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**Joint regression analysis of the effect of climate risk on food security in rural Nepal: Using Copula approach**

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Like many other developing countries, agriculture production in Nepal largely relies on rain-fed, which induces high vulnerability to climate risk of the household food security. This paper analyzes the effect of climate risk on food security in rural Nepal, utilizing the Nepal Living Standard Survey data and climate risk index data. We construct two indicators for food security, caloric intake per capita and food diversity, which captures comprehensive information of food security. The copula method, which allows us to obtain flexible bivariate parametric model for the continuous-count data, is used to simultaneously estimate the caloric intake and food diversity models. The estimated correlation parameter between the two models is significant from zero at the 5 percent level, indicating that there is strong correlation between calories and food diversity. The results show that household food security (both caloric intake per capita and food diversity) is negatively affected by the rainfall and temperature risk in rural Nepal. It also indicates that social capital is an important determinant of the household food security. In addition, we find more important factors significantly affecting food security, such as infrastructure, remittance, coping strategies, agriculture income, etc.