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### *Full Length Research Paper*

## Estimating the threshold value and loss distribution: Rice damaged by typhoons in Taiwan

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### Abstract

We apply extreme value theory to determine the over-threshold peaks of the data and then use the Kolmogorov-Smirnov and Anderson-Darling goodness of fit tests to show that the generalized Pareto distribution fits the heavy-tailed distribution better than the Lognormal, Gamma, Weibull and Normal distributions in rice damaged by typhoons. The appropriate of the threshold value and probable maximum loss can be calculated as one of reference indexes on risk retention or/and crop insurance associated with the natural systematic risk of major agricultural disasters. The properties we found are useful in crop loss assessment and in the decision making of government's risk financing for major agricultural disasters. Our method may be applied to other disasters and other countries.

**Key words:** Natural disasters, generalized Pareto distribution, heavy-tailed distribution, threshold value, probable maximum loss.

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