Inclusive Financial Ecosystem for Food Systems Transformation

Solution Design Report

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Contents

Acronyms and abbreviations

ADB	Asian Development Bank
ADB Ghana	Agricultural Development Bank Ghana
AEZ	Agro-Ecological Zone
AFLP	Agriculture Financial Literacy Program
AGRA	Alliance for a Green Revolution in Africa
AGRICULTURA	Secretariat of Agriculture and Rural Development (Mexico)
AI	Artificial Intelligence
ALIDE	Asociación Latinoamericana de Instituciones Financieras para el Desarrollo, Latin American Association of Development Financing Institutions
AML	Anti-Money Laundering
APR	Asia-Pacific Region
APRACA	Asia-Pacific Rural and Agricultural Credit Association
ASCEND	Access to Sustainable Credit and Enterprise Development (Philippines)
ASFI	Autoridad de Supervisión del Sistema Financiero, Financial System Supervisory Authority (Bolivia)
AYII	Area Yield Index Insurance
BDP	Banco de Desarollo Productivo, Development Bank for Productivity (Bolivia)
BIRD	Bankers Institute of Rural Development (India)
BNDES	Banco Nacional de Desenvolvimento Econômico e Social, National Bank for Economic and Social Development (Brazil)
BNF	Banco Nacional de Fomento, National Development Bank (Ecuador)
BSP	Bangko Sentral ng Pilipinas, Central Bank of the Philippines
CAF	Corporación Andina de Fomento, Development Bank of Latin America and the Caribbean
CAPEX	Capital Expenditure
CAR	Capital Adequacy Ratio
CGIAR	Consultative Group on International Agricultural Research
CIAT	International Center for Tropical Agriculture
CRF	Covariant Risk Fund
DINAR	Dirección Nacional de Registros Públicos, National Authority of Public Registries (Ecuador)
EIB	European Investment Bank
ESG	Environmental, Social, Governance
EU	European Union
EVFTA	Eu-Vietnam Free Trade Agreement
FAG	Fondo Agropecuario de Garantías, Agricultural Fund of Guarantees (Colombia)
FAO	Food and Agriculture Organization

FEFA	Fideicomiso Especial de Financiamiento Agropecuario, Special Agricultural Financing Trust (Mexico)
FEGA	Fideicomiso de Garantía y Fomento, Trust for Guarantee and Development (Mexico)
FI	Financial Institution
FIGI	Financial Inclusion Global Initiative
FINAGRO	Fondo para el Financiamiento del Sector Agropecuario, Fund for the Financing of the Agricultural Sector (Colombia)
FIRA	Fideicomisos Instituidos en Relación con la Agricultura, Trust Funds for Agriculture (Mexico)
FMO	Financieringsmaatschappij voor Maatschappelijk Ondernemen, Entrepreneurial Development Bank (the Netherlands)
IDB	Inter-American Development Bank
IFAD	International Fund for Agricultural Development
IFC	International Finance Corporation
IFE	Inclusive Financial Ecosystem
IFE-FST	Inclusive Financial Ecosystem for Food Systems Transformation
IFI	Intermediary Financial Institution
IT	Information Technology
KCC	Kisan Credit Card (India)
KYC	Know Your Customer
LAC	Latin America and the Caribbean
LBCDF	Land Bank Countryside Development Foundation
LBP	Land Bank of the Philippines
LIMS	Land Information Management System
LURC	Land User Rights Certificate
MAG	Ministerio de Agricultura, Ministry of Agriculture (Ecuador)
MDB	Multilateral Development Bank
MFI	Microfinance Institution
MIGA	Multilateral Investment Guarantee Agency
MXN	Mexican Peso
NABARD	National Bank for Agriculture and Rural Development (India)
NDB	National Development Bank
NPL	Non-Performing Loan
NSFSI	National Subsistence Farmers Support Initiative (Pakistan)
PACS	Official
PCIC	Philippines Crop Insurance Protection
PKSF	Palli Karma-Sahayak Foundation (Bangladesh)
PO	Producer Organisation

PSM	Prospensity Score Matching
QR	Quick Response (Code)
RCT	Randomised Control Trial
RDD	Regression Discontinuity Design
RP	Rabo Partnerships
RSBSA	Registry System for Basic Sectors in Agriculture
SBP	State Bank of Pakistan
SHCP	Secretaría de Hacienda y Crédito Público, Secretary of Finance and Public Credit (Mexico)
SME	Small Medium Enterprise
SMS	Short Message Service
TA	Technical Assistance
UNDP	United Nations Development Program
US	United States
USD	United States Dollar
VBSP	Vietnam Bank for Social Policies
VCF	Value Chain Finance
VND	Vietnamese Dông

Executive summary

The Inclusive Financial Ecosystem for Food Systems Transformation (IFE-FST) initiative, funded by IFAD and implemented by Rabo Partnerships, seeks to close the persistent financing gap for small-scale farmers in emerging markets. Building on insights from the inception phase, this second report – the solution design report – maps available tools for National Development Banks (NDBs) to support small-scale farmers, and outlines the potential contribution of other ecosystem actors such as commercial banks, Multilateral Development Banks (MDBs), and public institutions.

Small-scale farmers remain constrained by structural barriers. These can be categorised into 1) Social- and institutional hurdles, 2) Infrastructure- and market access imperfections, 3) Environmental- and climate change, and 4) Knowledge- and technology gaps. Altogether, these challenges lead to limited access to finance for farmers.

With their development mandate, NDBs can play a unique role in solving these challenges for small-scale farmers, by allocating capital as well as knowledge to farmers. To determine which solution contributes most effectively to a farmers' challenge at hand, the report suggests a playbook with six steps to move from challenges to solutions. The report elaborates on the steps as presented in the below figure.

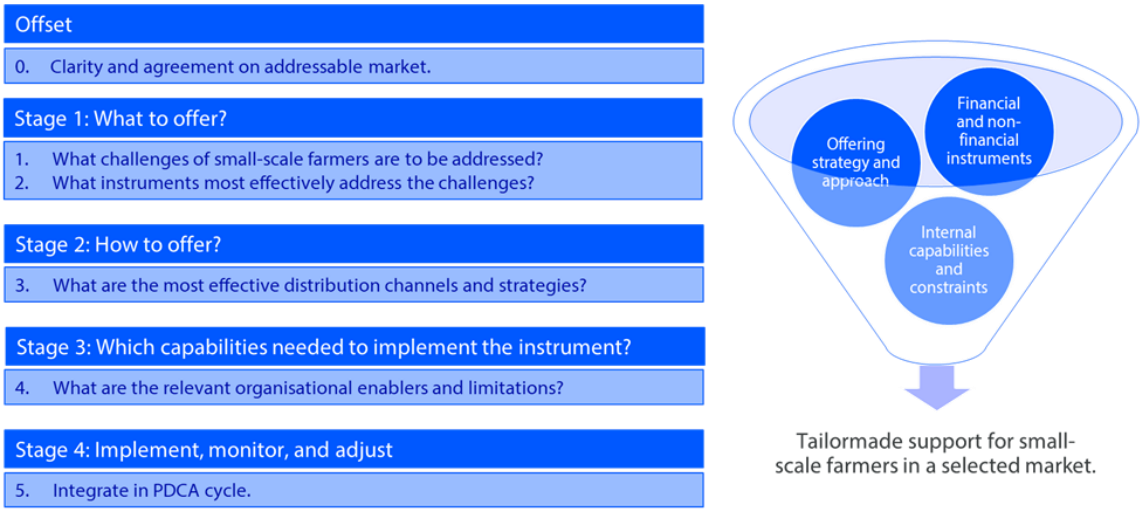


Figure 1: Six steps to move from challenges to solutions. Source: Rabo Partnerships, 2025.

The instruments that can be selected for offering to small-scale farmers are presented in the toolbox, including recommended distribution channels and strategies, as well as organisational enablers such as risk management and funding. The toolbox includes:

1. Financial instruments, including various types of concessional loans, credit guarantees for financial intermediaries, and insurance;
2. Non-financial instruments, including digital financial services and channels, and technical assistance.

To make the playbook and described instruments applicable to the NDBs that are in scope for this program phase, the annex dedicates a chapter to each of the selected countries (Bolivia, Ecuador, Mexico, Pakistan, the Philippines, and Vietnam). Here, key farmer- and organisational challenges are addressed, followed by recommended instruments and implementation strategies.

By equipping NDBs with practical tools and forward-looking strategies, this phase lays the foundation for the execution phase, where selected solutions will be piloted and refined in two selected countries. Ultimately, the initiative aims to catalyse inclusive, resilient, and sustainable food systems by unlocking finance for small-scale farmers.

1 Introduction

IFAD has developed the grant initiative titled "Inclusive Financial Ecosystem for Food Systems Transformation" (IFE-FST) to address a critical challenge in agricultural and rural development: the lack of adequate financing for small-scale farmers in developing regions. Access to finance remains a major barrier for smallholders, who require capital to address current challenges and increase resilience to adverse conditions and climate change. For securing sound future operations it is necessary to enhance productivity as well as quality, leapfrogged through a) the adaptation of sustainable practices, b) closing of knowledge and technology gaps, c) a more effective integration into agricultural value chains, and d) availability of reliable financial and operational data.

National Development Banks (NDBs), with their development-oriented mandates, are uniquely positioned to mobilize resources and engage public and private actors in creating a financial ecosystem that supports small-scale farmers. NDBs operate within a broader Inclusive Financial Ecosystem (IFE), which includes, among others, government bodies, private sector entities, farmer organizations and international organizations like, for example, IFAD, World Bank and Green Climate Fund. These actors contribute to creating an enabling environment for inclusive rural financing through resource and knowledge mobilization, policy alignment, innovation, and risk mitigation.

Rabo Partnerships has been entrusted with the implementation of IFAD's grant. Its primary objective is to enhance the capacity of NDBs to deliver tailored and effective financial services that address the specific needs of small-scale farmers. This will be achieved by systematizing best practices in rural finance, fostering strategic partnerships within the IFE, and piloting innovative and effective financial solutions in selected countries.

The program will be executed over a two-year period and is structured into four sequential phases: 1) Inception phase, 2) Solution design phase, 3) Execution phase, and 4) Dissemination phase.

This report is the second deliverable of the program, following the inception report that included an analysis of nine NDBs across Latin America and the Caribbean (LAC) and Asia Pacific Region (APR). This analysis spans insights on the overall status of agricultural finance in all nine countries, and the current and potential role of NDBs on this aspect. The report analyses strengths and weaknesses of the NDBs' key offerings; describes best practices from around the world; and maps key stakeholders for each NDB. Based on the insights of the inception phase and alignment with IFAD, six countries were selected for the solution design phase. Key factors in the selection process were financial ecosystem readiness, impact potential, institutional engagement, innovation potential, risk and stability, and opportunities for future engagements of IFAD in the country. After a careful selection process, the selected countries for solution design include Bolivia, Ecuador, Mexico, Pakistan, the Philippines, and Vietnam.

The solution design phase aims to develop a toolkit to help NDBs and other IFE actors advance their projects and partnerships, focusing on innovative financial structures. As described in the Grant Design Document, the toolkit aims to offer guidance on developing partnerships, accessing co-financing, and building solutions that combine public and private resources. It is forward-looking, addressing prevailing challenges faced by NDBs when financing small-scale farmers, such as risk mitigation and capital mobilization.

1.1 Methodology

To fulfil the objective of the solution design phase, the project team applied a combination of desk research and on-site country visits.

We (the RP team) organized country visits to all six countries[1] during the solution design phase, where the main part of the visit was spent with NDBs, meeting various departments at their head office, visiting branches if applicable, and interviewing clients and stakeholders. The visits helped to deepen our understanding of the NDBs: their strategies going forward, key challenges at hand, details and conditions of best practices, and local stakeholder dynamics. Additionally, by engaging with key stakeholders such as financial intermediaries, ministries, and farmer organizations in each country, we can ensure that the proposed solutions are practically relevant and feasible.

To complement insights from the country visits, we conducted desk research for a theoretical underpinning of the report. This helped us to leverage on existing knowledge regarding existing best practices of NDBs; impact measurement of financial instruments; and existing partnerships to enhance agricultural finance.

As a result of the above activities, this report starts by listing the challenges of small-scale farmers, or in other words the demand that NDBs should consider when designing their products and services. This is followed by a description of NDBs' roles and tools to support small-scale farmers in solving their challenges. Subsequently, we introduce the methodology that we developed for moving from challenges to solutions: the NDB playbook, including illustrating examples. This is followed by the toolkit, including key products and services NDBs can offer, and under which conditions. In the Annex, a dedicated chapter for each country describes which products and services we deem most relevant to solve the challenges at hand. In these chapters, we also describe local context to consider, including eventual modifications to the general toolkit.

[1] Please note that for Pakistan, the team worked with a local consultant and engaged in the visit remotely, due to security-related travel restrictions.

2 Challenges of small-scale farmers

Before considering solutions that NDBs can provide to smallholder farmers, it is important to first specify the most pertinent challenges small-scale farmers face in their farming business. There are many types of small-scale farmers performing different activities, operating in different markets in a multitude of countries, making it difficult, if not impossible, to come up with a universally applicable farmer profile. Nevertheless, to strengthen NDBs' product propositions, it is critically important to establish a global list of factors that must be assessed when identifying effective – and scalable – solutions for smallholder farmers. Here, five categories of challenging factors have been identified. They apply in a varying extent to all countries and markets and should constitute the incentive and driving force for NDBs to create and choose the appropriate solutions. Each of these factors have in common that they all result in one overarching challenge to smallholder farmers: access to financial services.

2.1 Key challenges for small-scale farmers

2.1.1 Social- and institutional hurdles

A key challenge for farmers in the light of creating access to finance is land tenure insecurity. Unclear or informal land ownership discourages long-term investment and makes traditional finance based on collateral nearly unattainable, with the effect further exacerbated when the ability to vest collateral or its foreclosure is restricted due to legal, institutional or social hurdles. Despite efforts in many countries to regulate land ownership, still many farmers face continuing insecurity.[2]

Small-scale farming is often dominated by female farmers.[3] These may encounter restricted access to land, credit or training. This gender inequality should be considered when designing solutions.

Limited organization among farmers reduces their ability to pool resources, expedite knowledge exchange, improve their bargaining power vis-a-vis suppliers and off-takers, or advocate for policy support. Despite numerous efforts worldwide to create farmer cooperatives, these may not always lead to organizations that are strong enough to represent the needs of farmers.

2.1.2 Infrastructure- and market access imperfections

Many smallholder farmers experience problems in reaching out to markets. Poor transportation networks in rural areas, inadequate roads and logistics limit access to markets and increase post-harvest losses. Additionally, smallholder farmers often lack storage facilities. Without proper storage, crops can deteriorate quickly, especially perishable goods. Furthermore, farmers also often lack proper market information. They may not know current market prices or demand trends, reducing their ability to make informed decisions.[4]

Lastly, smallholder farmers, because of their limited size, mostly have little bargaining power. Farmers typically buy and sell through middlemen, impacting on both input (increased) and output (reduced) prices. Due to farmers' weak positions at the start of the value chain, it is rather challenging to make a business case for them.

[2] Source: ILC, FAO & GLTN, 2021. Land Tenure and Sustainable Agri-Food Systems.

[3] Source: FAO, 2023, The Status of Women in Agrifood Systems.

[4] Source: J-PAL & CEGA, 2024. Increasing small-scale farmers' access to agricultural markets.

2.1.3 Environmental- and climate change

Understanding growing conditions is of significant relevance to farming. Increasingly, these conditions are impacted by weather events and climate change trends: dry edges are expanding in tropical zones, rainfall is reducing in traditional wet areas, drought duration is increasing, excessive rainfall more frequently results in (flash) floodings. Clearly, weather events and climate change are impacting agriculture and farmers need to be increasingly focused on improving farm operation resilience.[5]

To protect yields, soil degradation and poor land management needs to be circumvented. Additionally, limited access to clean water affects productivity, turning water into a critical resource next to a healthy soil. Optimizing soil and water management may lead to additional demand for irrigation, water and crop storage capacity, more climate resilient farm inputs, different crop types, et cetera. Above all, it requires transfer of knowledge on how to optimize farm operations through the application of more sustainable farming practices, likely requiring new and/or different crop selections and farming techniques, and thus equipment.[6]

2.1.4 Knowledge- and technology gaps

Many farmers not only lack adequate buildings, storage capacity and irrigation systems, but also – latest technology – equipment as well as mobile apps for farm management, including those for soil and water management. Additionally, even when they have access to modern technology, they may be wary to adopt farming methods new to them before having seen it successfully being applied elsewhere, or may not know how to apply it effectively. Digital literacy tends to be low among small-scale farmers. Overall, many small-scale farmers have had insufficient agricultural training: the lack of extension services and education hinders adoption of best practices.[7]

2.2 The relevance of access to finance

The hurdles as mentioned in section 2.1 lead to Financial Institutions (FIs) having a limited appetite to finance farming operations and small-scale farmers specifically. This is due to the perceived high risk of agricultural business on the one hand and the relatively high cost of service delivery in rural areas on the other. The perceived high risk stems from limited availability of operational and financial performance information, operating in and reliance on informal markets, high climate risks, low financial literacy, lacking availability of collateral (different from inability to vest and foreclose on collateral), high dependency on and (in absolute and relative terms) high cost of inputs and price as well as yield output volatility. Consequently, formal banking relationships have only been established for the minority of smallholder farmers.

[5] Source: Gates Foundation, 2021. Smallholder farming is a proven path out of poverty, but climate change is changing the rules.

[6] Source: Strandt, 2025. The intersection of climate change adaptation and smallholder farmer food security: a review of strategies and barriers.

[7] Source: Dhillon & Moncur, 2023. Small-scale farming: A review of challenges and potential opportunities offered by technological advancements.

3 NDBs' role in supporting small-scale farmers

Since agriculture is often pivotal for national development, many countries have created NDBs with a public mandate to further develop this sector and to also specifically concentrate on the needs of the myriads of small-scale farmers whose households form the backbone of the rural economy. This is rooted in public policy and national priorities.

Here, it is important to make a clear distinction between commercial farmers, i.e. those farmers that produce to sell, and subsistence farmers, i.e. those farmers that produce to feed themselves. The first category deals with productive farming practices that generate an income stream, which aligns with the business rationale of financing. The second category is often better helped with social support by governments rather than financing from financial institutions. As a stable income generation is often lacking at subsistence farming, providing them with credits can worsen their challenges by adding over-indebtedness to the equation. This distinction between commercial and social activities should be clearly made, especially by NDBs. Where NDBs' support on increasing access to finance by (non-)financial instruments is clearly adding value, social support measures should preferably remain the mandate of governments and/or NGOs. In the remainder of this report we will use the term 'small-scale farmers' as farmers who can grow a marketable surplus, typically on a small piece of land, thereby falling in the category of commercial farmers.

While needing to make financially sound decisions, NDBs are not mainly profit-driven like private sector banks. This allows them to provide patient long-term capital for agricultural projects that do not directly meet the risk-return profile needed for private investments. NDBs also often benefit from a public guarantee and favourable risk rating, which not only underwrites this approach to risk, but also allows them to raise money from capital markets to fund projects and significantly increases the size of their lending portfolios.

As mentioned in the Inception Report, one can distinguish between two operating models for NDBs: first-tier and second-tier. First-tier NDBs can reach out to primary markets, serving both large and small farmers directly. Second-tier NDBs mainly work through other players in the financial sector, leveraging on the networks, distribution and retail capabilities of these institutions. Despite these different operating models both types of NDBs aim for similar objectives. Crucially, all NDBs work in local currency, which eliminates exchange rate risk, helping to bring down the overall risk of projects and make them more viable.

Next to the role of NDBs being a bank, a financial institution providing finance to customers, NDBs transfer knowledge and vision as part of their public mandate. The below visual gives insight into the various roles that NDBs can perform.

Figure 2: Proposed role for NDBs. Source: Rabo Partnerships, 2025.

3.1 Capital allocation and leverage through de-risking

NDBs play a key role in allocating capital to small-scale farmers, through direct or indirect financing and guarantees as well as by catalysing public private partnerships, the latter especially in relation to sustainable agriculture.

Small-scale farmers are supported by NDBs through various financial instruments such as a variety of concessional loans (warehouse receipt financing and group lending, for example) and credit guarantees. These instruments often come with concessional features like low interest rates, grace periods, and flexible repayment terms to make financing more accessible and affordable for small-scale farmers.

First-tier NDBs provide financial instruments directly to retail markets. They serve small-scale farmers, farmer groups, farmer cooperatives and agro-dealers directly as well as their off-takers, small processors, traders or middlemen. They can only do so effectively if they have the key internal capabilities and distribution channels in place. This includes well-managed credit risk processes, insights in client and sector needs, and extensive branch networks, agents or digital networks to contact these retail clients directly. This puts them in a comfortable position of control.

The second-tier NDBs do not have this direct outreach to retail markets, but instead provide their financial services through third parties, intermediary financial institutions (IFIs), mostly local banks or microfinance institutions. This allows them among others to channel credit lines to IFIs, and provide credit guarantees on a portfolio level to local financial institutions, for these entities to bring finance to smallholder farmers. In doing so, the second-tier banks can create significant leverage on their capital. A strong example of leverage was found in Africa. The Alliance for a Green Revolution in Africa (AGRA), although a credit guarantee fund and not an NDB, reported using US$17 million in loan guarantee funds to leverage USD 160 million through four major lending programmes. This included a US$10 million line of credit that the National Microfinance Bank in Tanzania agreed to lend to agro-dealers at an interest rate of 18 per cent, compared with the typical market rate of 46 per cent charged by microfinance institutions in Tanzania.[8] This can only work when the local financial institutions have sufficient liquidity. If not, the second-tier NDBs can provide credit lines to the same effect, although in such cases the leverage on capital will be lower.

NDBs can play an important role in catalysing public-private partnerships (PPPs) for sustainable agriculture, acting as financial architects and strategic conveners to unlock investment, innovation, and impact across the agricultural value chain. NDBs can use blended finance instruments such as concessional loans, guarantees, and equity stakes, to de-risk private sector investments in sustainable agriculture. Private sector participation can thus be encouraged in areas like agroecology and regenerative farming, climate-resilient crops and irrigation systems or organic certification and sustainable supply chains. This is another, more bespoke, option for NDBs to attract additional capital and create leverage. This option is also open for first-tier NDBs.

In addition to financing and guarantees, insurance is a critical risk management tool that NDBs can help make accessible to small-scale farmers. Agricultural insurance products – such as weather-index insurance, crop insurance, and livestock insurance – can protect farmers against climate-related shocks, pest outbreaks, and other unforeseen events that threaten their livelihoods. NDBs can support the development and distribution of these insurance products either directly or through partnerships with insurance providers, leveraging their network and financial infrastructure. By subsidizing premiums or bundling insurance with credit products, NDBs can enhance the resilience of small-scale farmers and reduce the risk exposure of lending institutions, thereby encouraging greater investment in agriculture. Subsidizing premiums can best be done in an indirect way by lowering the risk of farming activities (e.g. by providing subsidized veterinary services for livestock to reduce mortality rates) and subsequently negotiating lower premiums with insurance companies (as an effect of the reduced risk), rather than directly subsidizing part of the insurance

[8] Source: IFAD, 2014. How to do Loan Guarantees.

premium for farmers. In this way, an NDB can contribute to structural and long-term strengthening of the sector, rather than ongoing price support.

3.2 Allocation of knowledge

Since NDBs aim for the development of agriculture in a broader sense, capital allocation is practically always accompanied by some sort of knowledge transfer, or in other words Technical Assistance (TA). Ideally, this TA is offered to (potential) clients and helps to de-risk allocated capital, either directly or indirectly. There are various categories of knowledge transfers which NDBs can either provide themselves or facilitate.

A first category of knowledge transfer when serving smallholder farmers concerns capacity building and training. Agronomic training can be used to share best practices in crop management, soil health, and climate-smart agriculture. Financial literacy can help educate farmers on budgeting, savings, and accessing credit. And business skills can help farmers better understand market dynamics, pricing strategies, and entrepreneurship. This can also apply to strengthening of governance structures of farmer cooperatives/associations.

NDBs can promote technology transfers. For instance, they can promote the use of digital tools, like mobile apps for weather forecasting, pest alerts, and market prices. They can also introduce tools for mechanization, such as affordable and scalable farming equipment, e.g. rice planting machines or irrigation systems. Another form of technology transfer would be the adoption of blockchain technology, supporting systems that improve transparency in value chains and meet global standards, which could be beneficial to smallholder farming as it increases their opportunities to meet export criteria and thereby access markets that pay higher prices for their produce.

NDBs are well positioned to create institutional linkages. Public-private partnerships can not only be created to source additional capital, but also to connect farmers with research institutions, NGOs, and private sector actors, to exchange knowledge. Farmer cooperatives can be encouraged to take collective action for bargaining power and shared resources and extension services to strengthen local agricultural advisory networks.

The insights NDBs have on climate resilience and sustainability allows them to promote agroecology, regenerative farming, and water conservation which may help in increasing farmers' resilience and reducing farmers' challenges on crop insurance, diversification, and climate adaptation strategies.

Finally, NDBs would be perfectly positioned to enhance digital inclusion. They can help in reducing the digital divide by investing in or supporting rural connectivity and digital literacy programs. And they can support digitized value chain finance to improve liquidity and reduce risk. To make their own offering more efficient and scalable to remote areas, NDBs can offer digital financial services to their end beneficiaries.

3.2.1 Organizing and managing sector knowledge

There are many considerations that NDBs should recognize when developing solutions for small-scale farmers. To effectively address the needs of small-scale farmers, each NDB is advised to establish or partner with its own (public) agricultural research and knowledge centre. Such centres can serve as repositories for gathering, sharing, and regularly updating relevant knowledge—both at a macro level, at the level of specific agricultural value chains, different geographic regions and at the level of the smallholder farmers.

Organizing sector knowledge within an NDB is crucial for informed policy making, opportunity identification, risk management, support of strategic objectives, and ultimately, the development of viable propositions. The optimal framework combines structured organization, ease of access and adaptability. Consequently, a centralized knowledge hub is recommended for capturing, maintaining and dissemination of market intelligence. This does not require the NDB to conduct all research internally; collaborative efforts with national bodies such as the Ministry of Agriculture, multilateral institutions, as well as interactions with locally active farmer unions and anchor companies can provide valuable information, knowledge and expertise. To capture and manage the knowledge on agriculture it is advisable to employ agronomists at NDBs. As the adage suggests, while farmers can adapt to banking roles, it is far more challenging for bankers to fully grasp the complexities of farming. Therefore, having professionals with an agricultural background is essential for creating effective and relevant solutions for the agricultural sector.

A thorough understanding of agriculture will be helpful in identifying the markets the NDB wants to operate in and to quantify the "additionality" that they create through their lending and business operations (e.g., providing financial services to firms and individuals for the first time, enabling other financial intermediaries to serve clients, making new deals possible, and encouraging their governments to adopt new policy actions in their market niches).[9] The ability of NDBs to reach customers in sectors that private financial institutions do not serve sufficiently makes them a relevant actor in the global development agenda.

3.2.2 Connecting value chain actors

Rather than viewing farmers in isolation, it is worthwhile for NDBs to consider the entire flow of goods and money – from input suppliers to processors and retailers- and identify opportunities to embed financial services within these relationships. Such a value chain approach leverages the interconnectedness of actors within agricultural value chains to improve access to finance for small-scale farmers.

NDBs can play an important role in enabling value chain finance by identifying and partnering with anchor firms that have strong relationships with other value chain actors, including exporters, retailers, traders, and processors. These firms often have the capacity to offer off-take agreements, provide inputs, or co-invest in infrastructure such as storage or irrigation. By connecting farmers as well as upstream actors to these anchor firms, NDBs have the potential to contribute to stronger, more integrated value chains. A higher efficiency of the value chain should ultimately lead to better prices for farmers and lower consumer prices.

3.3 The importance of sound governance

Sound governance is crucial for NDBs to fulfil their development mandates effectively and sustainably. Excessive political interference can undermine NDBs' operational integrity, distort financial decision-making, and erode trust among stakeholders.

Therefore, clear governance structures at arms' length from the government and Ministries should be established that safeguard a certain level of independence and technocracy. To do so, NDBs should be governed by clear legal mandates that define their roles, responsibilities, and decision-making autonomy. While the NDBs' strategic priorities may change along with political cycles, their mandates should be protected from frequent political changes. Additionally, boards composed of technocrats, sector experts, and representatives from various ministries – rather than political appointees – can help ensure strategic alignment without compromising financial- and operational soundness. A good example in this perspective is FIRA from Mexico. This NDB is organized under supervision from the Central Bank of Mexico, thereby safeguarding more independence from politics and sound banking practices. Moreover, FIRA's Technical Committee that evaluates and approves new instruments/programs consists of representatives from the Central Bank, Ministry of Finance, Ministry of Agriculture, agricultural producer organizations and the banking sector.

Moreover, NDBs should adopt robust internal controls, audit mechanisms, and performance monitoring frameworks. These systems should be designed to detect and prevent politically motivated lending, politically motivated repayment waivers, misallocation of resources, or preferential treatment.

3.4 Conclusions

This chapter aimed to summarize NDBs' role in solving small-scale farmers' challenges, and the available instruments in doing so. The below table provides an overview of the key categories of instruments as described. In the toolkits

[9] Source: World Bank Group, 2017. Survey of National Development Banks.

(chapters 5 and 6), these instruments are described in further detail, including the context of when it should be applied, enablers for success, and the potential role of public- and multilateral parties in enhancing effectiveness.

Instruments	Description
1. Concessional loans	Loans that are extended on terms substantially more generous than market loans.
2. Credit guarantees	Reducing the risk for commercial lenders, encouraging them to extend loans to underserved sectors
3. Insurances	Protecting farmers against risks such as crop failure, extreme weather, or livestock loss.
4. Digital financial services and channels	Leveraging mobile banking, digital wallets, and fintech platforms to increase access to financial services for farmers and rural communities.
5. Technical assistance and capacity building	Strengthening the capacity of farmers, financial institutions, and value chain actors, therewith de-risking capital allocation.

