



Donor Financial Inflows and Self-Reliant Farming Among Smallholder Farmers: Evidence from Yambio County, South Sudan

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Abstract

Smallholder farmer groups in Yambio County, South Sudan, financed their operations through donor funding, member contributions and informal savings, in a setting where private-sector credit was only 1.7% of GDP in 2019. Whether donor financial inflows have built lasting self-reliance, or a fragile dependency, remains an open empirical question. This study determined the extent and direction of the effect of donor financial inflows on self-reliant farming, guided by the Sustainable Livelihoods Framework, Collective Action Theory and Dependency Theory. A cross-sectional research design combining quantitative and qualitative approaches was used. 1,405 registered smallholder farmers were the target population. Sample size of 278 included eight extension agents, leader, secretary and accountant of the 30 farmer groups. Simple random sampling was used to choose 180 group members from the farmers, and 170 of them (94.4%) returned valid questionnaires. An analytical sample of 268 respondents was obtained by including all 98 purposively selected key informants. Thematic analysis, multiple linear regression (SPSS version 21), and descriptive statistics were used to analyse the data. Donor cash inflows significantly improved self-reliant farming after controlling for technical support, knowledge transfer, age, education, gender, and marital status ($B = 0.398$, $p < .001$). However, donor-dependent programs were deemed extremely vulnerable to funding withdrawal by 77.6% of respondents. Generalization was limited by the research design and sample size; the conditions under which funding becomes catalytic were not tested statistically. The donors ought to structure funding as catalytic rather than recurrent support in addition to local savings mechanisms, financial literacy training and exit strategies from the outset.

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Introduction

Financial sustainability is widely regarded as the foundation on which any farmer-led organisation builds its capacity to plan, invest and survive beyond the life of a single project. Some farmer groups mobilise their own incomes, while others depend heavily on external donor assistance, and the central challenge for the latter arises precisely at the point when that external source is withdrawn (Ekumah, 2026). Evidence from donor-led agricultural finance initiatives across the developing world shows a



recurring pattern: initial success followed by an inability to sustain services once project funding ends, as seen among Indonesian and Philippine Farmer Field Schools (Mariyono et al., 2021) and numerous donor-established grower associations that survive only as long as church, government, private-sector or NGO funding continues (Ngochemmbo et al., 2025).

South Sudan presents an especially difficult environment for financial self-reliance. Following the 2016 conflict, commercial banks drastically scaled down operations, private-sector credit to GDP stood at just 1.7% in 2019 compared to a Sub-Saharan African average of 50%, and only 8.6% of adults held a financial account (Libert-Amico & Koloffon, 2025). In this context, donor financial inflows, whether as grants, subsidised inputs or credit facilities, fill a critical gap for smallholder farmer groups, yet the same conditions that make external financing necessary also make it precarious: donor withdrawal, currency volatility, and weak local credit infrastructure all threaten the durability of donor-financed gains (Francesconi et al., 2025).

Smallholder farmer organizations in Yambio County rely on a combination of local donations, donor financing, and unofficial savings agreements to support their activities (Francesconi et al., 2025). Whether donor financial inflows have strengthened these groups' underlying capacity for self-reliance, or have instead entrenched a fragile dependency on external support, is the empirical question this study addresses.

Research hypotheses

H_{01} : Donor financial inflows have no significant effect on self-reliant farming among smallholder farmers in Yambio County.

H_{a1} : Donor financial inflows have a significant effect on self-reliant farming among smallholder farmers in Yambio County. The alternative hypothesis is non-directional because donor funding could also reduce self-reliance by entrenching dependency; the sign of the coefficient therefore shows the direction of the effect.

Theoretical framework

Sustainable Livelihoods Framework

The study was based on Chambers and Conway's (1992) Sustainable Livelihoods Framework, which views financial capital as an asset that rural households and groups use in conjunction with human, physical, natural, and social capital to pursue livelihood strategies and outcomes (Kumar et al., 2023; Opiyo et al., 2024). According to this viewpoint, donor financial inflows increase farmers' physical and financial capital, enabling them to invest in basic infrastructure, tools, and seeds, expanding their options for livelihood choices (Opiyo et al., 2024). The framework treats smallholders as active agents who combine assets to pursue their own strategies, not as passive recipients of external resources.

