

Evaluating the Impacts of Land Use Land Cover Changes on Agro-biodiversity of Kandyan Home Gardens

A.M.N.S.K. Abeyasinghe¹, L.M.H.R. Alwis¹, R.M.C.W.M. Rathnayake¹
H.K. Kadupitiya²

¹*Department of Export Agriculture, Uva Wellassa University, Badulla, Sri Lanka.*

²*Natural Resources Management Centre, Department of Agriculture, Peradeniya.*

Kandyan Home Gardens are multi-species traditional agro-forestry systems which conserve biodiversity. Land Use / Land Cover changes adversely affect on biodiversity in Kandyan Home Gardens. Land Use / Land Cover changes in the Kandy district were analyzed using Remote Sensing and GIS techniques. Landsat images of year 2000 and 2015 were used for the study. Supervised classification technique was used to identify different Land Use / Land Cover classes and Land Use / Land Cover change maps for year 2000 and 2015 were prepared. Normalized Difference Vegetation Index (NDVI) maps were prepared for year 2000 and 2015. Least square regression technique was used to rectify the climatic influences in satellite images. By obtaining the percentage NDVI change between 2000 and 2015, three Land Use / Land Cover change categories were identified; less changed, moderately changed and highly changed. Agro-biodiversity in Kandyan Home Gardens was evaluated through field investigations in 90 home gardens in Ambathenna, Pilimathalawa, and Gampola. The Land Use / Land Cover change category which each Kandyan Home Garden belonged to was identified using Global Positioning System. Species Richness, Shannon-Weiner index and Simpson Diversity Index were used to assess the agro-biodiversity. Land holding size in majority of home gardens was between 0.01 to 0.758 ha. Trees and root and tuber crops consisted of 88 species and 45 plant families were identified. Less changed area and moderately changed area had similar Species Richness and Shannon-Weiner values for diversity, but evenness of abundant species was higher in moderately changed area. Thus, agro-biodiversity in moderately changed area was high. Twenty seven species were perceived as threatened or lost from Kandyan Home Gardens. The study suggests the need of linking tree conservation programme with home gardens. A proper investigation has to be carried out to identify the threatened varieties.

Keywords: Agra-biodiversity, Kandyan Home Gardens, Land Use / Land Cover change, GIS and Remote Sensing