most of these are fast growing, light demanding pioneer species and suitable for bioengineering. Ground cover was dominated by two mat forming *Blechnum orientale*, and *Dicranopteris linearis* ferns. Although their presence improve soil fertility, they can also suppress woody regeneration by occupying both above and the below ground growing space in the early stages of the succession and hence not suitable for bioengineering. Most common shrub, herb and grass species were *Clidemia hirta*, *Osbeckia oandra*, *Rubus indicus*, *Lantana camara*, *Ricinus communis*, *Crotalaria retusa*, *Abelmoschus moschatus*, *Sida alnifolia*, *Austroeupatorium inulifolium*, *Mimosa pudica*, *Stachytarpheta jamaicensis*, *Ageratum conyzoides*, *Vernonia cineria*, *Eragrostis* sp., *Elusine indica* and *Panicum maximum*. Among these, most are invasive alien species which are strictly excluded in bioengineering. *Albizia* sp. was identified in whole landslide area. Transportation and the deposition area was planted with *Artocarpus nobilis* (Jack fruit).

Keywords: Bioengineering, Succession, Pioneering plants, Invasive species