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Food Insecurity and Farm Profitability among Zamfara Comprehensive Agricultural Revolution Programme (ZACAREP) Beneficiary and Non-Beneficiary, Zamfara State, Nigeria

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Abstract: Agricultural support programmes may influence farm earnings and household access to food, but beneficiary–non-beneficiary differences require careful interpretation. This study compared socioeconomic characteristics, farm profitability and food-insecurity profiles among 336 farming households in Zamfara State, Nigeria, comprising 168 beneficiaries of the Zamfara Comprehensive Agricultural Revolution Programme (ZACAREP) and 168 non-beneficiaries. The comparative cross-sectional analysis used descriptive statistics, Pearson chi-square tests, Welch's independent-samples t-tests, farm-budget measures and the Foster–Greer–Thorbecke (FGT) indices. Food insecurity was defined as daily per-capita calorie intake below 2,250 kcal. Beneficiaries had greater access to credit (61.90% versus 29.76%; $p < 0.001$) and cooperative membership (66.67% versus 0.00%; $p < 0.001$). Mean net farm income was ₦162,471.88 ± ₦31,231.82 among beneficiaries and ₦95,211.22 ± ₦26,886.35 among non-beneficiaries, a difference of ₦67,260.66 (95% confidence interval: ₦61,005.87–₦73,515.45; $p < 0.001$). Food-insecurity incidence, depth and severity were 0.0833, 0.0072 and 0.0010 among beneficiaries, compared with 0.8929, 0.2262 and 0.0790 among non-beneficiaries. The beneficiary advantage generally persisted across the main socioeconomic categories, although several subgroups were small. Beneficiary households therefore exhibited higher profitability and lower food-energy deprivation. The cross-sectional design and differences in institutional access preclude causal attribution to ZACAREP. Programme monitoring should integrate farm returns, dietary assessment and explicit evaluation of selection into participation.; Keywords: agricultural programme; farm profitability; food insecurity; Foster–Greer–Thorbecke index; household welfare; ZACAREP; Zamfara State

Introduction: Producing food does not necessarily protect a household from food insecurity. Farm earnings may be seasonal, production costs may absorb much of the revenue, and access to purchased food may remain constrained. Food security encompasses availability, access, utilisation and stability; adequate calorie intake is therefore one component of a wider welfare outcome (FAO, 2008). The financing of food-security interventions also requires clear evidence on the outcomes achieved and the populations reached (FAO et al., 2024). Nigerian evidence highlights the importance of examining purchasing power alongside agricultural production. Mekonnen et al. (2023) associated healthy-diet affordability with differences in state-level food systems, with northern states generally facing less favourable conditions. At household level, Irohibe and Agwu (2014) found food insecurity among 26% of 120 rural farming households in Kano State and identified associations with education, household size and credit access. Maharazu et al. (2024) reported an expenditure-based food-insecurity prevalence of 46% among women vegetable producers in north-western Nigeria. These findings establish the relevance of economic and institutional resources, but their different populations and indicators limit direct comparison of prevalence estimates. The Zamfara Comprehensive Agricultural Revolution Programme (ZACAREP) provides an opportunity to examine how participation in agricultural support relates to farm profitability and household food security. Anka et al. (2025) documented favourable beneficiary perceptions of ZACAREP in Anka and Bukkuyum. Such perceptions are informative about programme experience, but they do not establish whether participating households earn greater farm income or experience smaller food-energy deficits than non-participating households. Evidence that connects these outcomes is needed to inform programme monitoring and rural welfare policy. The research problem is that favourable production or income indicators do not, on their own, demonstrate adequate household food access. Similarly, reporting only the proportion of food-insecure households conceals the depth of their deprivation. For ZACAREP, the relevant empirical question is whether beneficiaries and non-beneficiaries differ simultaneously in farm returns and in the incidence, depth and severity of food insecurity. Addressing that question requires joint consideration of farm budgets

and food-energy shortfalls, together with an assessment of socioeconomic differences that may influence both participation and welfare. This study therefore compared the socioeconomic characteristics and farm costs and returns of ZACAREP beneficiary and non-beneficiary households; estimated their food-insecurity incidence, depth and severity; and profiled these indices across age, marital status, household size, education, credit access and cooperative membership. The FGT framework permits the headcount to be assessed alongside the magnitude and distribution of shortfalls (Foster et al., 1984). The objective is a comparative assessment of household outcomes rather than an estimate of causal programme impact.