Table 1: Brief summary of available instruments to solve small-scale farmers' challenges. Source: Rabo Partnerships, 2025.

4 Playbook for moving from challenges to solutions

For an NDB to fulfil its development mandate, it is to follow a structured process for setting concrete objectives regarding small-scale farmers in selected target markets. For instance boosting dairy production and farmer income in the southern province by 30% in the next 3 years, or reducing post-harvest losses for rice production by 40% in the next 4 years, addressing these objectives requires formulating solutions comprising the development, coordination and use of effective financial and non-financial instruments as well as KPIs. The playbook as mapped out in this chapter aims to serve as a tool for NDBs when assessing and enhancing their offering, taking the challenges of the end beneficiary as a starting point. The playbook contains 4 stages and 6 essential steps to assure that NDBs' solutions are well aligned to the challenges that are to be addressed.

These 4 stages will be explained in more detail in the next sections and should lead to an outcome of tailormade support for small-scale farmers in a selected market. This market can be either based on an agricultural sector, such as poultry or horticulture, or refer to a certain geographical area, like a province or a district. For each market it is essential to identify the most pressing challenges small-scale farmers encounter and then find a solution that effectively addresses these issues, enabling farmers to thrive.

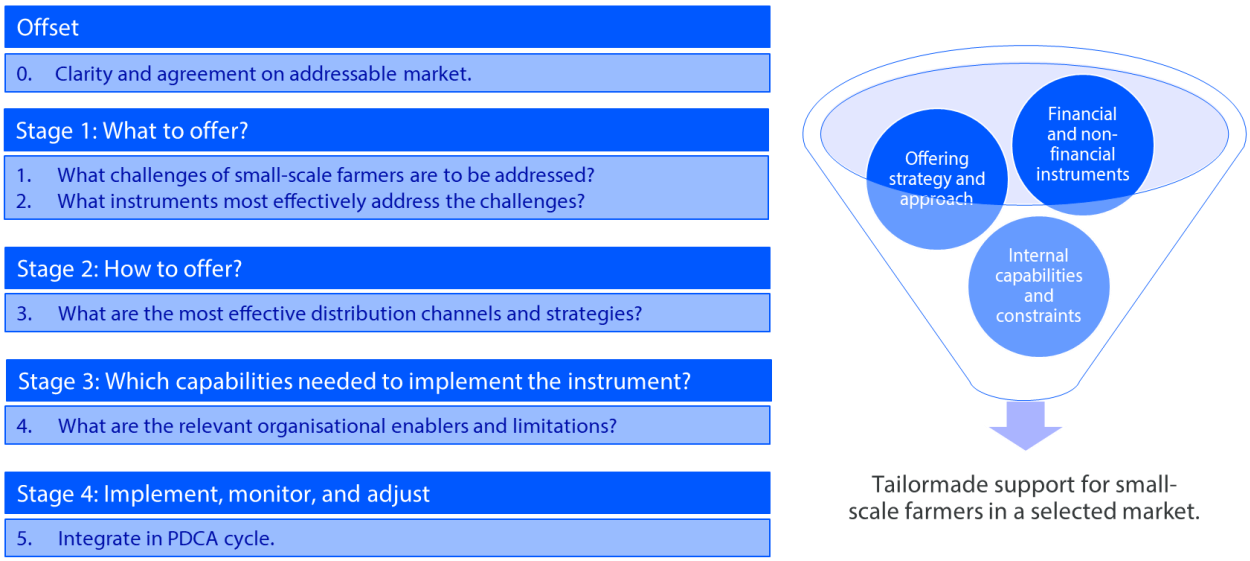


Figure 3: Overview of all stages in the playbook. Source: Rabo Partnerships, 2025.

4.1 Step 1: Which farmer challenges are identified in the market?

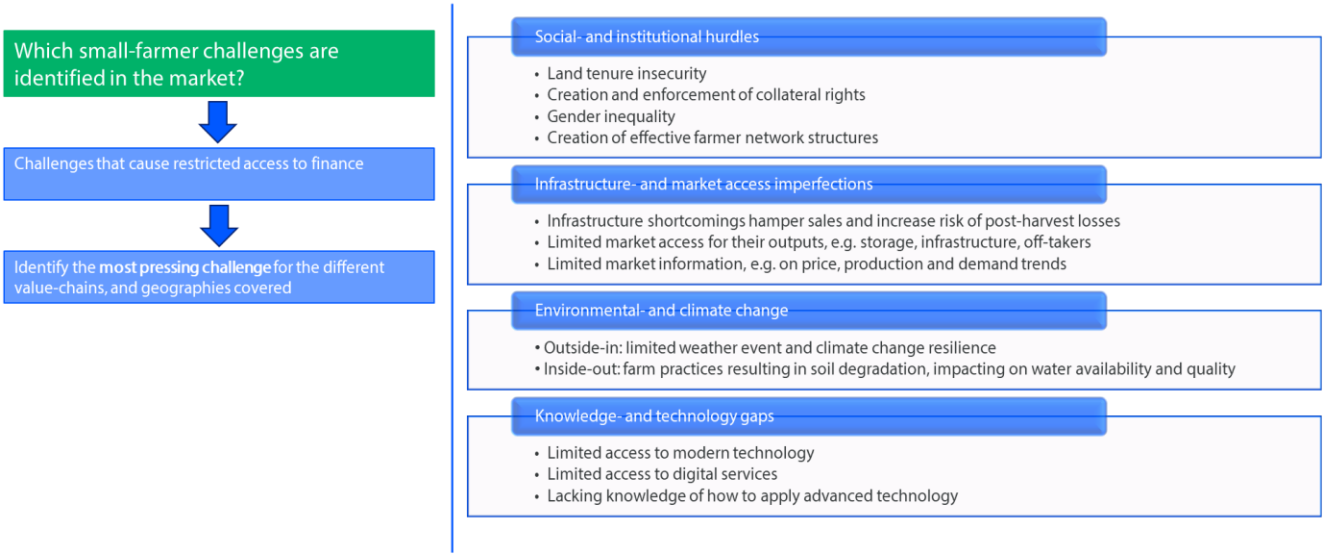


Figure 4: Step 1 of the playbook. Source: Rabo Partnerships, 2025.

4.1.1 Social and institutional hurdles

Typically, social and institutional barriers call for a variety of solutions to establish a more favourable enabling environment for small-scale farmers. An important enabling factor is the legal framework and registration of land titles in a country. This is often part of governmental scope and mandate. Nevertheless, NDBs can apply their influence to lobby and support in the establishment of these national legal frameworks. Another factor is the implementation of wide-spread financial literacy trainings that lay the foundation for formalisation of many financially excluded people, mostly in rural areas. These financial literacy programs can be promoted by NDBs and often implemented and scaled through NGOs that have granular outreach to rural areas.

To overcome the main social-economic hurdles for small-scale farmers (reliance on informal markets, high dependency on middlemen, limited bargaining power, etc.), there is a mix of conventional and digital initiatives found across the world. First, small-scale farmers joining forces through cooperatives or associations has proven a very effective solution to increase their bargaining power and economies of scale. Professionalism of these organizations remains a challenging factor though. In this perspective, NDBs can consider supporting the development of these organizations through non-financial instruments like TA through partners (NGOs, governmental organisations, anchor clients in the value chains, etc.). On the other hand, to increase access to formal markets for small-scale farmers, several (AgTech) initiatives have seen the light over the past years. For example DeHaat, AgroStar (India), Twiga Foods (Kenya), AgroLend (Brazil) and Frubana (Colombia) are interesting examples that shorten the value chains by leaving out middlemen, either focusing on input supplies and/or sales of produce by farmers. Some NDBs have -only recently- started to explore their role in these developments. Sometimes by investing in some of these AgTech initiatives (e.g. ambition of Agribank, Vietnam) or by actively promoting these digital tools and services to small-scale farmers (e.g. FIRA, Mexico).

4.1.2 Infrastructure and market access imperfections

Financial instruments that have been considered by NDBs to tackle infrastructure and market access challenges can be related to development of digital marketplaces for farmers and thereby shortening the value chains by leaving out middlemen, as described in section 2.1.2. Other examples are financial support (de-risking) by NDBs of national infrastructural projects that are focused on agriculture (e.g. irrigation projects, road access to rural areas, warehousing, cold storage, etc.).

Non-financial instruments to contribute to improved market access to farmers focus on improving agricultural practices (to match better quality or certification requirements of markets), improving digital connectivity in rural areas, information about demand trends and prices of certain crops and the facilitation of stronger (formal) linkages in productive value chains between farmers and off-takers/processors.

4.1.3 Environmental- and climate change

NDBs can contribute to mitigating environmental and climate change hurdles for small-scale farmers through a variety of financial and non-financial solutions. Non-financial solutions that focus on deepening and disseminating knowledge about increasing resilience of small-scale farmers against environmental and climate changes. For example, crop suitability plans for different soil types and regions in a country, agroforestry models, regenerative agronomic practices, substitution of synthetic fertilizers by bio-fertilizers and other sustainable agricultural practices. When looking at financial instruments that can be deployed by NDBs, we have encountered climate and/or crop insurance products, guarantee structures, special funds/programs (e.g. Sustenta+ by FIRA, Mexico) to support farmers in their transition towards more sustainable agricultural practices, etc.

4.1.4 Knowledge- and technology gaps

In this context NDBs can play a pivotal role through collecting, validating and distributing relevant know-how to small-scale farmers throughout the country. Digital channels allow NDBs to increase their outreach, provided that digital connectivity in rural areas is sufficiently available. An interesting example stems from FIRA in Mexico, where its regional Technological Development Centres focus on validating innovative and sustainable agricultural practices together with farmers that are open to adopt new practices and test them on their own lands. Their learnings are distributed through videos on social media to other farmers (training of farmers by farmers), which significantly increases the adoption rate of new and improved practices or technologies.

4.2 Step 2: What instruments most effectively address the challenge?

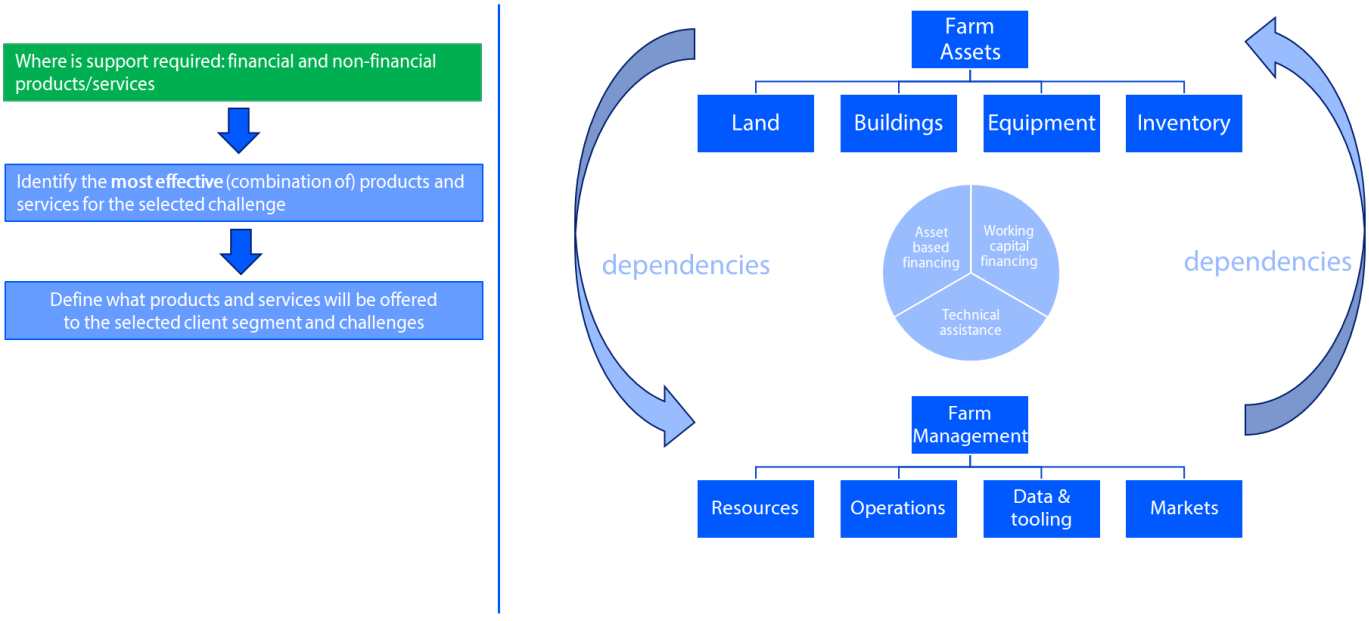


Figure 5: Step 2 of the playbook. Source: Rabo Partnerships, 2025.

Based on the identified challenges, an understanding can be created of what financial and non-financial instruments are best suited to address the issues of small-scale farmers. Financial instruments can mostly be linked to farm assets, such as farmland, real estate, equipment and inventories. Finance and insurance is needed to make this work. Non-financial instruments are primarily linked to farm management, such as the application of new farming methods, enjoying better market access, or obtaining more market power through cooperation with other farmers.

Solutions should be scaled to a level that fits the actual requirements of the farmers and matches the ability of the NDB to offer these solutions themselves or avail these through third parties, depending on cost and available resources. It defines the final product mix.

4.3 Step 3: How to offer the identified solution?

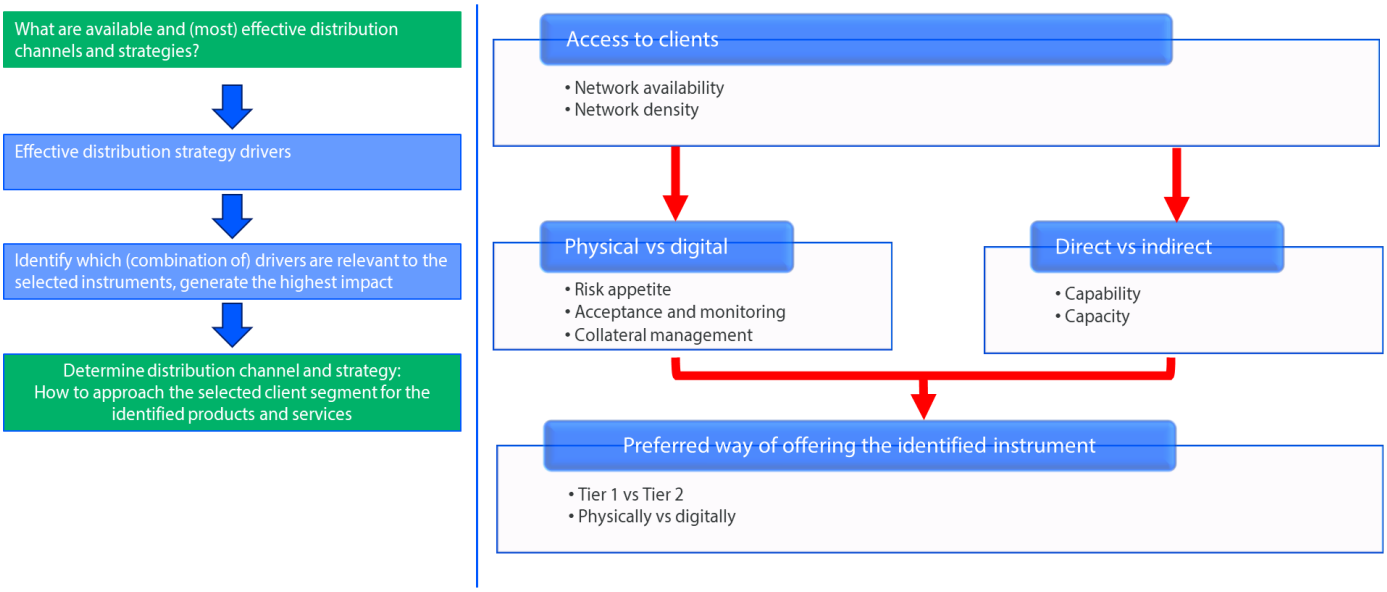


Figure 6: Step 4 of the playbook. Source: Rabo Partnerships, 2025.

Now that the NDB has developed a preferred product mix in stage 1, in stage 2 the question needs to be answered what would be the best way of bringing this to the market. Distribution of products and services in rural areas has its challenges and the outcome will largely depend on local circumstances. For example, Agribank in Vietnam can access large parts of the country, owing to its extensive branch network. And since it's a Tier-1 bank, it can swiftly make a credit product accessible for its clients across multiple regions in Vietnam and many remote regions. However, with limited digitization integrated into rural lending operations, it is unable to build a strong credit profile of its clients through data and hence can only offer limited products for rural regions such as group-based lending. For other higher ticket sizes, it is highly dependent on collateral.

4.4 Step 4: Which capabilities are needed to implement the solution?

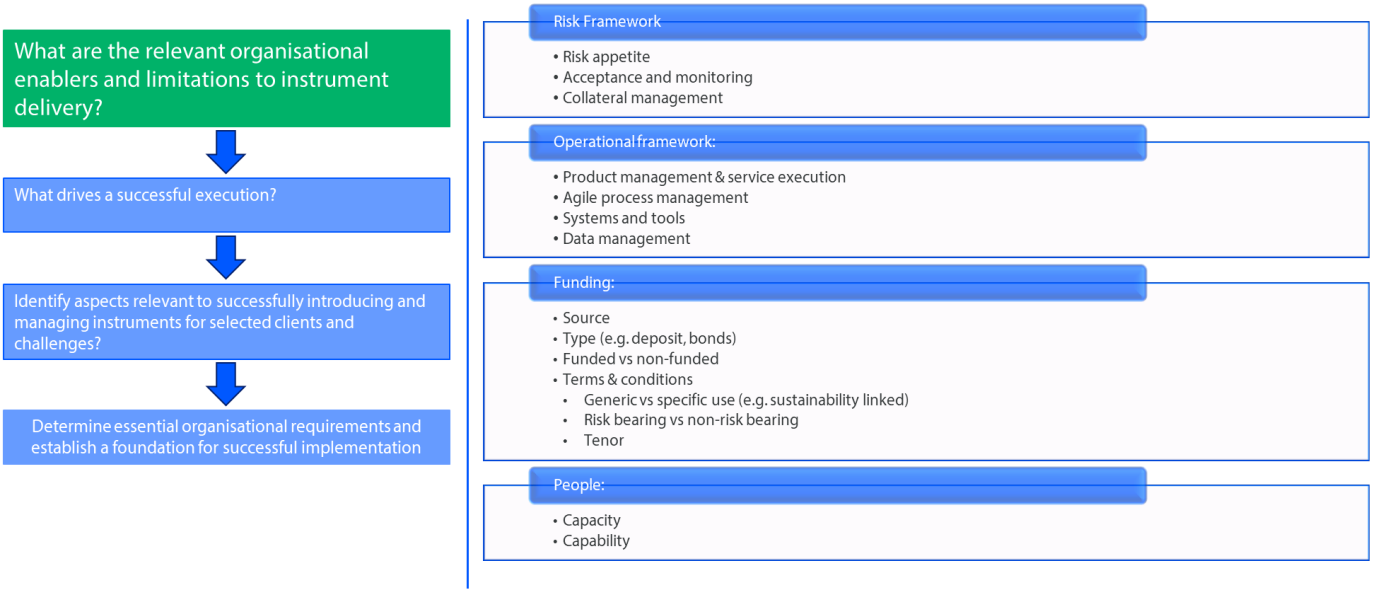


Figure 7: Step 5 of the playbook. Source: Rabo Partnerships, 2025.

When the solution is sorted and a distribution method has been chosen, everything must be set for implementation. The NDB needs to be well geared to put the entire proposition in motion, in terms of risks, operational capacity, funding and human resources. Things can easily get complex, especially when coordinating work with other parties which can range from government institutions to multilateral development banks to microfinance institutions or farmer cooperatives. Careful planning and organisation is key. For example, in Mexico, to finance CAPEX for farmers – where longer-term credit is essential – banks and financial cooperatives institutions turn to FIRA for funding. FIRA can offer such credit to these institutions since it has leveraged long-term capital from domestic and international investors through issuing bonds. It has established a Sustainable Bond Framework to issue green, social, and sustainability bonds through its trust funds (FONDO and FEFA) and the proceeds are earmarked for projects that contribute to climate resilience, financial inclusion, and socio-economic advancement in rural Mexico. Additionally, FIRA also leverages its digital platform to multiply FIRA's TA outreach to more farmers in the country. The application is widely used to identify crop diseases and possible solutions for the diseases.

4.5 Step 5: Implement, monitor, and adjust

Actual implementation takes place in stage 4. It never ends with implementation, as the NDB's intervention deserves a proper follow-up with careful monitoring and adjustment where needed. From a management perspective, these interventions into markets regarding small-scale farmers can be viewed as projects with a pre-set timeframe, which can vary in length to multiple years. After launching a new instrument, the NDB should embed a Plan-Do-Check-Act cycle to ensure continuous improvement. Primarily, it should define clear goals and success metrics aligned with farmer needs and internal capabilities. Then, roll out the instrument in pilot regions, ensuring proper training and data collection. It can use the pilot to regularly monitor performance through field feedback and digital tools, comparing actual outcomes with expectations. And based on insights, further refine product features, partnerships, and outreach strategies. This iterative approach helps the bank adapt quickly, enhance impact, and scale responsibly while staying aligned with national development goals.

4.6 Examples of moving from challenges to solutions

While most NDBs show to have a thorough understanding of their end beneficiaries' challenges, the solutions being offered for a particular challenge are not always solving it in the most optimal way, often because one or more steps of the suggested playbook were not considered. To concretise this, we outline – both effective and ineffective – examples

in this section. Please note that the examples in this section are focused on the overall design (process) of solutions. The next two chapter describe the instruments, including their enabling factors, in more detail.

4.6.1 Concessional loans

BanEcuador's "Crédito 1x30" program aimed to solve economic and social and institutional hurdles for small-scale farmers. The program offered loans of up to 5,000 USD at a 1% annual interest rate with a 30-year repayment term. While the program saw rapid uptake, the repayment discipline was weak. One year after introducing the product, BanEcuador's NPL had soared to 25%, up from 13% in 2019 and far above the 3-4% typical for private banks in Ecuador. This shows a design flaw in the product: the generous terms likely encouraged a perception among end-beneficiaries that repayment was optional. This shows an additional challenge that needed to be solved: knowledge gaps of small-scale farmers, on financial literacy specifically. Financial literacy training accompanying the product could have positively contributed. Additionally, the program raised concerns about financial sustainability. The concessional terms meant the real value of the loans was far below their nominal value, while BanEcuador received no direct government funding to cover this subsidy. This strained the bank's financial health, and showing that step 5 of the playbook (funding specifically) has not been considered carefully in the design.

Moreover, by not including a minimum, but only a maximum amount of USD 5,000, it remains to be seen how many of the targeted farmers can classify as commercial farmers instead of subsistent farmers. As indicated in chapter 3, farmers are often best helped through social support from government or NGOs, whereas commercial farmers generate an income stream that aligns with the business rationale of financing. This separation should always be considered when designing solutions by NDBs, as it might directly (negatively) impact the financial sustainability of these institutions.

4.6.2 Guarantees

An effective example comes from FIRA's (Mexico) guarantee product, that aims to solve the key challenge of the high perceived risk of small-scale farmers by IFIs. The specific financing needs can differ greatly among small-scale farmers throughout the country and across different sectors. That is why FIRA offers twelve different modalities within the same guarantee product. The modalities range from programs for priority segments to rural SMEs and sustainable productive territories. All modalities follow the same principles and process for application and disbursement, but have varying percentages and coverage. Moreover, FIRA has applied a minimum amount to the credit guarantee, to assure that the instrument is geared towards commercial farmers instead of subsistence farmers.

Targeting the same challenge, FINAGRO's (Colombia) guarantee product is structured differently from that of FIRA. One important difference is the fact that the guarantee premium is passed on by the financial intermediary to the farmer by adding the percentage to the overall interest rate. While this makes the product more attractive for financial intermediaries, it is not designed with the challenge of the farmer as the main priority.

Therefore, following the reasoning of our framework, FIRA's guarantee product would be most effective, as it takes the challenges of the farmer as a starting point, and solving farmers' challenges is reflected throughout the design of the product.

4.6.3 Insurance

Agricultural insurance products can provide a buffer to climate shocks for most farmers, especially small-scale farmers who are most vulnerable to climate shocks. However, according to UNDP less than 20% of all farmers globally are insured and for smallholder farmers in low-income countries that percentage drops below 5%. There is much room for improvement here, as less than 10% of NDBs with an agricultural focus include insurance in their portfolios.[10] In the Philippines, agricultural insurance uptake was extremely low; only 4.5% of rice farmers and 0.9% of corn farmers were

[10] Source: UNDP, 2025. How public development banks can use insurance to de-risk agricultural lending.

covered as of 2013. However, through targeted efforts by the Philippine Crop Insurance Corporation (PCIC), coverage increased significantly, reaching between 36% and 45% of all farmers by 2021.[11]

Agricultural index insurance products are innovative examples that can bring down the costs of these insurance products for farmers using data and technology. Pula (Kenya) and MiCRO/SBS Seguros (Colombia) have shown promising examples of embedding index-based insurance product in lending products and/or agricultural inputs for farmers in emerging countries.

Experience from the International Fund for Agricultural Development (IFAD) INSURED program across 13 countries offers another strong example – bundling crop insurance with input subsidies, access to digital banking and farmer training. Over five seasons, the programme reached more than 100,000 farmers – 58 percent of them women or youth – with nearly 90 percent reporting increased resilience.

However, despite some promising examples, agricultural insurance still has very limited uptake among small-scale farmers, largely due to high premiums and lack of financial education among this target group.

4.6.4 Technical assistance

As we argue in chapter 3, allocation of knowledge is ideally organised in such a way that it accompanies capital allocation, making the financial solutions of an NDB more effective and embedding the foreseen improvements among small-scale farmers.

BDP's (Bolivia) climate risk system is partially adding value to their financial services. The system has two key functionalities, being an agroclimatic vulnerability model for internal use, and climate alerts to warn farmers through WhatsApp messages. Farmers indicated that the latter helps them to better plan their farming and harvesting practices, therewith decreasing crop loss and increasing repayment capacity. As such, the climate alerts positively contribute to the performance of BDP's financial solutions. However, the vulnerability probability model could be deployed more effectively. While it provides valuable insights in risk levels of regions and crops, these insights do not influence credit decisions. Even at the highest risk level, indicators from the system have no impact on the credit decision of BDP. The credit will be offered to the client, with additional TA being suggested.

FIRA's Technical Development Centers ("Centros de Desarollo Technologico") recognize farmers' knowledge and technology gaps. As such, they offer farmers agronomic advice, with in-house laboratories to perform soil tests, and demonstration plots to showcase (sustainable) agronomic practices. Here, it is acknowledged that farmers' preferred way of learning is by seeing proof of how new practices can work, rather than hearing about it in a workshop. By offering this advice to clients specifically – and not to non-clients – FIRA offers this TA in a dedicated way to de-risk capital allocation.

Looking at the low financial literacy levels in rural Pakistan, the State Bank of Pakistan launched an Agriculture Finance Literacy Program (AFLP) aimed at integrating 500,000 farmers into the financial ecosystem through workshops and outreach delivered with provincial agriculture and livestock departments.

[11] Source: World Bank Group, 2023. Reforming Agricultural Insurance in the Philippines.

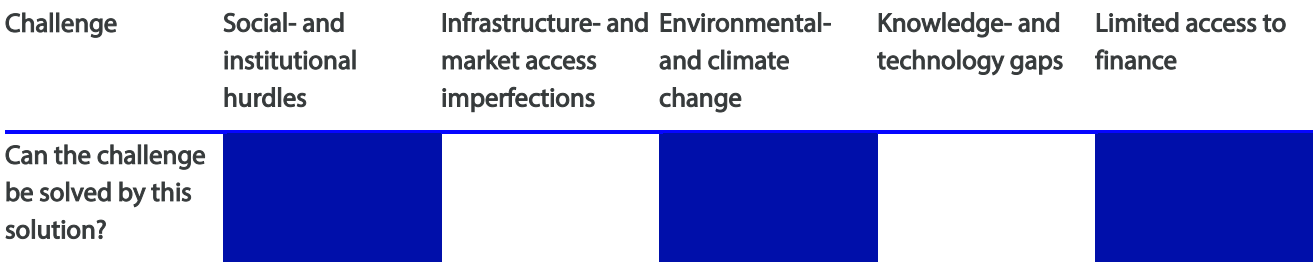
5 Toolkit of financial instruments

Depending on the challenge that the NDBs aims to solve for selected client segments, a palette of solutions is available. As described in chapter 3, the role of NDBs is to allocate capital as well as knowledge, which can be done through the various instruments as described. This chapter further elaborates on the specific way these instruments can be channelled to small-scale farmers. While we do not invent new solutions here, we rather describe how to offer existing products and services in an effective and innovative way, building on lessons learned from countries around the world.

As becomes clear throughout this chapter, a crucial enabler for the solution to be offered is appropriate funding. A relatively new phenomenon for NDBs is to use capital market instruments to raise funding beyond its government budget allocations. Already, NDBs in various countries work together with NGOs, multilateral development banks, multilateral agencies and a variety of donors to set-up impactful development projects aiming at the improvement of access to finance for smallholder farmers. Most of this takes place on a project basis. Through blended finance mechanisms, NDBs can make strategic use of public or philanthropic capital to attract private investment into projects that deliver social, environmental, and economic benefits, especially in emerging markets or underserved sectors.

Innovative is the issuance of impact focused bonds. In this way NDBs can broaden their investor-base and mobilise private funds for agriculture for longer-term, in some markets even up to 15 years. When linked to a specific sector or theme, such as agroforestry or gender, they can attract specific new private sector investors, also from abroad. This is not done in a traditional sense on a project basis, but more on a basis for multi-year programs.

