

## ***Evaluating the Economic Feasibility and Social Acceptance of Inhibitor Technologies in Sri Lankan Paddy Cultivation***

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Nitrogen loss inhibitor technologies are the most emerging advancement in the global fertilizer sector. Although Sri Lanka continues to rely on conventional nitrogen sources, the Nutrient Use Efficiency (NUE) in the agriculture sector remains approximately 30%, leading to significant environmental pollution. Therefore, this study focuses on usage of nitrogen loss inhibitor technologies in the paddy sector, evaluating two main application techniques which are application of urease inhibitor treated urea (LIMUS) and direct application of inhibitors (NBPT and DCD) with conventional urea. A cost benefit analysis was carried out to evaluate the financial benefits of these two techniques compared to conventional urea application. Results revealed that, LIMUS decreased profit by 0.7% and direct application of inhibitors increased the profit by 9% when compared to conventional urea. Also, nitrogen lost was calculated using NUE of each technique and there it was identified that, 79% and 56% reduction was observed when using LIMUS and direct application of inhibitors respectively. After considering shadow cost of nitrogen surplus, the study revealed that, social benefit increases 12% and 9% respectively in direct application and LIMUS, when compared to practicing conventional method. Key informant interviews with stakeholders revealed that social acceptance towards inhibitor technologies among farmers and Agricultural Production and Research Assistants was low while it was identified to be high for fertilizer importers. The primary reasons for this disparity were lack of knowledge about these technologies and market challenges such as low demand for novel fertilizers due to negative past experiences, quality concerns and high initial investment. According to this study inhibitor technologies can be introduced to Sri Lanka as environmentally and socially viable solutions. Therefore, it is necessary conduct further scientific research studies and followed by an effective extension service and provide a slightly relaxed quarantine regulatory background when introducing new fertilizers to the country.

**Keywords:** Nitrogen, Fertilizer, Nutrient Use Efficiency, Inhibitor, social profit, paddy