



# Financing Smallholder Irrigation: An Examination of Not-for-Profit Financing

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High upfront equipment costs and a lack of access to conventional bank loans have created a critical financing gap for Rwandan smallholder farmers. This gap prevents them from acquiring necessary irrigation equipment, leaving them to rely solely on seasonal rainfall to grow their crops. This paper analyzes the three alternative, not-for-profit financing models that have emerged to address this challenge: Savings and Credit Cooperative Organizations; Farming Cooperatives; and informal Rotational Savings and Loan Groups. These models possess inherent limitations, including operational inefficiencies; vulnerability to agricultural income volatility; and the potential exclusion of the most marginalized individuals. However, they offer viable alternatives to conventional financing by grounding solutions in community trust and collective action. Together, these community-based financing mechanisms represent an adaptive and effective financial landscape that provides meaningful contributions to increasing smallholder farmers' access to irrigation where the formal banking sector falls short.

## Introduction

For Rwanda's smallholder farmers, irrigation is a key tool for increasing productivity and building climate resilience. However, high upfront capital costs of irrigation technologies like water pumps and piping are a major obstacle. Government initiatives, such as the Small-Scale Irrigation Technology program, subsidize 50-75% of these costs, but farmers struggle to finance the remainder. Conventional banks often have stringent collateral requirements and inflexible repayment schedules that are misaligned with the

seasonal nature of agricultural income, making formal credit difficult to secure. In response, not-for-profit models have developed to fill this gap by offering smaller loans, alternative collateral forms, and flexible repayment schedules that coincide with agricultural revenue streams. This paper compares these models to understand how they navigate farmers' financial constraints to provide access to irrigation equipment that is often inaccessible through conventional banking methods.

## Not-for-profit Financing Models in Rwanda

Three primary not-for-profit models serve Rwandan smallholder farmers:

### 1. Savings and Credit Cooperative Organizations (SACCOs)

These community-based financial institutions provide credit with more farmer-suitable terms than conventional banks, such as lower interest rates and services tailored to agricultural needs (Nuwagaba, 2012) (Table 1). Research in Rwanda indicates that SACCO membership improves farmers' access to credit, facilitates on-farm investment and leads to higher productivity and income compared to non-members (Berna et al., 2020). However, as outlined in Table 1, their efficacy and long-term viability are often constrained by operational challenges like shortages of skilled personnel, inadequate funding, weak institutional frameworks and bureaucratic inefficiencies (Bwana & Mwakujonga, 2013). These constraints limit their capacity to consistently support members, particularly during periods of high demand like that of irrigation seasons.



## 2. Farming Cooperatives

Cooperatives allow smallholder farmers to finance irrigation equipment through collective ownership, cost-sharing and access to donor funds. This model depends on strong mutual trust, as members trade individual control for collective decision-making (Table 1). For example, the KOHIKA cooperative, in Rwanda's Nyagatare district, used pooled member fees and government subsidies to acquire irrigation equipment that it now rents to members at below-market rates (FAO, 2020). While intermediary organizations like European Cooperative for Rural Development (EUCORD) and One Acre Fund help link some cooperatives to financial institutions, their reach is limited, leaving many farmers without support.

## 3. Rotational Savings and Loan Groups (IKIMINA)

These informal groups, known locally as IKIMINA, are common in rural areas, especially with limited access to formal financial services. They operate through mutual agreement, where members contribute fixed sums of money at regular intervals to a collective fund that is distributed to a single member in rotation. This model is effective at increasing financial participation among marginalized populations, such as women, by providing collateral-free credit (Zambrano et al., 2023). This enables investment in assets (e.g., irrigation equipment) and supports socioeconomic development (Habumuremyi et al., 2019). These features are compared with other models in Table 1.

The inherent limitation of relying on a single informal financing method has led many farmers to adopt diversified financial strategies (Christen & Anderson, 2013). A common approach involves

combining funds from an IKIMINA with resources from a SACCO or a farming cooperative to accelerate the acquisition of equipment. However, this strategy introduces distinct challenges. Navigating the requirements of multiple financial systems can be complex and dividing limited capital across several platforms may dilute the potential impact of any single investment. Despite these complexities, the IKIMINA remains the prevalent financing mechanism due to its high accessibility, its foundation in community and its function as a source of social capital.