Methodolog: Study design and setting: The study used a comparative cross-sectional design involving farming households in Zamfara State, north-western Nigeria. Households were classified by participation in ZACAREP, enabling comparisons of socioeconomic characteristics, farm-economic performance and food-insecurity outcomes between beneficiaries and non-beneficiaries. The empirical study dataset contained household socioeconomic information, farm costs and returns, daily per-capita calorie intake and programme participation status. All results presented in this article relate to the study data. Programme participation was coded as 1 for beneficiaries and 0 for non-beneficiaries.

Study population and analytical sample: The analytical sample comprised 336 farming households: 168 ZACAREP beneficiaries and 168 non-beneficiaries. Each household was the unit of analysis, and programme status defined the two comparison groups. Group-specific descriptive statistics, farm-budget measures and food-insecurity indices used these denominators. Equal group sizes facilitate the presentation of comparisons but do not establish equivalence between the groups or remove selection into programme participation.

Variables and summary measures: Socioeconomic variables comprised sex, age, marital status, household size, years of schooling, educational attainment, farm size, farming experience, credit access and cooperative membership. Age, household size, schooling, farm size and farming experience were summarised using means and standard deviations; categorical characteristics were summarised as frequencies and percentages. Subgroup food-insecurity profiles were produced for age, marital status, household size, education, credit access and cooperative membership. Categories containing no households have undefined indices and are indicated by a dash.

Farm budget measures: Farm profitability was assessed using total revenue (TR), total variable cost (TVC), total fixed cost (TFC), gross margin (GM) and net farm income (NFI). Total revenue represents the value of farm output. Gross margin is the amount remaining after variable production costs, while net farm income also deducts fixed production costs. The accounting relationships were:

$$GM = TR - TVC \quad (1)$$

$$NFI = GM - TFC \quad (2)$$

All monetary values are expressed in Nigerian naira (₦). The indicators were summarised separately for the two participation groups. Differences in the group means describe their relative farm-economic performance; they are not estimates of the financial return attributable solely to programme participation.

Household food security measurement: Food-security classification used daily per-capita calorie intake and an operational threshold, z, of 2,250 kcal/person/day. A household with daily per-capita intake $y_i < z$ was classified as food insecure; a household at or above z was classified as food secure. The threshold defines the energy-adequacy criterion used in this study and is applied consistently to both groups. It does not imply identical physiological requirements for every household member or capture all dimensions of food security.

Foster Greer Thorbecke indices: The incidence, depth and severity of food insecurity were estimated separately for beneficiaries and non-beneficiaries using the FGT family of measures (Foster et al., 1984):

$$P\alpha = (1/N) \sum_i \in F\ [(z - y_i)/z]^{\alpha}, \quad \alpha \in \{0, 1, 2\} \qquad (3)$$

N denotes the number of households in the participation group, F is the set of households with daily per-capita calorie intake $y_i < z$, and q is the number of households in F. The parameter α determines the sensitivity of the index to the size of the shortfall. Restricting the summation to food-insecure households ensures that households at or above the threshold contribute zero. The three indices are:

$$P_0 = q/N; \quad P_1 = (1/N) \sum_i \in F\ [(z - y_i)/z]; \quad P_2 = (1/N) \sum_i \in F\ [(z - y_i)/z]^2. \qquad (4)$$

P_0 is the proportion of households below the calorie threshold. P_1 is the average proportional calorie shortfall across all households in the group, including zero contributions from food-secure households. P_2 is the average squared proportional shortfall, giving greater relative weight to larger deficits. With non-negative calorie intake, $0 \leq P_2 \leq P_1 \leq P_0 \leq 1$. The indices describe energy-based food insecurity and should not be interpreted as probabilities of future deprivation.

