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Does cluster farming work? Productivity gains and institutional dynamics among smallholders in South Punjab, Pakistan

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Abstract

Farming in Pakistan's smallholder sector has never been easy, but the pressures have intensified. Landholdings are shrinking, markets remain inefficient and exploitative, and institutional support is, at best, uneven. Against this backdrop, cluster farming has attracted considerable attention as a practical organisational arrangement in many regions through which smallholders can pool resources, bargain collectively, access better inputs, and grow high-value crops particularly vegetables that would otherwise be beyond their individual reach. The idea is compelling, yet despite growing policy interest, rigorous empirical evidence on whether cluster farming works and under what institutional conditions, remains limited, especially for South Punjab.

The present study investigates the productivity and income effects of cluster farming among smallholders in South Punjab, Pakistan, with a focus on vegetable and chili clusters by employing a mixed-methods explanatory sequential design. Quantitative data were collected from 400 smallholder farmers, from both cluster members and non-member controls across the study area using stratified random sampling and employing the Yamane formula. Data were analysed through Propensity Score Matching (PSM) and Difference-in-Differences (DiD) estimation. These were complemented by semi-structured interviews with 30 key informants, including extension agents, cooperative leaders, and local officials, with findings interpreted through thematic analysis.

The results suggest that cluster membership does make a measurable difference. Farmers within clusters reported higher crop yields, improved net farm income, and better input-use efficiency. They also showed greater independence from commission agents and stronger connections to formal markets. Qualitative findings reveal that governance weaknesses, limited financial inclusion, and poor extension coordination constitute the primary institutional constraints to cluster scalability and sustainability. This study contributes context-specific evidence to the agricultural innovation systems literature and offers policy recommendations for strengthening institutional support to scale cluster-based farming interventions for smallholder livelihoods and food security in South Punjab.

Keywords: Difference-in-Differences, Institutional dynamics, keywords: Cluster farming, Pakistan, Propensity Score Matching, Smallholder productivity, South Punjab, Vegetables