## Comparative Analysis of Financing Models

The financing models available to Rwandan smallholder farmers present more than just different loan terms; they represent distinct pathways with trade-offs between individual autonomy, community integration, risk and return. An analysis of the attributes in Table 2 reveals that a farmer's choice is not just about securing capital but about selecting a financial option that aligns with their resources, risk tolerance and social standing.

The primary trade-off lies in the balance between institutional security and financial accessibility. A conventional bank, as a for-profit entity, offers the highest security for funds through formal regulation. However, its strict requirements for collateral and its high-interest, inflexible loan structure create a barrier for most smallholders. As such, the bank externalizes risk onto the farmer and works to overcome this barrier by shifting loan security from tangible assets to social collateral. This is most evident in the IKIMINA model, which operates entirely on mutual trust, offering easy access but the lowest security of funds. SACCOs







and Farming Cooperatives blend formal registration with community accountability, moderating both risk and accessibility.

This spectrum of trust also dictates the level of farmer agency and control. Financing through a bank is a purely transactional relationship that preserves individual ownership and decision-making. In contrast, joining a Farming Cooperative requires a farmer to trade individual control for the benefits of collective action, where the irrigation equipment is owned and managed by the group. Thus, the cooperative model depends on a high degree of mutual trust to function effectively. The outcome is access to equipment and markets that would be unattainable for an individual, but it comes at the cost of personal autonomy. This is a core decision for farmers: whether to retain individual ownership with its higher personal

burden or embrace collective models that socialize both the costs and the benefits.

Finally, the models differ in their role beyond just financing. Conventional banking offers a single service: credit. However, the not-for-profit models are embedded in the community's social and economic ecosystem. Financial training by SACCOs and the market access support offered by Farming Cooperatives (Table 2) demonstrate that their objective is not only loan repayment but the long-term success of the farmer. Their community impact stems from the concept of local development. They build social cohesion and financial literacy in ways that a profit-driven institution cannot. This act reinforces the observed landscape that for smallholder farmers, the most effective financial solutions are often those that are built by and for the community.







**Table 1. Overview of Financing Models for Rwandan Smallholder Farmers**

Financing Model	Description	Benefits	Challenges	Potential Adjustments
<b>Conventional Banking</b>	For-profit financial institutions offering loans	<ul style="list-style-type: none"> <li>• Formal financial services;</li> <li>• Larger loan amounts</li> </ul>	<ul style="list-style-type: none"> <li>• High collateral;</li> <li>• Inflexible terms;</li> <li>• Mismatch in loan size (often too large);</li> <li>• Limited rural access</li> </ul>	<ul style="list-style-type: none"> <li>• Tailored agri-loan products;</li> <li>• Simplified application processes;</li> <li>• Use of alternative credit scoring;</li> <li>• Financial literacy training</li> </ul>
<b>Savings and Credit Cooperative Organizations (SACCOs)</b>	Not-for-profit, community-based, financial institutions offering savings & loans	<ul style="list-style-type: none"> <li>• Lower interest rates;</li> <li>• Customized to needs;</li> <li>• Accessible</li> </ul>	<ul style="list-style-type: none"> <li>• Limited capital;</li> <li>• High default rates;</li> <li>• Operational inefficiencies</li> </ul>	<ul style="list-style-type: none"> <li>• Dedicated savings accounts for assets;</li> <li>• Improved risk management frameworks;</li> <li>• Digital financial services integration;</li> <li>• Financial training for members and staff</li> </ul>
<b>Farming Cooperatives</b>	Not-for-profit, farmer-owned, pooling resources to provide specific services to members	<ul style="list-style-type: none"> <li>• Shared equipment costs;</li> <li>• Enhanced market access;</li> <li>• Collective bargaining power</li> </ul>	<ul style="list-style-type: none"> <li>• Limited individual control;</li> <li>• High trust requirement;</li> <li>• Reliance on intermediaries and donor funding</li> </ul>	<ul style="list-style-type: none"> <li>• Structured schedules for equipment access;</li> <li>• Strategic planning for growth and asset acquisition;</li> <li>• Expanding intermediary support networks</li> </ul>
<b>Rotational Savings and Loan Groups (IKIMINA)</b>	Not-for-profit, community groups, providing financial services using a rotational savings & loan mechanism based on informal agreements	<ul style="list-style-type: none"> <li>• Quick access;</li> <li>• Low or no interest rates;</li> <li>• Promotes regular savings habits</li> </ul>	<ul style="list-style-type: none"> <li>• High trust requirement;</li> <li>• Risk of theft/mismanagement;</li> <li>• Limited scalability;</li> <li>• Potential for internal conflict</li> </ul>	<ul style="list-style-type: none"> <li>• Transparent communication protocols;</li> <li>• Secure storage options (e.g., lockboxes or safes);</li> <li>• Exploring pathways to formalization (group bank accounts)</li> </ul>