5.1 Concessional loans



5.1.1 Context

NDBs typically offer loans at terms more favourable than those available commercially. They feature lower interest rates, longer repayment periods, or grace periods before repayment begins in their strive to provide additionality. They do this because private sector parties fail to provide suitable finance to small-scale farmers and because they pursue specific developmental objectives. Various types of lending are offered.

5.1.1.1 Seasonal loans

Seasonal loans are a vital financial tool for smallholder farmers, especially in regions where agriculture is the primary livelihood and income is tied to crop cycles. These loans are designed to align with the rhythms of farming, and they come with specific characteristics tailored to the unique needs of smallholder farmers. The following characteristics can be noted:

Timing and disbursement is linked to the agricultural season. At the start of the season farmers need funds for farm inputs and planting. After these significant expenses, revenues will only become available when sales are made after harvesting. So, any financing should be aligned with the crop cycle. Funds are then typically disbursed before the start of the agricultural season to cover input costs. Most seasonal loans have a short-term duration lasting one crop cycle (e.g., 3–12 months), though some may extend slightly depending on the crop.

Although the concept of seasonal loans sounds straightforward, it requires some flexibility and know-how from the lender. After all, seasons largely depend on soil and weather conditions, which on their part become increasingly dependent on climate change. Many microfinance organisations for instance lack the proper agri know-how and flexibility, leading to delayed disbursement or repayment schemes that are not in sync with crop cycles and thus farmer income.

The purpose-specific use of seasonal loans is restricted to input financing, such as for seeds, fertilizers, pesticides, labour, and irrigation or for some specific post-harvest needs, such as for storage or transport if repayment is expected after sale. This purpose-specific use can justify the application of disbursement controls by the lender. So, for instance the NDBs can directly pay the invoice of the seeds supplier when granting the seasonal loan, rather than disbursing cash to the farmer who then intends to pay the seeds supplier. This system is for instance now being applied in Pakistan, where the disbursement of a loan can partially be done in cash and partially by the emission of QR-codes, which can be converted into farm inputs at selected agro-dealers.

The repayment structure of seasonal loans typically is a bullet repayment, often repaid in a lump sum after harvest, when farmers have cashflow available. Terms can be flexible: some lenders offer grace periods or adjust repayment schedules depending on weather or market conditions. To encourage timely loan repayments, the Indian government has introduced a Prompt Repayment Incentive, which offers farmers a 3% interest subvention when loans are repaid on time.

Seasonal loans can also become part of value chain finance, where offtake contracts for farmers can provide comfort to lenders, or where NDBs can provide loans to off-takers for on-lending to small-scale farmers. The largest source of smallholder finance is provided by off-takers sourcing from farmers e.g., traders, processors and input suppliers. This short-term and agriculture-specific finance is typically delivered via advances, input credits, or contract farming. These forms of value chain finance also come with some considerations, like the interest levels applied by value chain partners and the risk of locking in small-scale farmers through these lending practices, which can limit their ability to get the best market price for their produce.

Looking at the risk profile of small-scale farming, lack of collateral and the administrative cost for relatively small loans, the interest rates for seasonal loans could become prohibitively high, at levels that farmers just cannot afford. Therefore, certain concessional terms are often needed for farmers to step in. In some markets, governments prescribe interest rate ceilings or interest rates can be subsidized by the lending institution following policy mandates.

5.1.1.2 Value chain finance

NDBs can enhance small-scale farmers' access to finance through value chain finance (VCF) instruments by leveraging relationships and cash flows within agricultural value chains. By aligning financial products with the production, processing, and marketing stages, NDBs can reduce risks and improve creditworthiness. Key mechanisms include the below.

- Tripartite agreements or anchor-based lending: financing is extended based on contracts with buyers or processors who act as anchors in the value chain, sometimes with closed loops where payment from anchor client to farmers passes through an escrow account, where the bank can deduct interest and principal repayment before disbursing it to farmers.
- Warehouse receipt financing: farmers use stored produce as collateral to access short-term credit. See more elaborate description below.
- Input financing: loans are provided for seeds, fertilizers, and equipment, often facilitated through input providers or cooperatives.
- Risk-sharing instruments: guarantees and insurance schemes mitigate risks for financial institutions and/or anchor clients lending to smallholders in their value chains with some of the instruments mentioned above.

These instruments help integrate farmers into formal agricultural value chains, improve productivity, and foster inclusive rural development.

5.1.1.3 Warehouse receipt finance

A special form of seasonal loans, and a strong example of value chain finance, is warehouse receipt finance. Many farmers are under pressure to sell their produce directly after harvesting because of a lack of storage capacity and a dire need for cash. Since for most farmers harvest similar produce, this often takes place at the same time/season, prices become under pressure as supply of the same produce increases significantly. To avoid a fire-sale and take matters under control, it will be helpful for farmers to store their harvest in a warehouse and use this as collateral for finance until sales can occur when prices go up again. So, warehouse receipt finance is a form of collateral-based lending that enables businesses, especially in agriculture and commodities, to access working capital by using stored goods as security.

When loans are issued against warehouse receipts, which serve as proof that goods are stored in a certified warehouse, there must of course be warehouses and operators available that meet certain quality standards. All goods must be well inspected and validated before entering the warehouse. Therefore, an infrastructure of trusted warehouse operators plays a key role in the loan approval process. Financing is short-term, aligned with the commodity's storage life and market cycles. Since the value of the collateral is subject to market price fluctuations, loan terms or margin calls may be triggered.

Warehouse receipt finance requires a robust legal and regulatory system to enforce claims on the collateral in case of default. This, and the lack of qualified warehouses, has hindered the successful introduction of this type of finance in various markets. Finally, this product requires a bit of scale, for instance on a regional or cooperative level (especially for small-scale farmers), to make things work financially.

5.1.1.4 Group lending

Another special category of seasonal loans are group loans to smallholder farmers. They are a widely used financial mechanism, especially in developing regions, to overcome barriers to credit access. Most group lending schemes apply a collective guarantee model. It means that farmers form groups (often 5–20 members) and jointly guarantee each other's loans. It reduces the need for traditional collateral, which many smallholders lack, and it encourages peer accountability and repayment discipline. To increase social cohesion, group members preferably already have mutual ties, such as membership of a farmers' union.

Group lending is specifically targeted at resource-constrained farmers, considered unbankable by formal institutions due to their low income or lack of assets. It is often perceived as a tool for poverty alleviation and financial inclusion. Group lending is characterised by smaller loan tickets. Loan amounts are typically modest due to perceived risk of default. While this limits investment potential, it also reduces exposure for lenders such as NDBs or microfinance institutions. Group members monitor each other's farming activities and repayment behaviour through social pressure and peer monitoring. Social cohesion and trust within the group are critical for success. Depending on culture and specific circumstances, the inability to repay their loan may lead to farmers experiencing serious social consequences such as out casting. Repayment schedules may align with crop cycles (e.g., post-harvest) and therefore allow for flexible lending terms. Some models deduct loan repayments directly from crop sales via aggregators or processors.

Following the membership of an agricultural association or cooperative, lending can be bundled with integrated support services such as agricultural training, input supply (seeds, fertilizer) and market access. This will help improve productivity and repayment capacity. Sometimes additional risk-sharing mechanisms come into play, for instance when value chain actors (e.g., buyers or input suppliers) partly share the financial risk through a guarantee that they provide. This encourages broader participation and sustainability of the lending system.

Participation tends to be higher among poorer farmers with fewer assets and lower household expenses. Another socioeconomic implication regarding group loans is that they can foster collective action, improve bargaining power, and enhance access to markets and inputs.

5.1.1.5 Investment loans

Investment loans for smallholder farmers differ from seasonal loans in that they are designed to support long-term improvements in agricultural productivity and sustainability. These loans help farmers move beyond subsistence farming and invest in assets that can transform their operations.

The purpose and use of investment loans is the acquisition of assets. Durable goods can be purchased like tractors, irrigation systems, greenhouses, or livestock. Or investments can be made in infrastructure or land such as the build of storage facilities, fencing, acquisition of land or farm buildings. More innovation-driven investments can be made, e.g. precision agriculture tools, solar-powered equipment or mobile-based farm management systems.

The loan duration tends to be medium to long-term. They will typically range from 1 to 7 years, depending on the asset's lifespan and expected return. A structured repayment scheme often includes instalment payments spread over several seasons. The repayment terms are instalment-based: monthly, quarterly, or seasonal payments depending on cash flow of the end-beneficiary. It is not uncommon to incorporate grace periods. A delay before repayment begins, allows time for the investment to generate returns.

Collateral and guarantees are typically asset-backed. The purchased assets may serve as collateral. Alternatively, group guarantees, co-signers, or future income projections may be used when formal collateral is unavailable. Interest rates tend to be lower than for seasonal loans, due to more security and potential for income generation. Rates can be both variable or fixed depending on the lender and economic conditions. Risk management is very much based on business planning and cashflow projections. Farmers may need to submit a basic investment plan or feasibility study. The appraisal of loan applications can therefore be tiresome, lengthy and costly. Eventually, loans may be bundled with insurance on the collateral to protect against loss.

Capacity building will normally be a key issue when providing investment loans to smallholder farmers since the take-up of an investment loan can mean that these farmers are about to outgrow their status to mid-sized farmers. To familiarize them on this journey, training and advisory services, often paired with financial literacy, technical training, or mentorship to ensure successful implementation will come to good use. Lenders may track progress to ensure the investment is yielding the expected benefit with an adequate monitoring and evaluation system in place.

5.1.1.6 Financial lease or hire-purchase schemes

Financial lease can be considered an alternate way to finance asset investments. In many agricultural markets there's a great and growing need to invest in agricultural equipment like two-wheel tractors (power tillers), manual and motorized planter, smart irrigation systems, mini tractors for tilling and hauling, solar-powered cold storage units et cetera. Yet, without a proper track record, full land ownership or collateral, it becomes difficult for farmers to purchase this equipment.

Financial lease, or hire-purchase schemes, may bring a solution to this problem, especially with the involvement of nearby agro-dealers operating in the value chain. NDBs or commercial banks could consider financing solid agro-dealers, taking the equipment into account as collateral. The agro-dealers on their part operate as a lessor of this equipment to smallholder farmers. The farmers would have to make regular payments for using the equipment, sometimes after making a small initial deposit, and would obtain full ownerships of this equipment after a pre-agreed period.

Effectiveness of financial leasing structures is heavily dependent on fiscal regulation in a country. In some countries' fiscal regulation, interest payments for loans are considered tax-deductible, whereas leasing payments are not.

5.1.2 Enabling factors

5.1.2.1 Product characteristics

NDBs can offer loans either directly or indirectly towards their end beneficiary. As mentioned in our inception report, both come with advantages and disadvantages. Direct lending allows NDBs to target the most vulnerable segments that other types of FIs would not target, but comes with high operational costs and risks. Indirect lending allows NDBs to reach a broad and diverse range of end-beneficiaries without high operational costs. At the same time, this requires the onboarding of a wide range of financial intermediaries, varying in terms of size and professionalism, and therewith needed approach. Depending on the type of lending, we suggest the product characteristics as described below.

5.1.2.1.1 Direct lending

If an NDB provides a direct lending product, it provides banking services to end-beneficiaries in the country. We recommend that an NDB should therefore also position itself as such. We cannot make concrete recommendations for

interest rates, as these depend on the market and differ from country to country and can come with certain restrictions. In Ecuador and Bolivia for example, the government has placed maximum interest rate caps for lending to underserved segments such as agriculture and small businesses.

As a general advice, we recommend NDBs to follow general banking principles in their pricing strategy, rather than acting as a non-profit institution. The pricing strategy should be based on risk-based pricing models that differentiate interest rates by borrower segment. Proxy indicators such as repayment history, sector volatility, and size can assess risk- and return levels and suggest appropriate interest rates accordingly.

In their pricing strategy, we encourage NDBs to avoid market distortion. While concessional loans are crucial to enhance financial inclusion for underserved segments, the pricing for larger, less-risky segments should be aligned with market benchmarks. Moreover, it should always be checked whether concessional lending is well matched with the challenges to be solved. Crowding out private lenders should not be a consequence of an NDB's presence.

Additionally, we recommend refraining from extremely low interest rates, such as the 1% rate offered by BanEcuador, or the 0.5% by BDP. In the case of BDP, this has been a loss-making product line because the cost of placing a loan with this interest rate does not even cover the operational costs and inflation. For BanEcuador, this gap (15%) was filled by additional funding from the Ministry of Agriculture, but the product has led to high NPLs as many end beneficiaries perceived it as a grant rather than a loan, therewith decreasing their motivation to repay. Such low interest rates in our opinion do not contribute to financial inclusion on the longer term, as it does not prepare end beneficiaries to develop and become part of the broader financial system. End beneficiaries that were interviewed as part of this phase were not keen to move from their 0.5% or 1% credit product to other products with higher (market based) interest rates, as this would disturb their revenue model.

5.1.2.1.2 Indirect lending

For indirect lending through financial intermediaries, we recommend adopting a flexible pricing approach similar to that of FIRA (Mexico). Rather than imposing a cap on interest rates, FIRA allows financial intermediaries to set rates based on market dynamics and borrower segment characteristics. This market-driven strategy has proven effective: FIRA is widely regarded as a preferred funding source among FIs in Mexico, particularly non-bank financial institutions that lack access to low-cost funding due to their inability to attract savings.

Banks and financial cooperatives, while able to mobilize savings, often do so at shorter tenors than those offered by FIRA. As a result, when financing CAPEX for farmers – where longer-term credit is essential – these institutions turn to FIRA for funding. This approach not only supports financial inclusion but also ensures that pricing reflects actual market conditions, thereby promoting sustainability and reducing the risk of misaligned incentives.

5.1.2.2 Process

During the country visits, we noted that in most countries, commercial banks' credit processes are much faster than those of NDBs. In direct lending to SMEs for example, in Ecuador we noticed a difference of 24-hour approval at commercial banks, and a minimum of 10 business days at BanEcuador. To optimize the process and serve end beneficiaries in an effective manner, we recommend the processes as described below, based on a combination of lessons learned seen in Colombia, Mexico, and Pakistan.

5.1.2.2.1 Direct lending

The below steps show the recommended process for direct lending of NDBs, while considering the capacities of NDBs we visited as part of the program to determine what is realistic and prudent.

1. The clients can find all available credit products, including terms and conditions, online on the NDB's website. Here is also mentioned which required information should be submitted by the client for a credit application.
2. In an application from the NDB, clients can do a pre-screening or eligibility check to self-assess whether they meet basic criteria before submitting full documentation. As a complementary element, a brief onboarding session or digital module is offered on loan management, repayment schedules, and financial literacy.

3. The client has the opportunity to provide required information virtually through a digital application from the NDB. If preferred, another option is to bring the documents to the branch or agency in person. The required documentation includes photos of the clients' activities.
4. The NDB visits the client to verify whether submitted documentation is in line with the reality.
5. A preliminary credit score or risk rating is generated based on the information that is entered into the system by the client.
6. The documentation and preliminary credit recommendation is validated and analysed by the branch staff.
7. Depending on the amount and corresponding decision threshold, the authorized level approves or disapproves the credit.
8. The client is informed through the application and/or SMS about the final decision.
9. If the credit is approved, the client is requested to sign the loan agreement.
10. The loan gets disbursed to the client's account.
11. For large clients, a semi-annual review should be conducted. For micro clients, a random assessment of the portfolio should be carried out. Additionally, a data-driven early warning system flags potential repayment risks, allowing the branch to proactively engage before defaults occur.

5.1.2.2.2 Indirect lending

The below steps show the recommended process for direct lending of NDBs, while considering the capacities of NDBs we visited as part of the program to determine what is realistic and prudent. The process is largely based on best practices of FIRA, combined with insights from BDP and FINAGRO.

1. If a financial intermediary wishes to access resources from the NDB, a legal and financial analysis is conducted by the NDB. Limitations/restrictions for authorization may include:
    a. A limit for NPLs in the portfolio of FIs
    b. A requirement that the intermediary does not have negative cumulative profitability in the last three months, amongst other financial ratios.
    c. Regulations, bylaws, powers of attorney are required.
2. Once the information collection is complete, the legal- and risk departments of the NDB present the applying FI to an internal committee including a recommendation regarding approval.
3. Once approved, a framework agreement is signed, which determines the limit on the resources to be granted to the FI, and the purpose (sector, segments, ticket sizes) for which it should be used.[12]
4. The loan is disbursed all at once to the FI.
5. FIs are given a deadline (depending on the amount and scope) to place the amount coming from the NDB. For on-lending the credit to end- beneficiaries, FIs follow their internal credit process.
6. FIs must submit a portfolio report, including where they are investing, at what interest rate, and the performance of the loans.

5.1.2.3 Distribution channels and -strategies

With indirect lending, the effectiveness of concessional loans depends heavily on the distribution capacity and outreach of intermediaries. NDBs should prioritize partnerships with a diverse range of intermediaries, including commercial banks, financial cooperatives, and non-bank financial institutions. The NDB should ensure broad geographic and demographic coverage throughout the country. The NDB can focus on delivering economies of scale for intermediaries through (agricultural) sector knowledge, taxonomy (e.g.., sustainable finance), climate risk information, money laundering monitoring capabilities, and innovation.

[12] Specific example from BDP: The limit that can be granted is 1x the regulatory capital of the NDB or 2x the regulatory capital of the FI (whichever is less). Of the total amount requested by the FI, the FI must provide 20% of its own contribution.

In direct lending, NDBs should focus on filling the gap by being present in areas where other types of financial institutions are not present. So it is recommended to focus less on (semi-)urban areas, and more on remote rural areas. To decrease the operational pressure, NDBs can work together with agents who interact with clients on the NDBs' behalf. These agents can consist of one-stop-shops, post offices, and input suppliers.

5.1.2.4 Policy and regulation

NDBs must operate within a clearly defined legal mandate that allows them to offer concessional loans. This includes the authority to set below-market interest rates, and the permission to operate as first-tier and/or second-tier lenders.

Looking at interest rates, in some countries governments impose interest rate ceilings for priority sectors such as agriculture. While these can support inclusion, they may also limit financial sustainability if not set realistically or accompanied by subsidies or cost-recovery mechanisms. We suggest that NDBs should advocate for flexible pricing frameworks that allow risk-based pricing and avoid crowding out private lenders.

When NDBs lend through financial intermediaries, regulations must ensure eligibility criteria, clear rules for on-lending terms and target segments, and mechanisms for monitoring and reporting loan replacement and performance.

5.1.3 Potential role for MDBs and public institutions

When it comes to concessional loans, NDBs often face challenges related to capital adequacy, operational capacity, and impact measurement. MDBs and public institutions can support in various ways as listed below.

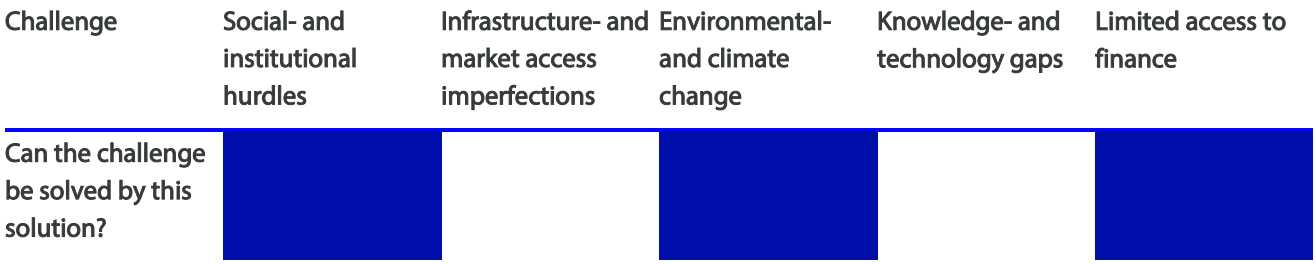
- Concessional funding: provide low-interest or grant-based capital to NDBs, enabling them to offer affordable loans to underserved segments. A concrete example comes from IFAD who provided concessional funding to the Agricultural Development Bank of Ghana (ADB Ghana), under the rural enterprises program. The concessional capital enabled ADB Ghana to offer low-interest loans tailored to agricultural cycles and rural needs.[13]
- Support on building strong value chain financing (VCF) structures can be a very effective way for MDBs (Multilateral Development Banks) to support NDBs. This can be done through financial instruments like concessional funding as part of blended finance structures in the value chain and/or through grants for TA to structure value chain finance solutions and/or build required infrastructure to make VCF effective (e.g. warehouses).
- Technical assistance: support the design and implementation of bundled products that combine loans with agronomic advice and/or digital literacy. For indirect lending, training can be offered that focuses on advisory services to intermediaries regarding agricultural lending and risk assessment.
- Digital infrastructure: help NDBs (and their intermediaries) develop digital loan origination platforms, credit scoring tools, and farmer registries to improve efficiency and outreach. For example, the Inter-American Development Bank (IDB) supported Banco do Nordeste in Brazil in developing a digital loan origination platform and credit scoring tools for rural clients. The digital infrastructure reduced processing time and improved access to finance for small-scale farmers.[14]
- Policy alignment: work with governments to embed concessional loan programs into national agricultural strategies, ensuring long-term support. In Kenya and Rwanda, Climate Policy Initiative and the ClimateShot Investor Coalition worked with governments and NDBs to embed concessional loan programs into national

[13] Source: FERDI, 2025. Mapping financial support from major multilateral development banks to public development banks.

[14] Source: Momentus, IFAD & IDB, 2023. Food Systems Finance for Resilient Futures: An MDB and NDB Collaboration Roadmap.

agricultural strategies, particularly for climate-smart agriculture. This ensured long-term support and policy coherence.[15]

5.2 Credit guarantees for financial intermediaries



5.2.1 Context

Credit guarantees are financial instruments where a third party such as an NDB promises to cover a portion of a loan if the borrower defaults. Credit guarantees are a cornerstone financial instrument for national development banks (NDBs) aiming to unlock access to finance for smallholder farmers. Credit guarantees are only issued by second-tier NDBs to their financial intermediaries. When it comes to first-tier NDBs, these can only be a user of credit guarantees issued by e.g. multilateral development banks.

Credit guarantees reduce the perceived credit risk by assuring lenders that a portion of the loan will be repaid even if the borrower defaults. This risk-sharing mechanism makes financial institutions more willing to lend to farmers they would otherwise reject. Since NDBs typically have limited resources, this is an interesting instrument because by using guarantees, they leverage private sector funds rather than directly lending themselves. This multiplies their impact. One dollar of guarantee can unlock several dollars of commercial lending, and it encourages banks and microfinance institutions to enter agricultural lending markets. Moreover, when financial intermediaries are also charged a cost for the use of the guarantee by the NDB (e.g. a percentage of loan amount guaranteed), a revolving characteristic is added to the instrument. This allows for a structural increase of the funds that underpin the guarantee product which should at least offset the incurred losses, thereby further increasing the leverage for the NDB.

Credit guarantees help overcome structural barriers that exclude smallholders from formal finance. They allow banks to experiment with new borrower segments and they incentivize banks to develop tailored products for agriculture. This may include the promotion of services to women, youth, and marginalized groups. As a result, farmers who were previously invisible to the financial system become active participants in the economy. In short: credit guarantees can catalyse financial inclusion. Various structures of guarantees exist, all solving different types of challenges.

First Loss Guarantees are structures where the guarantor absorbs the initial portion of losses (e.g. first 10–30%) in a loan portfolio. This reduces the lender's risk exposure, making them more willing to lend to riskier segments. They enable loans to smallholders who lack collateral or formal credit history and are often used in blended finance models where donors or development agencies provide the first-loss cushion. Considering the challenges as mentioned in chapter 2, this structure works best to solve economic and financial barriers, as well as social and institutional hurdles for early-stage inclusion.

A Pari Passu Guarantee is where the guarantor shares losses proportionally with the lender (e.g., 50/50). Here, lenders are encouraged to maintain skin in the game while still reducing their exposure. Considering the distinction between commercial and subsistence farmers as mentioned in chapter 2, these structures seem to be more suitable for more

[15] Source: Climate Policy Initiative & ISF Advisors, 2025. Blended Finance for Climate-Smart Agrifood Systems: A playbook for concessional capital providers.

mature agricultural SMEs or farmer cooperatives and are mostly used to scale up lending once lenders are comfortable with the sector.

Risk-Sharing Facilities offer a broader structure where multiple parties (donors, DFIs, banks) share credit risk. They diversify risk and attract commercial capital. And as such they're often used in regional or national agricultural finance programs. Like the other structures, they can include TA to improve farmer productivity and repayment capacity. Looking at the various categories of challenges, risk-sharing facilities are often applied to target environmental and climate challenges, infrastructure and market access, and social and institutional hurdles for systemic change.

Throughout the solution design phase, we have reviewed credit guarantees offered by FIRA, FINAGRO, FMO, SBP, amongst others. In this toolkit, we combine all lessons learned.

5.2.2 Enabling factors

5.2.2.1 Product characteristics

We suggest coverage of guarantees should always be partial, ranging 10%-90% of the loan amount, therewith also granting a sense of ownership to the IFI. A guarantee product should be flexible to cater to different borrower profiles. This can be done by offering various modalities of which the IFI can choose during the application. Modalities can focus on financial inclusion of priority populations; medium-sized agri enterprises; agriculture modernization; sustainable productive territories; large companies with a low probability of default.

To fund guarantees, NDBs typically charge a premium of 1-3% to the IFI, depending on the risk of the borrower. A borrower with a higher risk profile usually results in a higher premium. Keeping the end objective of financial inclusion and serving small-scale farmers in mind, we argue that this premium should not be channelled through to the end beneficiary, but rather paid by the IFI.

NDBs may allocate a portion of their annual profits or reserves to their guarantee fund. An example of this is FINAGRO, who assigns 25% of its annual profits to capitalize its guarantee instrument FAG.

5.2.2.2 Process

We suggest the application process for a credit guarantee to be as follows.

1. Interested IFIs are screened in a selection process by the NDB, which results in a risk profile of the IFI. Minimum requirements for IFI should be made clear upfront.
2. A producer is applying for credit at an intermediary financial institution (IFI).
3. The IFI assesses the client's risk following its own processes, and if needed, requests a guarantee from the NDB. The IFI selects the appropriate guarantee product, based on loan size, borrower profile, and sub-sector.
4. The IFI submits a digital application for the guarantee via an integrated digital platform. Ideally, the application software for the guarantee is integrated with the loan origination system of the IFI.
5. The NDB conducts an assessment on 1) project feasibility, 2) repayment capacity, 3) whether the project is in line with eligibility criteria, internal policies, and ESG regulations.
6. If approved, the NDB issues a guarantee certificate to the IFI, in which the guarantee terms are clearly stated. These include the % coverage, duration, premium.
7. The guarantee is registered in a centralized system accessible to both parties.
8. The IFI disburses the loan to the producer.

For the claiming and disbursement process, we suggest the below process.

1. If the borrower defaults, the IFI has a limited timeframe to request payment from the guarantee fund. This encourages timely action, ensures that the guarantee fund is not exposed to indefinite liabilities, and helps the NDB to manage its risk and cash flow more effectively. For short-term loans, a time window of 120 calendar days is suggested. For long-term loans, we suggest 180 calendar days. If the IFI does not submit the claim within these timeframes, it loses the right to receive the guarantee payment.

2. The amount of the guarantee payable will be the balance of the loan as of the date default is deemed imminent (before maturity), or the balance of the loan as of the maturity date.
3. The guarantee is paid immediately, without any analysis done by the NDB. We have seen that one-day guarantee payment processing builds trust with IFIs, encouraging more IFIs to participate in the guarantee scheme. At the same time, it reduces the administrative burden for the NDB.
4. Once the guarantee has been paid, the IFI is obligated to recover the paid guarantee, as well as to report any late payments to the credit reporting agencies, and, where applicable, the corresponding observation and prevention codes.
5. The NDB can conduct ex-post sample checks on guarantee claims to monitor quality. The frequency of these checks can be determined by the risk profile of the IFI, as determined in the selection process (higher risk, higher frequency of checks).

5.2.2.3 Distribution channels and -strategies

Since second-tier NDBs are dependent on IFIs for their distribution channels, using digital means to interact with IFIs is the most preferred channel. However, low uptake of guarantees by IFIs can be a challenge due to their limited understanding of the options and/or conditions. An example can be taken from FIRA here, who publishes transparent criteria on their website.

Additionally, practice has shown that schemes that only provide guarantees often fail. Strong guarantee products are part of broader packages, where guarantees are coupled with financial literacy training, business planning support, agricultural extension services, and insurance.

5.2.2.4 Policy and regulation

The legal framework of credit guarantees is essential to ensure their enforceability, transparency, and alignment with national financial regulations. Guarantee instruments of both FIRA and FINAGRO were initiated under a dedicated law, which was subsequently amended to provide direction on the end beneficiaries that could be served under the product. For example, FAG was created in 1985, but only in 2000 a new legislation allowed FAG to guarantee agricultural projects, formalising its role in project-based financing.

While the law ensures the overall legality, guarantee agreements are fully formalized through:

- Service contracts between the NDB and financial intermediaries;
- Guarantee certificates specifying coverage, terms, and obligations;
- Credit line contracts if guarantees are linked to NDB funding.

5.2.3 Potential role for MDBs and public institutions

Multilateral institutions can enhance the effectiveness of credit guarantee schemes offered by NDBs. They do so by providing concessional funding to capitalize guarantee funds and offering first-loss coverage to de-risk lending to underserved segments. World Bank Group's guarantee platform, launched in 2024, consolidates guarantee products across the World Bank, IFC, and MIGA into a single system. This platform enables NDBs to access tailored credit guarantees, including partial credit and political risk guarantees.[16]

Additionally, MDBs can support the development of agile processes and digital platforms for guarantee administration and monitoring. While we could not find a specific example of this support towards NDBs, World Bank's AgriFin program

[16] Source: World Bank Group, 2024. World Bank Group Guarantees Platform.

has helped financial institutions automate rural banking operations and integrate credit bureaus, improving the reach and efficiency of guarantee schemes in remote areas.[17]

Next to that, MDBs contribute TA to help NDBs design guarantee products tailored to the needs of small-scale farmers. This includes support for gender-sensitive and climate-resilient financing solutions.

