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Effects of access to agricultural microcredit on the multidimensional well-being of households in Borgou, Benin

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ABSTRACT

The objective of this research is to evaluate the effect of microcredit on the multidimensional well-being of agricultural households in three municipalities south of Borgou in Benin, based on a sample of 372 producers divided into three socioeconomic groups: (1) young farmers with low integration into microcredit schemes, (2) experienced and well-integrated farmers, and (3) intermediate farmers oriented towards diversification. A quantitative approach was adopted, using analyses of variance (ANOVA) and descriptive statistics under the Stata software to compare indicators of well-being before and after access to credit. The results reveal significant effects of microcredit on several dimensions of well-being. Investment in infrastructure or equipment is significantly higher at the 1% threshold for young farmers (0.94), compared to experienced (0.78) and intermediate (0.83) farmers. The acquisition of new skills is also more pronounced among young people (0.70). In addition, the average number of children enrolled in school increased from 1.39 to 1.58 for Class 1 and from 1.22 to 1.43 for Class 2, reflecting an improvement in educational well-being. Health expenditure, although increasing (up to 34% for Class 2), does not differ significantly between groups (p>0,10). Microcredit promotes productive investment, learning and schooling, thereby strengthening the economic resilience of rural households. It would be advisable to link credit to agricultural training and advisory programmes tailored to the profiles of beneficiaries in order to maximise the impact on welfare.

Key words: Microcredit, Wellness, Health, Investment, Skills, Benin

INTRODUCTION

Microcredit has been a central instrument in poverty reduction policies in developing countries for several decades. It aims to provide low-income households with access to loans (often small amounts) to invest in productive activities and meet urgent expenses, or to improve their living conditions. This leads to several positive effects of the on income, consumption or the company. In this respect, Kipkogei *et al.* (2025) showed that access to microcredit combined with the adoption of agricultural technologies significantly increases the income of maize farmers.

In addition, Karlan *et al.* (2017) analyzed the impact of a program combining credit and health education on health knowledge and behaviors. These complementary interventions can improve some health indicators. Households that use microcredit have better food security than those that do not make formal loans, by taking them from the same basic reference (Berhanu *et al.*, 2021). In addition, Ssengonzi *et al.* (2025) show that social capital and access to microcredit combine to increase the economic well-being of smallholder farmers. However, access to sometimes very expensive credit options can lead to increased financial distress and mental health issues while hindering well-being (Lee, 2019).

One of the shortcomings of existing research is the failure to take into account the pre/post-credit dimension. There is a tendency to simply compare beneficiaries and non-beneficiaries, but few directly examine changes within the same households before and after on various indicators (health, education, infrastructure, skills). Apart from this factor that legitimizes this research, it is necessary to emphasize the heterogeneity of the socioeconomic characteristics of households. The effects of microcredit can vary according to the initial socio-economic level, the size of the household, the type of farm or activity. Economic effects such as income, consumption, and productivity are explored a lot (Djinthe *et al.*, 2024) but those on the strengthening of human capital (health, schooling or the strengthening of human capital) remain less documented, especially in the sub-Saharan context.

The objective of this research is to assess the effect of microcredit on the multidimensional well-being of households through a global approach that integrates the temporal aspects of the effects and takes into account the sociodemographic and economic specificities intrinsic to households. Thus, the net changes are attributable to access to microcredit, beyond cross-sectional comparisons. In addition, disparities in effects and the status of households with regard to microcredit are taken into account. These elements can guide policymakers, microfinance institutions and public policy actors on how to better target or complement microcredit programs in order to optimize benefits for household well-being.

More specifically, it is first of all a question of quantifying the evolution, before and after obtaining microcredit, of health expenditure, schooling of children, investments in domestic infrastructure and acquisition of new skills. Then, to analyze these changes according to class, to show the variations in the effects according to socio-economic profiles and then to make recommendations to improve microfinance policies, highlighting the most effective levers identified.

Theoretical framework

Microcredit is often presented as a tool for poverty alleviation by enabling households excluded from the formal banking system to access financial resources to undertake, invest or cope with economic shocks (Morduch, 1999). According to the theory of social capital (Coleman, 1988), access to credit is not limited to a financial transaction, but is part of a network of social and institutional relations that can strengthen the capacity of households to improve their living conditions. Sen's (2001) theory of capabilities also provides relevant insights. Well-being is not only a function of income, but also of the freedom to access real opportunities, such as education, health or productive investment. Microcredit helps to broaden these "capabilities" by increasing households' margin of choice. Becker (1964) highlights the need for investment in human capital to understand how resources from microcredit can be used for children's schooling, training or skills acquisition, thereby enhancing productivity and intergenerational well-being. This framework was the guiding principle of this research and is schematized by Fig. 1.

