

IMPLEMENTATION OF GEOGRAPHIC INFORMATION SYSTEM FOR TEA PLANTATION MANAGEMENT A CASE STUDY AT St. COOMBS ESTATE TALAWAKELLE

K.W.N. Nadeeshani

Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka
Tea Research Institute of Sri Lanka, Talawakelle, Sri Lanka

Tea (*Camellia sinensis* (L) O. Kuntze) is the oldest non-alcoholic caffeine containing beverage crop and it is the most popular beverage in the world. Sri Lanka is one of the top global producers of tea. Sri Lankan tea industry is now in a decisive situation where a need of solutions to prevail over challenges such as low productivity, high cost of production comparatively other main producing countries and declining competitiveness in the world tea market. One of the problems related to the low land productivity rate in the plantation sector of Sri Lanka is the loss of fertile top soil through soil erosion and associated land degradation. Efficient utilization of available lands with proper soil conservation measures and environmental protection are mandatory to increase productivity.

Geo-Information Technologies (GIT) provides an important tool for the management of plantations. Geographic Information System (GIS) and Remote Sensing (RS) techniques can be effectively used to create a system to support decision-making process in plantation sector. Efficient utilization of land available for a variety of uses needs a variety of information pertaining to the Land and the approach adopted or propagated by the use of GIS which is one the latest technological breakthrough

A case study was undertaken with the objective of creating a GIS based Decision Supporting System (DSS) for the St Coombs Estate, Talawakelle. High resolution satellite images, topographic maps (1:10,000) and field data were used to prepare a base data set. Visual interpretation techniques and other GIS techniques were used to prepare these layers. Some of resulted layers are, field map, land use map, road map, drainage map, building map, soil map etc. These base layers were integrated in order to create, a digital map for St. Coombs Estate and a spatial database which gives information on socioeconomic and environmental factors. By utilizing these maps and other information, a GIS based DSS was created. Finally some analysis was carried out to investigate the applicability of this DSS. Proximity analysis and overlaying analysis techniques were used to identify the areas which need protection. Proximity to the water resource and steep area identification was done. Identified sensitive areas are presented in a map. It is necessary to pay attention on vegetable cultivation which covers 67% extent of stream reservation. The areas of the terrain having slopes over 60% are considered as steep area. These slopes are calculated using the generated Triangulated Irregular Network (TIN) of the terrain. It was identified 8% of total area as steep area. Tea cultivation occupies 68% (5% of total land area) of total steep area. It is necessary to search out and take actions to minimize soil erosion in this area.