Moreover, the convening power of these MDBs enables NDBs to foster multi-stakeholder partnerships, bringing together NDBs, financial intermediaries, and government agencies to align efforts and scale impact. Other public actors, such as ministries of agriculture and finance can play a complementary role by embedding guarantee schemes into national agricultural strategies, providing regulatory support, and ensuring policy coherence. They can also contribute to data infrastructure, such as farmer registries and credit reporting systems, which are key for risk assessment and impact measurement.

5.3 Insurance

Challenge	Social- and institutional hurdles	Infrastructure- and market access imperfections	Environmental- and climate change	Knowledge- and technology gaps	Limited access to finance
Can the challenge be solved by this solution?		■	■		■

5.3.1 Context

Risk and insurance integration can take place by incorporating weather-indexed insurance. Bundling seasonal loans with crop insurance mitigates climate risks. On the other hand, risk-sharing models such as partnerships with agribusinesses or cooperatives can reduce lender exposure.

As stated in chapter 2, small-scale farmers face a complex web of risk, erratic weather, pests, price volatility and limited access to capital, that undermine their productivity and incomes. Without reliable risk-management tools, many farmers remain excluded from formal finance, trapping them in subsistence cycles. Insurance products, when offered through National Development Banks, can break this cycle by providing a safety net that both protects farmers and makes lending to them more attractive.

NDBs play a vital role in agricultural finance, channelling nearly two-thirds of global agricultural funding and deploying an estimated USD 160 billion into rural economies in 2022. Yet fewer than 20 percent of smallholder farmers benefit from any form of agricultural insurance, and less than 10 percent of these banks currently integrate insurance into their portfolios.[18] By expanding insurance offerings, development banks can shield farmers from climate shocks—droughts, floods or irregular rainfall—and reduce the credit risk associated with lending in volatile environments.

One of the most promising products is weather index insurance, which pays out automatically when a predefined weather index—such as cumulative rainfall or temperature thresholds—is breached.[19] This approach eliminates time-consuming loss assessments, lowers administrative costs and speeds up payouts. For farmers, it means timely

[17] Source: World Bank Group, 2017. Credit Guarantee Schemes for Agricultural Development.

[18] Source: UNDP, 2025. How public development banks can use insurance to de-risk agricultural lending.

[19] Source: GSMA, 2024. De-risking smallholder farmers lending: How weather index insurance can improve access to credit.

compensation after a bad season; for banks, it means a lower probability of loan defaults because insurance proceeds can be channelled directly toward outstanding debts or reinvestment in the next planting cycle.

Beyond weather-based covers, NDBs can offer area-yield and multi-peril crop insurance. Area-yield schemes pool risk across a region: if overall production dips below a trigger, all insured farmers receive a payout, regardless of individual losses. Multi-peril policies combine protection against a range of hazards (e.g. pests, plant disease and extreme weather) into a single premium. Together, these products boost farmers' liquidity when they need it most, allowing them to purchase quality seeds, fertilizers and equipment, thereby enhancing productivity and resilience.

To successfully deploy insurance at scale, banks must align their internal strategies and build capacity. Leadership commitment, staff training in actuarial methods and streamlined claims processes are essential. Bundling insurance with existing credit or input-supply schemes simplifies delivery and improves uptake, while partnerships with private insurers and technology providers can defray costs and foster innovation. Lastly, subsidies or premium support—targeted at the most vulnerable—can kick-start participation until risk pooling mechanisms mature.

By embedding well-designed insurance products into their lending models, national development banks can transform the financing landscape for small-scale farmers. They not only safeguard rural livelihoods against the growing threat of climate change but also cultivate a more creditworthy client base, unlocking greater agricultural investment and fostering sustainable rural development.

5.3.2 Enabling factors

5.3.2.1 Product characteristics

There are many types of insurance available, but in this section, we focus on a) Insurance in combination with preventive measures, and b) Parametric or index insurance.

5.3.2.1.1 Embedded insurance

To safeguard the livelihoods of marginal farmers engaged in animal husbandry, PKSF, in partnership with the Asian Development Bank (ADB), launched a Livestock Insurance Scheme in Bangladesh. This initiative aims to reduce farmers' vulnerability to risks such as disease outbreaks and natural disasters, which often lead to significant financial losses.

Initially piloted in 2010, the scheme involved 40 MFIs and nearly 3,000 branches. It was structured around four key components:

1. Market assessment and product development
2. Strengthening the policy, legal, and regulatory framework
3. Awareness creation and capacity building
4. Implementation of the microinsurance pilot

Having moved beyond the pilot phase, the scheme is now a regular part of PKSF's operations.

Farmers access the insurance by paying a premium when they take out a loan through one of the participating MFIs. What sets this model apart is its integration of preventive services alongside insurance coverage. In addition to financial protection, farmers receive access to vaccination programs, veterinary care, and feed advisory services. Each insured animal is issued a health card, documenting vaccinations, check-ups, and insurance details. These services are delivered in collaboration with government agencies and research institutions affiliated with PKSF, helping to reduce both pre- and post-event risks.

5.3.2.1.2 Parametric insurance

Pula is a pioneering Insurtech company operating at the intersection of agriculture, technology, and insurance. Central to its innovative approach is the Area Yield Index Insurance (AYII), which protects farmers against low yields by using historical yield data and weather indices to trigger timely payouts at the end of the season. This model enables farmers to invest confidently in their farms, adopt improved practices, and build long-term resilience to climate risks. Operating

in 22 countries across four continents, Pula has insured over 20 million smallholder farmers. Its extensive network includes partnerships with farmer organizations, insurers, governments, and development agencies.[20]

A key example of Pula's private sector collaboration is its partnership with the Bayer Foundation, which provided a €10 million grant to support insurance premiums. This initiative aims to unlock up to USD 127 million in insurance coverage for 10 million farmers across countries such as Bangladesh, Pakistan, Malawi, Ghana, Nigeria, Kenya, and Mali, in coordination with national governments.[21] Pula also works closely with agri-tech companies like Apollo Agriculture to bundle insurance with essential farming inputs, such as high-quality seeds and fertilizers, often provided on credit. This integrated approach reduces the financial risks of input investments and empowers farmers to adopt more productive and sustainable farming methods.[22]

Another example of parametric or index insurance is offered by the Philippine Crop Insurance Corporation (PCIC). The government-owned PCIC is the primary provider of agricultural insurance in the Philippines, with a major focus on rice and corn farmers. PCIC recently launched a parametric insurance product that uses satellite data and weather indices (e.g., typhoon paths, wind speeds) to quickly assess damage and release payouts within 3–5 days after a disaster. While still in its early stages, this initiative shows promising potential to enhance the speed and efficiency of insurance support for farmers.[23]

5.3.2.2 Process

The application and payout process for PKSF's Livestock Insurance Scheme is structured as presented below.

Policy enrolment:

- Farmers participating in the beef fattening program are required to purchase livestock insurance.
- The insurance premium is 0.7% of the loan amount per cattle, paid at the start of the loan cycle.
- Additionally, borrowers could opt for a life insurance against an additional payment of 0.3% of loan as premium.

Coverage period:

- The insurance covers a six-month period, aligning with the typical beef fattening cycle.
- It protects against conventional mortality and natural catastrophes or epidemics.

Claim trigger:

- If the insured cattle dies during the coverage period due to covered risks, the insurance is triggered.
- The farmer must report the incident to the partner MFI.

Claim verification:

- The MFI verifies the claim, often with support from veterinary professionals and health card records (which track vaccinations, check-ups, and health status).
- Proper documentation and adherence to cattle care protocols (e.g., vaccinations, feeding, housing) are essential for claim approval.

Payout mechanism:

- Upon verification, 100% of the outstanding loan amount is waived by the MFI.

[20] Source: Pula, 2025. ABOUT | PULA.

[21] Source: Bayer Foundation, 2025. Partnership with Pula Foundation: Insuring 10 Million smallholder farmers across Africa & Asia | Bayer Foundation.

[22] Source: UNSGA, 2023. Empowering Kenyan Smallholder Farmers: Pula's Game-Changing Digital Insurance | United Nations | UNSGSA Queen Máxima.

[23] Source: Department of Agriculture, 2025. PCIC launches parametric insurance to expedite claims payouts | Official Portal of the Department of Agriculture.

- The payout is made directly to the farmer through the MFI.

Covariant Risk Fund (CRF):

- In the event of catastrophic losses (e.g., widespread disease or disaster), MFIs can claim from the CRF established by PKSF.
- This fund acts as a substitute for reinsurance, ensuring MFIs can still compensate farmers even during large-scale events.

For Pula the application and to some extent the payout process may differ depending on the implementing partners, but in general, the following steps are as presented below.

Application process:

- Bundled with inputs: Pula's AYII is often bundled with agricultural inputs such as seeds and fertilizers. Farmers receive insurance coverage automatically when they purchase these inputs, often through partner organizations like agri-input suppliers, microfinance institutions, or government subsidy programs.
- Farmer registration: farmers are registered into the insurance scheme through Pula's partners. During registration, key data is collected, including farmer identity and contact details, farm location (geo-tagged), crop type and area planted.
- Premium payment: the insurance premium is typically embedded in the cost of the input package or subsidized by governments or development partners.

Payout process:

- Throughout the growing season Pula monitors the yield through satellite imagery, agro-ecological zone (AEZ) data and ground-truthing surveys.
- At the end of the growing season, actuals yields in an AEZ are compared to a historical benchmark yield. If the yield falls below a set threshold, a payout is triggered.
- Payouts are made automatically to eligible farmers and can happen in cash or in-kind (agri inputs for the next season).

5.3.2.3 Distribution channels and strategies

NDBs often have deep reach into rural and underserved areas through their lending programs, making them ideal partners for distributing insurance products, particularly to smallholder farmers and agri-MSMEs. Also, in the case of PKSF, insurance can be bundled with loans, de-risking both the financial institution and the borrower. Traditionally, however, the claims process in such models can be time-consuming and burdensome for both parties. However, parametric insurance is gaining ground due to technological advancements and a higher demand for tailored insurance products due to the increasing frequency of climate-related events. Parametric insurance offers fast, transparent payouts without the need for lengthy assessments. Given these advantages, NDBs could play a strategic role in scaling such innovations by partnering with insurers to deliver more efficient insurance solutions.

5.3.2.4 Policy and regulation

At national government level, a clearly defined institutional framework is essential to design and translate agricultural insurance policies into effective action. Market reforms backed by strong regulations and legal frameworks are key to enabling effective collaboration between governments and insurers across the agricultural value chain. These reforms should support innovation, improve access to data for product design, and ensure transparency and consumer protection. Aligning national regulations with global best practices can help scale sustainable insurance solutions.

5.3.3 Potential role for MDBs and public institutions

MDBs like the World Bank, IFAD, ADB, and UNDP often fund pilot programs and support the development of innovative insurance products such as index-based or parametric insurance. Additionally, they can help support governments with designing insurance frameworks that align with national priorities. A notable example is the Financial Resilience in Agriculture initiative by UNDP's Insurance and Risk Finance Facility, in collaboration with the Gates Foundation, which provides a structured framework and action plan to help governments institutionalize agricultural insurance.

As high premiums are one of the main hurdles to a wide uptake of agricultural insurance among small-scale farmers, potential support from MDBs and public institutions could focus on ways to lower those premiums over time. In the short run this can be done through insurance premium subsidies, until the uptake of insurances is collectively accepted and thereby leads to reduced (or distributed) risks for the insurance company, which in turn offers opportunities to negotiate lower the insurance premiums. On the other hand, as became clear from the example from Bangladesh, MDBs can also focus on grants for TA that directly reduces risks (e.g. lower mortality rate of livestock through veterinary services) and can thereby offer opportunities to negotiate lower insurance premiums with insurance companies.

5.4 Risk management for financial instruments

As mentioned throughout this chapter, it is important for NDBs to ensure their processes for financial instruments are agile and at par with industry standards. When it comes to credit guarantees for example, it is suggested that the guarantee is paid out immediately after a claim. And for credits to smaller segments – both directly and indirectly – the total approval process should not take more than five business days, preferably even real-time.

A way to achieve this is by following FIRA's example, who has established "intermediary faculties" based on risk rating and size of IFIs. Depending on the faculty the IFI is categorised into, the mandate of the IFI is determined, as well as the % of sample checks to be conducted by FIRA.

Sample checks are carried out only after paying the guarantee for a defaulted loan. If the result of a sample check is negative, i.e. the IFI has not correctly carried out its credit process, the payment will need to be recovered by the NDB, with an additional penalty and potential negative consequences for FIRA's internal credit rating of the IFI.

The below figure shows how intermediary faculties are categorised at FIRA. Based on credit worthiness, risk rating, and size, IFIs are classified. The figure shows the limits per category. Depending on the average size of IFIs in a country, and the average size of loans and guarantees, a tailored version can be made.

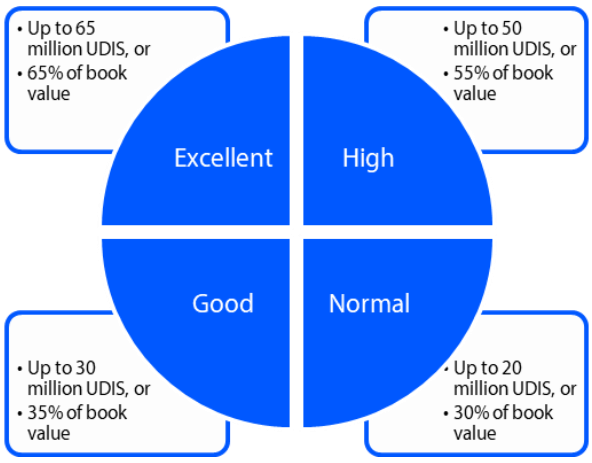


Figure 8: Limits for IFI categories. Source: FIRA, 2025.

Note: UDIS is not a fixed peso amount, but a value that fluctuates with inflation. As of recent data, 1 UDI = 7.9 MXN, though this changes regularly.

5.5 Funding needs and options

To sustain concessional loans, credit guarantees, and insurance offering, NDBs must secure reliable and diversified funding options. The funding structure should be aligned with the tenor and pricing of the credit lines offered. For

example, long-tenor concessional loans for CAPEX should be backed by long-term funding sources to avoid asset-liability mismatches. Funding options may include the below.

- Government budget allocations, earmarked for priority sectors such as agriculture or MSMEs.
- Multilateral concessional loans, e.g., from IFAD, IDB, ADB, or World Bank, often linked to specific development outcomes.
- Blended finance structures, where donor grants or first-loss capital are combined with NDB funds to de-risk lending.
- Bond issuance, including green or social bonds, to raise long-term capital for concessional programs.

Since blended finance and bonds are usually more complex to develop, this section further outlines the details and points to consider from an NDB's perspective.

5.5.1 Blended finance

Blended finance is increasingly recognized as a powerful solution for NDBs to support small-scale farmers. By strategically combining concessional public or philanthropic capital with commercial investment, blended finance enables NDBs to extend tailored financial services to smallholders, fostering inclusive growth, sustainable food production, and improved livelihoods. Blended finance helps to contribute to these objectives by de-risking investments and incentivizing private sector participation in agricultural finance.

NDBs are uniquely positioned to deploy blended finance effectively. With their public mandate and local knowledge, NDBs can structure financial instruments that align with smallholders' needs such as seasonal repayment schedules, low-interest loans, and crop insurance. By using concessional capital to absorb first losses or provide guarantees, NDBs reduce the risk for commercial investors, making smallholder lending more attractive and scalable.

Moreover, blended finance allows NDBs to integrate non-financial support into their offerings. TA, capacity building, and digital tools can be bundled with financial instruments to enhance farmers' productivity and financial literacy. For example, a blended finance facility might fund mobile platforms that deliver agronomic advice or market information, helping farmers make informed decisions and access better prices.

Sustainability is another critical dimension. As climate change intensifies, small-scale farmers must adopt resilient and regenerative practices. Blended finance can support this transition by funding climate-smart technologies such as drip irrigation, drought-resistant seeds, and agroforestry systems, which may be unaffordable without concessional support. By linking finance to environmental outcomes, NDBs can promote sustainable food systems while mitigating climate risks.

Importantly, blended finance fosters ecosystem development. It encourages collaboration among donors, investors, agribusinesses, and civil society, creating holistic solutions that address both financial and structural barriers. For instance, blended finance can catalyse investment in rural infrastructure, storage facilities, and value chains that connect smallholders to markets.

In sum, blended finance empowers national development banks in emerging markets to unlock the potential of smallholder farmers. It enables the delivery of customized, affordable, and impactful financial services that drive business growth, enhance food security, and improve incomes. By leveraging this approach, NDBs can transform agriculture from a subsistence activity into a sustainable engine of development.

There's a growing interest of international impact investors to allocate funds towards food security and sustainable food production worldwide. New funds are being established and financially committed to on a weekly basis. Raising funds for these causes however seems to be less of a trouble than identifying viable investment projects. Although some of these funds will have a clear philanthropic nature, the majority is next to impact looking for a minimum of capital preservation. For these foreign investors one of the main obstacles in project identification and assessment is currency risk. Investment projects reaching out to smallholder farmers are always likely to be more risk prone than other projects, so a clear outlook on a positive financial yield is a big plus. But when financial yields need to be converted to hard currencies, the outlook for a fund manager may become negative.

NDBs, for instance through the instruments of multilateral development banks or specialized institutions, would be able to hedge local currency-denominated instruments. This makes projects more attractive and bankable. Some NDBs already collaborate with multilateral development banks or donors to provide guarantees or first-loss capital, which can include currency risk protection.

5.5.2 Bonds

Bonds are increasingly recognized as a strategic funding instrument for NDBs. By issuing bonds – especially thematic ones such as green, social, or gender bonds – NDBs can mobilize long-term capital from domestic and international investors. Usually domestic bonds have shorter tenors between 1.5-5 years, and international bonds have longer tenors of 7-10 years. Unlike donor grants or budget allocations, bonds offer NDBs a market-based mechanism to raise funds at scale, often with longer tenors and more flexible terms.

A strong example comes from FIRA, which has established a Sustainable Bond Framework to issue green, social, and sustainability bonds through its trust funds (FONDO and FEFA). The proceeds are earmarked for projects that contribute to climate resilience, financial inclusion, and socio-economic advancement in rural Mexico. Eligible categories include sustainable agriculture, renewable energy, water management, and access to financial services for smallholder farmers and women-led enterprises. FIRA's framework aligns with international standards such as the Green Bond Principles, Social Bond Principles, and Sustainability Bond Guidelines, and includes mechanisms for project selection, environmental and social risk management, and impact reporting. For example, FIRA commits to annual allocation and impact reports, tracking metrics such as reduced emissions, increased adaptive capacity to climate events, and the number of women receiving credit for the first time.

When structured effectively, bonds can align with national development priorities and SDGs, making them attractive to impact investors and institutional buyers. For example, FIRA has issued green bonds to finance climate-resilient agriculture, while BDP has explored social bonds to support inclusive rural finance. In such a case, an important prerequisite is that the NDB's law and statues allow the possibility to attract own funding.

5.5.3 Potential role for MDBs and public institutions

MDBs and public institutions are increasingly partnering with NDBs to scale up blended finance and thematic bond issuance for climate and development goals. In Indonesia and the Philippines, for example, the Asian Development Bank has worked with NDBs to structure blended finance facilities for clean energy and climate resilience. These facilities include first-loss guarantees, concessional debt, and support for project preparation, enabling NDBs to attract private capital for long-tenor infrastructure investments.[24]

The European Investment Bank (EIB) has supported NDBs in Latin America through initiatives like the Latin American Green Bond Fund, which provides TA and co-financing to help NDBs develop local currency green bonds. This fund has mobilized over USD 2 billion in green investments.[25]

5.6 Determining effectiveness

To ensure optimal impact of financial instruments, it is important to regularly evaluate the effectiveness and adjust the structure if needed. Based on inputs from the World Bank[26] and our own additional insights, we suggest the following process to determine effectiveness of a financial instrument.

[24] Source: GDPC, 2025. Blending from the Gound Up: Multilateral and National Development Bank Collaboration to Scale Climate Finance.

[25] Source: La Green, 2025. https://lagreen.lu/.

[26] Source: World Bank, 2014. Toolkit for Impact Evaluation of Public Credit Guarantee Schemes for SMEs.

5.6.1 Define clear objectives and theory of change for the instrument

Here, the target group should be defined in terms of (sub-)sector, ultimate financing objective, size (either of the loan or the income of the end beneficiary), geographical location, and any other special development objectives that this instrument aims to address. In other words: which challenge of the end beneficiary is being addressed?

5.6.2 Financial- and impact indicators

During the design process of the financial instrument, indicators should be determined to measure success on both financial- and impact aspects.

Financial metrics can include: .

- Leverage ratio: amount of private capital mobilized per unit of guarantee;
- Default rate: percentage of (guaranteed) loans that default;
- Utilization rate: share of guarantee- or on-lending facility actually used;
- Cost-effectiveness: cost per unit of development impact (e.g. per farmer reached).

Impact metrics include:

- Number of small-scale farmers reached;
- Increase in loan volume and frequency;
- Improvement in loan terms (e.g., interest rate and collateral);
- Changes in farm productivity or income;
- Gender or youth inclusion.

Depending on the available capital and objectives of the guarantee, for all indicators clear targets should be set, at least on a yearly basis. This supports the NDB to evaluate the success and adjust certain aspects of the guarantee if needed.

5.6.3 Evaluation methods

To collect data and insights for all indicators, various evaluation methods can be applied. Randomized Control Trials (RCTs) are considered the most reliable method for evaluating impact, as they use random assignment to create statistically identical treatment and control groups, allowing for credible comparisons. However, RCTs require specific conditions such as large participant pools, feasibility of randomization, and compliance, and they can be costly and complex to implement. Encouragement Design is a variation of RCT suitable for programs with voluntary participation or universal coverage, where randomly selected units receive incentives to join the program. Despite their potential, to our knowledge neither RCTs or EDs have been used to evaluate the impact of credit guarantee schemes or concessional loans.

When randomized experiments are not feasible, quasi-experimental methods offer robust alternatives for evaluation the impact of the credit guarantee schemes. These include Regression Discontinuity Design (RDD), Propensity Score Matching (PSM), and Difference-in-Difference (DiD) approaches. RDD exploits eligibility thresholds (e.g. firm size or turnover) to compare firms just above and below the cut-off, assuming they are otherwise similar. PSM constructs a statistically equivalent control group by matching firms on observable characteristics, while DiD compares changes in outcomes over time between treated and untreated groups. These methods rely on strong data and assumptions but can yield credible estimates of impact when implemented carefully.

5.6.4 Data collection

Data should be collected for both end beneficiaries of the financial instrument as well as non-beneficiaries, covering financial and economic indicators. Sources can include monitoring data from credit guarantee operations, administrative data from credit registries, central banks, and lenders, and survey data to complement. Administrative data can be particularly cost-effective and rich in detail, while surveys offer flexibility but are more expensive. Qualitative data from interviews and focus groups can complement quantitative findings by providing context and insights into beneficiary experiences.

5.6.5 Potential role for MDBs and public institutions

During our country visits, we noted that impact measurement remains a large gap for most NDBs. Various NDBs measure the impact for selected products. For example FIRA measures the impact that is required for the green bond certification, and BanEcuador measures indicators required by the Ministry of Agriculture for their concessional funding. However, for all selected NDBs an all-encompassing impact framework to measure success from a development perspective is lacking.

MDBs and public institutions can play an important role in supporting NDBs to evaluate and improve the effectiveness of financial instruments. More concretely, they can assist in developing monitoring frameworks to track loan performance, repayment behaviour, and development outcomes. The World Bank introduced a corporate scorecard with 22 indicators focused on outcomes. This framework is being shared with other development banks to harmonize impact measurement and improve accountability. It enables NDBs to track loan performance, repayment behaviour, and development outcomes like growth and resilience.[27]

[27] Source: World Bank Group, 2024. World Bank Group Announces New Approach to Measuring Impact.

6 Toolkit of non-financial instruments

6.1 Digital financial services and channels

Challenge	Social- and institutional hurdles	Infrastructure- and market access imperfections	Environmental- and climate change	Knowledge- and technology gaps	Limited access to finance
Can the challenge be solved by this solution?					

6.1.1 Context

Most of the recent innovation does not come from radically different thinking about finance, but originate from the potential of digitization. Not only the lenders now have the option to go digital and work on process driven retail solutions at scale, digitization has also reached out to the lives of small-scale farmers. Having access to a mobile phone opens a new world for them, which may also include access to financial products and services. Digital tools are transforming payments, saving and lending for smallholder farmers in profound ways, making it more efficient, inclusive and scalable.

A digital identity through biometric verification or digital IDs help lenders to onboard farmers who lack formal documentation. It enhances transparency and reduces the risk of fraud, which is omnipresent in informal markets. Strong Know-Your-Customer (KYC) tools will help both lenders and farmers to prevent fraud.

Digitization can be a great tool for streamlining loan origination and approval. Mobile apps and digital platforms can help automate credit checks and reduce paperwork. It may also speed up loan approval and disbursement, which is crucial for time-sensitive agricultural cycles. Mobile and digital platforms are increasingly used to reach remote farmers. This reduces transaction costs and enables to go further down-market, serving farmers that otherwise wouldn't be eligible. And these systems can be made with gender-sensitive design in the sense that they can be tailored to include women farmers, who often face greater barriers to access credit.

Digitization enables the adoption of data-driven credit scoring models. By leveraging alternative data sources, such as mobile phone usage, agricultural records, and satellite imagery, financial institutions can better assess the creditworthiness of farmers, including those without a formal credit history. However, while promising, implementing such models is more complex than it may initially appear. Many financial institutions lack experience in handling non-financial customer data, and making effective use of these data sources often requires significant investment in robust data infrastructure and analytics capabilities.

More comfort can be created by linking the lending activities with digital payment systems or mobile wallets. This may for instance enable the direct disbursement and repayment of loans. It reduces transaction costs and improves accessibility, especially in remote areas.

For group lending, group coordination and monitoring can be enhanced by messaging apps and digital dashboards help groups stay connected and track repayment. It facilitates peer monitoring and accountability.

Digitization also allows for training and extension services. Digital platforms offer e.g. agricultural advice, weather updates, and market prices. This may lead to productivity improvements and larger loan repayment capacity. A concrete example for this is FIRA's platform called AgriTech Nexus. With this platform, FIRA aims to connect supply and demand through a digital marketplace where producers and potential buyers are united. The platform also offers other innovative solutions that can strengthen the agricultural sector, such as remote sensing data, weather- and climate data, market information, and TA for producers. The solutions are accessible for financial intermediaries as well as end beneficiaries.

And as said earlier, transparency between lenders and borrowers, but also between second-tier NDBs and their beneficiaries can be improved. Digitization allows for real-time tracking of loan performance and trust between lenders, farmers, and other stakeholders.

In the end, digital lending is not just about speed, it's about creating personalized, inclusive financial journeys for underserved communities. For smallholder farmers, it means better access to capital, improved productivity, and stronger resilience against shocks.

6.1.2 Enabling factors

6.1.2.1 Product characteristics

Digital financial services can take many forms. To keep things concrete, we'll focus on one specific product (working capital loans for small-scale farmers) that is currently offered primarily in a non-digital way and therefore has high potential for improved impact. We'll explore examples of institutions that have successfully digitized this product. The emphasis is not on the recommended loan amount, which varies by country and crop, but rather on how the product is delivered to its beneficiaries.

6.1.2.2 Process

To build on the introduction section, the process of digitizing credit for smallholder farmers involves several key components. Ideally, these elements should be in place before launching a digital financial service to customers.

1. Reliable internet connectivity: to complete the loan application, the applicant- or in an assisted model, the field officer- must have access to a reliable internet connection. While some platforms allow data to be saved offline and synchronized once connectivity is restored, a stable connection becomes essential when real-time customer verification is required during onboarding. In such cases, uninterrupted internet access is a critical prerequisite.
2. Availability of relevant data: to digitize the loan application process effectively, it is essential to assess both the required and the nice-to-have data, and compare these with what is currently available. This includes farmer profiles, crop cycles, transaction histories, and potentially alternative data sources. In most cases, there will be gaps between the ideal and the available data, and sometimes even between the required and the minimum data needed to proceed.
    a. A useful approach is to define a current state, an improved state, and a target state for data availability and quality. This framework allows FIs to begin their digitization journey today, while also setting a clear path for enhancing data availability and quality over time.
3. Digitization of core processes: to enable a seamless and efficient user experience, processes such as loan origination, credit assessment, and disbursement must be digitized. A good starting point is conducting a gap analysis to understand which systems are currently in place and what additional tools and integrations are needed to deliver a truly end-to-end digital financial service. Key components that support this digitization include:
    - Digital loan application forms;
    - Loan origination and management systems;
    - Credit scoring models and engines;
    - Core banking systems;
    - Integration with digital wallets.

    Identifying gaps and mapping out the required infrastructure supports FIs in priority setting and planning for future improvements in system capabilities and interoperability.

A notable example of a bank investing heavily in the digitization of financial services for smallholder farmers across the country is SBP in Pakistan. In partnership with the Government of Pakistan, SBP launched a nationwide financial inclusion initiative in July 2025 aimed at enabling end-to-end digital lending for farmers. The initiative seeks to significantly reduce loan application turnaround times by leveraging digital tools and alternative data sources for credit assessment.

SBP has outlined the following process for digital lending as below.

1. Application Submission: farmers submit loan applications via a dedicated digital portal and select their preferred bank.
2. Data Screening: the system integrates data from credit bureaus, agro-based ratings, personal and land information.
3. Land Information Management System (LIMS): farmers geotag their land by dropping a pin. LIMS uses satellite imagery to provide insights into crop patterns, cultivation history, and fertilizer usage.
4. Psychometric Testing: a test (BIGINI) assesses the farmer's digital and financial literacy.
5. Scoring & Approval: two scores are generated and shared with the bank. Based on these, banks approve loans.
6. Disbursement: approved loan amounts are transferred to the farmer's digital wallet. Funds are disbursed in a hybrid model-75% in a closed loop (restricted to selected vendors) and 25% in an open loop.

