**Analysis of Energy Balance of the Teaching Farm of Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka**

W.M.S.Dhanapala1, Eranga M.Wimalasiri1\*, Helitha H. Nilmalgoda2

*1Department of Export Agriculture, Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka*

*2Department of Biosystem Technology, Faculty of Technology, Sabaragamuwa University of Sri Lanka,Belihuloya, Sri Lanka*

*\* eranga@agri.sab.ac.lk*

Agriculture requires energy as an inputs for production. Efficient use of energy inputs helps to improve more efficient, sustainable, environmentallly friendly production. Also, it contributes to the economy and profitability. The objectives of this study are to evaluate the energy balance of crop and livestock production, net energy ratio (NER), and water use efficiency of crops from the period of 2020 – 2022 using the life cycle assessment (LCA) approach on the farm of the Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka. In this study, inputs and outputs used in the calculation of energy in crop production include human labor, seed, fertilizer, pesticide, machinery, electricity, crop products and their residuals. The inputs used in the calculation of energy in livestock production include human labor, amount of feed, and electricity while milk, eggs, meat produced and manure are considered as output energy. Data were obtained from farm records, contact with farm laborers, and previously published literature. The results showed that the total average energy inputs, outputs, and energy balance in crop production were 75.71 GJ/year (400.24 GJ/ha/year), 107.06 GJ/year (717.11 GJ/ha/year ), and -31.35 GJ/year (-316.87GJ/ha/year) respectively. Total average energy inputs, outputs, and energy balance in livestock production were 867.44 GJ/year, 108.70 GJ/year, and 758.73 GJ/year respectively. The water use efficiency (WUE) of crop production was 31.35 MJ/m3. The total energy balance of the faculty farm was 736.2 GJ/farm/year. The net energy ratio (NER) of the crop production, livestock production, and overall farm were 1.71, 0.13, and 0.23 respectively. The results of the study indicate a positive energy balance in livestock production due to a high amount of energy inputs than output energy and a negative energy balance in crop production due to high amount of energy outputs than energy inputs in the faculty farm.

**Keywords:** *crop production, energy balances, life cycle assessment, livestock production*