Collective Action Theory

Sustainable livelihoods framework is perfected by Collective Action Theory, first set out by Olson (1965) and revisited by Battaglini and Palfrey (2024), which explains how farmers pool financial contributions, in the form of membership fees, group savings and revolving funds, to provide public goods such as seeds, tools and shared infrastructure, thereby working toward sustainable incomes. Collective action reduces transaction costs by lowering the number of individual contracts and the associated bureaucratic, screening and monitoring costs (de Oliveira et al., 2023), and is most effective where it is farmer-led, bottom-up and built on trust among members with shared goals (Cloete & Veda, 2024; Isgren et al., 2026).

Dependency Theory

A counterargument is provided by Dependency Theory, first proposed by the Latin American structuralist Prebisch (1950) and later developed by Frank (1967). It warns that continuous external



financing without concurrent development of internal revenue streams runs the risk of embedding structural reliance and limiting long-term financial autonomy. When taken as a whole, the three frameworks indicate that donor financial inflows are most likely to result in self-reliance when they strengthen rather than replace farmers' own social and financial capital as well as their group processes for resource mobilization and management.

Empirical literature review

Comparative evidence on donor-farmer financial relationships is mixed. Some arrangements have endured: cocoa farmers organised into primary societies in Ghana received financing from Barclays Bank through a group-lending model in which members were jointly responsible for repayment, though the arrangement left farmer groups in a weak bargaining position relative to the bank (Bernards, 2023; Osei, 2024). Similarly, vanilla farmer associations in Uganda negotiated prices jointly with a private exporter, UVAN Limited, while participation and access to credit remained restricted to farmers deemed "suitable" by the company (Rwabwogo, 2025). By contrast, numerous donor-established grower associations funded by churches, government or NGOs have failed to outlive the funding period that created them (Matsa et al., 2023), a pattern echoed at Mwea, Kenya, where government- and donor-funded millers ceased functioning once funding was withdrawn (Mano et al., 2021).

These cases suggest that farmer groups formed around donor financial inflows risk aid dependency, since withdrawal of that funding threatens their survival and can lower farmers' willingness to invest in their own financial growth (Ekumah, 2026).

Farmer-led financial models present a more encouraging pattern. In Bangladesh, a comparative study of farmer-led extension groups found that combining extension with economic activities, including microcredit, could help externally initiated groups to endure, although microcredit suited women farmers better than men (Islam et al., 2011). In KwaZulu-Natal, South Africa, smallholder farmers facing a lack of formal financial institutions formed informal self-regulatory groups that provided timely access to inputs, irrigation and markets, underscoring the role of strong local institutions in sustaining farmer-led financing where formal credit is scarce (Chiwawa & Naidoo, 2026). Community-based microfinance or savings groups in Ghana, Malawi and Uganda similarly allow members to lend to one another using their own accumulated funds, improving domestic commerce earnings while requiring no continuous donor input (Kantola, 2026).

Financial sustainability literature identifies four pillars relevant to donor-farmer relationships: financial and strategic planning, income diversification, sound administrative and financial procedures, and own-income generation (Siankwilimba et al., 2025). Groups that rely completely on aid to support operations may achieve short-term relief while sacrificing long-term financial planning, whereas groups with no less than 60% of their budget drawn from five or more diverse income sources are markedly less vulnerable to the loss of any single donor (Siankwilimba et al., 2025). In South Sudan specifically, group-lending approaches, particularly Village Savings and Loan Associations that establish self-managed and self-capitalised savings clubs, have proven adaptable to the country's fragile financial environment, since decades of conflict have not diminished people's willingness to form bonds and work together through solidarity groups (Francesconi et al., 2025; Libert-Amico & Koloffon, 2025). A fundamental condition for self-reliance is thus financial independence, defined as the material capacity to act without needing to accept externally imposed conditions that might conflict with a group's own agenda (Francesconi et al., 2025); the higher the proportion of a group's budget drawn from outside funds, the more financial dependency overrides financial independence.