Another example of an NDB heavily investing in digitization is NABARD in India. Farmers in selected states can apply for working capital via the e-KCC portal, which is integrated with the Unique Identification Authority of India, enabling secure identity verification. A Unified Lending Interface allows for access to digitized land records to validate land ownership. Finally loans are automatically approved or rejected, and disbursal happens digitally. Currently being piloted in six states, the program is expected to scale nationwide, ultimately benefiting millions of farmers mainly through cooperative banks, Primary Agricultural Credit Societies, and Regional Rural Banks.

6.1.2.3 Distribution channels and strategies

Working capital loans for smallholder farmers are typically provided by first-tier institutions, often with funding and support from second-tier institutions and government programs. The way these loans are delivered changes significantly when digitization is introduced.

Successfully digitizing this product requires more than just technology; it often depends on strong support from second-tier institutions, governments, and even multilateral organizations. Their involvement is crucial to implement digital solutions cost-effectively and at scale, especially since first-tier institutions frequently face limitations in resources, capacity, and technical expertise. As outlined earlier, the digitization of financial services in Pakistan is being spearheaded by SBP in collaboration with the Government of Pakistan. In India, the national government is making substantial investments in digital public infrastructure through the AgriStack initiative, which aims to consolidate and streamline agricultural data nationwide. Moreover, the Reserve Bank Innovation Hub and NABARD are leading the design and rollout of the e-KCC platform. To support widespread adoption of e-KCC, but also other digital services, NABARD has recently established a Common Service Center to assist first-tier institutions, such as cooperative banks, in utilizing digital technologies effectively.

6.1.2.4 Risk management

Digitizing the working capital facility application and disbursement process for farmers requires substantial risk management changes at the FI level, both in systems and behaviour. Currently, risk assessments typically involves the steps as outlined below.

- Field inspections by loan officers to verify a farmer's landholding during the loan application process, and follow-up visits during the crop cycle to confirm that the crops being cultivated match those declared in the application.
- Verification through digitized land registries, where available, to confirm land ownership details and check whether the land is already pledged against another loan.
- Retrieval of the farmer's credit score from a credit bureau.
- Multi-layered loan evaluation, often involving several loan officers, legal teams, and - depending on the loan amount - multiple credit committees.

Digitizing risk management practices for a working capital facility can be achieved through the below approaches.

- Remote sensing technologies can be used to monitor crop growth, replacing the need for physical field inspections and enabling more efficient verification of crop types and health.

- Advanced credit models and engines can incorporate transaction histories and alternative data sources-often excluded from traditional credit bureau scores-to assess creditworthiness of farmers based on cash flow, rather than relying solely on land as collateral.
- Automated decision-making systems can apply predefined business rules alongside the credit model, such as setting threshold scores for automatic rejection or approval. This significantly reduces turnaround time and minimizes the need for manual intervention by loan officers.

As digitization transforms processes, it's essential to also reassess the risk appetite statement and risk management policies. Traditional credit bureau scores are often low or unavailable for farmers, making it crucial to design policies that go beyond conventional metrics. By incorporating alternative data sources and moving away from reliance on land as collateral, institutions can create more inclusive and effective risk frameworks.

6.1.2.5 Policy and regulation

This chapter highlights the critical role of government and central bank involvement in enabling digital financial services for agriculture, not only through investments in public digital infrastructure, but also by shaping enabling policies and regulatory frameworks that foster innovation, inclusion, and scalability. Some countries have adopted dedicated digital lending frameworks. For example, India's Digital Lending Guidelines, issued by the Reserve Bank of India, aim to regulate digital lending practices while ensuring consumer protection, transparency, and responsible innovation. Other countries have chosen to integrate digital financial services within broader financial inclusion strategies. In the Philippines, the National Strategy for Financial Inclusion serves as a comprehensive roadmap to promote inclusive growth and financial resilience. Coordinated by the Financial Inclusion Steering Committee and chaired by the Bangko Sentral ng Pilipinas (BSP), the strategy places strong emphasis on leveraging digital financial services as a key instrument to reach underserved populations, including those in rural and agricultural communities.

6.1.3 Potential role for multilaterals and public institutions

The transition to digital lending requires coordinated investments from governments, central banks, and second-tier NDBs. Multilateral institutions also have a critical role to play in this shift. They can provide TA to both first- and second-tier NDBs, support the development of a robust digital ecosystem involving FinTechs and other stakeholders, and facilitate the sharing of best practices across regions. The following list outlines key instruments that multilateral organizations can leverage to support NDBs and the broader IFE in enhancing digital service delivery.

- TA grants: in 2023 ADB launched the Fintech for Inclusion Transformation Program in the Philippines to encourage local financial institutions to invest in digitalization of their operations. ADB offers matching grants to digitally strengthen small and mid-size FIs that focus on agri-finance, agri-value chains, women empowerment and/ or climate change mitigation.[28]
- Loans: the IDB Lab has provided a USD 150 million sovereign guaranteed loan in partnership with BNDES, who will contribute USD 30 million to implement PRODIGITAL, a program that supports digital transformation and aims to expand the use of digital public services in Brazil.[29]
- Research Initiatives: ADB has published the *Harnessing Digital Transformation for Good: Asian Development Policy Report 2025*, which outlines key challenges and emphasizes how national digital strategies can enhance policy coordination. The report also explores how tailored digital policy tools can address market inefficiencies and equity gaps. [30] Another notable publication, *Digital Transformation for the SDGs*, showcases best practices

[28] Source: ADB-SGV, 2023. FIT Program | Fintech Inclusion for Rural Banks and Microfinance Institutions | Philippines.

[29] Source: IDB, 2025.IDB | IDB and BNDES to Accelerate Digital Transformation in Brazilian States and Municipalities with $180 Million in Financing.

[30] Source: Asian Development Bank, 2025. Harnessing Digital Transformation for Good: Asian Development Policy Report 2025.

from countries such as Bangladesh, India, and Vietnam, highlighting successful approaches to leveraging digital technologies for sustainable development.[31]

- Training: IFC, for example, through its DigiLab initiative supports FIs in their digital transformation through a 12-week training program.[32]
- Digital infrastructure & regulatory development: another example is the Financial Inclusion Global Initiative (FIGI) which was executed between 2017 and 2021. The program was funded by the Gates Foundation and implemented by the World Bank Group, Committee on Payments and Market Infrastructure and the International Telecommunications Union. FIGI concentrated on enhancing electronic payment acceptance, digital identity for financial services, and security, with a geographic focus on China, Egypt, and Mexico. Its approach included diagnostic assessments, TA, capacity building, and piloting innovative solutions to advance digital financial inclusion.[33] Crucially, FIGI-stakeholders collaborated closely with national authorities to support the development of enabling legal and regulatory frameworks - for instance for FinTech - helping to create a more inclusive and supportive environment for digital financial services.[34]

Moreover, MDBs can help encourage the adoption of digital lending and encouraging a shift from collateral-based lending to cashflow-based credit assessments, by offering de-risking instruments, such as guarantees, thereby expanding financial access to underserved segments.

6.2 Technical assistance and capacity building

Challenge	Social- and institutional hurdles	Infrastructure- and market access imperfections	Environmental- and climate change	Knowledge- and technology gaps	Limited access to finance
Can the challenge be solved by this solution?					

6.2.1 Context

6.2.1.1 TA for small-scale farmers

NDBs play a role in supporting smallholder farmers, not just through financing, but also via a suite of non-financial services that build capacity, reduce risk, and improve market access. A breakdown of the most impactful types of non-financial services NDBs include the below.

- Agricultural extension services: e.g. on-the-ground training and TA in farming practices, pest control, soil management, and crop diversification.
- Market linkages and value chain support: connecting farmers to buyers, processors, and exporters; facilitating contracts and aggregation.
- Capacity Building and training: workshops and education on financial literacy, business planning, cooperative management, and digital tools.

[31] Source: Asian Development Bank, 2024. Digital Transformation for the Sustainable Development Goals.

[32] Source: IFC, 2024. Digital Strategy Program for Financial Institutions | About DigiLab

[33] Source: World Bank Group, n.d. Financial Inclusion Global Initiative (FIGI)

[34] Source: FIGI, 2024. Country implementations – FIGI

- Access to inputs and technology: facilitating access to seeds, fertilizers, irrigation systems, and mechanization through partnerships or subsidies.
- Post-harvest infrastructure support: support for storage facilities, cold chains, and transport logistics.
- Climate Resilience and Risk Management Advisory: guidance on climate-smart agriculture, crop insurance education, and disaster preparedness.
- Digital Inclusion and Mobile Services: promoting mobile banking, digital extension platforms, and SMS-based market updates.
- Policy Advocacy and Institutional Support: helping farmer groups engage with policymakers or navigate regulatory systems, e.g. on land titles.

There is abundant literature supporting the effectiveness of packaging TA to financial services. It means that there is a major role to play for NDBs to avail and coordinate both into one package for specific target groups of small-scale farmers. NDBs can leverage the expertise of external parties, such as NGOs, MDBs or even research institutes to provide TA. For example, in the case of livestock insurance offered by PKSF, complementary services such as access to vaccination programs, feed advisory services, and veterinary care, are delivered in partnership with government agencies and research institutions.

6.2.1.2 TA for financial intermediaries[35]

TA and capacity building should not be limited to small-scale farmers only. Especially intermediary financial institutions (IFIs) working together with second tier NDBs, such as with credit guarantees, might take benefit from additional knowledge and insights related to the agricultural sector. Since they have to reach out to customers in remote rural areas, and lack elaborate experience in agriculture, they may need assistance.

Especially financial institutions receiving credit guarantees often require targeted TA to maximize the effectiveness of these instruments and ensure sound lending practices. Below the key types of support typically facilitated by NDBs are listed.

- Risk assessment and management; training on evaluating borrower creditworthiness, especially in sectors with limited track records (e.g., climate adaptation projects) and tools for modelling default probabilities and stress testing portfolios.
- Loan structuring and documentation; guidance on designing loan products that align with guarantee terms and support in drafting contracts and legal documentation that incorporate guarantee provisions.
- Monitoring and reporting systems; development of systems to track loan performance and compliance with guarantee conditions and assistance in setting up reporting frameworks for guarantors and regulators.
- Impact measurement; beyond system development, TA should also support the measurement of impact, helping stakeholders assess both financial outcomes and broader development goals. As highlighted in section 5.6, it is essential to define success indicators, covering financial performance and impact metrics, during the design phase of any financial instrument.
- Capacity building and staff training; workshops and courses to educate bank staff on guarantee mechanisms and their benefits, and sector-specific training (e.g., agriculture, renewable energy, SMEs) to improve lending decisions.
- Digital tools and infrastructure; implementation of digital platforms for loan origination, monitoring, and guarantee claims and the integration of guarantee schemes into existing banking systems.
- Market and sector intelligence; insights into emerging sectors supported by guarantees (e.g., climate resilience, green infrastructure) and data sharing on borrower behaviour and repayment trends.

[35] On behalf of multilateral development banks, throughout many years Rabo Partnerships has gained extensive experience in capacitating financial institutions in emerging markets to better serve rural markets, including an effective use of credit guarantees, which has often been instrumental in managing the risk profile of their loan portfolio within acceptable boundaries. TA has addressed basically all the points mentioned in this section.

- Regulatory and compliance support; help navigating local and international regulations related to credit guarantees and ensuring alignment with anti-money laundering (AML) and know-your-customer (KYC) standards.

These forms of assistance are often provided through multilateral development banks, government agencies, or specialized financial institutions alongside the guarantees themselves, and can be availed by NDBs.

6.2.2 Enabling factors

6.2.2.1 Program characteristics

6.2.2.1.1 TA for small-scale farmers

As highlighted in section 6.2.1, linking TA to financial services enhances their overall effectiveness. In this regard, we would like to share an example of a TA program that is a prerequisite for accessing a loan. The ASCEND program by LBP in the Philippines must be successfully completed before applying for a working capital loan through the AgriSenso Plus program. The focus of ASCEND are smallholder farmers, MSMEs, and cooperatives. The ASCEND program has multiple components, but three are especially worth mentioning here.

- Digital Financial Literacy Training: Focuses on enhancing financial management skills at the farm level, such as how to record their income and managing their expenses, savings and credit. A key element of the training has been teaching farmers how to separate household from production. Additionally, participants are introduced to LBP's digital banking services, including mobile banking and digital deposit platforms.
- Agri-Advisory and Market Linkage Training: This training guides farmers on optimal crop planning-when and how to plant-while also introducing strategies for establishing market linkages. It encourages farmers to join associations or cooperatives to improve access to markets and increase profitability through collective bargaining and shared resources.
- AgriSenso Plus Training: Provides an overview of the program, outlining its objectives, eligibility criteria, and the application process to help farmers understand how they can participate.

The Land Bank Countryside Development Foundation (LBCDF) serves as the main partner of LBP in delivering capacity-building initiatives aimed at strengthening cooperatives and supporting the development of farmers and fisherfolk. LBCDF is responsible for determining the timing and location of training sessions.

To ensure that participants have completed the ASCEND program-a prerequisite for loan applications-the following verification process is in place.

- The Registry System for Basic Sectors in Agriculture (RSBSA) is a government-managed database that is used to identify eligible beneficiaries for agriculture-related programs and services, including insurance and financial assistance.
- Training attendance is recorded in the RSBSA system. Upon successful completion, participants receive a certificate, which is required when applying for loans.

Another example of providing TA is through the "Centros de Desarrollo Tecnologico" (CDTs), Technical Development Centres of FIRA. FIRA has five CDTs across the country that focus on increasing efficiency of water use in agriculture, energy efficiency, input efficiency and productivity increase. They do so through four key functions:

1. Validation of new technologies and methodologies (that are flexible and scalable);
2. Demonstration of new technologies and methodologies;
3. Training (both in-person and virtual) on financial and agronomic matters;
4. Facilitation of peer-to-peer trainings through videos and field/classroom trainings. This function is focused on multiplying FIRA's outreach to more farmers in the country.

The change strategy of the CDTs is to focus on early innovators and early adopters among farmers to initiate the spreading of improvements in agriculture. According to the interviewed CDTs, culture in rural areas is usually change-averse and innovators are often not respected until positive effects can be demonstrated.

Since the CDTs operate break-even, they are not a big cost center for FIRA, while they do have a significant impact on farmers' productivity and repayment capacity. For example, the soil diagnostics that FIRA offers, leads sometimes to a 43% increase in yields for farmers.

Considering the large spread and remoteness of many of NDBs' end beneficiaries, examples of TA through digital channels can be increasingly noted. FIRA's digital TA platform "Plataforma de Asesoría Técnica" functions as a gateway to a large knowledge base for farmers. The application is widely used to identify crop diseases and possible solutions. Additionally, BDP has implemented weather alerts on WhatsApp that are being sent to clients according to the latest data.

6.2.2.1.2 TA for financial intermediaries

As mentioned in 6.2.1.2., there are many types of support that second-tier institutions can provide to their financial intermediaries. The approach to organizing TA varies across second-tier NDBs. In some cases, NDBs collaborate with governments, NGOs or multilateral institutions to provide and even fund TA. FINAGRO for example, organizes agricultural finance trainings for intermediaries, applying their in-house methodology for digital onboarding of farmers and using a wide range of parameters for credit decisions. In other cases, NDBs have their own dedicated training centres. For example, NABARD delivers TA through its dedicated institution: the Bankers Institute of Rural Development (BIRD). BIRD specializes in training and capacity building for bankers, NGOs, and other development organizations across India and the Asia-Pacific region. With three centres located throughout India, BIRD offers programs focused on rural finance, risk management, and policy implementation. While some programs are specifically designed for financial institutions that receive funding from NABARD, many training opportunities are also available to professionals from other banks, microfinance institutions (MFIs), and government agencies.

6.2.2.2 Risk management

While TA is not a financial instrument in itself, it can be considered a risk management tool that strengthens individual borrowers, first-tier institutions and even the second-tier NDBs.

- Strengthening individual borrowers: when integrated with a specific financial instrument, TA can contribute to lowering the NPL-ratio associated with that product. A good example of this is PKSF, which has a livestock insurance scheme, where ADB provides finance and PKSF provides technical support-such as veterinary services, vaccinations, and feed advice-to reduce risks and decrease livestock mortality through education and knowledge-sharing. In addition to paying the insurance premium, the borrower's ability to repay the loan used for purchasing livestock significantly improves when technical support is provided. Since the support has proven to significantly reduce livestock mortality, the overall risk associated with the loan is reduced.
- Strengthening first-tier institutions: TA can enhance the capacity of first-tier institutions by providing training on assessing borrower creditworthiness and equipping them with tools to model probabilities of default. This leads to more robust and sustainable loan portfolios over time. A strong example is SBP's investment in digital infrastructure and the provision of digital underwriting tools to banks. The next critical step is to ensure that banks are trained to effectively use these tools and integrate them into their lending processes.
- Strengthening second-tier institutions: TA aimed at training second-tier NDBs to evaluate the performance of first-tier institutions, monitor their financial health, and adjust funding levels accordingly plays a direct role in risk management. For example, NABARD assesses and rates cooperative banks, and may adjust credit lines based on their financial stability and compliance status.

6.2.2.3 Funding needs and options

TA programs for NDBs are often funded by governments, with the beneficiaries being either the borrowers directly or the NDBs acting as facilitators. In the latter case, the NDB receives the TA budget and organizes the support for current or potential borrowers. In the Philippines, TA funding often originates from government agencies, which prefer not to provide these directly to beneficiaries, as doing so may be seen as subsidies- an approach considered unsustainable. Instead, the government creates more leverage by channelling funds for capacity building through LBP or its subsidiary, the Countryside Foundation.

Many NDBs in emerging markets also have experience with projects that are supported by international development assistance, such as those under the Green Climate Fund. Additional sources of TA funding and projects include internal resources from NDBs, grants from multilateral organizations (see section 6.2.3), partnerships with academic institutions, and regional knowledge networks such as ALIDE and APRACA.

6.2.3 Potential role for MDBs and public institutions

Multilateral organizations and public institutions play a critical and multifaceted role in providing TA to NDBs. While not exhaustive, the following examples illustrate common ways in which multilateral institutions engage in TA.

- Provide grants of concessional funding for TA to NDBs or to their beneficiaries.
- Institutional capacity building through training staff in areas such as credit risk assessment, ESG compliance, IT security and data management.
- Policy support through aligning NDB operations with international standards and advocate for policy reforms-such as the adoption of a national green taxonomy-that create an enabling environment for inclusive finance.
- Research such as conducting feasibility studies and environmental and social impact assessments to evaluate the effectiveness and sustainability of financial instruments and TA interventions.
- Provide connections with international research institutes (e.g. CGIAR, CIAT or Wageningen University) through MDBs' networks. These connections can be bundles with seed capital to fund the first steps of a partnership with the NDB (e.g. to conduct or validate research applicable for improving resilience of small-scale farmers).

6.3 Determining effectiveness

Determining the effectiveness of non-financial instruments requires evaluating both the outputs-what was delivered-and the outcomes-what changed as a result. This becomes especially important when multilateral institutions are involved in delivering TA, as they often require measurable impact. Establishing clear objectives, KPIs, and methods for tracking these KPIs before the intervention begins is essential for assessing its effectiveness.

Monitoring outputs tends to be relatively straightforward and often includes metrics such as the number of trainings conducted or the number of participants, often disaggregated by gender and age. However, evaluating outcomes and long-term impact is more complex. Changes such as increased financial inclusion or improved farmer incomes are harder to quantify and may only become evident months or even years after the intervention.

At the level of financial institutions, certain indicators can offer insight into the impact of TA. For example, a reduction in NPLs for specific product categories may suggest improved risk management, while faster loan processing times could indicate enhanced operational efficiency. However, significant improvements are still needed in defining clear objectives, measuring impact effectively, and using results to inform decision-making to enhance the overall effectiveness of technical TA delivery.

7 Concluding remarks

During the solution design phase of the IFE-FST initiative, a comprehensive exploration of current practices, challenges, and opportunities in agricultural finance across LAC and APR was conducted. Special attention was given to the core challenges faced by farmers, including social and institutional barriers, limited infrastructure and market access, environmental pressures and climate change, and gaps in knowledge and technology. A central focus of this phase was the role of NDBs in supporting small-scale farmers through strategic allocation of both capital and knowledge.

This phase led to the development of a practical and adaptable toolkit for NDBs and their partners. The playbook serves as a guide for NDBs to assess and strengthen their offerings, starting from the needs and challenges of end beneficiaries, particularly small-scale farmers. Depending on the specific challenges NDBs aim to address for their target segments, a range of solutions is available. These include:

- **allocation of capital** through concessional loans, credit guarantees, and insurance products; and
- **allocation of knowledge** and capacity building through digital financial services and TA.

The solutions toolkit further explores how these instruments can be effectively deployed to reach small-scale farmers. Rather than introducing new products, the focus is on leveraging existing solutions in innovative and impactful ways, drawing on lessons learned from successful initiatives around the world.

What becomes clear is that no single solution can address all the challenges faced by small-scale farmers. A combination of financial and non-financial interventions is essential, and ideally, these should be offered in an integrated manner to maximize impact. Additionally, the transition from traditional to digital tools is a significant development. Whether through digital TA platforms, online loan applications, or end-to-end digital financial services, there are growing opportunities for NDBs to digitize parts of their operations. This shift not only enhances efficiency but also enables greater scale and outreach, allowing NDBs to better serve rural farming communities.

In addition, the report also highlights opportunities for multilateral development institutions to strengthen and support NDBs in their endeavours to increase access to finance for small-scale farmers. Besides providing financial or non-financial support, it remains vital for multilateral development institutions to assess both the effectiveness of NDBs (e.g. governance, agile processes, capacity and outreach) as well as the appropriate match of the instruments with market challenges to be solved. Without these enabling factors, impact of MDB support to NDBs will be limited.

This report marks the completion of the solution design phase. For the next phase 'the execution phase' two countries (one in LAC and one in APR) will be selected for pilot implementation of specific financial and/ or non-financial solutions. Selection will be based on feasibility, stakeholder commitment, learning potential, and alignment with existing IFAD projects. The pilots will test the effectiveness of financial solutions in improving access for rural smallholders. Local NDBs and IFE actors will lead implementation, with active participation from smallholder communities. Insights from the pilots will guide refinements to the toolkit, ensuring solutions are both effective and scalable across diverse contexts.

8 Annex A: Country toolkits

8.1 Mexico

8.1.1 Brief overview of FIRA

FIRA's mission is to promote and consolidate an inclusive, sustainable, and productive agri-food and rural sector. They do this by providing credit, guarantees, training and technology transfer to the agriculture, livestock, forestry, fishing, and agribusiness sectors.[36] As a second-tier lender, FIRA channels resources as refinancing lines or guarantees to financial intermediaries. These intermediaries on-lend the resources to the end beneficiaries.

FIRA was established in 1954 and is constituted by four public trust funds: FONDO (1954), FEFA (1965), FEGA (1972), and FOPESCA (1989), each created to support different segments including agriculture, agro-industry, TA/guarantees, fisheries, respectively. These trusts are all administered by the Central Bank of Mexico (Banco de México or Banxico) as trustee, with funding and oversight from the federal government. The Ministry of Finance (SHCP) is the settlor. Although FIRA's trusts have their own equity, they operate under a single administration and brand, effectively functioning as one institution.

The important roles of Banxico and SHCP are also reflected in FIRA's governance structure. The highest decision-making body is the Technical Committee, which defines the strategic priorities and corresponding budgets. This committee includes representatives of Banxico, SHCP, and the Secretariat of Agriculture and Rural Development (AGRICULTURA). The Technical Committee (chaired by the SHCP) appoints the General Directorate, which is responsible for executing the institution's strategy and managing operations. This is divided into dedicated arms for internal control and oversight, and regional and sectoral coordination. Thanks to this structure and the large influence of Banxico, who prioritises sound operations and monetary stability, FIRA's leadership is less subject to political interference, and therefore more technocratic and stable than that of most other NDBs.

To date, out of FIRA's total outstanding credit of MXN 155.5 billion (USD 8.18 billion), 75% is destined to the agricultural sector.[37] With this, the institution is responsible for 68.4% of all agricultural lending in Mexico, which is provided through a total of 151 intermediaries.

8.1.2 Hurdles to be addressed

8.1.2.1 Hurdles based on country data

The below table shows key country data that can be related to the four categories of farmer challenges as introduced in chapter 2.

Category	Indicator	Scale	Data
1. Social- and institutional hurdles	a. Adults that feel insecure about land tenure	0% (no adults feel insecure) - 100% (all adults feel insecure)	22%
	b. Strength of legal rights	0 (weak) - 12 (strong)	10
	c. Gender inequality	0 (equal) - 1 (unequal)	0.358

[36] Source: FIRA, n.d. https://www.fira.gob.mx/Nd/VisionMisionValores.jsp.

[37] Source: FIRA, 2024. Informe Actividades.

	d. Informal employment	0% (no informal employment) - 100% (only informal employment)	56.6%
	e. Rural adults' account ownership	0% (no adults 15+, rural, with account) - 100% (all adults 15+, rural, have account)	47.1%
2. Infrastructure- and market access imperfections	a. Quality of trade- and transport-related infrastructure	1 (low) - 5 (high)	2.8
3. Environmental- and climate change	a. Adults who experienced natural disaster or severe weather events	0% (no adults 15+ experienced this) - 100% (all adults 15+ experienced this)	15.6%
	b. Environmentally sustainable agriculture score	0 (environmentally unsustainable practices) - 100 (environmentally sustainable practices)	58
4. Knowledge- and technology gaps	a. Rural adults who made or received digital payment	0% (no digital payments made/received by 15+ adults in rural areas) - 100% (all adults of 15+ in rural areas made/received digital payments)	33%
	b. Adults who use phone/internet for weather/agri information	0% (no adults) - 100% (all adults)	1.3%
	c. Agricultural irrigated land	0% (no irrigated land) - 100% (all land is irrigated)	6.16%

Table 2: Country data for Mexico (definitions and years in Annex B). Sources: FAO, Prindex, SAM, UNDP, World Bank.

On all indicators, Mexico scores at par or above regional averages. Yet, a few themes strike the attention and could be considered for design or improvement of solutions.

First, only 1.3% adults use their phone or the internet for weather- and agriculture-related information. With FIRA increasingly focusing on digital offering of TA and financial services, it is important to monitor the adoption of these services. It might be recommendable to accompany these services with in-person guidance on how to best use applications as developed.

Additionally, the 6.16% of irrigated agricultural land leaves room for improvement. By channelling finance to irrigation and technology adoption on farms, FIRA could contribute to filling this gap.

8.1.2.2 Hurdles based on additional insights

Additionally to macroeconomic country data, FIRA's operational and strategic challenges are as listed below.

- FIRA applies a minimum credit need of 10,000 UDIs (approximately MXN 84,000 or USD 5,000) to determine eligibility for its instruments. This threshold is based on credit need rather than farm size, sales, or employment, due to informality of the sector. However, a relevant question for FIRA is when their support to beneficiaries should be phased out and replaced by regular market instruments. Currently, there is no formal graduation process in place to transition clients from subsidized instruments to commercial finance, which may lead to prolonged dependency on FIRA's support.
- There is no comprehensive impact measurement framework in place yet. This limits FIRA's ability to assess the effectiveness of its instruments and inform decisions on continuation or redesign of programs.

Next to the challenges, we identified the below opportunities.

- FIRA collects substantial client data, including through TA activities and its digital platforms. However, this data is not yet systemically used for financial decision-making, product design, or portfolio management. This represents a missed opportunity to improve targeting and efficiency.
- FIRA already provides TA to both intermediaries and farmers, but there is potential to more closely link TA with financial instruments. This could improve uptake, repayment behaviour, and overall effectiveness of its instruments.

8.1.3 Relevant solutions for FIRA

Following the playbook as explained in chapter 4 of this document, country-wide hurdles of farmers in Mexico should be taken as the basis for solution design at FIRA. Combining this with challenges and opportunities we noted for FIRA specifically, brings us to the recommended solutions in this section. The solutions are based on the instruments as described in chapter 5 and 6, which can be referred to at all times for further details.

8.1.3.1 Insurance

While FIRA already offers crop insurance to end beneficiaries, expanding their insurance portfolio could help better manage agricultural risks. For example, price insurance can cover the risk of income loss due to price fluctuations or yield reductions. This is useful for farmers growing high-value or export-oriented crops. If FIRA were to implement this, the below figure suggests a roadmap towards it.

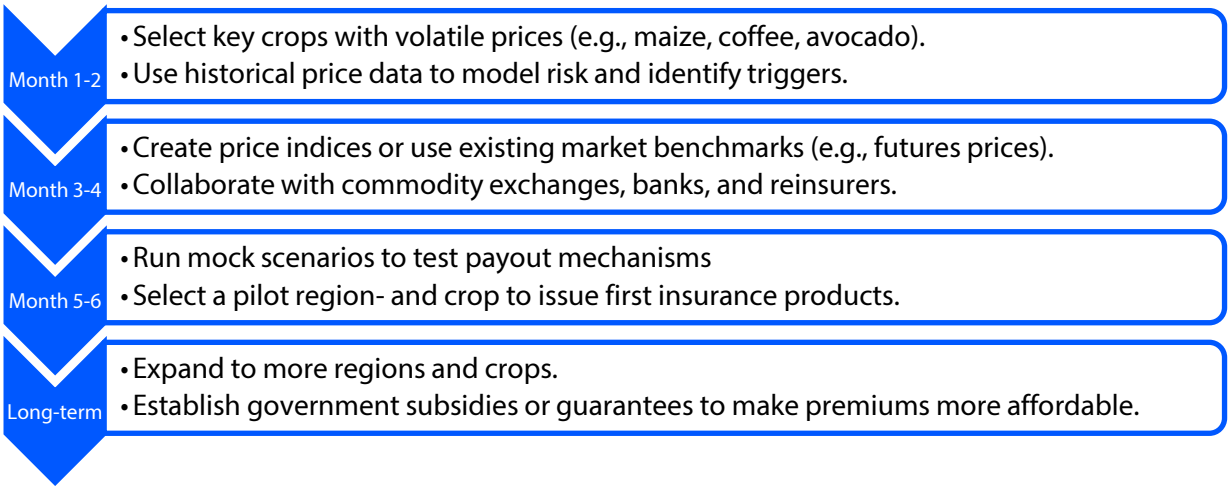


Figure 9: Suggested roadmap towards insurance for FIRA. Source: Rabo Partnerships, 2025.