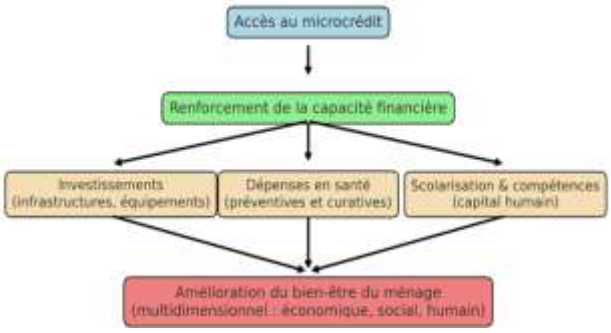

Fig. 1. Framework for analysing the influence of microcredit on multidimensional well-being

In the literature, the effect of microcredit is analysed through a causal chain. Access to microcredit leads to an improvement in investment capacity and better economic resilience, which translates into an improvement in living conditions, measured by:

1. Increased access to health care (Bapolisi Ndjovu and Iragi Ntwali, 2025);
2. Infrastructure and equipment investments (Morduch, 2023);
3. Increased schooling of children and reduction of child labour (Banerjee *et al.*, 2024);
4. Skills development and adoption of new agricultural practices (Al-Shami *et al.*, 2019).

MATERIALS AND METHODS

Study area

The study was conducted among agricultural households benefiting from microcredit in three municipalities (Tchaourou, N'Dali, Parakou) in the south of the Borgou department (Fig. 2). The choice of this population is justified by the fact that agriculture is the main source of income and a privileged vector of economic and social transformation in rural areas (Karlan *et al.*, 2017a).

Sampling

A sample of households was selected using a random sampling method, targeting credit beneficiaries within local organizations. Once the exhaustive list was established, the sample size was determined using the formula of Yamane (1967) as follows:

$$n = \frac{N}{1 + N * e^2}$$

N is the population size of maïze producers, here 1741 from the three municipalities; n is the required sample size; e is the estimated accuracy of the margin of error, here 5%; 1 is a natural integer.

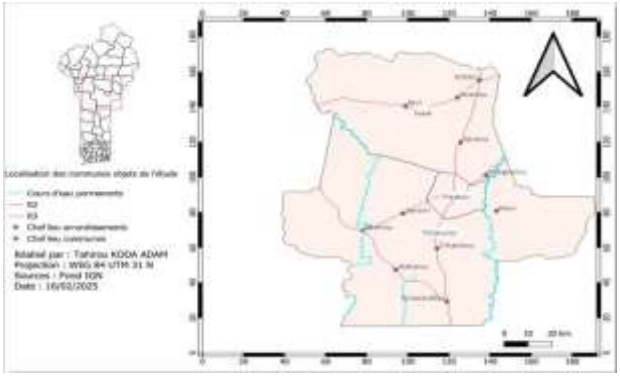

Fig. 2. Study area map

This gives a value of n equal to 325 producers. The sample was slightly oversized to ensure better robustness and take into account the realities of the municipality, especially that of Parakou, because of the presence of decentralized financial systems and active producers' cooperatives. In total, 21.4% of the total population of corn producers instead of 18.7% at the start. The number of producers required for the municipality of N'dali is 132, that of the municipality of Parakou is 95 and finally 145 for Tchaourou as shown in Table 1. This approach ensures a better understanding of the questions and limits non-response biases, which is essential in rural contexts where the level of education may be relatively low (Banerjee *et al.*, 2024).

Data collected

Household well-being was apprehended from a multidimensional perspective, following approaches commonly used in the literature on the impact of microcredit (Al-Shami *et al.*, 2019; Mahmud *et al.*, 2021). The main variables considered include:

Access to health care: A measure of the change in the household's ability to access health services after obtaining credit, as well as a comparison of the average amount of health expenditure before and after.

Infrastructure investment: A binary indicator reflecting investment in productive assets (buildings, storage equipment, etc.) after the campaign.

Table 1. Sample allocation

Municipalities	CVP Maize	Reference population	Proportion (%)	Sampling rate (%)	Sample
N'dali	27	639	36,7	20.7	132
Parakou	17	384	22,0	22.0	95
Tchaourou	23	718	41,2	20.2	145
Total	67	1741	100	21,4	372

Human capital: Change in the number of children in school in the household before and after the loan.

