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Rating of cash crop insurance contracts in Tanzania using nonparametric methods

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Abstract

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This chapter used nonparametric methods to establish the parameters of cash crop insurance contracts based on zone yields. The secondary historical yields data obtained from the Food and Agriculture Organization of the United Nations, for the period of 1961 through 2018, for cotton and cashew nuts, were used both in estimating the kernel density function and forecasting the mean yield. The estimated kernel density and mean forecasts were used to tabulate, at a different level of coverage, the probability of loss, the expected yield shortfall (kilogram per hectare, denote kg/ha), and the actuarial-fair premium rates for each crop. The results showed that, at different levels of coverage (i.e., from 50% to 90%), the actuarial-fair premium rates range between 0% and 32% of the sum assured. However, the range for cashew nuts is narrow (0% to 8%) while that of cotton is 4% to 32%, a very wider range compared to cashew nuts. Further, the expected losses for cotton, in the same coverage intervals, ranges from 11.58kg/ha to 256.06kg/ha while that of cashew was 0.44kg/ha to 19.69kg/ha.