8.1.3.2 Digital financial services and channels

FIRA is a pioneer with their AgriTech Nexus initiative. To further enhance the platform, various elements can be applied on the long-term:

- Enhanced digital marketplace features, such as AI algorithms to match producers with buyers based on location, product type, volume, and price references. Verified buyer/seller profiles could include ratings, transaction history, and certifications to build trust.
- Weather predictions tailored to crop cycles, and climate risk maps to visualize drought, flood, and heat risk zones to guide planting and insurance decisions.
- Digital loan origination and credit scoring, enabling faster credit approvals using farm-level data and predictive analytics.

FIRA has expressed the ambition to expand the AgriTech Nexus platform to other countries. The visited NDBs in LAC (BDP, FINAGRO, BanEcuador), have expressed interest in this.

8.1.3.3 Technical Assistance

While FIRA's TA offering is advanced, it could be even further enhanced by collaborating with international knowledge centers such as CGIAR, a global partnership of 15 international agricultural research centers focused on food, land, and water systems. Additionally, the Global Forum on Agricultural Research and Innovation, as well as international universities such as Wageningen University could be of relevance. Considering the low percentage of irrigated land in the country, this might be a special topic of attention.

Next to that, the soil tests that are currently being conducted at CDTs could be applied at larger scale and combined with macroeconomic and -agronomic data to be applied for crop suitability advice. BDP's "mapa de complejidades" and FINAGRO's "Marcos de Referencia Agroeconómicos" can be applied as examples.

The below figure shows steps that could be taken for these actions on both the short- and long-term.

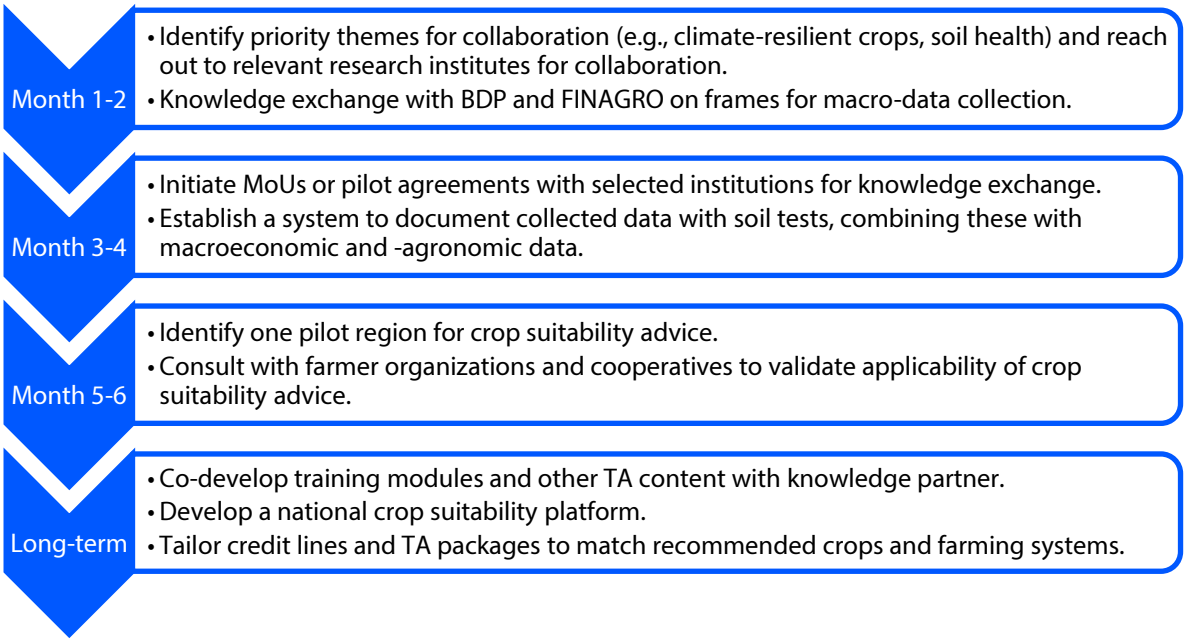


Figure 10: Suggested roadmap towards TA for FIRA. Source: Rabo Partnerships, 2025.

8.2 Bolivia

8.2.1 Brief overview of BDP

BDP was established in 1996 with the objective to reach those areas in Bolivia where other financial institutions would not venture. Up to 2015, BDP reached its end beneficiaries via second-tier operations, through financial intermediaries. However, these intermediaries had limited coverage in rural areas, and sometimes low willingness to assume productive risk. This made it challenging for BDP to fulfil its development mandates. As such, BDP added first-tier operations to its model, allowing them to directly manage credit design, disbursement, and monitoring, often combining finance with TA. It turned out that BDP could reach rural areas more easily through first-tier operations.

Now, ten years later, 80% of the portfolio consists of first-tier operations. These are offered through a total of 5 branches and 38 agencies, with 28 agencies being located in rural areas. The wide distribution of the agency network in combination with external banking correspondents leads to a coverage of 297 out of 339 municipalities in the country.

The ownership of BDP is largely dominated by the Plurinational State of Bolivia, having 80% of the shares. The other 20% are owned by CAF (Development Bank of Latin America and the Caribbean). This ownership structure is not entirely reflected in the Board, where only one out of five directors (being the president) represents the State. The other directors represent CAF, the Central Bank, and public development agencies. The general management reports to the Board and is responsible for executing the bank's strategy and operations. Their composition is of technocratic nature.

Like all financial institutions in the country, BDP is supervised by ASFI, and subject to the same regulation. BDP obtains financing through various sources. Traditional financing comes from capital markets, fixed term deposits, and credit lines from both local and foreign financial institutions. Non-traditional financing includes trust funds, bonds (green, social, sustainable), and multilateral concessional loans. Going forward, BDP aims to access additional resources from climate finance institutions.

8.2.2 Hurdles to be addressed

8.2.2.1 Hurdles based on country data

The below table shows key country data that can be related to the four categories of farmer challenges as introduced in chapter 2.

Category	Indicator	Scale	Data
1. Social- and institutional hurdles	a. Adults that feel insecure about land tenure	0% (no adults feel insecure) - 100% (all adults feel insecure)	27%
	b. Strength of legal rights	0 (weak) - 12 (strong)	0
	c. Gender inequality	0 (equal) - 1 (unequal)	0.419
	d. Informal employment	0% (no informal employment) - 100% (only informal employment)	82.2%
	e. Rural adults' account ownership	0% (no adults 15+, rural, with account) - 100% (all adults 15+, rural, have account)	49%
2. Infrastructure- and market access imperfections	a. Quality of trade- and transport-related infrastructure	1 (low) - 5 (high)	2.4
3. Environmental- and climate change	a. Adults who experienced natural disaster or severe weather events	0% (no adults 15+ experienced this) - 100% (all adults 15+ experienced this)	21.4%
	b. Environmentally sustainable agriculture score	0 (environmentally unsustainable practices) - 100 (environmentally sustainable practices)	47
4. Knowledge- and technology gaps	a. Rural adults who made or received digital payment	0% (no digital payments made/received by 15+ adults in rural areas) - 100% (all adults of 15+ in rural areas made/received digital payments)	36.4%
	b. Adults who use phone/internet for weather/agri information	0% (no adults) - 100% (all adults)	6.7%
	c. Agricultural irrigated land	0% (no irrigated land) - 100% (all land is irrigated)	0.8

Table 3: Country data for Bolivia (definitions and years in Annex B). Sources: FAO, Prindex, SAM, UNDP, World Bank.

While most indicators leave room for improvement, three topics catch most attention and are considered for solution design for BDP as discussed in the next section.

First, strength of legal rights are very weak in Bolivia, indicating very limited protections for lenders and borrowers in secured transactions and insolvency proceedings. Consequently, lenders face high risks due to poor enforcement of collateral rights and weak bankruptcy protections. Small-scale farmers are particularly disadvantaged, as they lack formal land titles or collateral. It is therefore recommended for NDBs to seek alternative financing models, leveraging on e.g.,

data or other types of collateral when financing small-scale farmers, and at the same time living up to their social mandate.

Second, Bolivia has one of the highest rates of informal employment in Latin America, with 82.2% on average. Informality is especially prevalent in micro- and small enterprises which dominate Bolivia's agricultural sector. Informal workers and farmers often lack documentation, such as proof of income or formal land titles, again requiring banks to find alternative ways to secure their loans.

Last, only 0.8% of agricultural land is reported to be irrigated. This falls within a broader pattern of small-scale farmers having limited access to modern farming techniques, digital tools, and business training, limiting their productivity and ability to scale.

8.2.2.2 Hurdles based on additional insights

Additionally to macroeconomic country data, BDP's operational and strategic challenges are the below.

- While the NPL of BDP's portfolio is not extremely high with 3.8%, it is still slightly above market average of 2%. Part of the reason may be that applications are not often rejected, around 5% of the total.
- Loan approvals are slow and vary across regions. In rural branches, staff have limited digital tools, and the full credit process is carried out manually. This leads to slow credit processes that take much longer than those of other types of financial institutions. Usually the total turnaround time for microcredit is 25 days, 93 days for SMEs, 108 days for business.

Next to the challenges, we identified the below opportunities.

- In the past, BDP offered a credit guarantee structure to first-tier IFIs. This product was discontinued because of limited resources at BDP: all second-tier activities of BDP are funded from their own resources. Private FIs in Bolivia indicated to be highly interested in this guarantee again. At the moment, many of the FIs see BDP as an – unfair – direct competitor due to their subsidized lending rates. Focussing more on guarantees to de-risk the portfolio of FIs in the country could improve this position of BDP. Additionally, re-launching the credit guarantee product could help to deploy available capital more efficiently.
- BDP added first-tier activities because other IFIs were too risk-averse to finance the micro segment. However, BDP does not only cover the micro segment with their first-tier activities, but also SMEs and businesses because of risk diversification purposes. As BDP offers direct funding to all these segments, other financial institutions in the country are not all in favour of BDP's first-tier activities. BDP can offer subsidised interest rates, which can be perceived as unfair competition, and the question is whether this should be the role of an NDB. The opportunity in this case lies in a re-assessment of BDP's position.
- TA is currently merely a standalone product, and not integrated with financial product offering. Currently, TA is not offered to IFIs or indirect clients. The latter is because they want to separate potential liability for late payments from the end beneficiary to the IFI, with the IFI making a claim to BDP. BDP is afraid that if they offer TA to IFIs or indirect clients, these stakeholders will hold them accountable for things that go wrong in the yield or financial management, for example. Instead, BDP seeks independence of responsibilities and prefers not to intervene with TA for other people than their own direct clients.
- BDP would be willing to share climatological information with the IFIs (like they do with weather alerts for farmers), but training to IFIs directly is not part of their ambitions.

8.2.3 Relevant solutions for BDP

Following the playbook as explained in chapter 4 of this document, country-wide hurdles of farmers in Bolivia should be taken as the basis for solution design at BDP. Combining this with challenges and opportunities that we noted for BDP specifically, brings us to the recommended solutions in this section. The solutions are based on the instruments as described in chapter 5 and 6, which can be referred to at all times for further details.

During the on-site visit, BDP indicated to be open for joint implementation of new and improved solutions. Their formal agreement upon reading the specific proposed solutions will be sought and is required before starting the pilot activities as suggested below.

8.2.3.1 *Credit guarantees for financial intermediaries*

BDP previously offered credit guarantees but discontinued them due to funding constraints. However, FIs in Bolivia have expressed renewed interest in accessing guarantees, especially to serve rural and agricultural segments. Reintroducing guarantees would allow BDP to leverage private sector capital, reduce risk aversion among FIs, and expand outreach to underserved farmers without direct lending.

BDP's current model is predominantly first-tier, so reintroducing guarantees as part of the second-tier operations would require approval at strategic level. It was mentioned that BDP's Board has a strategic focus on first-tier lending for the coming years. However, guarantees could be presented as an effective way of making impact by leveraging on capacities of other FIs. At the same time, credit guarantees can offer security towards FIs in the country that might be lacking at the moment, due to the weak legal structures and informality as mentioned in section 8.2.2.1.

If BDP were to agree with exploring this option, the first steps towards implementation would look as presented in the below figure.

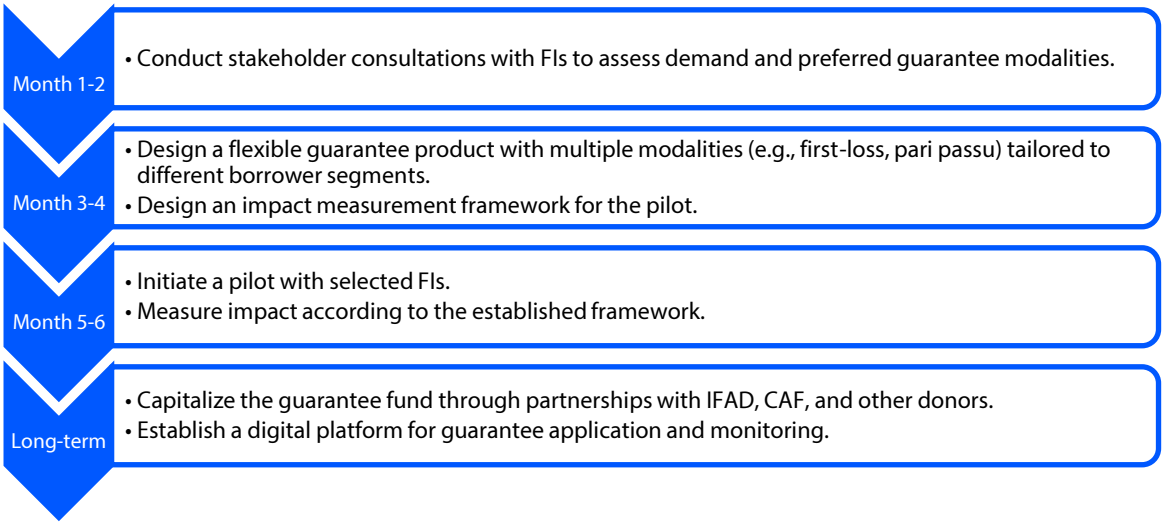


Figure 11: Suggested roadmap towards credit guarantees for BDP. Source: Rabo Partnerships, 2025.

8.2.3.2 *Digital financial services and challenges*

BDP's loan approval process is slow, especially compared to other FIs in the country. Digitization can streamline credit processes, improve turnaround times, and enhance outreach to remote areas. This would bank on an emerging trend of 36.4% rural adults who currently make or receive digital payments. The wide rural presence of BDP's branches can be leveraged for assisted digital onboarding, on the longer term leading to more efficiency.

The below figure suggests first steps towards implementation.

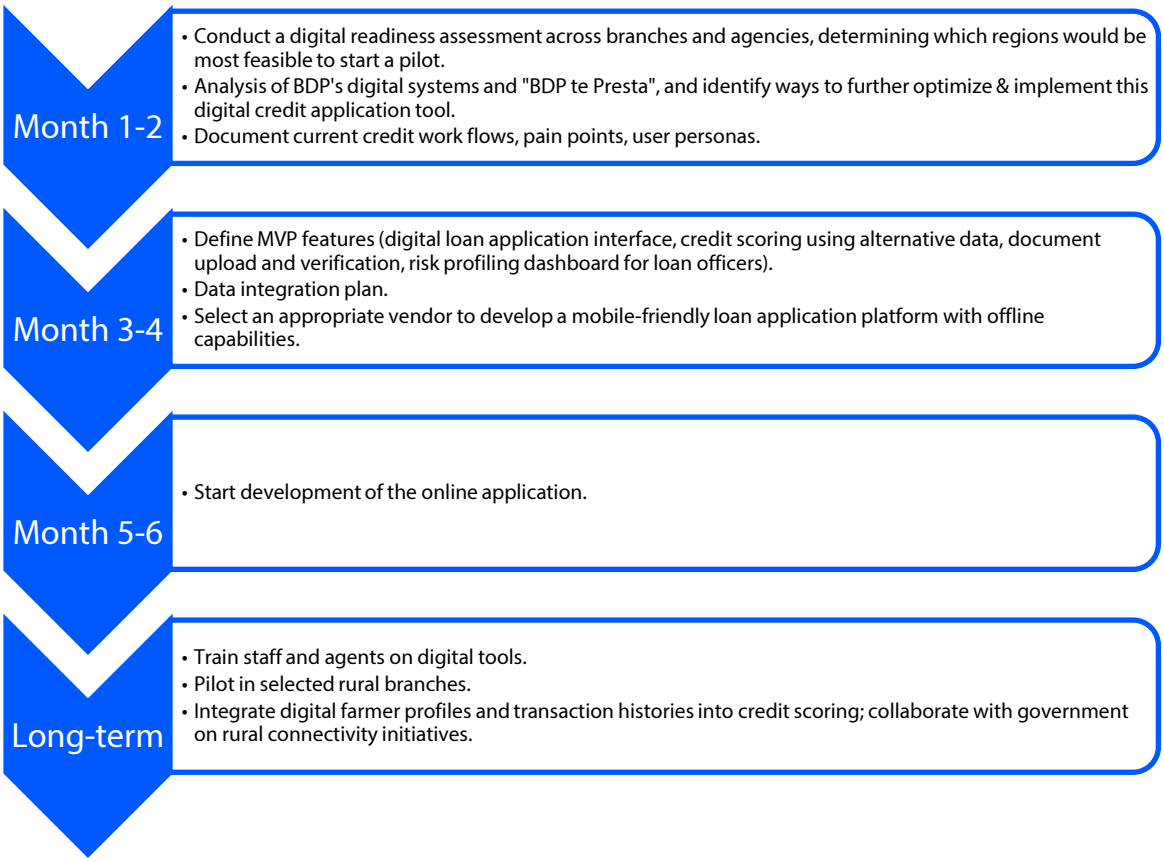


Figure 12: Suggested roadmap towards digital financial services and channels for BDP. Source: Rabo Partnerships, 2025.

8.2.3.3 Technical assistance

BDP's current TA offering includes WhatsApp alerts for farmers on weather events, which have proven useful. However, TA is currently standalone and not integrated with financial instruments. Bundling TA with credit can improve resilience and repayment capacity and reduce risk for BDP's financial portfolio.

A starting point could be to deploy BDP's agroclimatic vulnerability model more in credit decisions. The indicators could have a deciding role in credit decisions. Additionally, looking at ways to improve farmers' yields and quality of produce, crop suitability recommendations could be beneficial. This can be aligned with BDP's "mapa de complejidades", which currently focuses on economic indicators and market suitability. By adding an environmental component, this model could be more all-encompassing. Lastly, looking at the low irrigation coverage of 0.8%, this could be a specific topic for attention.

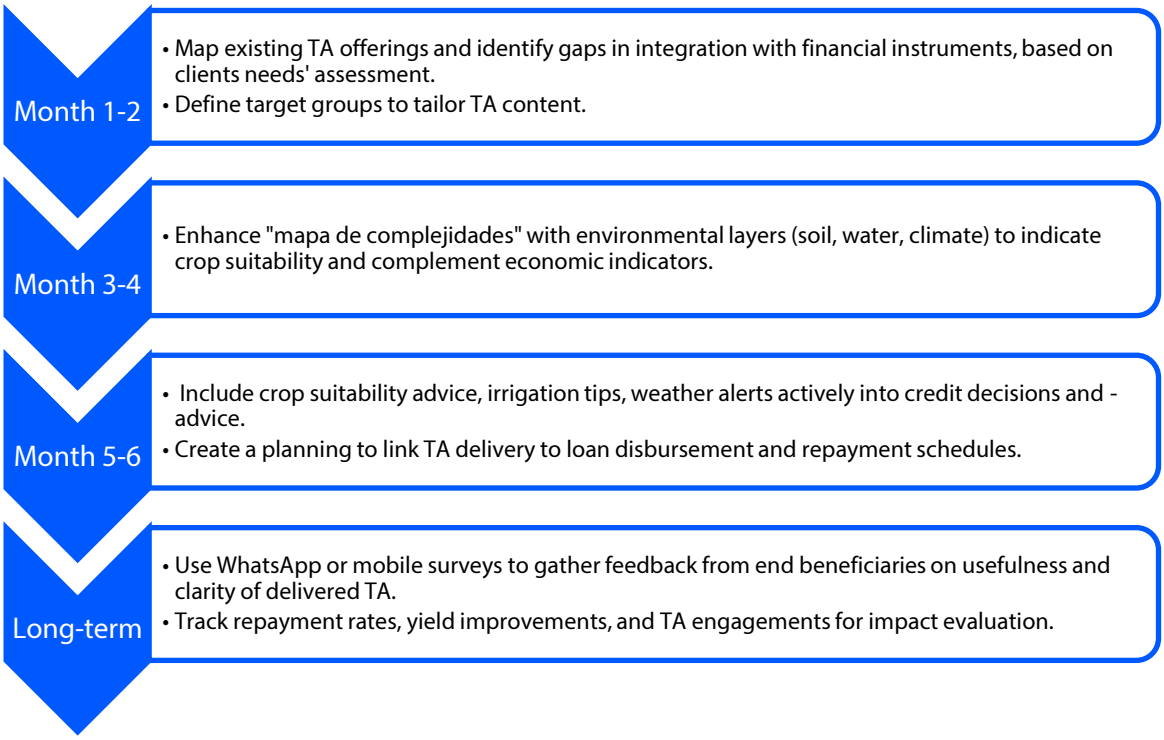


Figure 13: Suggested roadmap towards TA for BDP. Source: Rabo Partnerships, 2025.

8.3 Ecuador

8.3.1 Brief overview of BanEcuador

BanEcuador B.P. was established in 2015 to replace the defunct Banco Nacional de Fomento (BNF), which had long served as Ecuador's agricultural state bank but was closed due to inefficiencies and unsustainable lending practices. BanEcuador inherited BNF's infrastructure and portfolio but aimed to modernize operations and improve financial discipline. Its core mission is to provide direct financial services – primarily credit – to small and medium producers across agriculture, livestock, fisheries, forestry, and rural commerce. Unlike second-tier development banks, BanEcuador lends directly to clients and accepts public deposits, operating under the supervision of the Superintendencia de Bancos. However, it does not receive regular government funding and must sustain itself through loan recoveries and deposit mobilization, creating tension between its social mandate and financial sustainability.

BanEcuador maintains around 170 branches, often serving as the only bank in remote areas, and has recently taken steps to improve customer experience, such as introducing debit cards and streamlining loan applications. However, its loan portfolio has deteriorated, with non-performing loans rising to nearly 25% by early 2023. This has led to substantial financial losses and erosion of capital, threatening the bank's solvency. While BanEcuador plays a vital role in rural development, its challenge is to balance inclusive lending with stronger risk management and operational efficiency.

8.3.2 Hurdles to be addressed

8.3.2.1 Hurdles based on country data

The below table shows key country data that can be related to the four categories of farmer challenges as introduced in chapter 2.

Category	Indicator	Scale	Data
1. Social- and institutional hurdles	a. Adults that feel insecure about land tenure	0% (no adults feel insecure) - 100% (all adults feel insecure)	26%
	b. Strength of legal rights	0 (weak) - 12 (strong)	1
	c. Gender inequality	0 (equal) - 1 (unequal)	0.358
	d. Informal employment	0% (no informal employment) - 100% (only informal employment)	67.3%
	e. Rural adults' account ownership	0% (no adults 15+, rural, with account) - 100% (all adults 15+, rural, have account)	47.1%
2. Infrastructure- and market access imperfections	a. Quality of trade- and transport-related infrastructure	1 (low) - 5 (high)	2.7
3. Environmental- and climate change	a. Adults who experienced natural disaster or severe weather events	0% (no adults 15+ experienced this) - 100% (all adults 15+ experienced this)	16.8%
	b. Environmentally sustainable agriculture score	0 (environmentally unsustainable practices) - 100 (environmentally sustainable practices)	52
4. Knowledge- and technology gaps	a. Rural adults who made or received digital payment	0% (no digital payments made/received by 15+ adults in rural areas) - 100% (all adults of 15+ in rural areas made/received digital payments)	41.6%
	b. Adults who use phone/internet for weather/agri information	0% (no adults) - 100% (all adults)	2.8%
	c. Agricultural irrigated land	0% (no irrigated land) - 100% (all land is irrigated)	18.9%

Table 4: Country data for Ecuador (definitions and years in Annex B). Sources: FAO, Prindex, SAM, UNDP, World Bank.

While most indicators leave room for improvement, two topics catch most attention and are considered for solution design for BanEcuador as discussed in the next section.

First, strength of legal rights are very weak in Ecuador, indicating very limited protection for lenders and borrowers in secured transactions and insolvency proceedings. Consequently, lenders face high risks due to poor enforcement of collateral rights and weak bankruptcy protections. Small-scale farmers are particularly disadvantaged, as they often lack formal land titles or collateral. It is therefore recommended for NDBs to seek alternative financing models, leveraging on e.g., data or other types of collateral when financing small-scale farmers, and at the same time living up to their social mandate.

While the indicators for knowledge and technology gaps do not show extremely high percentages, these are above regional averages. This provides an opportunity for digital product and service development, complemented with in-person training and education.

8.3.2.2 Hurdles based on additional insights

BanEcuador's operational and strategic challenges reflect deeper structural and behavioural issues within Ecuador's rural financial ecosystem, as presented below.

- The Crédito 1% program, offering loans at 1% interest up to 30 years, was designed to promote inclusion. However, the absence of financial education and repayment enforcement led to widespread moral hazard.

Many borrowers perceived the loan as a subsidy, resulting in a surge in non-performing loans (NPLs) to ~25%. This undermines the bank's financial sustainability and erodes trust in future programs.

- Loan approval processes are slow and vary across regions. In rural branches, staff face high workloads and limited digital tools. Manual workflows dominate, leading to delays of up to 60 days, especially problematic for seasonal loans where timing is critical.
- TA is not systematically bundled with credit products. Farmers often receive financing without agronomic advice, financial literacy, or business planning support. This disconnect reduces the effectiveness of loans and increases default risk.
- BanEcuador operates in silos, with limited coordination with MAG (Ministry of Agriculture), insurance providers, and cooperatives. For example, the DINAR registry[38] is not integrated into loan origination systems, and insurance is not routinely bundled with loans. This fragmentation limits the bank's ability to offer holistic solutions.
- BanEcuador has recorded losses for three consecutive years. Programs like Crédito 1% lack budgetary compensation from the government, forcing the bank to cross-subsidize from other products. This strains its balance sheet and limits its ability to innovate, scale, or attract private co-financing.

Despite these hurdles, BanEcuador operates in an environment rich with opportunities, including the below.

- Gender-focused products such as Crédito Violeta and Súper Mujer Rural have demonstrated strong uptake, signalling demand for tailored solutions that combine credit with TA and digital tools.
- Existing TA pilots, such as Crédito Semilla, provide a foundation for scaling integrated advisory services.
- Digital infrastructure, including pre-qualified client databases and the DINAR registry, offers potential for integration and data-driven credit scoring.
- Furthermore, ecosystem actors such as MAG, FAO, and NGOs have expressed willingness to collaborate on TA and climate-resilient finance initiatives.
- Additionally, the fast-growing uptake of digital wallets like Deuna in Ecuador offer opportunities for BanEcuador to further digitize its disbursement process.
- Finally, government priorities on energy transition and rural development create space for blended finance and green products, aligning BanEcuador's mandate with national policy objectives.

8.3.3 Relevant solutions for BanEcuador

Relevant tailored solutions for BanEcuador are listed below, aligned with the seven instrument categories defined in chapter 5 and 6. The following solutions are designed to address the identified hurdles while leveraging BanEcuador's institutional strengths and ecosystem partnerships. Each solution combines financial and non-financial instruments to maximize impact.

8.3.3.1 Technical Assistance

The diagnosis revealed that repayment discipline is weak, particularly in ultra-concessional programs like Crédito 1%, where borrowers perceived loans as subsidies. This behaviour is linked to the design of the loan conditions, but also due to low financial literacy and limited agronomic knowledge. By bundling TA with credit products, BanEcuador can address these gaps directly. TA modules on crop management, budgeting, and market planning will help farmers use loans productively, reducing default risk and improving portfolio quality.

Without TA, credit alone cannot solve systemic issues such as low yields, poor market integration, and weak repayment culture. TA creates a virtuous cycle: better farming practices lead to higher income, which improves repayment capacity

[38] The national authority responsible for organizing, regulating, and managing the national system of public data registration.

and reduces NPLs. This solution also aligns with BanEcuador's strategic goal of promoting sustainable agriculture and gender equity.