The studies reviewed are largely descriptive or case-based, and none estimates the effect of donor financial inflows on self-reliant farming among smallholder groups in Yambio County while controlling for other donor-aid components. This study addresses that gap.

Conceptual framework

The link between the variables is shown in Figure 1. Donor financial inflows (grants, subsidised inputs and credit facilities) are the independent variable, and self-reliant farming (capacity to mobilise alternative funding, independent financial planning, and saving and managing funds) is the dependent variable. Technical assistance, knowledge transfer, age, education, gender and marital status are control variables. The structure of funding (catalytic or recurrent), local savings and resource mobilisation, and exit arrangements are conditions that shape how the relationship is interpreted; they were examined descriptively and qualitatively, not tested as moderators.

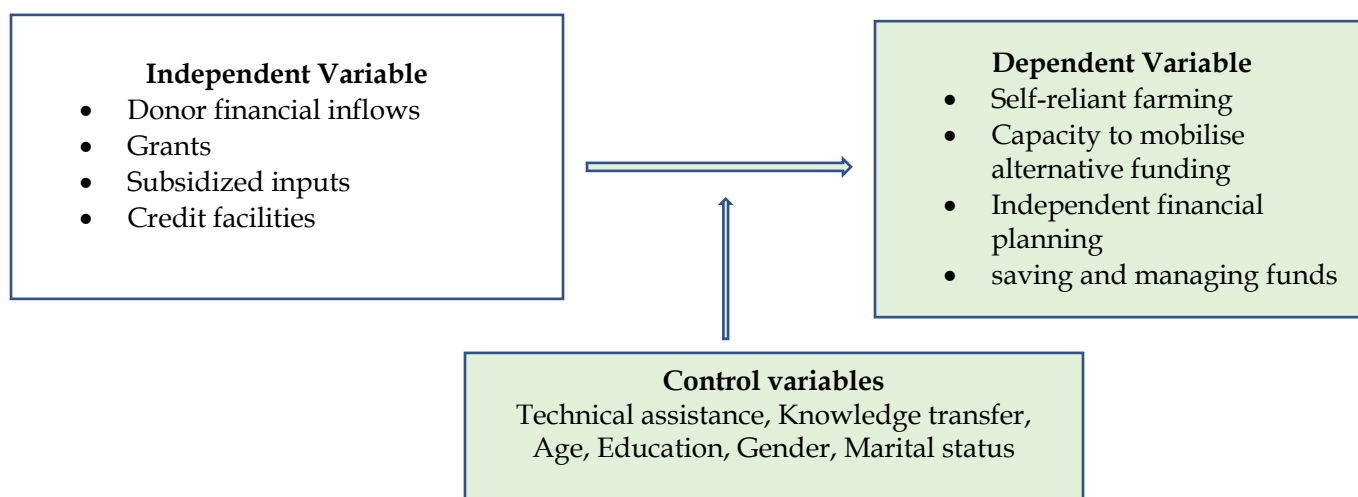


Figure 1: Conceptual framework of the study

Method

Research design

The study adopted a cross-sectional research design combining quantitative and qualitative approaches, allowing the researcher to describe the financial characteristics, behaviours and relationships of the study population as they actually existed.

Target population and sampling

The target population comprised 1,405 registered individual smallholder farmers in Yambio County's eight sub-counties (Francesconi et al., 2025), the eight sub-county agricultural extension officers and the leaders, secretaries and accountants of 30 farmer groups. Table 1 shows how this population translated into the sample.