Subgroup profiles: Each subgroup index uses the number of records in that subgroup as its denominator. It is therefore a within-subgroup index, not its direct contribution to the participation-group total. For mutually exclusive and exhaustive subgroups, the group index is the weighted sum of subgroup indices, with each weight equal to the subgroup's share of group records (Foster et al., 1984). Small categories are retained for completeness but are interpreted descriptively; no subgroup significance tests are reported.

Statistical analysis: Categorical comparisons used Pearson's chi-square test, with Yates' continuity correction for 2 × 2 tables. Continuous variables were compared using Welch's independent-samples t-test, which does not require equal group variances. Two-sided statistical significance was assessed at $p < 0.05$. For farm-budget indicators, beneficiary-minus-non-beneficiary mean differences and 95% confidence intervals were calculated using the Welch standard error and Satterthwaite degrees of freedom. These intervals were derived from the group means, standard deviations and sample sizes. FGT indices and subgroup profiles were interpreted descriptively; no significance tests are attached to their differences. Farm-budget identities, category totals and percentages were checked for internal consistency. The statistical comparisons are unadjusted between-group analyses and do not identify an independent programme effect after controlling for socioeconomic differences.

Result: Socioeconomic characteristics: Socioeconomic characteristics are presented in Table 1. Credit access was greater among beneficiaries (104 households; 61.90%) than non-beneficiaries (50 households; 29.76%; $p < 0.001$). Cooperative membership was recorded for 112 beneficiaries (66.67%) and no non-beneficiaries ($p < 0.001$). Educational distributions differed between the groups ($p = 0.035$), while non-beneficiaries had more farming experience (21.20 ± 10.45 versus 18.49 ± 8.84 years; $p = 0.011$). Differences in sex, age, household size, years of schooling, farm size and marital status were not statistically significant. These findings do not establish equivalence on those characteristics. Farm costs and returns are presented in Table 2. Beneficiaries had higher total revenue, variable costs, gross margin, fixed costs and net farm income (all $p < 0.001$). Mean total revenue was ₦300,957.86 among beneficiaries and ₦220,942.18 among non-beneficiaries, a difference of ₦80,015.68. Mean net farm income was ₦162,471.88 and ₦95,211.22, respectively, corresponding to a beneficiary advantage of ₦67,260.66 (95% CI: ₦61,005.87–₦73,515.45). The greater costs incurred by beneficiaries were accompanied by larger revenues and retained farm earnings. Food-security status and FGT indices are presented in Table 3. Fourteen beneficiaries (8.33%) and 150 non-beneficiaries (89.29%) were food insecure, giving incidence indices of 0.0833 and 0.8929. The difference calculated from the household counts was 80.95 percentage points. Food-insecurity depth was 0.0072 among beneficiaries and 0.2262 among non-beneficiaries; severity was 0.0010 and 0.0790, respectively. The beneficiary group thus had a lower share of food-insecure households and smaller population-average calorie shortfalls. Food insecurity by age and marital status Age-specific indices are presented in Table 4. Beneficiaries recorded lower incidence, depth and severity in both the 21–40 and 41–60 year categories. Only two beneficiaries were older than 60 years, and no non-beneficiaries occupied that category. Table 5 presents the marital-status profiles. Among married households, incidence was 0.0733 for beneficiaries and 0.8839 for non-beneficiaries. Single and widowed/divorced households showed the same overall direction of between-group differences, but these categories were small. Household-size profiles are presented in Table 6. Among beneficiaries, incidence was 0.0588 for households with ≤5 members and 0.0991 for those with 6–10 members; corresponding non-beneficiary values were 0.8542 and 0.9009. Categories above ten members contained few households. Educational profiles are presented in Table 7. No consistent monotonic relationship was evident across educational categories. The tertiary categories contained ten beneficiaries and six non-beneficiaries, with incidence values of 0.3000 and 1.0000, respectively; these estimates require particular caution because of their small denominators. Credit-access profiles are presented in Table 8. Beneficiaries with credit access had lower incidence than those without credit (0.0673 versus 0.1094), but a slightly higher severity index (0.0011 versus 0.0008). Among non-beneficiaries, incidence was 0.9000 with credit and 0.8898 without credit, whereas depth and severity were lower among those with credit. Cooperative profiles are presented in Table 9. Within the beneficiary group, members recorded incidence of 0.0893 compared with 0.0714 among non-members. No non-beneficiary household was a cooperative member, preventing a programme-group comparison within that membership category.

