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“Development on the margin”

Vulnerabilities and Adaptive Capacities of Populations in Marginal Areas of Central Asia to Climate Change

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Abstract

Central Asia is located in arid and semiarid regions with significant areas affected by anthropogenic and natural land degradation. Agriculture is the leading economic sector and a key source of livelihoods in most of those marginal areas. The marginal areas in Central Asia are also prone to significant weather volatility. Climate change is projected to further widen the weather volatility with a potential to increase the vulnerability of local agricultural populations to annual and seasonal weather fluctuations and extreme events. Therefore, it is important to i) identify the extent of vulnerability of agricultural production in marginal areas to current weather fluctuations and anticipate possible impacts of increased weather volatility in future, ii) estimate the potential interactive effects of weather volatility and land degradation on agriculture, and iii) identify factors leading to stronger resilience and adaptive capacities of agricultural producers in marginal areas to climate volatility and change, given their unfavourable natural endowments. To answer these questions, I use a random-effects panel model at the province-level (1991–2009) for the five countries of Central Asia — Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, with econometric emphasis on spatial heterogeneity. The agricultural production in marginal areas of the region is negatively impacted by climate volatility and this impact is largely magnified through interaction with land degradation. The marginal areas are not well prepared against climate volatility and extreme events, therefore, targeted development interventions are needed to increase their adaptive capacities including through investments in marginal-area specific agricultural research (for example, salinity and drought-resistant crop cultivars), better infrastructure, higher access to credit and extension.

Keywords: Central Asia, climate change, land degradation, marginal areas