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Linking climate trends to coping strategies in northern Tanzania

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This paper explores the nature of shocks that rural households in Kagera, Tanzania, have experienced during a period of ten years, examines their responses to these shocks and evaluates the impact of future climatic changes on these responses. The effect of increased climate variability is pronounced especially in Least Developed Countries (LDCs) where most agricultural production systems are rainfed and where few resources are available in order to adapt to these changes. Climate variability and droughts are already important stressors in East Africa, and rural households have adapted to such shocks for decades. Nonetheless, rural livelihoods will experience more uncertainty in their agricultural production due to increased variability in rainfall and temperatures induced by climate change. In Kagera, a remote and poor region in northern Tanzania, about 90 percent of the population depends on agriculture for food and cash crops. The rainfall pattern is bi-modal with 900-2,000 mm per annum and temperatures range between 20°C and 28°C. The region is predicted to experience an increase in total precipitation and temperatures as a consequence of climate change. These changes are already experienced today through increased variability in precipitation with longer dry periods and periods with heavy rains. The agricultural production is generally rainfed and therefore unable to resist longer periods without rain or to resist extreme rainfall events, which can cause problems related to, for example, water logging. Firstly, development paths in Kagera are identified in order to relate different coping strategies to conditions that rural households are facing. This is done by classification of different zones in the region according to rainfall, access to markets and population density. Secondly, the paper identifies shocks and negative trends experienced by rural households in the region related to weather induced changes during a period of 10 years. Thirdly, the identified shocks are linked to climate data and the development paths in order to explore possible synergies between climate variability and these shocks and trends. Fourthly, the coping strategies that the rural households have followed are explored and in addition it is discussed how increased climate variability may influence these strategies. Lastly, some suggestions are made on possible alternative coping strategies. The analysis is based on the Kagera Health and Development Survey (KHDS) from 2004, which consists of interviews with more than 800 households from nearly 50 communities. The survey includes information on the incidence of shocks and trends experienced during the last 10 years (both positive and negative), monthly rainfall from 1989 – 2004 on a district level, and GPS data on location of villages. The paper shows that the main shocks and negative trends that can be related to climate variability are associated with drought and chronic food insecurity as a consequence of this, and malaria epidemics and related deaths subsequent to heavy rains and thereby high humidity. Hail and wind storms resulted in crop damages and thereby resulted in farm revenue losses. Also crop pests related to increased humidity for already wet periods are problematic in the region. The current coping strategies have helped to maintain household welfare during periods with stress from shocks. However, the coping strategies that households in Kagera follow today will not be sufficient in the long term as they presently include selling livestock and crops. Selling these assets will decrease households' own consumption or substitute high value goods with poor value goods and possibly cause poor nutrition. Sufficient coping strategies should consist of several complementary measures. This can include improved land management practices such as management of water resources and introduction of conservation tillage, improved access to markets to increase marketing opportunities for sale of a diversified production, and lastly enhancement of farmers' skills through training and education which would enable farmers to make decisions in regards of production as well as marketing issues.