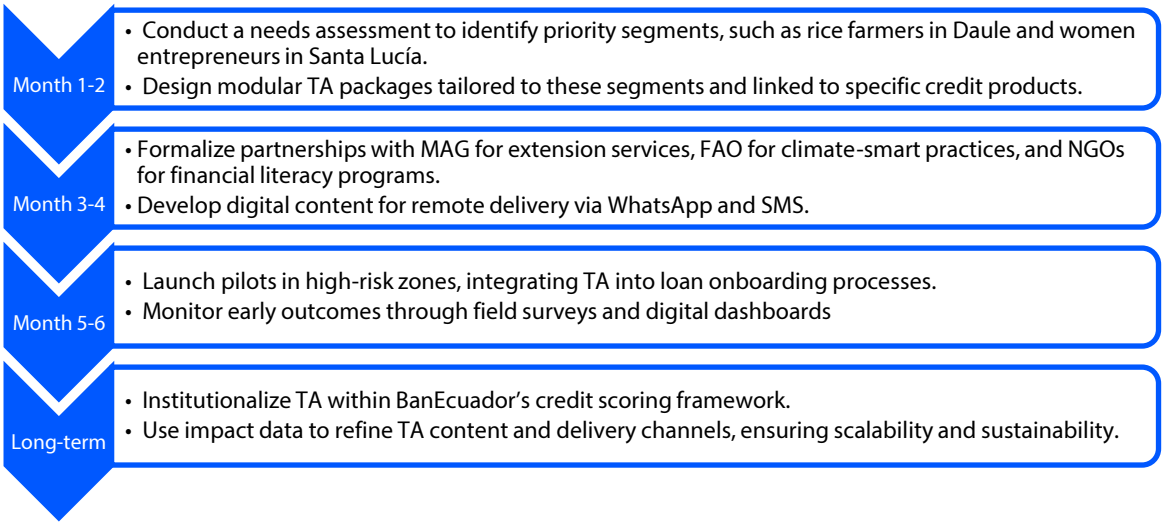


Figure 14: Suggested roadmap towards TA for BanEcuador. Source: Rabo Partnerships, 2025.

8.3.3.2 Insurance

Climate shocks threaten farmer livelihoods and BanEcuador's loan portfolio. The diagnosis revealed that less than 8% of farmers have insurance coverage, leaving them vulnerable to floods, droughts, and El Niño events. Bundling parametric insurance with credit products and subsidizing premiums through blended finance addresses this gap. It reduces systemic risk for BanEcuador while enhancing farmer resilience.

Without risk-transfer mechanisms, climate shocks can trigger widespread defaults, undermining BanEcuador's financial stability. Insurance coupled with concessional finance ensures continuity of farming operations after adverse events, safeguarding both farmers and the institution.

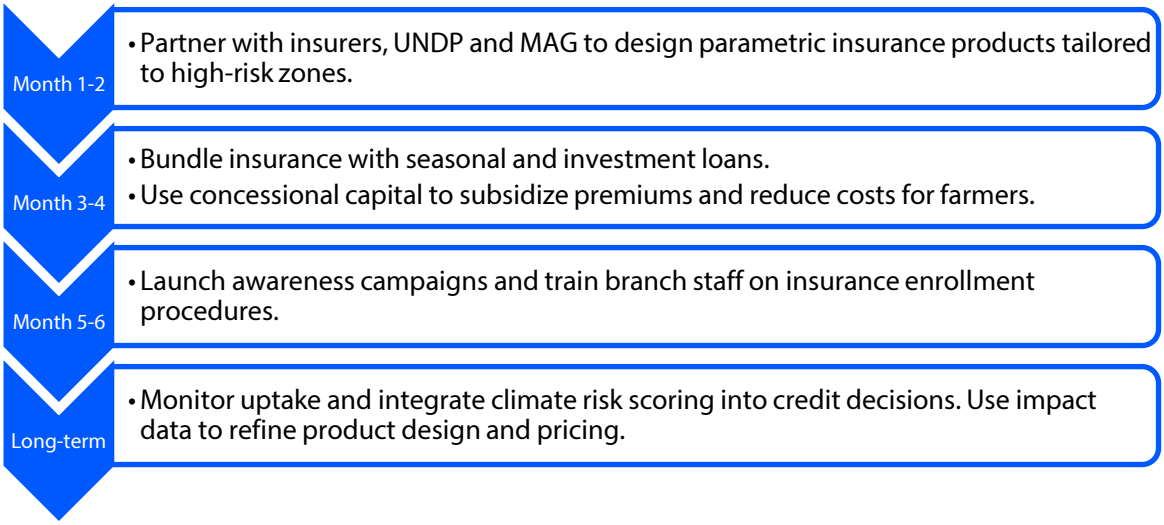


Figure 15: Suggested roadmap towards insurance for BanEcuador. Source: Rabo Partnerships, 2025.

8.3.3.3 Digital Financial Services and Channels

Slow loan approval processes and fragmented data systems were identified as major operational bottlenecks. Digitizing loan origination and integrating BanEcuador's client database with MAG's DINAR registry addresses these issues by enabling faster approvals, better targeting, and data-driven credit scoring. This solution also supports scalability and transparency, reducing operational costs and improving customer experience.

Digitalization is not just a technological upgrade; it is a strategic enabler for efficiency and inclusion. By reducing turnaround times and leveraging data for risk assessment, BanEcuador can serve more clients at lower cost while improving portfolio quality.

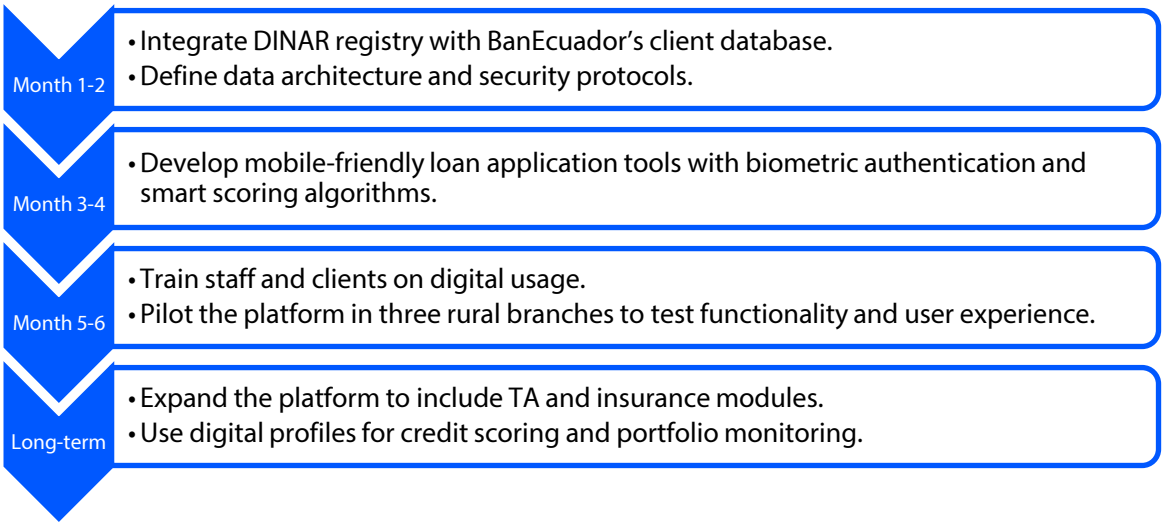


Figure 16: Suggested roadmap towards digital financial services and channels for BanEcuador. Source: Rabo Partnerships, 2025.

8.4 Vietnam

8.4.1 Brief overview of Agribank

Agribank was established in 1988 by government decree with a sole aim to serve and uplift Vietnam's agriculture sector. Continuing towards its mission over the decades, it has evolved into Vietnam's largest state-owned commercial bank with an extensive network of over 2200 branches and transaction offices. Through its countrywide reach, it serves an estimated 35 million customers, managing over VND 1.9 quadrillion in assets (approx. USD 77 billion). Over the past years, Agribank has also ventured into building itself as a full-services bank, although its core mandate remains supporting agriculture, farmers, and rural communities to build a financially inclusive rural economy. Agribank is fully owned by the state and reports to the State Bank of Vietnam. Its governance includes a board of directors, a supervisory board and management team for leading day to day operations.

Agribank offers an array of financial instruments catering to the needs of rural and agriculture linked segments including loans for groups (group-lending), purchase of agriculture machinery, loans for agricultural and rural development policies, and preferential loans for poor districts. Over 65% of its loan book is dedicated to smallholder farmers and cooperatives, and large portion of the bank's clients are in the major agriculture zones. For other clients that are harder to access such as in mountainous regions and low-income households in remote communes, it has strategic partnerships with grass root organizations like the Women's Union, Farmers Association and Veterans' Association to build extend its outreach.

Agribank's partnerships with organizations such as Farmers association is also one of the crucial pillars of its group-lending model, that extends credit to individuals who lack conventional collateral. This model leverages social collateral,

peer accountability, and local monitoring to reach over 1.2 million borrowers organized into more than 62,000 lending groups.

8.4.2 Hurdles to be addressed

8.4.2.1 Hurdles based on country data

The below table shows key country data that can be related to the four categories of farmer challenges as introduced in chapter 2.

Category	Indicator	Scale	Data
1. Social- and institutional hurdles	a. Adults that feel insecure about land tenure	0% (no adults feel insecure) - 100% (all adults feel insecure)	8%
	b. Strength of legal rights	0 (weak) - 12 (strong)	8
	c. Gender inequality	0 (equal) - 1 (unequal)	0.299
	d. Informal employment	0% (no informal employment) - 100% (only informal employment)	68.6%
	e. Rural adults' account ownership	0% (no adults 15+, rural, with account) - 100% (all adults 15+, rural, have account)	67.4%
2. Infrastructure- and market access imperfections	a. Quality of trade- and transport-related infrastructure	1 (low) - 5 (high)	3.2
3. Environmental- and climate change	a. Adults who experienced natural disaster or severe weather events	0% (no adults 15+ experienced this) - 100% (all adults 15+ experienced this)	9.9%
	b. Environmentally sustainable agriculture score	0 (environmentally unsustainable practices) - 100 (environmentally sustainable practices)	61
4. Knowledge- and technology gaps	a. Rural adults who made or received digital payment	0% (no digital payments made/received by 15+ adults in rural areas) - 100% (all adults of 15+ in rural areas made/received digital payments)	59.5%
	b. Adults who use phone/internet for weather/agri information	0% (no adults) - 100% (all adults)	11.9%

Table 5: Country data for Vietnam (definitions and years in Annex B). Sources: FAO, Prindex, SAM, UNDP, World Bank.

While some indicators for Vietnam convey notable progress, there are significant opportunities for improvement specifically across rural and agriculture related indicators on account ownership, digital payments and irrigated land (where there is no recent data available).

Additionally, while the indicator on land tenure insecurity is comparatively better in Vietnam, it is to be noted that that Vietnam presents a unique situation where all land is owned and managed by the Government. The citizens are issued Land Use Rights Certificates (LURCs), which are legally recognized and transferable, and could hence provide the perception of lower risk of private land grabs. For small farmers, it was indicated during our stakeholder interviews, that very limited number of small farmers have LURC that they can use to get sufficient formal loan. There are two reasons understood for non-usage of LURCs by small farmers. First, nearly two-thirds of farmers cultivate less than 0.5 hectares,

which is of low collateral value to meet the credit demand and secondly, they are reluctant to use LURC as collateral since they treat it as a prized asset which they do not want risk for availing credit.[39]

Furthermore, mandated rural financial institutes largely support poverty reduction needs and not the demand for improving productivity or value. Agribank has a major share (over 40%) of lending to rural and agriculture in Vietnam. However, major portion of the credit (57 percent) to agriculture and rural areas is for less than one year, which may be insufficient to meet famers' or agribusinesses' demand for long-term investment loans for agricultural expansion related activities.[40]

These indicators are considered for solution design for Agribank as discussed in the next section. Please note that the following sections have been written with limited access to primary information and no on-site visit.

8.4.2.2 Hurdles based on additional insights

To get a better picture of where the demand and constraints of rural finance lies, the following table presents an indication of rural demand for credit), and the financial institutions addressing them in Vietnam.

Segments	Typical credit usage	Sources of finance (most prevalent to least)	Documentation needed
Lowest-income farmers with basic credit needs	Emergency needs, daily consumption, small input purchases	1. Informal lenders 2. Vietnam Bank for Social Policies (VBSP) 3. Microfinance 4. Agribank (i)	Basic identity documentation (for informal loans)
Small farmers with seasonal production needs	Seasonal farming inputs, and small livestock expansion	1. VBSP 2. Agribank 3. Microfinance	• Loan application, identity, and income related documentation, in addition to group agreements **(for group lending)** • **Collateral (land title)** for higher ticket size loans
Middle level farmers and organized producer cooperatives	Farm equipment, irrigation, small business expansion	Agribank	**Collateral (land title),** loan application, identity, business plan and income related documentation

Table 6: Rural credit demand and source of finance in Vietnam (indicative). Source: Rabo Partnerships, 2025.

For subsistence to small farmers and farmers based in remote regions, Agribank group-lending can be a viable option to meet immediate needs. Agribank offers up to VND 300mn (approximately USD 11,000), collateral free credit through their group-lending product to address the subsistence and small farmer credit demand. Each individual member of the group is reported to avail on an average VND 120mn (approximately USD 4,500).[41] Other rural focussed financial institutions such as VBSP and microfinance organizations also offer collateral free credit targeting daily consumption needs. However, group-lending is indicated to address only a portion of the lowest tier financing need and informal

[39] Source: Mekok Region Land Governance, 2022. Agricultural land accumulation and concentration in Viet Nam: policy objectives and implications for smallholder farmers.

[40] Source: The World Bank Group, 2019. Vietnam Agriculture Finance Diagnostic Report.

[41] Source: Stakeholder interviews for IFAD project– Rabo Partnerships, 2025

credit remains to be a prevalent source of finance for this tier.[42] Applying to group-lending is a tedious process and requires a lot of time to be spent by the loan application officer, and a number of documents to be submitted on part of the customer.[43] On the other hand, informal lenders can offer immediate access to cash without paperwork, credit checks, or travel. Microfinance institutions that cater to this segment only have presence in specific regions and have not expanded remote regions, especially the mountainous areas.

At the small to middle tier farming level, group-lending ticket size (without collateral requirement) may not be sufficient to meet the credit demand. Moreover, the hard requirement for collateral to avail larger ticket size loans, beyond group-lending, excludes other farmers at this tier. Farmers at this tier can be better organized and typically demand credit for improving their productivity such as irrigation systems, livestock expansion, and small-scale agribusiness development. However, most farmers do not meet the requirement for collateral (specifically land) to avail a sufficient ticket size loan at this tier. This also holds true for many farmer cooperatives that are seeking finance. As these cooperatives do not possess any land, it requires the cooperative leader to pledge their own private land (if they own it).

Beyond the availability of collateral, farmers in Vietnam face additional constraints that further limit their access to finance and ability to scale operations.

a) Lack of formal documentation and limited financial literacy: Most smallholder farmers and cooperatives operate informally, without proper bookkeeping, income statements, or credit histories. According to a previous study enquiring deeper into debt-averse farmers in Vietnam, "hassle costs" was cited as a notable reason.[44] This refers to the burden of paperwork, travel, eligibility screening, and bureaucratic procedures. Moreover, limited levels of financial literacy adds to the hassle that farmers experience while navigating loan applications.
b) Climate risk exposure: Vietnam's diverse agro-ecological zones is increasingly exposed to region-specific climate risks as elaborated below.
    i. Mekong Delta (Rice farms): It is estimated a large portion of Mekong Delta's land area is at risk of flooding and over 50,000 hectares of farmland has been affected by increasing salinity levels.
    ii. The Central Highlands (Robusta coffee and black pepper): This region has increasingly experienced droughts, affecting coffee quality and yield. The drought event in 2024 caused a major disruption to exports, due to an estimated 20% decline in production. Most of the irrigation in the region is rainfed and hence highly exposed to water shortages.
c) Compliance pressure from export markets: To build more value out of local agriculture production, Vietnam's exports are increasingly targeting high-value markets such as the European Union (EU) and the United States (US). However, these markets are demanding higher levels of compliance with sustainability, traceability, and environmental standards. While this presents an opportunity for the sector, it also requires farmers to invest in compliant production practices. Some of the key value-chains impacted include the below.
    a. Coffee and Pepper: exported primarily to the EU and US and requires Fairtrade, Rainforest Alliance, and Organic certifications. Coffee exports to the EU now benefit from zero tariffs under EVFTA, but only if certified and traceable.
    b. Seafood: The US and EU demand traceability and sustainability compliance, an addition to health safety, due to concerns over overfishing and environmental impact.
    c. Cashew and Rice: Cashew exports to the US face increasing pressure for ethical sourcing. For Rice, Japan and the EU are introducing low-emission rice certification under new sustainability protocols.

[42] Source: Migheli, 2024. Land-Use Rights and Informal Credit in Rural Vietnam.

[43] Source: Quang Do, 2022. Evaluating the Group Lending Development at the Vietnam Bank for Agriculture and Rural Development: A Case Study In Bac Giang Branch II

[44] Source: Trinh, Berg, Garces-Ozanne and Knowles, 2021. Why did they not borrow? Debt-averse farmers in rural Vietnam.

Next to the challenges, we identified the below opportunities.

- It can be established that Agribank's group-lending demonstrates a strong potential to reach subsistence farmers and can be a critical tool for addressing poverty reduction. It is also understood that agriculture in Vietnam is undergoing a transformation, which requires supporting a full spectrum of agricultural finance needs, especially for farmers seeking to scale operations with new technology, climate resilient practices or integration with high-value markets. Agribank's current position in the rural financial ecosystem allows it to become a front-runner in transitioning away from a collateral heavy model to embrace alternative credit models, climate-resilient finance, and value chain-integrated approach.
- Upgrading the group-lending model through simplification and digitization: Agribank can reduce the "hassle costs" that deter farmers from applying to the group-lending scheme. This can be implemented in a phased-wise manner. For example, using smart calculation templates for estimating income and farm productivity based on key data/questions, mobile-based screening tools to build client profile (identify, incomes, expenses and assets), and expanding the network of rural agents potentially by recruiting tech-savvy youth from rural communities, who can perform profile/income validation through mobile devices. In future iterations, the tool can also be used to share early warning signals on loan repayment risk, based on weather events using remote sensing capability.
- Introducing offtake contract-based financing product with support from a guarantee, tailored to needs of the value-chain: Agribank has the opportunity to uplift the agriculture export markets and connect more small farmers to export oriented value-chains. Using offtake contract-based finance, Agribank can support scaling-up of commercial relationships between farmers and exporters or processors to structure credit around future sales, rather than physical assets. This model can be first introduced for export-oriented value chains such as coffee, spices, rice, and seafood, and it can be tested in collaboration with exporters who closely engage with farmers. To make this offering stronger, Agribank can explore partnerships with multilateral development banks for backing the product with guarantee mechanism, and offer a TA facility for training farmers on climate resilient agriculture practices and building capacity for compliance toward global certification.
- Supporting digitization of agri value-chains through building digital farmer profiles, which also includes farm geo-data (through mapping of polygons) and farm health data via remote sensing. Farmers can then apply for a Agribank loan via a web portal, which can instantly validate profile and farm information. This same platform can also be further enhanced to build farmer transaction profile with integration of market linkages (both on farm inputs and selling to off takers). Farmers with strong offtake transactions can further be identified for offtake contract-based financing.
- Leveraging existing capabilities: Agribank's physical reach can ensure last-mile banking access for rural and remote communities, which can be leveraged to pilot simplified loan application templates and roll out digital tools for group-lending in a phased manner, starting with high-volume rural districts. Additionally, its strong partnerships with rural associations can support region specific trainings on climate resilient or certification linked practices. Lastly, Agribank can use its rich experience and knowledge of agriculture value-chains in designing credit instruments such as guarantees, to support offtake contract-based financing with farmers.
- Identifying key limitations: While there are several digital initiatives ongoing at Agribank including mobile banking, eKYC, and smart ATMs, these services are not yet fully integrated into rural lending operations, which still rely heavily on physical documentation and in-person verification. This also adds to Agribank's credit officer's workload in rural areas and limits their capacity to adequately engage with client needs such as financial literacy and conducting regular monitoring to build longer term trust. Moreover, Agribank is reported to have a low capital adequacy ratio compared to its peers[45], limiting its ability to expand credit, especially for higher-risk segments like smallholder farmers and agri-SMEs.

[45] Source: Fitch Ratings, 2023. Fitch Upgrades Vietnam's Agribank to 'BB+' on Sovereign Changes; Outlook Stable.

8.4.3 Relevant solutions for Agribank

Learning from the existing agriculture finance gaps and combining them with strengths and limitations of Agribank, we can recommend the following financial and non-financial solutions. This follows the playbook as explained in chapter 4 of this document. The solutions are based on the instruments as described in chapter 5 and 6, which can be always referred to for further details.

8.4.3.1 Guarantee fund for expanding agricultural credit to small farmers and linkage with off takers

To plug the financing gap for scaling-up demand from farmers in Vietnam, it will be crucial that an offtake-based financing product is widely available to farmers who work closely or are keen to work with traders or exporters, directly in their value-chain. Since Agribank in unable to expand such credit directly (due to low CAR), it can use a multi-partner guarantee fund integrated with TA on training farmers on climate resilient and certification complaint practices. This structure would enable broader access to credit while safeguarding farmers' only assets, such as Land Use Rights Certificates (LURCs).

The guarantee fund could be capitalized through funding from MDBs such as IFAD and the TA facility to train farmers can be supported via Agribank's own branch network or through its collaboration with women's union and farmer associations. Agribank can further support the linkage between farmers and exporters who are also keen to gain more transparency in their value-chain and expand access to export markets.

If Agribank were to agree with exploring this option, the broad phases would be implemented as presented in the figure below.

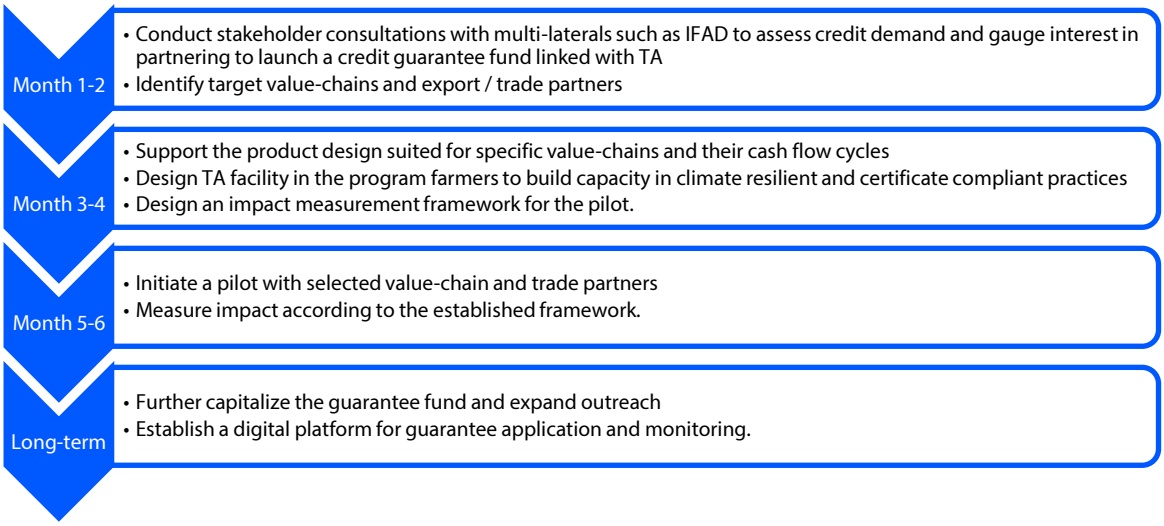


Figure 17: Suggested roadmap towards credit guarantees for Agribank. Source: Rabo Partnerships, 2025.

8.4.3.2 Digital financial services and channels - Platform for loan application and farmer profiling

Agribank can support the development of a mobile and web-based platform with an aim to digitize group lending and further support group farmers expand their operations. This foundation of the platform will be built on farmer profiles using geo-mapped farm data and remote sensing. Farmers can then use the portal to apply for loans online, with instant validation of identity, farm location, and health.

In the next phase, the portal can also integrate input suppliers and offtake buyers to track transactions, enabling tailored offtake financing based on verified market linkages. This platform can be envisioned to evolve and service multi-modal functions beyond farmer profiling and loan applications such as providing rural youth employment opportunities as digital agents to train farmers and monitor productivity, share traceability data with certification agencies and global markets, and create a nationwide warning system to identify stress signals in crop health across the country.

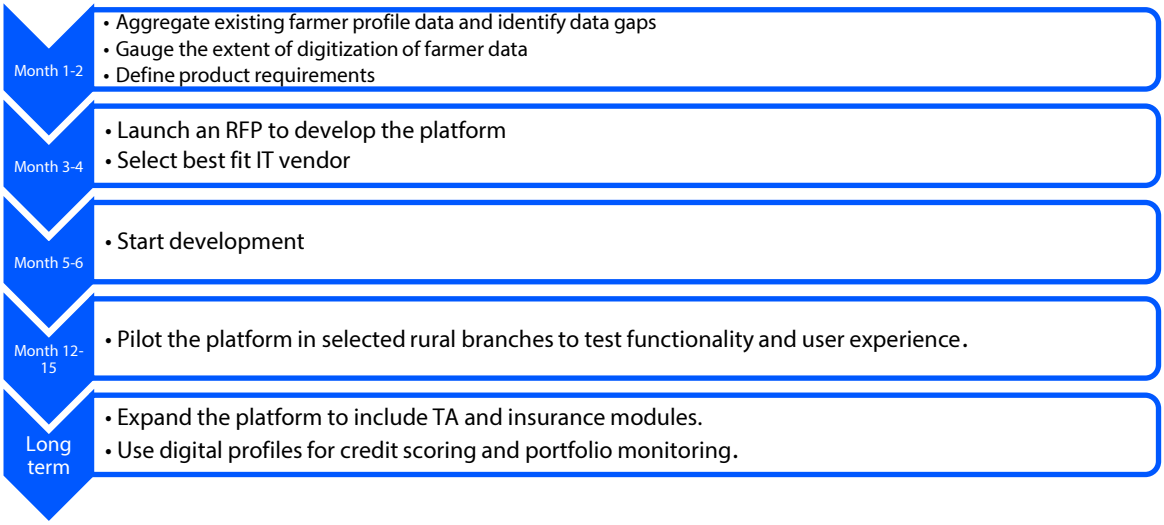


Figure 18: Suggested roadmap towards digital financial services and challenges for Agribank. Source: Rabo Partnerships, 2025.

8.5 Pakistan

8.5.1 Brief overview of SBP

The State Bank of Pakistan (SBP) is Pakistan's central bank and the primary regulator of the country's financial system, with an explicit mandate to facilitate inclusive credit allocation to priority sectors including agriculture, small and medium enterprises, and low-cost housing. SBP's role combines prudential supervision, development of enabling policy frameworks, and targeted interventions to expand formal finance into rural and agricultural markets.

SBP pursues agricultural finance through a five-pillar strategy: creating an enabling policy environment, diversifying lending instruments, introducing modern financing techniques, running farmer financial-literacy programs, and strengthening financial institutions' capacity to serve rural clients. SBP has promoted instruments such as warehouse receipt financing, value-chain financing, concessional lending facilities, credit-guarantee arrangements for small farmers, simplified loan processes, and loan-insurance schemes to reduce barriers for banks to lend to agriculture. In this capacity SBP acts very much like a national development bank, although when it comes to actual financial services it works through selected financial institutions in the country.

8.5.2 Hurdles to be addressed

The most important agricultural region of Pakistan is the Indus River Plain, especially Punjab province, followed by the irrigated plains of Sindh. Punjab and the broader Indus Plain host the largest share of arable, irrigated land, produce the country's bulk of staple and cash crops, and support the densest concentration of commercial and smallholder farming, making them the single most important agricultural region in economic and food-security terms. Climate change has begun to exert considerable pressure on Pakistan's agricultural sector, with rising temperatures, water shortages, and unpredictable weather patterns affecting both crop quality and yield. The high concentration of farmers can be considered a plus in term s of outreach and market access, yet the professional level of farming is low with only a limited set of skills available.

8.5.2.1 Hurdles based on country data

Category	Indicator	Scale	Data
1. Social- and institutional hurdles	a. Adults with insecure land tenure	0% (no adults feel insecure) - 100% (all adults feel insecure)	12%

	b. Gender inequality index	0 (weak) - 12 (strong)	0.536
	c. Rural adults with account ownership	0 (equal) - 1 (unequal)	21.1%
	d. Informal employment	0% (no informal employment) - 100% (only informal employment)	84.3%
	e. Rural adults' account ownership	0% (no adults 15+, rural, with account) - 100% (all adults 15+, rural, have account)	21.1%
2. Infrastructure- and market access imperfections	a. Quality of trade- and transport-related infrastructure	1 (low) - 5 (high)	2.2
3. Environmental- and climate change	a. Adults who experienced a natural disaster or severe weather event	0% (no adults 15+ experienced this) - 100% (all adults 15+ experienced this)	25.6
	b. Environmentally sustainable agriculture score	0 (environmentally unsustainable practices) - 100 (environmentally sustainable practices)	39
4. Knowledge- and technology gaps	a. Rural adults who made or received digital payment	0% (no digital payments made/received by 15+ adults in rural areas) - 100% (all adults of 15+ in rural areas made/received digital payments)	19%
	b. Adults who use phone/internet for weather/agri information	0% (no adults) - 100% (all adults)	3%
	c. Agricultural irrigated land	0% (no adults feel insecure) - 100% (all adults feel insecure)	52.66%

Table 7: Country data for Pakistan (definitions and years in Annex B). Sources: FAO, Prindex, SAM, UNDP, World Bank.

8.5.2.2 Hurdles based on additional insights

Small scale farmers in Pakistan (who make up the majority of farm households) face persistent, interlinked barriers that limit business growth, reduce productivity, and increase vulnerability to shocks.

8.5.2.2.1 Social and institutional hurdles

Small scale farmers in Pakistan confront a web of social and institutional barriers that limit their ability to invest, plan, and grow. Fragmented and insecure landholdings reduce economies of scale and discourage investments in soil improvement or machinery; for example, successive subdivision of a 5-acre holding can leave families farming parcels too small to justify a tractor or commercial seed purchases. Access to formal finance is weak because banks require collateral and have high transaction costs; a farmer may therefore rely on local (agro) shopkeepers for seasonal credit at high interest rates. Public services and agricultural extension services are underfunded and unevenly distributed, so many farmers never receive timely agronomic advice or support for complying with buyer standards. Gender and social norms further restrict women's access to land, credit, inputs, and markets, constraining household diversification—for instance, women may be unable to register land or travel unaccompanied to sell produce. Policy unpredictability and distorted incentives, such as sudden changes to fertilizer subsidies or procurement rules, create planning risk and can wipe out margins for small producers.

