Abstract No: 280 ***ICT, Mathematics and Statistics***

EFFECTIVE DECISION MAKING IN FRESHWATER PRAWN EXPORT INDUSTRY IN SRI LANKA

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During the last decade, Sri Lanka has taken many steps to improve the quality and quantity of export merchandise. Among many exports, edible fish is a rapidly growing industry as well as a major contributor to the national economy of Sri Lanka. In this study, we specifically focus on the edible prawns exporting industry with the hope of developing a Logistic Regression model to predict the likelihood of exporting a given prawn batch based on several human and naturally controlled matters. Currently, the exporting decision made by the exporters is based on their personal experience, and statistical techniques are hardly in use. The model developed in this study will help both farmers and prawn exporters to predict the exporting likelihood based on the available data, and thus save a significant amount of money and time. The study reveals that the dissolved oxygen level, water pH, ammonia, nitrate, alkalinity, saltinity and small prawn density per hectare of a prawn farm play a vital role in achieving export quality prawn harvest. Based on the *P*-value, water temperature is not a significant factor for the export decision, and the fitted logistic model predicts response with 87% accuracy. The same accuracy can be achieved under Support Vector Machine and Random Forest techniques. Moreover, the model was extended with the Bayesian approach and the parameters were updated accordingly. Only for alkalinity and small prawn density, converged parameter values were very close to zero. Actual data collected from the field in the future would be revised to improve the predictability of the model. All the statistical analyses in the study were carried out using RStudio and WinBugs.

Keywords: Bayesian approach, Edible prawns, Logistic regression, RStudio, WinBugs