Skills development: Adoption of new production techniques or environmentally friendly agricultural practices.

Analytical methods

The data were processed and analysed using the Stata 17 software. The analysis was based on a combination of descriptive statistics and comparative analyses to assess changes before and after access to microcredit. The indicators were broken down according to the variable Class, which reflects the socio-economic categorization of households.

Mean difference tests (paired t-test) were used to assess changes in health expenditure and schooling. Frequency analyses and graphical representations examined the proportions of households that improved their access to care, invested in infrastructure or acquired new skills. Finally, in order to better understand the heterogeneity of the effects, the results were disaggregated by sociodemographic characteristics and household class. This methodological approach makes it possible to highlight not only the direct impact of microcredit on certain aspects of well-being, but also the way in which these effects vary according to social categories.

RESULTS

Analysis of the averages of health expenditure and the number of children attending school before access to microcredit (Table 2) reveals significant differences at the 2% threshold ($p < 0.05$) between the three classes of producers, confirmed by the analysis of variance tests. These differences reflect initial inequalities in well-being within the population studied. The results show that experienced, well-integrated farmers who are beneficiaries of microcredit (Class 2) have the highest average health expenditure of 75,515 CFA francs (±73,848) before access to credit, compared to young people who are poorly integrated (Class 1) whose average expenditure is 58,406 CFA francs, and intermediate farmers oriented towards diversification (Class 3) whose average expenditure is the lowest (54,309 CFA francs). For school enrolment, the results indicate that young and poorly integrated farmers (Class 1) have a slightly higher average of children in school (1.39 ± 0.91) compared to classes 2 and 3 (1.22 and 1.28 respectively). Although the differences appear to be small, they are statistically significant ($F = 3.20$; $p = 0.01$), reflecting variations in demographic structure and family priorities between groups.

The analysis of the indicators of well-being after access to credit (Table 3) reveals significant differences between the three classes of farmers. The results first show that investment in infrastructure or equipment varies greatly between the groups (p=0.00). Farmers in Class 1 have the highest average (0.94), reflecting a higher propensity to invest after obtaining credit. On the other hand, experienced and well-integrated farmers (Class 2) have the lowest average (0.78), while intermediate farmers oriented towards diversification (Class 3) are at an intermediate level (0.83). This trend suggests that young producers are using credit more as a lever to strengthen their productive capacities.

The acquisition of new skills also shows significant differences (p=0.00). Class 1 still stands out with the highest average (0.70), compared to 0.50 for Class 2 and 0.47 for Class 3. This reflects a stronger commitment of young farmers to training and apprenticeships, probably to better value the opportunities offered by microcredit. The differences observed in health expenditure after credit are not statistically significant (p=0.12), although Class 2 has a higher average (103,122.8 CFA francs) compared to Class 1 (76,869.57 CFA francs) and Class 3 (71,233.77 CFA francs). This suggests that the credit did not result in a significant difference in health spending between groups. But compared to the initial situation, expenses have increased.

Table 2. Distribution of indicators according to classes before access to credit

Variable	Class 1	Class 2	Class 3	ANOVA (*p*)
	Mean (Standard deviation)			
Health spending before access credit	58406.21 (36004.02)	75515.79 (73848.17)	54309.09 (45480.51)	4.22 (0.01)
Number of children enrolled school before access credit	1.39 (0.91)	1.22 (1.14)	1.28 (1.07)	3.20 (0.01)

Table 3. Distribution of indicators by class after access to credit

Variable	Class 1	Class 2	Class 3	ANOVA (*p*)
	Mean (Standard deviation)			
Investment in infrastructure or equipment	0.94 (0.23)	0.78 (0.41)	0.83 (0.37)	9.39 (0.00)
Acquisition of new skills	0.70 (0.45)	0.50 (0.50)	0.47 (0.50)	18.59 (0.00)
Health spending after access credit	76869.57 (56232.08)	103122.8 (113982.7)	71233.77 (69116.39)	1.19 (0.12)
Number of children enrolled in school after access credit	1.58 (0.99)	1.43 (1.32)	1.41 (1.15)	2.65 (0.02)

The number of children enrolled in post-credit school varied significantly between grades (p=0.02). Young farmers with low integration (Class 1) have the highest average (1.58), ahead of Class 2 (1.43) and Class 3 (1.41). This reflects a slight improvement in the well-being of Class 1 households, which appear to be reallocating part of the income generated by the credit to the schooling of children. Overall, the indicators have increased between the before credit and after credit situations.