Table 1: From target population to sample

Category	Target population	Sampling technique	Sample selected	Completed	Response rate (%)
Ordinary group members	1,405	Simple random	180	170	94.4
Extension officers	8	Purposive (all eligible)	8	8	100.0
Group leaders	30	Purposive (all eligible)	30	30	100.0
Group secretaries	30	Purposive (all eligible)	30	30	100.0
Group accountants	30	Purposive (all eligible)	30	30	100.0
Total	—		278	268	96.4

Note. Key informants (n = 98) were not part of the survey sample-size calculation.

For the survey, 180 ordinary group members were drawn from the list of registered farmers by simple random sampling, and 170 returned fully completed questionnaires (94.4%). For a population of 1,405, standard sample-size tables (Krejcie & Morgan, 1970) suggest about 300 respondents at a 95% confidence level and a 5% margin of error; the achieved sample of 170 corresponds to a margin of error of about $\pm 7.1\%$ at the same confidence level, with finite population correction applied. This is acknowledged as a limitation. Key informants were not part of the survey sample-size calculation. Because the key-informant population was small and information-rich, all 98 eligible office holders were purposively included: the 8 extension officers and the leader, secretary and accountant of each of the 30 farmer groups. All of them took part (100%), giving an overall response of 268 out of 278 targeted respondents (96.4%).

Data collection, validity and reliability

The questionnaire's perception items were rated on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Key informants were interviewed using a semi-structured interview guide covering donor capital inflows, budget levels and local resource mobilisation. Content validity was established through expert review using the content validity ratio. Reliability of the Likert-scale items was assessed through internal consistency using Cronbach's (1951) alpha, with $\alpha \geq 0.70$ adopted as the acceptable threshold; the coefficient obtained was $\alpha = 0.80$.

Data analysis

Quantitative data were coded and analysed in SPSS version 21. Descriptive statistics (frequencies, percentages, means and standard deviations) summarised the responses, and multiple linear regression, an inferential technique with one dependent variable (self-reliant farming), was used to test the hypotheses. The model was specified as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \varepsilon$$

where Y is self-reliant farming, X_1 is donor financial inflows, and X_2 to X_7 are technical assistance, knowledge transfer, age, education, gender and marital status, respectively. Hypotheses were tested at the 95% confidence level ($\alpha = 0.05$), with the null hypothesis rejected where $p \leq 0.05$. Qualitative data from the interview guides were transcribed and coded thematically to complement and contextualise the quantitative findings on donor financial inflows.



Results

Response rate

Of the 180 questionnaires administered, 170 were fully completed (94.4%), and all 98 key informants were interviewed (Table 1). The quantitative results below are based on the 170 completed questionnaires, and the qualitative findings on the 98 interviews.

Descriptive findings on donor financial inflows

Most respondents operated with modest annual farming budgets: 67.1% managed budgets between USD 1,000 and 5,000, 22.9% between USD 6,000 and 10,000, 8.2% between USD 11,000 and 15,000, and only 1.8% above USD 16,000. This concentration in the lowest budget bracket reflects persistent capital constraints that limit farmers' capacity to acquire improved inputs, invest in irrigation or mechanisation, and strengthen post-harvest handling.

On perceptions of donor aid and self-reliance, rated on the five-point scale described above, respondents strongly agreed that farmer groups could obtain funding from sources other than donor aid to achieve self-reliance ($M = 4.55$, $SD = 0.917$, 82.4% agreement), and equally strongly agreed that farmers themselves can develop independent financial plans, generate income, save and administer funds effectively ($M = 4.535$, $SD = 0.843$, 76.5% agreement). At the same time, 77.6% of respondents agreed that donor-dependent projects are highly vulnerable to withdrawal of funding or external shocks ($M = 4.065$, $SD = 0.992$), and 65.3% expressed doubt about the consistency and reliability of donor inflows ($M = 2.72$, $SD = 1.445$), the lowest-rated item in the set, below the scale midpoint of 3.0. Respondents also recognised the role of other key actors, including cooperatives, local authorities and development partners, in supporting self-reliant farming ($M = 4.306$, $SD = 0.767$, 67.6% agreement).

