

(93)

Analytical Hierarchy Process for Comparison of Organic and Chemical Farming of Tea Small Holdings in Baddegama, Galle

Jayasinghe D.^{1*}, Wijesinghe M.¹, Gunawardena U.A.D.P.², Mohotti K.³, Thatsarani W.T.V.⁴

¹*University of Colombo, Colombo 03, Sri Lanka*

²*Department of Forestry and Environmental Science, University of Sri Jayewardenepura, Nugegoda, Sri Lanka*

³*Tea Research Institute, Talawakalle, Sri Lanka*

⁴*University of Ruhuna, Matara, Sri Lanka*

**jayasinghedinali@gmail.com*

Abstract

Tea Small Holders in Baddegama, Galle typically use chemical fertilisers and pesticides for their tea cultivations. However, in recent years, there has been a gradual transition to organic and non-chemical practices, including a variety of soil conservation techniques such as stone hedges, live fences, lock and spill drains. Yet, no quantitative comparative studies have been carried out in Sri Lanka on these aspects for tea small holdings.

The present study broadly intends to compare costs and benefits related to four categories of tea small holdings which include: Organic plots with soil conservation (ORG+SC), Organic plots without soil conservation (ORG-SC), Chemical plots with soil conservation (CHE+SC) and Chemical plots without soil conservation (CHE-SC), selecting five plots per each category. Physical, chemical and biological parameters and economic parameters were used to estimate overall soil condition and quality in a given plot. The physical and chemical parameters included soil retention capacity and the nitrogen and carbon content. The diversity and abundance of soil organisms was selected as the biological parameter. The economic indicators were the income received from tea and other plants and the cost of production. The Analytic Hierarchical Process Method (AHP), a multi criteria analysis was adopted to select the best category that provide optimal benefits under small tea holding conditions.

The physicochemical parameters of soil retention and nitrogen and carbon content were more positive in the organic tea plots. The biological parameters such as earthworms, biological activity and arthropods in the soil were significantly higher in the organic plots. Benefit cost ratio of tea production for the small tea holders was higher in the organic plus soil conservation plots. AHP provided the ranking of the selected categories as ORG+SC, ORG-SC, CHE+SC and CHE-SC.

The study highlights the importance of understanding environment issues holistically. In order to understand the sustainability of a system both economic parameters and non- economic parameters have to be considered.

Key words: Analytic Hierarchy Method, Organic farming, Soil Conservation