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Climate Thresholds, Institutional Quality, and Structural Agricultural Inequality in Sub-Saharan Africa

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Abstract: This study examines the effects of climate variability and institutional quality on structural agricultural inequality in Sub-Saharan Africa (SSA). Agricultural inequality is measured using the Agricultural Productivity Gap Index (APGI), which captures disparities between agriculture's share of employment and its contribution to value added. Using an unbalanced panel of 45 SSA countries from 2000 to 2023, the study applies fixed-effects and panel threshold regression models to identify both linear and nonlinear climate impacts. The results show that temperature anomalies significantly affect agricultural inequality, while rainfall anomalies have weaker effects. Institutional quality consistently reduces productivity gaps, highlighting the importance of governance in supporting agricultural transformation. Threshold estimates reveal a critical temperature anomaly of 0.48°C, beyond which climate shocks intensify inequality. Moderate temperature deviations are associated with lower productivity gaps, whereas larger deviations tend to increase inequality. Similarly, severe rainfall deficits widen agricultural inequality in predominantly rain-fed systems. Robustness checks confirm the stability of the findings. These results underscore the importance of climate adaptation policies and stronger institutions for reducing agricultural inequality and promoting sustainable development in SSA.

Keywords: Climate Change, Agricultural Inequality, Institutional Quality, Panel Threshold Regression, Sub-Saharan Africa

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