Regression and inferential findings

Multiple linear regression analysis confirmed that donor financial inflows exerted a positive and statistically significant effect on self-reliant farming ($B = 0.398$, $SE = 0.086$, $t = 4.63$, $p < .001$, 95% CI [0.23, 0.57], controlling for technical assistance, knowledge transfer, age, education, gender and marital status. Table 2 reports all coefficients.

Table 2: Regression coefficients for self-reliant farming

Predictor	B	SE	t	p	95% CI
Constant	1.221	0.296	4.13	<.001	[0.64, 1.81]
Donor financial inflows	0.398	0.086	4.63	<.001	[0.23, 0.57]
Technical assistance	0.284	0.082	3.46	<.001	[0.12, 0.45]
Transfer of agricultural knowledge	0.359	0.078	4.60	<.001	[0.20, 0.51]
Age	0.067	0.036	1.86	.065	[-0.00, 0.14]
Education level	0.144	0.051	2.82	.005	[0.04, 0.24]
Gender	0.068	0.047	1.45	.150	[-0.02, 0.16]
Marital status	0.119	0.043	2.77	.006	[0.03, 0.20]

Note. Dependent variable: self-reliant farming. B = unstandardised coefficient; 95% CI computed from B and SE (df = 162). N = 170.

This indicates that a one-unit increase in donor financial inflows was associated with a 0.398-unit increase in self-reliant farming, holding other variables constant, implying that financial support meaningfully enhances farmers' access to inputs, credit and investment resources necessary for sustained production.

The overall regression model, incorporating all three donor-aid components together with age, education, gender and marital status, produced a strong fit ($R = 0.788$, $R^2 = 0.621$, adjusted $R^2 = 0.605$, standard error of the estimate = 0.405), meaning that 62.1% of the variation in self-reliant farming was



jointly explained by these predictors. Analysis of variance confirmed the model's overall statistical significance ($F(7, 162) = 37.92, p < .001$), with the regression sum of squares (43.49) substantially exceeding the residual sum of squares (26.54). On this basis, the null hypothesis that donor financial inflows have no significant effect on self-reliant farming among smallholder farmers in Yambio County was rejected in favour of the alternative hypothesis; the positive coefficient shows that the effect was towards higher self-reliance.

Qualitative findings

Interviews with the 98 key informants produced three themes, which Table 3 sets beside the survey evidence that corroborates them.

Table 3: Themes from key-informant interviews and corroborating survey evidence

Theme	Key-informant accounts	Corroborating survey evidence
Irregular and small donor support	A group leader observed that "donor support comes irregularly and in small amounts, so we only plan according to what is available each season."	65.3% doubted the consistency and reliability of donor inflows ($M = 2.72, SD = 1.445$).
Member contributions as the budget base	Most groups budgeted between USD 1,000 and 2,000 annually, sustained largely through member contributions.	67.1% of farmers managed budgets of USD 1,000 to 5,000; 82.4% agreed that groups could obtain funding from sources other than donor aid ($M = 4.55$).
Planning around available funds	Seasonal budgets were set by what was available, not by expected donor funds.	77.6% agreed that donor-dependent projects are highly vulnerable to withdrawal of funding ($M = 4.065$).

Taken together, the accounts show that donor support, though welcome, was too irregular and too small to serve as the foundation of group budgets, which rested mainly on members' own contributions.

Discussion

Interpretation of the findings

The regression findings confirm that donor financial inflows exerted a significant positive effect on self-reliant farming (Table 2). The coefficients of the three donor-aid components were similar ($B = 0.398$ for financial inflows, 0.359 for knowledge transfer and 0.284 for technical assistance) and their confidence intervals overlap, so no ranking among them was claimed. Interpreted through the Sustainable Livelihoods Framework, donor funding strengthens farmers' financial and physical capital, thereby improving their ability to invest in seeds, tools and basic infrastructure (Kumar et al., 2023; Opiyo et al., 2024). From a Collective Action Theory perspective, such inflows can reinforce group cohesion and operational efficiency when managed through structured savings schemes and accountable leadership systems (Battaglini & Palfrey, 2024). From a Dependency Theory perspective, however, sustained external financing without parallel development of internal revenue streams risks embedding structural reliance, thereby constraining sustainable independence. The regression results, therefore, do not merely confirm that aid "works"; the descriptive and qualitative evidence suggests that its impact depends on whether it catalyses or substitutes local capacity formation.