Discussion: Farm profitability and programme participation: Beneficiaries generated larger revenues and net farm incomes despite incurring greater production costs. The net-income difference was substantial, and its confidence interval excluded zero. This pattern is compatible with greater investment in production, stronger market participation or more remunerative farming activities among beneficiaries. However, output quantities, prices, crop composition and particular programme services were not separated in the analysis, so the mechanism underlying the profitability difference cannot be identified. The result establishes an association with participation, rather than the incremental return generated by ZACAREP. The direction is consistent with Nigerian evidence that agricultural development interventions can improve economic outcomes, although study designs differ. Nkonya et al. (2012) estimated income gains of approximately 40–60% from Fadama II using matching and difference-in-differences methods, with heterogeneous benefits across income groups. Those estimates concern household income and an explicit counterfactual analysis, whereas the present results compare cross-sectional farm budgets. Anka et al. (2025) also reported favourable perceptions among ZACAREP beneficiaries. Together, these studies provide context for a positive beneficiary profile, but neither justifies interpreting the present net-income difference as a causal effect.

Financial access and diet affordability: Beneficiaries' greater credit access is relevant because liquidity can influence the timing and scale of farm activities and the ability to purchase food. Irohibe and Agwu (2014) identified credit access and household size among the correlates of food-security status in Kano. Maharazu et al. (2024) likewise linked food-security status among women vegetable producers to credit access, farm income and off-farm income. These findings support attention to financial access, but they do not establish that credit alone explains the ZACAREP comparison. Mekonnen et al. (2023) demonstrated that healthy-diet affordability varied with food-system performance across Nigerian states. This supports the relevance of purchasing power alongside production. In the present study, higher mean farm earnings and lower food-insecurity indices occurred in the same participation group, but their association was not modelled at household level. Food prices, competing expenditure needs, household composition and other income sources may influence how farm earnings translate into diets. The contrast is therefore consistent with an income–food-access pathway without identifying that pathway as the sole explanation.

Incidence depth and severity of food insecurity: The three FGT measures reveal a consistent between-group contrast. The headcount difference shows that fewer beneficiary households were below the operational calorie threshold, while the depth and severity differences indicate smaller population-average deficits and less weight concentrated in large shortfalls. For example, $P_1 = 0.2262$ among non-beneficiaries represents an average proportional deficit of 22.62% across the full non-beneficiary group, not a deficit of 22.62% among food-insecure households alone. P_2 gives greater relative weight to larger deficits; it is not a probability that a household will become food insecure. The direction of the food-security difference accords with Wudil et al. (2023), who found higher food-security prevalence among Kano River Irrigation Project beneficiaries than non-beneficiaries. Their sample comprised 382 rice farmers, and approximately 72.6% of beneficiaries and 65.4% of non-beneficiaries were food secure. Their analysis used a 2,700 kcal criterion, compared with 2,250 kcal/person/day here. The much larger separation in the ZACAREP sample should therefore be interpreted in relation to differences in eligibility, farming systems, household composition, measurement and study period rather than as a directly comparable programme-effect estimate. The variation across other Nigerian studies further cautions against treating one prevalence estimate as a regional benchmark. Irohibe and Agwu (2014) found a different food-security distribution in rural Kano, while Maharazu et al. (2024) used an expenditure-based threshold among women vegetable producers. Expenditure adequacy, calorie adequacy and healthy-diet affordability address related but distinct questions. The present findings establish a strong energy-based contrast within this sample; they do not establish that beneficiaries meet every dimension of food security or that the same difference applies to all Zamfara farming households.

