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Enhancing Rural Women Farmers' Resilience to Climate Change-Induced Impacts through Financial Inclusion in Nigeria

A Mixed-Methods Study of Rural Women Farmers Across Benue, Ebonyi & Ogun States

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Introduction

- Climate change affects every Nigerian farmer with heat, erratic rainfall and drought but women farmers are usually disproportionately disadvantaged in accessing land, credit and financial services.
- Gender gaps exists in financial inclusion (account ownership, digital payments, savings and credit) and constrain women's capacity to invest in adaptation and recover from shocks.
- With multiple financial services, it is unclear which financial-service combinations actually build resilience
- This study asks:: (1) Which combinations of financial inclusion services improve women farmers' resilience ? (2) How does the association between financial inclusion and climate resilience influence livelihood and welfare outcome? (3) How effective are existing financial inclusion initiatives in enhancing rural women farmer's climate resilience?

Fig 1: Water infrastructure and a beneficiary farmer, VCDP communities, Ebonyi State

Method

- **Financial initiative**: Value Chain Development Programme (VCDP) operates through cooperative membership, agricultural inputs (counterpart funding), trainings, financial-inclusion services components (loans, account ownership, credits, insurance) and infrastructure aims to enhance smallholders' resilience
- **Mixed-methods** study: 360 rural women farmers (180 beneficiaries &180 non-beneficiaries) across Benue, Ebonyi and Ogun States with Key informant interviews and Focus Group Discussions.
- **Two composite indices** built : a. **Financial Inclusion Index (FII)**: 3 Dimensions (Access, Availability, and Usage) and b. **Climate Resilience Index (CRI):** Adaptive capacity, Asset, Social safety nets, Basic services access, Income and food access & Stability
- **Binary logistic regression** on 27 financial-service combinations; **Propensity Score Matching:** (3 methods: paired Nearest neighbour (NN), NN with replacement, Inverse Probability of Treatment Weighting- IPTW) for Average Treatment Effect on the Treated (ATT).

Result

Table 1: FII, CRI ,Food Security & TFP by State

State	Group	FII (%)	CRI (%)	Food-Secure (%)	Total Factor Productivity
Benue	Non-ben	35.8	48.8	8.3	3.794
Benue	Beneficiary	37.5	59.4	36.7	5.902
Ebonyi	Non-ben	34.7	43.7	6.7	2.954
Ebonyi	Beneficiary	44.2	54.8	41.7	3.794
Ogun	Non-ben	48.3	41.7	5.0	3.204
Ogun	Beneficiary	51.4	49.9	3.3	3.551

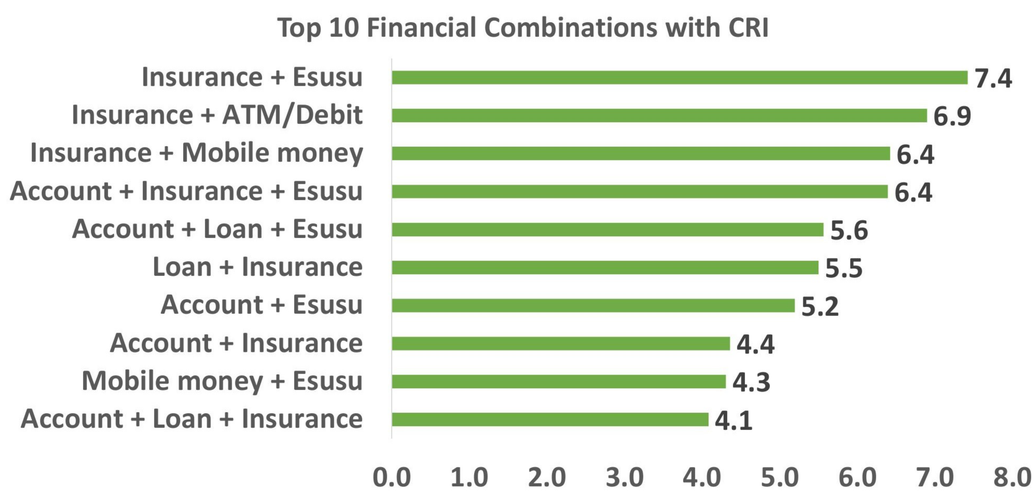
Food-Secure Households
6.7% N-bene ↑ 27.2% Beneficiaries
4.1×

Climate Resilience (CRI)
44.8 N-bene ↑ 54.7 Beneficiaries
+9.9pts

Financial Inclusion Index (FII)
39.6 N-bene ↑ 44.4 Beneficiaries
+4.8 pts

- Beneficiaries are consistently more food-secure, resilient and modestly more financially included than non-beneficiaries.
- Gap is largest in Ebonyi and Benue (food security roughly 4–5× higher among beneficiaries) and much narrower in Ogun State, which already had the highest FII.

Fig 2: Top 10 Financial-Service Combinations Driving Climate Resilience (CRI)



CRI regressed on each financial-service combination + propensity score + state fixed effects (all p<0.05, N=360). Top 10 of 27 combinations tested.

- Combinations anchored on a formal ACCOUNT or INSURANCE are consistently the strongest predictors of resilience; pairing with Esusu, debit cards or mobile money adds further gains.
- Savings-only combinations show weak, non-significant effects — informal savings alone is not enough to build resilience.
- Income and productivity move together for 89% of respondents (r = 0.82, p<0.001); for farm households, the harvest largely is the income.
- 34% of those with increased income cited "improved practices/inputs" as the main reason, ahead of price or market factors.

Table 2: Financial Initiative Effect (ATT) on Key Outcomes, Cross-Validated Across 3 PSM Methods

Outcome	ATT (range)	Significance
Climate Resilience Index	+8.9 to +9.5 pts	p<0.001, all 3 methods
Food Secure	+0.17 to +0.18 pp	p<0.001, all 3 methods
FII x CRI interaction	+351.27 to + 591.43 pts	p<0.001, all 3 methods
Financial Inclusion Index	–1.0 to +4.0 pts	not significant
Agric. Productivity (TFP)	–0.4 to +0.6	not significant
Household Income (₦)	–541K to –607K	not significant

Key: the financial inititativess clearest, best-evidenced effects run through Climate Resilience and Food Security and not through the formal Financial Inclusion Index itself.

Conclusion

- Financial inclusion builds climate resilience mainly when BUNDLED (account, insurance and esusu-anchored combinations) — not through single-product access.
- Climate resilience (CRI), through BUNDLED combinations but not the formal FII, is the primary channel to welfare: it robustly predicts food security, pointing to non-financial programme components (inputs, training, infrastructure) as key drivers.
- Matched-comparison (PSM) analysis confirms that financial initiatives can genuinely, causally raise rural women farmers' resilience and food security, though unevenly, strongest in Benue and Ebonyi and weakest in Ogun State.

Policy priority:

- incentivize bundled products, redesign agricultural insurance, treat irrigation/water access as financial-inclusion-adjacent, and target support directly to women and not through intermediaries.

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