**Table 2. Comparison of the discovered financing irrigation models for an individual smallholder farmer in Rwanda**

Key Features	Conventional Banking	Savings and Credit Cooperative Organizations	Farming Cooperatives	Rotational Savings and Loan Groups (IKIMINA)
Equipment Ownership	Individual	Individual	Collective**	Individual
For-profit	✓			
Loan Access	✓	✓	✓ <i>often via intermediary</i>	✓
Collateral Requirement	✓			
Loan Interest Rates*	High	Moderate	Low <i>w/intermediary support</i>	Low / None
Early Withdrawal	✓	✓		
Accessibility		✓	<i>limited to members</i>	✓
Trust Requirement†	Low	Moderate	High	High
Group Decision-Making			✓	✓
Financial Training		✓	✓ <i>often via intermediary</i>	
Security of Funds‡	High	Moderate	Moderate	Low
Community Impact§	Variable	High	High	High
Membership Requirement		✓ <i>open to community</i>	✓ <i>farmers only</i>	✓ <i>close personal contacts/ referrals</i>
Savings Component	✓	✓		✓
Market Access Support		Limited	✓	

\*Loan Interest Rates: **High**: Rates significantly above market average. **Moderate**: Rates near market average. **Low**: Rates considerably below market average.

\*\*Collective Ownership: The cooperative owns the asset and members gain access through rental or shared use agreements, rather than individual ownership.

†Trust Requirement: **High**: Relies heavily on interpersonal trust. **Moderate**: Trust is important but complemented by formal structures. **Low**: Operates primarily on formal agreements.

‡Security of Funds: **High**: Formal, regulated institution with deposit insurance. **Moderate**: Formal or semi-formal registered entity, but may lack insurance. **Low**: Informal structure with no external regulation or protection.

§Community Impact: **High**: Positive impact on financial services and social cohesion. **Variable**: Impact varies depending on implementation.



## Challenges and Limitations of Not-for-profit Financing Models in Rwanda

While not-for-profit financing models provide solutions for smallholder farmers, they possess inherent risks and limitations. The viability of cooperative models, such as SACCOs and IKIMINA, depend on community trust and effective leadership. Specifically, the informal structure of IKIMINA, makes it vulnerable to risks and mismanagement, a weakness reflected in its low security rating in Table 2.

These models are vulnerable to agricultural income volatility. Despite offering flexible repayment terms, external factors like market fluctuations, adverse climate events and crop disease can negatively impact a farmers' ability to repay loans, potentially leading to higher default rates. Their limited financial capacity can also constrain their ability to meet credit demand, especially during peak seasons.

Although these models provide financial access for resource-limited farmers, they may inadvertently marginalize the most vulnerable members of this group. Participation often requires social capital and integration within a cooperative, which can disadvantage individuals who are geographically isolated, new to the community, or lack the necessary social networks. These challenges highlight the complexities of developing financing solutions that can manage risk and ensure stability while promoting access to irrigation for all smallholder farmers.



## Conclusion

An active alternative system of not-for-profit financing has emerged to fill the gap left by conventional banking for Rwanda's smallholder farmers. Informal IKIMINA groups demonstrate the power of social capital and collateral-free credit. Farming cooperatives showcase the benefits of collective action, enhancing market access and bargaining power. Bridging the gap between these models, SACCOs offer more structured community-focused, financial products that contribute directly to higher on-farm investment, productivity and income. Together, these models represent an adaptive financial landscape, suggesting that effective, farmer-centric solutions grounded in community trust can meaningfully contribute to increasing farmers' access to irrigation.





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