Subgroup interpretation and identification: Subgroup results generally retained the beneficiary advantage, but they did not reveal a uniform relationship between every household characteristic and deprivation. Larger household categories, older respondents and tertiary-educated respondents were represented by small numbers. Their estimates can change considerably with a few households and should not be treated as stable population gradients. Likewise, lower incidence among credit-using beneficiaries coexisted with a slightly higher severity index. Financial access may be associated with the number of households below the threshold without showing the same pattern for the distribution of shortfalls. Cooperative membership requires separate attention because no non-beneficiary household was a member. This limits comparison of programme groups within the member category and makes it difficult to separate programme access from cooperative arrangements. Programme status and membership are not identical, however, because 56 beneficiaries were non-members. The absence of a lower beneficiary-member headcount relative to beneficiary non-members also cautions against attributing a protective effect to membership from these descriptive results. Non-significant comparisons on some demographic variables do not remove confounding or establish exchangeability.

Implications for measurement and evaluation: The findings suggest that programme monitoring should assess retained farm earnings alongside household food access rather than

treating production or revenue growth as sufficient evidence of improved welfare. Credit access, market participation and collective institutions are plausible components of this relationship, but their contributions require separate analysis. FAO's (2008) broader food-security framework also supports complementing calorie adequacy with diet quality and stability measures. A household can meet an energy threshold while remaining vulnerable to seasonal shortfalls or nutritionally inadequate diets. Further evaluation should distinguish selection into participation from outcomes after participation. Nkonya et al. (2012) demonstrate how an explicit counterfactual framework can strengthen programme evaluation. For ZACAREP, longitudinal information and careful assessment of common support would be valuable before choosing matching, weighting or other adjustment methods. Policy recommendations should therefore focus on sustaining access to productive and financial resources while improving outcome monitoring, rather than treating the present cross-sectional comparison as proof of programme impact.

Strengths and limitations: A strength of the study is its joint assessment of farm economics and complementary food-insecurity measures within the same beneficiary–non-beneficiary comparison. Reporting both headcount and shortfall measures distinguishes the prevalence of energy inadequacy from its depth and severity. Farm-budget confidence intervals also make the precision of the economic comparisons explicit. Several limitations qualify the findings. The cross-sectional design cannot establish temporal ordering or causality, and the analyses do not adjust for observed or unobserved selection into ZACAREP. Differences in institutional access and farming experience may contribute to the welfare contrast. Small subgroup sizes limit the stability of some FGT profiles, while the absence of cooperative members among non-beneficiaries restricts overlap. Calorie adequacy is a narrow measure of food security and does not capture dietary quality, intra-household allocation or seasonal stability. The large between-group headcount separation should consequently be assessed through replication and complementary measures before drawing population-wide or causal conclusions.

Conclusion: ZACAREP beneficiaries had higher farm revenue, gross margin and net farm income than non-beneficiaries, together with lower incidence, depth and severity of energy-based food insecurity. The pattern generally persisted across the main socioeconomic categories, although sparse subgroups and institutional differences limited interpretation. The findings support integrating farm-economic performance and household food access in programme monitoring. They do not establish that participation caused the observed advantages. Sustained access to productive resources, financial services and markets merits policy attention alongside a stronger counterfactual evaluation of programme outcomes.

