

## **Meta-analysis of Technical Efficiency (TE) in selected agricultural sub-sectors: implications for policy making to the government**

**S.M.P. Senevirathne\*, M.H.S.M. Hettiarachchi, R.P.W.A. Dilrukshi and C.K. Beneragama**

Department of Crop Science, Faculty of Agriculture, University of Peradeniya, Peradeniya, Sri Lanka

### **Abstract**

Technical efficiency (TE) can be defined as the ability of a decision-making unit to produce maximum output with a given set of inputs and technology. In recent years, evaluating farmer's efficiency in an agricultural community has become a vital issue. To reduce the poverty of farmers, production efficiency needs to be optimized and the government-controlled policy interventions are necessary. Objective of this study was to evaluate the TE in selected agricultural sub-sectors and to propose possible policy interventions to the government. Study was conducted through a meta-analysis based on empirical studies conducted by various scientists worldwide. Research articles for the meta-analysis were selected using a thorough screening process based on the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) concept. Mean TE of each sub sector was calculated by averaging the TE values from different studies in the selected articles. TE data presented in the original articles show a considerable dispersion within a given study, in some cases dispersed in the range from 0.2 (min) to 0.9 (max). Of the 94 studies considered, only 47 studies have recorded a TE of above 0.8, where livestock sector stands out predominantly (poultry, dairy and aquaculture). Among the major crops belong to this category, cucumber and B-onion dominate. The highest mean TE was recorded in B-onion ( $0.83 \pm 0.15$ ) whereas the lowest was recorded in maize ( $0.703 \pm 0.09$ ) and in soybean ( $0.705 \pm 0.13$ ). The TE of chili cultivation was 0.78 with the greatest variability (0.19 SEM) among the crops considered, which signifies the unpredictable nature of the chili cultivation. Dairy, poultry and aquaculture farming operations were found to be highly technically efficient having mean TE values of  $0.80 \pm 0.16$ ,  $0.89 \pm 0.02$  and  $0.88 \pm 0.08$ , respectively. The broad differences in the technical efficiencies show that there is a need to make farmers aware to operate the farming techniques appropriately. Findings of this study will lead to several key policy implications including, improvement of the socioeconomic characteristics of farmers, implementation of farmer field schools (FFS) and establishment of a cautious and gradual strategy for expansion of the rural financial institutions in the farming communities in Sri Lanka.

**Keywords:** Agricultural technical efficiency (TE), Meta-analysis, Policy implications

**\*Corresponding Author:** prabaath92@gmail.com