

A production function approach in coconut cultivation

A production function for coconut, one of the major crops in Sri Lanka was estimated by using time series data from 1971 to 1998. Regression analysis was carried out using multiple-linear, Cobb-Douglas and translog functional forms of total coconut

production, effected by cultivated area, fertilizer use, rainfall and the technological change. From the economic theories and the statistical point of view, the Cobb-Douglas model revealed good insight to other functional forms tested. However, this model only explains 35% of the total variability of the coconut production, attributed to the changes in the input variables included in the model. This suggests, the magnificent combined effect of many other excluded variables in the model and the unexplained variability, on the coconut production.

Inputs evaluated according to their contribution to total production suggested that soil moisture (rainfall) and the technology (research & development) were significant at 5% level for production increase at aggregate level. The output elasticity indicate that for 10% increase in fertilizer use and soil moisture, increases the nut yeild by 2% and 4% respectively. The marginal product for rainfall, fertilizer and technology was positive as expected, but less than one which indicates operating at the rational zone of production. There was a negative marginal product for land, implying the characteristic nature of land use by coconut palms utilizing only 25% of the land under cultivation. Returns to scale was 0.42, indicating decreasing returns to scale in production. The results reveal that, only 42% change in output can be expected for a 100% change in all these inputs together.

According to the findings of this study, the soil moisture was found to be the signification factor in determining the coconut yield on aggregate level. This clearly indicates that the investments in irrigation, which facilitates soil moisture improvements during dry periods, would be extremely valuable to increase coconut production at national level.