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Tables

Table 1 Socioeconomic characteristics of ZACAREP beneficiary and non beneficiary households

Characteristic	ZACAREP (n = 168)	Non-ZACAREP (n = 168)	Test or p-value
Sex			$\chi^2 = 0.52$; p = 0.470
Male	142 (84.52%)	136 (80.95%)	
Female	26 (15.48%)	32 (19.05%)	
Age (years)	44.71 ± 5.81	43.36 ± 9.21	p = 0.109
Household size	6.96 ± 2.49	7.19 ± 2.79	p = 0.422

Characteristic	ZACAREP (n = 168)	Non-ZACAREP (n = 168)	Test or p-value
Years of schooling	6.16 ± 3.81	5.97 ± 3.81	p = 0.647
Farm size (ha)	1.88 ± 0.64	1.92 ± 0.62	p = 0.548
Farming experience (years)	18.49 ± 8.84	21.20 ± 10.45	p = 0.011
Marital status			$\chi^2 = 0.90$; p = 0.639
Single	10 (5.95%)	7 (4.17%)	
Married	150 (89.29%)	155 (92.26%)	
Widowed/divorced	8 (4.76%)	6 (3.57%)	
Educational level			$\chi^2 = 8.60$; p = 0.035
No formal education	55 (32.74%)	81 (48.21%)	
Primary	67 (39.88%)	53 (31.55%)	
Secondary	36 (21.43%)	28 (16.67%)	
Tertiary	10 (5.95%)	6 (3.57%)	
Access to credit			$\chi^2 = 33.67$; p < 0.001
Yes	104 (61.90%)	50 (29.76%)	
No	64 (38.10%)	118 (70.24%)	
Cooperative membership			$\chi^2 = 165.01$; p < 0.001
Yes	112 (66.67%)	0 (0.00%)	
No	56 (33.33%)	168 (100.00%)	

Source: (2025 Data Collection). Values are mean ± standard deviation or frequency (%). χ^2 denotes Pearson chi-square; Yates' correction applies to 2 × 2 comparisons. Group n = 168 each.

Table 2 Farm costs and returns by ZACAREP participation status

Indicator (₦)	Beneficiaries mean ± SD	Non-beneficiaries mean ± SD	Mean difference (95% CI)	Welch t (df)	p-value
Total revenue	300,957.86 ± 27,341.85	220,942.18 ± 23,685.97	80,015.68 (74,525.26 to 85,506.10)	28.67 (327.35)	<0.001
Total variable cost	118,597.82 ± 11,574.18	108,150.10 ± 11,156.09	10,447.72 (8,008.03 to 12,887.41)	8.42 (333.55)	<0.001
Gross margin	182,360.04 ± 30,848.22	112,792.09 ± 26,829.29	69,567.95 (63,362.92 to 75,772.98)	22.06 (327.70)	<0.001
Total fixed cost	19,888.16 ± 2,946.93	17,580.87 ± 3,004.77	2,307.29 (1,668.56 to 2,946.02)	7.11 (333.87)	<0.001
Net farm income	162,471.88 ± 31,231.82	95,211.22 ± 26,886.35	67,260.66 (61,005.87 to 73,515.45)	21.15 (326.77)	<0.001

Source: (2025 Data Collection). Values are mean ± SD in Nigerian naira (₦). Differences are beneficiary minus non-beneficiary; 95% CIs use Welch standard errors and Satterthwaite degrees of freedom computed from the displayed group summaries. Group n = 168 each. SD, standard deviation; CI, confidence interval; df, degrees of freedom.

Table 3 Incidence depth and severity of household food insecurity

Indicator	ZACAREP	Non-ZACAREP
Households	168	168
Food secure	154 (91.67%)	18 (10.71%)
Food insecure	14 (8.33%)	150 (89.29%)
Incidence (P_0)	0.0833	0.8929
Depth (P_1)	0.0072	0.2262
Severity (P_2)	0.0010	0.0790

Source: (2025 Data Collection). Threshold = 2,250 kcal/person/day. P_0, incidence; P_1, depth; P_2, severity. Group n = 168 each.

Table 4 FGT indices by age of household head

B = ZACAREP beneficiaries; NB = non-beneficiaries.

Age of household head	B n	B P_0	B P_1	B P_2	NB n	NB P_0	NB P_1	NB P_2
21–40	23	0.0870	0.0026	0.0001	75	0.9067	0.2322	0.0843
41–60	143	0.0839	0.0080	0.0012	93	0.8817	0.2213	0.0747
>60	2	0.0000	0.0000	0.0000	0	–	–	–

Source: (2025 Data Collection). n is the subgroup denominator. P_0, incidence; P_1, depth; P_2, severity. A dash denotes an undefined index because n = 0. Subgroup indices are descriptive; small categories require caution.