DISCUSSION

Investment in infrastructure or equipment

Several experimental and quasi-experimental studies show that access to credit can stimulate productive investment (purchase of tools, equipment, facilities), especially when households had a prior liquidity constraint. Crépon *et al.* (2015) in Morocco show an increase in investment and profits among households most likely to borrow. Other studies find heterogeneous effects according to which credit expansion increases investment for certain groups but does not lead to a "general" transformation for all targets, hence the importance of the heterogeneity observed between classes (Angelucci *et al.*, 2014). Those of Cai *et al.* (2025) recent and synthetic reviews confirm that lending for assets or combining credit and support increases the probability of investing in domestic or health infrastructure. These solutions particularly favour young households or those in the expansion phase. Young producers, if they overcome the liquidity constraint via a loan, have a strong propensity to transform these resources into tangible assets. To reinforce this effect, the literature recommends supporting credit with targeted products (labelled loans, conditions that promote investment) and technical support in order to maximize investment productivity (Crépon *et al.*, 2015).

Acquisition of new skills

The adoption of agricultural technologies or practices is higher when credit is combined with technical extension or training. Makate *et al.* (2019) find that programs that combine micro-credit + learning/training show that training increases the impact of credit on the adoption of practices. Karlan *et al.* (2017b) discuss the importance of the non-financial component in transforming loans into behavioural changes. The broader literature on agricultural innovation shows that young farmers are often more receptive to new techniques if they are given financial resources and technical support simultaneously (Kipkogei *et al.*, 2025b). This finding corroborates the consistent result showing that Class 1 has a high propensity for training. To sustain these achievements, it is advisable to include mandatory or incentive training modules in microcredit products (or to co-finance capacity building and credit). This combination maximizes adoption and productive gains.

Health spending

Access to credit has not led to a systematic and robust difference between classes in health expenditure. Studies evaluating the effect of microcredit on health have found mixed results. Some interventions that have integrated a

health component (health education) have improved knowledge and sometimes behaviour (Karlan *et al.*, 2017b), but the effect on expenditure or objective health indicators often remains weak or heterogeneous. Hamad and Fernald (2015) indicate that the relationship between microcredit and health varies by program design, gender, and context. Large-scale randomised trials (Banerjee *et al.*, 2024) show that access to credit does not systematically guarantee "transformative effects" on all social services; health spending may remain impulsive (reactive to shocks) rather than an indicator of improved prevention. The absence of significant class differences means that the increase in the post-credit health budget is not clearly related to social group. The analysis should be refined and credit should be linked to explicit health interventions (education, health, micro-insurance).

Number of children enrolled in school

The greater increase in enrolment in Class 1 indicates that microcredit has a partial shift towards human capital for these young farmers. They devote part of the resources released to the financing of children's schooling. Several studies show positive effects of microcredit on schooling, but the results are heterogeneous. Some contexts such as productive loans or sustained increases in income encourage sending students to school, while others do not observe a significant effect. You (2014) and Phan (2023) document gains in schooling under certain conditions but recall the importance of mechanisms (income, reduction in child labour) (You and Annim, 2014). The broad syntheses by Banerjee *et al.* (2015) show that the impact of microcredit on education is often moderate at the medium level but can be substantial for subgroups (young households, or those that invest specifically in productive activities). Post-disaster and panel evaluations also show that access to credit can protect children's schooling in times of shock, but this depends on the stability of incomes (Stark *et al.*, 2015). Gains from credit can be reallocated to education, especially among young households that prioritize investment in human capital. To consolidate this effect, the literature recommends promoting financial products with educational incentives (scholarships, staggered school payments) and sustainable income support (You and Annim, 2014).

CONCLUSION

This research analysed the effects of access to microcredit on the well-being of agricultural households according to three distinct socio-economic profiles. The results show that microcredit positively influences several dimensions of well-being, including infrastructure investment, skills acquisition, health spending and children's schooling. Young farmers with low levels of integration (Class 1) are distinguished by a stronger propensity to invest and train, reflecting a desire to improve their productivity. Experienced farmers who are well integrated (Class 2) have higher levels of social spending, a sign of better economic security, while intermediate farmers (Class 3) show a tendency to diversify their sources of income. These results confirm that microcredit contributes to strengthening both the productive and social capital of rural farms, although its effects vary according to the profile of the beneficiaries.

RECOMMENDATION(S)

They suggest the need for microfinance institutions to adopt differentiated approaches, combining financing, technical support and personalized monitoring. Looking ahead, the integration of agricultural training and advisory programs into microcredit schemes could maximize its impact on household well-being and the sustainability of family farms.

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