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“Development on the margin”

## Climate Change-related Vulnerabilities and Adaptive Capacities of Populations in Marginal Areas of Central Asia

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### Abstract

Central Asia is located in arid and semi-arid 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 exacerbate 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 answer these questions, we 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. We hypothesise that agricultural production in marginal areas of the region is negatively impacted by climate change; coupled with land degradation, this impact is likely to be magnified. Given their unfavourable natural endowments and weak response behaviour, we expect that people in the marginal areas are least prepared for the effects of climate change and extreme events. Therefore, targeted development interventions are needed to increase their adaptive capacities which would include 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