Table 5 FGT indices by marital status

B = ZACAREP beneficiaries; NB = non-beneficiaries.

Marital status	B n	B P_0	B P_1	B P_2	NB n	NB P_0	NB P_1	NB P_2
Single	10	0.1000	0.0048	0.0002	7	1.0000	0.2121	0.0644
Married	150	0.0733	0.0061	0.0007	155	0.8839	0.2258	0.0794
Widowed/divorced	8	0.2500	0.0303	0.0070	6	1.0000	0.2537	0.0851

Source: (2025 Data Collection). n is the subgroup denominator. P_0, incidence; P_1, depth; P_2, severity. A dash denotes an undefined index because n = 0. Subgroup indices are descriptive; small categories require caution.

Table 6 FGT indices by household size

B = ZACAREP beneficiaries; NB = non-beneficiaries.

Household size	B n	B P_0	B P_1	B P_2	NB n	NB P_0	NB P_1	NB P_2
≤5	51	0.0588	0.0037	0.0004	48	0.8542	0.2228	0.0803
6–10	111	0.0991	0.0091	0.0013	111	0.9009	0.2303	0.0810
11–15	6	0.0000	0.0000	0.0000	8	1.0000	0.1843	0.0444
16–20	0	–	–	–	1	1.0000	0.2742	0.0752

Source: (2025 Data Collection). n is the subgroup denominator. P_0, incidence; P_1, depth; P_2, severity. A dash denotes an undefined index because n = 0. Subgroup indices are descriptive; small categories require caution.

Table 7 FGT indices by educational attainment

B = ZACAREP beneficiaries; NB = non-beneficiaries.

Educational attainment	B n	B P_0	B P_1	B P_2	NB n	NB P_0	NB P_1	NB P_2
No formal education	55	0.0727	0.0075	0.0013	81	0.9136	0.2296	0.0781

Educational attainment	B n	B P_0	B P_1	B P_2	NB n	NB P_0	NB P_1	NB P_2
Primary	67	0.0597	0.0070	0.0009	53	0.8679	0.2388	0.0878
Secondary	36	0.0833	0.0051	0.0005	28	0.8571	0.1678	0.0493
Tertiary	10	0.3000	0.0137	0.0017	6	1.0000	0.3412	0.1514

Source: (2025 Data Collection). n is the subgroup denominator. P_0, incidence; P_1, depth; P_2, severity. A dash denotes an undefined index because n = 0. Subgroup indices are descriptive; small categories require caution.

Table 8 FGT indices by access to agricultural credit

B = ZACAREP beneficiaries; NB = non-beneficiaries.

Access to agricultural credit	B n	B P_0	B P_1	B P_2	NB n	NB P_0	NB P_1	NB P_2
Yes	104	0.0673	0.0069	0.0011	50	0.9000	0.2071	0.0674
No	64	0.1094	0.0076	0.0008	118	0.8898	0.2343	0.0839

Source: (2025 Data Collection). n is the subgroup denominator. P_0, incidence; P_1, depth; P_2, severity. A dash denotes an undefined index because n = 0. Subgroup indices are descriptive; small categories require caution.

Table 9 FGT indices by cooperative membership

B = ZACAREP beneficiaries; NB = non-beneficiaries.

Cooperative membership	B n	B P_0	B P_1	B P_2	NB n	NB P_0	NB P_1	NB P_2
Member	112	0.0893	0.0077	0.0012	0	–	–	–
Non-member	56	0.0714	0.0061	0.0006	168	0.8929	0.2262	0.0790

Source: (2025 Data Collection). n is the subgroup denominator. P_0, incidence; P_1, depth; P_2, severity. A dash denotes an undefined index because n = 0. Subgroup indices are descriptive; small categories require caution.