Modeling a feasible actuarially fair crop insurance premium for the paddy field sector of Sri Lanka

W.N.C.J. Fernando, S.S.N. Perera

Department of Mathematics, University of Colombo, Sri Lanka

Agriculture plays a vital role in the Sri Lankan economy, similar to most Asian countries. The existence of a crop insurance for the paddy field sector of the country is of vital importance since the crop heavily fluctuates on climate-sensitivities, making farmers vulnerable. This research focuses on determining a feasible Actuarially Fair Premium (AFP) from the perspective of the farming community in Sri Lanka. In order to identify the loss and the financial capabilities of farmers, a survey was conducted in the Monaragala and Kurunegala districts. The Beta Distribution was used as the parametric approach to model paddy yield. The moment estimators of the Beta Distribution were calculated using the Maximum Likelihood Estimation method. Monte Carlo simulation was carried out to generate the yield. The AFP was computed for different coverage levels from the farmer's perspective. Fuzzy logic was used to compute the coverage level by considering membership functions of cost and loss which are considered to be two influential factors. According to the findings, it is observed that, if the crop insurance instrument is to be implemented for the Sri Lankan farming community, the behavioural variation of risk loading factors due to climatic and demographic variations needs to be analyzed, since there is high variability, although the country is small.