The same findings point to structural vulnerability: where donor resources substitute for, rather than complement, local resource mobilisation, they may weaken endogenous financial practices and reduce incentives for internal capital formation. In Yambio County, where farmer groups traditionally rely on informal savings associations, communal labour arrangements and culturally embedded reciprocity norms, external funding can unintentionally disrupt established collective systems if not aligned with local institutional practices (Ayuya et al., 2024). This is an interpretation: the regression



tested only the direct effect of donor financial inflows, not whether alignment with local institutions conditions that effect.

Comparison with previous studies

Previous studies point in two directions, and the present findings help to reconcile them. Reports that donor-established groups and facilities stopped functioning once funding ended (Mano, 2021; Siankwilimba et al., 2025), and that dependence can lower farmers' willingness to invest in their own financial growth (Ekumah, 2026), support the dependency concern. Conversely, evidence that groups with diversified income sources are less vulnerable to the loss of any single donor (Eliste et al., 2022), and that self-capitalised savings groups are adaptable in fragile settings (Francesconi et al., 2025; Kantola, 2026), supports the view that aid is empowering when it strengthens local financial systems. The positive and significant coefficient is consistent with livelihoods research showing that financial capital widens farmers' strategies (Kumar et al., 2023; Opiyo et al., 2024). It appears to contradict the post-funding collapse reported in Liberia and Kenya, but the difference is largely one of timing: this study measured self-reliance while inflows were still available, whereas those studies examined groups after funding ended.

Rather than opposing positions, these perspectives point to a shared mechanism: aid becomes empowering when it builds organisational systems, financial literacy and collective governance, but becomes constraining when it creates expectations of continued external provision. The finding that 77.6% of respondents recognised the vulnerability of donor-dependent projects, alongside strong endorsement of farmers' own capacity for independent financial planning, suggests that Yambio County's farmers themselves are already alert to this tension.

Conclusion

This study set out to determine the extent and direction of the effect of donor financial inflows on self-reliant farming among smallholder farmers in Yambio County, South Sudan. The matching null hypothesis is rejected since the data shows that donor financial inflows were positively and significantly linked with self-reliant farming ($B = 0.398$, $p < .001$). The descriptive and qualitative data, however, show a dual effect: while donor financial inflows clearly improve farmers' access to inputs, credit, and investment resources, most respondents acknowledged the vulnerability of depending on such inflows due to their irregularity and the susceptibility of donor-dependent projects to funding withdrawal. Donor financial inflows in Yambio County have therefore functioned both as a catalyst for, and a potential source of dependency undermining, long-term financial self-reliance, depending on how they are structured and combined with local resource mobilisation. This restrictive understanding is based on qualitative and descriptive data rather than a statistical test, but it conveys a clear lesson: donor funds only contribute to long-term self-sufficiency when they complement, not replace, farmers' own financial institutions.

The study depicted correlation as opposed to causation. There is need for due diligence for the results to be generalized to other contexts. The perception items rely on self-report. Lastly, the regression only looked at the direct impact of donor cash inputs; the funding structure, local resource mobilization, and exit arrangements analysed qualitatively and descriptively.

Studies in future may consider to: (i) follow groups before and after donor withdrawal in a longitudinal design; (ii) investigate, through interaction terms, whether local savings mechanisms and the structure of funding condition the effect of donor inflows; (iii) explore larger probability samples in other counties of South Sudan; and (iv) conduct an independent examination of grants, credit facilities, and subsidized inputs.



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