8.5.2.2.2 Infrastructure and market access

Physical and market infrastructure gaps turn otherwise viable production into low-return subsistence activity. Poor rural roads and limited transport raise the cost of getting perishables to town markets, increasing spoilage and cutting margins; a mango grower may lose a significant share of fruit on their way to a city auction because of long, bumpy transit and no cold chain. Lack of aggregation and transparent market information fragments value chains and leaves farmers dependent on intermediaries who capture most of the margin; one small vegetable producer selling single crates at the village market earns far less than nearby cooperatives that consolidate, grade, and access urban buyers. Storage and local processing facilities are scarce, so crops that could be dried, canned, or milled locally are sold raw at low prices. Inefficient irrigation infrastructure and inequitable water distribution, leaky canals, poor on-farm delivery, and unreliable tube-well access, force suboptimal cropping decisions and reduce yields. Limited formal input and output market access means many farmers buy low-quality seed or fertilizer from informal traders and sell through informal channels at depressed prices.

8.5.2.2.3 Environmental and climate change

Environmental degradation and an increasingly volatile climate are rapidly raising production risk for smallholders. Water scarcity and falling groundwater levels, compounded by inefficient canal systems, reduce the cropped area and force a shift to lower-value, drought-tolerant crops; for example, growers in arid districts may abandon water-intensive rice for millet or sorghum. More frequent extreme weather events, floods in monsoon seasons, heatwaves during flowering, and irregular dry spells, cause crop failures, secondary pest outbreaks, and large income swings that small farmers cannot easily absorb. Soil degradation through erosion, salinity buildup in irrigated plains, and loss of organic matter lowers baseline productivity and increases dependency on costly fertilizers. Changing pest and disease patterns driven by warmer, wetter microclimates raise input costs and uncertainty; a new insect outbreak can wipe out an entire vegetable season. Because insurance penetration and formal risk-transfer mechanisms are minimal, most households rely on distress coping strategies such as selling productive assets or migrating for work after a shock.

8.5.2.2.4 Knowledge and technology gaps

Low diffusion of appropriate knowledge and technologies keeps productivity and value-addition low across small farms. Many farmers still use outdated agronomic practices, timing of sowing, nutrient management, and pest control, that reduce yields and input efficiency; for instance, broadcast sowing on small plots wastes seed compared with row planting. Mechanization suited to small plots, such as two-wheel tractors, seed drills for smallholders, or pedal threshers, is often unavailable or unaffordable, so labour remains costly and slow. Digital and advisory services that deliver timely weather forecasts, market prices, or pest alerts are limited in reach and local language adaptation, leaving farmers to make decisions without crucial information. Quality inputs are inconsistently available; counterfeit or poor-quality seed and fertilizers depress yields and farmer confidence. Skills for post-harvest handling, food safety, packaging, and business planning are scarce, preventing farmers from accessing higher-value markets; a group trained in basic grading and cold-storage handling can often improve incomes by shifting from spot sales to contracted supply, but such training is seldom scaled. Finally, uptake of climate-smart practices and technologies is hindered by lack of demonstration sites, tailored financing, and small-plot designs, so even proven methods fail to spread rapidly among remote smallholders.

8.5.3 Relevant solutions for SBP

SBP has very recently launched a fully digital platform encouraging banks to roll out digital, collateral-free lending for small scale farmers. The central bank supported the National Subsistence Farmers Support Initiative (NSFSI) that provides simplified digital loans without collateral for small farmers and enables rapid disbursement and input financing through bank partners.[46] SBP has also asked commercial banks to submit multi-year expansion plans for agriculture and SME portfolios and set ambitious targets under its Vision framework to scale outstanding agri-finance and total

[46] Source: Business Recorder, 2025. Collateral free loans: SBP launches NSFSI for-small farmers.

disbursements significantly over the near term. SBP aims to sign up 30 to 40 financial institutions to participate in this initiative.

The NSFSI will enable farmers to apply for agriculture loans at a centralized digital portal, without the need to visit a bank branch. After a small entry-payment followed by necessary verifications, including psychometric assessment and agronomic assessment through Land Information Management System (LIMS), the application will be forwarded to the bank(s) chosen by the applicant for further processing. The banks will use a centralized credit scoring system for further assessment.

A key feature of the NSFSI is the closed-loop or in-kind disbursement of at least 75 percent of the financing to ensure provision of the quality inputs (seed, fertilizers, pesticides and diesel etc.) to the farmers from reputed agri-merchants on-boarded by banks by using a QR-code, while up to 25 percent can be disbursed in cash to meet other farming expenses. The system is created to disburse loans up to USD 3560 and are repayable over six months with a 30-day grace period.

To make the portal and mobile app more accessible and user-friendly for farmers, the NSFSI has been rebranded as "Zarkhez-e", accompanied by the tagline "Asaan Digital Zarai Qarza", meaning *Easy Digital Agricultural Loan*. This name and tagline will be consistently used across all communication and awareness efforts to enhance recognition and engagement among rural users.

8.5.3.1 Credit guarantees for financial institutions

The financing extended to small and marginalized farmers under NSFSI will have a 10 percent first loss coverage in line with a Risk Coverage Scheme installed by the Government for small farmers. Participating financial institutions will also be entitled to operational cost subsidy of USD 35 per borrower for net increase in the number of outstanding borrowers. The SBP has announced to encourage the financial institutions to fully leverage the end-to-end digital solution for providing financing to the subsistence farmers.

SBP's regulatory and facilitation work aims to expand the number and diversity of institutions serving agriculture, including specialized banks, commercial banks, microfinance banks, Islamic banks, and microfinance institutions, and to contribute to sustained growth in agricultural credit. The central bank's emphasis on digital payments, agent networks, and fintech collaboration is intended to deepen rural outreach, lower transaction costs, and improve farmers' access to timely credit and risk-management products.

If SBP were to agree with exploring this option, the broad phases would be implemented as presented in the figure below.

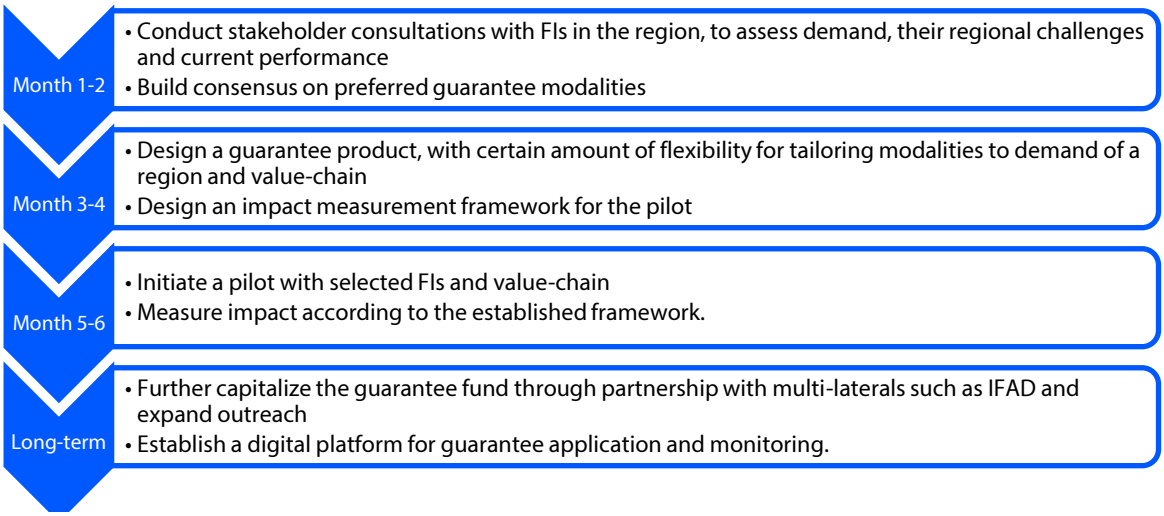


Figure 19: Suggested roadmap towards credit guarantees for SBP. Source: Rabo Partnerships, 2025.

8.5.3.2 Digital financial services and challenges

The Zarkhez-e is an initiative aimed at promoting collateral-free financing for the small farmers through tech-enabled end-to-end digital process & delivery channels for provision of quality inputs to farmers to raise their agricultural yields and support rural uplift.

To enhance the adoption and impact of the Zarkhez-e initiative, the initial focus should be on building outreach among partner financial institutions and simplifying access for agents, who can support in onboarding of small farmers. Furthermore, strengthening institutional capacity of participating banks in terms of having trained staff members and robust IT systems will ensure smoother delivery of the desired adoption. The end-to-end system should be initially piloted with selected partner banks to identify gap and test system capability before scaling up the initiative's geographic and crop coverage. And finally, embedding continuous feedback and adaptive learning mechanisms will help refine the initiative over time.

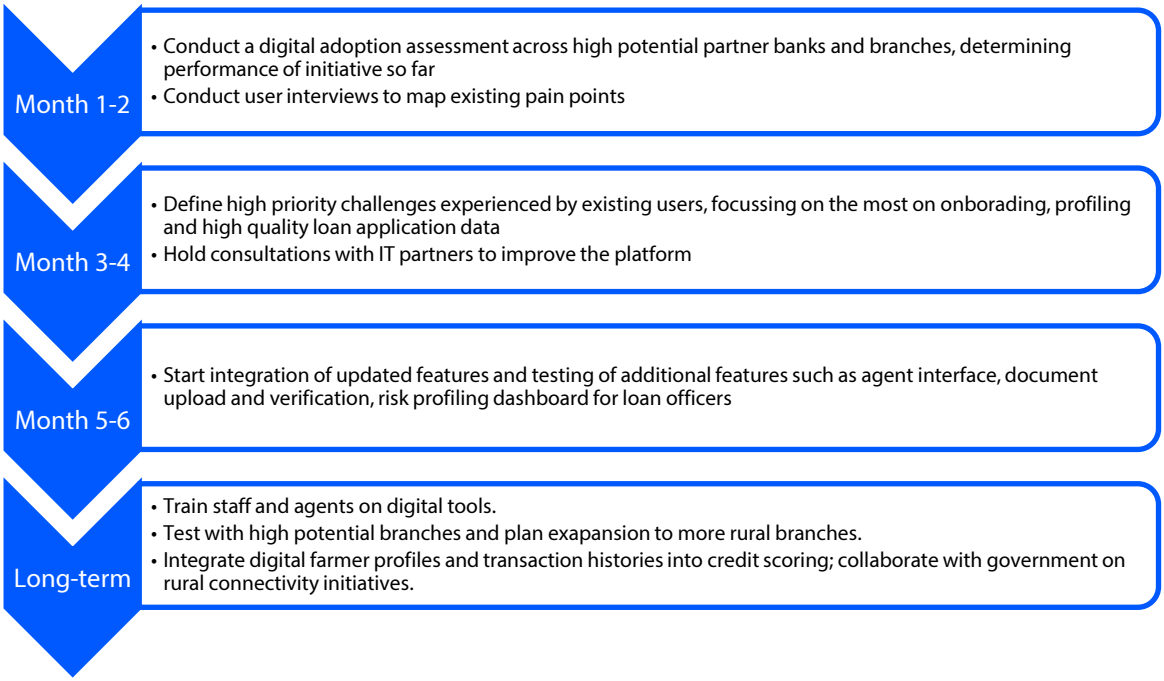


Figure 20: Suggested roadmap towards digital financial services and channels for SBP. Source: Rabo Partnerships, 2025.

8.5.3.3 Technical assistance

Farmers using financing under Zarkhez-e will also be provided agri-advisory services for improving their crop productivity. To ensure a seamless and uniform rollout across the financial sector, SBP has developed a standardized Process Flow consultation with the financial institutions.

SBP's combined policy, programmatic, and market development actions aim to increase formal finance penetration among smallholders, reduce reliance on informal credit, and support productivity gains through timely input finance and risk mitigation tools. Continued emphasis on digital lending channels, warehouse and value-chain finance, credit guarantees, and financial-literacy outreach is central to scaling sustainable rural finance solutions across Pakistan.

The NSFSI is a strong example of how a multitude of challenges faced by small scale farmers can be addressed by a coordinated action plan involving multiple stakeholders. The digital approach should warrant cost efficiency and scalability, which is needed for reaching out to millions of small-scale farmers. However, it also requires farmers to adopt these new technologies in a rapid pace.

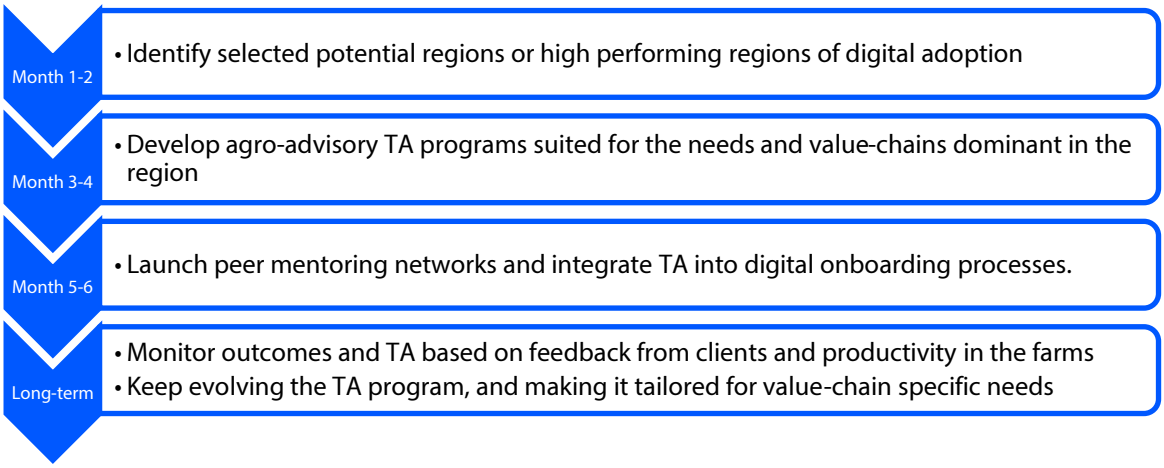


Figure 21: Suggested roadmap towards TA for SBP. Source: Rabo Partnerships, 2025.

8.5.3.4 Solutions for financial institutions in Pakistan

As discussed, SBP plays a pivotal role in shaping enabling policy frameworks and implementing targeted interventions to expand formal financial services into rural and agricultural markets. To deepen this understanding, it is valuable to explore how the proposed solutions align with the needs and capacities of the financial institutions expected to adopt them.

To this end, a workshop will be jointly hosted with selected financial institutions in Pakistan. This session will provide a platform to gather insights on the relevance, feasibility, and potential uptake of SBP-designed solutions. The feedback and learnings from this workshop will be incorporated into this section to enrich the analysis with practical perspectives from key stakeholders.

8.6 The Philippines

8.6.1 Brief overview of LBP

The Land Bank of the Philippines (LBP), established on August 8, 1963, is a government-owned financial institution with a mandate to promote inclusive rural development.[47] As the country's largest agricultural lender, LBP has a dual role as both a first-tier and second-tier lender allowing it to directly finance individuals, enterprises, and government projects, while also extending wholesale loans to partner institutions such as rural banks, cooperatives, and microfinance organizations. In 2023, it reported USD 12.43 billion in outstanding loans for agriculture, fisheries, and rural development, with 99.9% disbursed directly to end beneficiaries.[48] While its direct lending may overlap with MFIs and rural banks, LBP also plays a complementary role by offering wholesale funds and capacity-building support to these partners. LBP's role is largely institutional and programmatic as its direct lending is tied to government programs and

[47] Source: LBP, n.d. Land Bank of the Philippines | History.

[48] Source: LBP, 2023. Annual Report.

involves more documentation and eligibility criteria which could be harder to comply with for smallholder farmers. Nonetheless, its dual approach helps expand financial inclusion and strengthen the broader rural finance ecosystem.

The bank's sectoral priorities - agriculture, fisheries, and rural development – are shaped by its mission, regulatory mandates, and alignment with national development goals. In 2023, 47.15% of its loan portfolio supported small farmers, fisherfolk, and agrarian reform beneficiaries, while 34.5% went to local government units for infrastructure and public service projects.

LBP's funding sources include USD 51.84 billion in deposits (64% from the National Government), capital infusions, and investment income. It maintains a strong capital base of USD 5.04 billion, supported by a record net income of USD 753.03 million. It also accesses external funding through partnerships, syndicated loans, and grants, such as the USD 10 million from the Green Climate Fund for climate adaptation projects. These funding mechanisms enable LBP to support their lending programs particularly in agriculture and sustainable development. With a Net Funding Ratio of 151.13%, LBP demonstrates robust liquidity and sound risk management, though this may also suggest conservative capital utilization.

8.6.2 Hurdles to be addressed

8.6.2.1 Hurdles based on country data

The below table shows key country data that can be related to the four categories of farmer challenges as introduced in chapter 2.

Category	Indicator	Scale	Data
1. Social and institutional hurdles	a. Adults that feel insecure about land tenure	0% (no adults feel insecure) - 100% (all adults feel insecure)	56%
	b. Strength of legal rights	0 (weak) - 12 (strong)	1
	c. Gender inequality	0 (equal) - 1 (unequal)	0.351
	d. Informal employment	0% (no informal employment) - 100% (only informal employment)	68%
	e. Rural adults' account ownership	0% (no adults 15+, rural, with account) - 100% (all adults 15+, rural, have account)	46.5%
2. Infrastructure and market access	a. Quality of trade- and transport-related infrastructure	1 (low) - 5 (high)	2.2
3. Environmental and climate change	a. Adults who experienced natural disaster or severe weather events	0% (no adults 15+ experienced this) - 100% (all adults 15+ experienced this)	77.5%
	b. Environmentally sustainable agriculture score	0 (environmentally unsustainable practices) - 100 (environmentally sustainable practices)	55
4. Knowledge and technology gaps	a. Rural adults who made or received digital payment	0% (no digital payments made/received by 15+ adults in rural areas) - 100% (all adults of 15+ in rural areas made/received digital payments)	33.6%
	b. Adults who use phone/internet for weather/Agri information	0% (no adults) - 100% (all adults)	8.7%

c. Agricultural irrigated land	0% (no irrigated land) - 100% (all land 9.27 is irrigated)

Table 8: Country data for Bolivia (definitions and years in Annex B). Sources: FAO, Prindex, SAM, UNDP, World Bank.

The high number of adults in the Philippines who have experienced natural disasters or severe weather events is primarily due to the country's geographic and climatic vulnerability. The Philippines is naturally exposed to frequent earthquakes, volcanic eruptions, and tropical cyclones, averaging around 20 earthquakes and 20 cyclones per year.

In addition to environmental risks, many Filipinos face insecurity regarding land tenure. Despite the existence of land reform programs, a large portion of the population still lacks formal titles or legal documentation to prove ownership. This issue is particularly pronounced in informal settlements and rural areas, where land is often occupied without official recognition. Even when titles are present, they may be disputed due to overlapping claims, outdated land records, or corruption within land administration systems, all of which contribute to uncertainty and vulnerability. Another social and institutional hurdle that stands out in the table is the low score on the strength of legal rights. The rule of law in the Philippines is considered weak due to a combination of institutional fragility, political interference, and systemic corruption. Factors such as limited constraints on government powers, the use of public funds frequently misused and legal processes manipulated for personal or political gain, contribute to weak legal rights. These conditions erode public trust and weaken the legal protections that should safeguard citizens' rights, including those related to land, safety, and justice.

8.6.2.2 Hurdles based on additional insights

In addition to macroeconomic challenges that impact smallholder farmers, but also make it challenging for financial institutions to function optimally, the following operational and strategic challenges within LBP where identified.

8.6.2.2.1 Funding

The dependency of LBP on government funds for agri finance and insurance, means that LBP's capacity to support farmers is closely tied to the availability and stability of public resources. When government budgets are constrained or reprioritized, LBP's ability to extend credit, insurance, and other financial services to smallholders can be significantly affected. To strengthen its resilience and impact, LBP needs to diversify its sources of funding. Opportunities for diversification could be partnering with multilateral institutions for guarantees, issuing green or social bonds, and mobilizing private sector investments through blended finance models.

8.6.2.2.2 Insurance

The Philippine Crop Insurance Corporation (PCIC) is the only institution in the country that provides agricultural insurance, with its operations subsidized by the government. For rice farmers, PCIC typically charges a premium rate of 10%. LBP plays a key role in this system, serving both as a member of PCIC's board and as an agent that helps facilitate access to crop insurance for farmers. Among the various agricultural support programs, crop insurance is widely regarded as the most impactful. It is implemented nationwide and is well known among borrowers, who are generally more familiar with it than with other forms of assistance. However, despite its reach and importance, the program faces significant implementation challenges. Insurance payouts are often delayed and difficult to access, which diminishes their effectiveness. Additionally, limited government funding means that not all farmers are able to benefit from the insurance.

A further concern is the narrow scope of coverage. Current insurance schemes primarily focus on rice farmers, leaving those who grow other crops without protection. This gap poses a risk to broader agricultural resilience. Compounding the issue, this year (2025)'s unusually low rice prices have increased the likelihood of a surge in insurance claims. If the volume of claims exceeds available funds, the financial sustainability of the program could be compromised, potentially leaving it underfunded in the following year. The low rice prices and potentially underfunded crop insurance has direct implications for LBP whose agricultural lending portfolio is heavily concentrated in rice. Increased defaults due to economic pressure on rice farmers is already leading to a rise in NPLs, which will increase if crop insurance is underfunded next year.

8.6.2.2.3 Data & digital lending

LBP recognizes the significant potential for improvement in its digitization efforts. A clear example is the AgriSenso Plus loan application process for farmers, which remains entirely manual. This highlights a major opportunity to digitize not only the application process but also the broader credit assessment framework. However, before these processes can be effectively digitized, a foundational step is required: the development of a robust database that captures both operational and financial performance data of agricultural borrowers. To ensure the data is meaningful and actionable, it is essential to first identify the most relevant and predictive performance indicators. These indicators should then be integrated into a comprehensive scoring model.

Even with a robust database in place and digitized processes implemented, a key challenge remains: the level of digitalization and digital literacy among smallholder farmers in the Philippines is limited. Therefore, targeted technical and knowledge assistance will be critical to successfully implement and sustain LBP's digital transformation.

Digitization has become a strategic priority for LBP. In support of this, a Digital Innovation Department has recently been established, and collaboration with the Bangko Sentral ng Pilipinas (BSP) is being pursued to align on policy development related to digital financial services. These developments are fostering a conducive environment for innovation, experimentation (a.o. in regulatory sandbox of BSP), and the rollout of digital initiatives across the organization.

8.6.3 Relevant solutions for LBP

Some of the challenges mentioned above fall outside the scope of LBP. For example, protecting the rice market and ensuring fair prices for farmers are responsibilities that lie primarily with the government. The same applies to investments in digital public infrastructure for agriculture that can be leveraged by financial institutions.

However, there are several promising opportunities that do fall within LBP's scope. In this section, we will focus on three high-potential areas that, especially when combined, can drive significant impact: a Digital TA Platform, Digital Lending, and Insurance. As mentioned in chapter 6, the proposed solutions and innovations do not come from radically different thinking about finance, but originate from the potential of digitization.

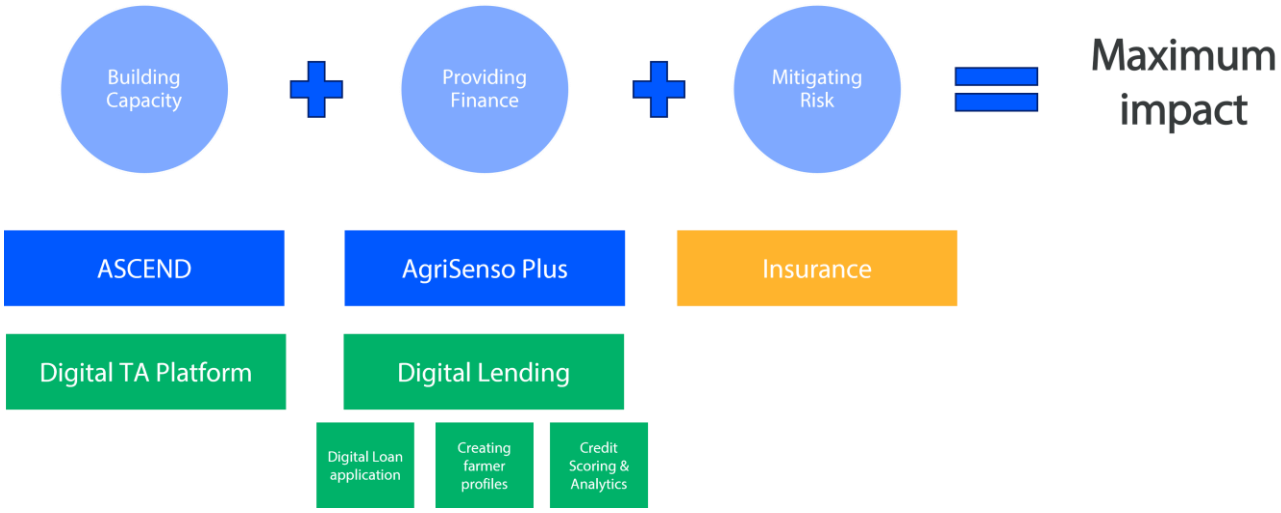


Figure 22: Building blocks for maximum impact (blue = existing, green = new, yellow = existing/partially new). Source: Rabo Partnerships, 2025.

8.6.3.1 Digital TA Platform

As mentioned earlier, one of the key challenges is the low level of digitalization and digital literacy among smallholder farmers in the Philippines. To ensure the successful implementation of LBP's digital transformation, targeted technical and knowledge support will be essential.

Currently, the ASCEND program provides mandatory training to potential borrowers before they can apply for AgriSenso Plus. While this approach is sound in theory, in practice, lending centres sometimes deliver the training themselves. Especially when farmers urgently need financing and hence need to complete a training, waiting for the official program to be conducted might not be an option. Another limitation of this one-off training model is that it does not encourage ongoing learning or peer-to-peer knowledge exchange, which are both critical for building digital confidence and resilience among farmers. Finally, offering in-person trainings is costly and hard to access for rural communities.

A digital TA platform could be a valuable solution for LBP to explore. In addition to delivering the current ASCEND training through e-learning modules and instructional videos, a digital TA platform could offer even greater value to farmers. Such a platform could provide access to digital agricultural services and personalized agronomic advice, including features like satellite imagery, crop health monitoring, and pest alerts. If LBP decides to implement such a platform, the following could serve as an initial roadmap for moving forward.

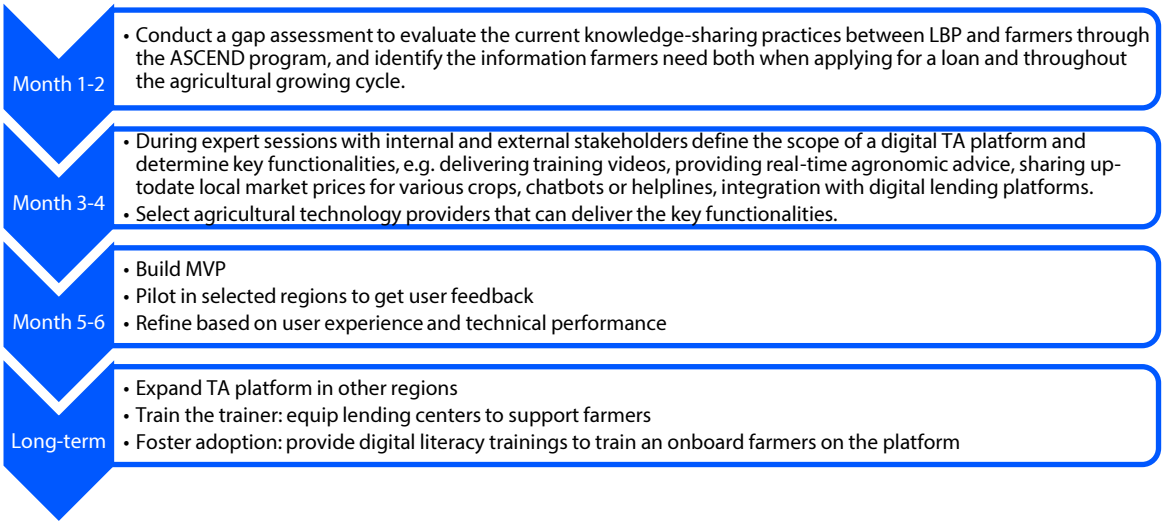


Figure 23: Suggested roadmap towards digital TA platform for LBP. Source: Rabo Partnerships, 2025.

8.6.3.2 Digital financial services and channels

As mentioned, digitization is a strategic priority for LBP and recently established a Digital Innovation Department. The department operates within the digital banking sector of LBP, which functions alongside the traditional lending divisions. It is structured into four sub-units as presented below.

1. A digital technology and innovation lab that identifies emerging technologies, analyses trends and prepares business cases.
2. A development team responsible for prototyping and testing.
3. An implementation and validation unit.
4. A fraud department.

The department leads strategy and innovation programs, aiming to digitize both new and existing banking products. The main objective is to enhance customer service through digital solutions. Initially, internal stakeholders and customer groups 'millennials and private customers' are key target groups and efforts are focused on consolidating data bases, streamlining internal processes and digitizing access to standard banking services.

However, including agricultural clients in delivering digital services is part of LBP's pipeline. Within the scope of the IFAD project, we agreed that digitizing the AgriSenso Plus program would be very interesting for LBP and aligns with their internal digital strategy. Several steps in the program could be transitioned from manual to digital processes, as listed below.

- Replacing the current manual loan application with a digital form.

- Introducing loan origination and management systems, and implementing e-KYC in place of traditional KYC procedures.
- Credit assessment could be enhanced through the development of credit scoring models and engines, potentially enriched with alternative data sources such as remote sensing Digitizing these steps would support in building sound farmer profiles.

Digitizing these components would contribute to building robust farmer profiles and improving service delivery.

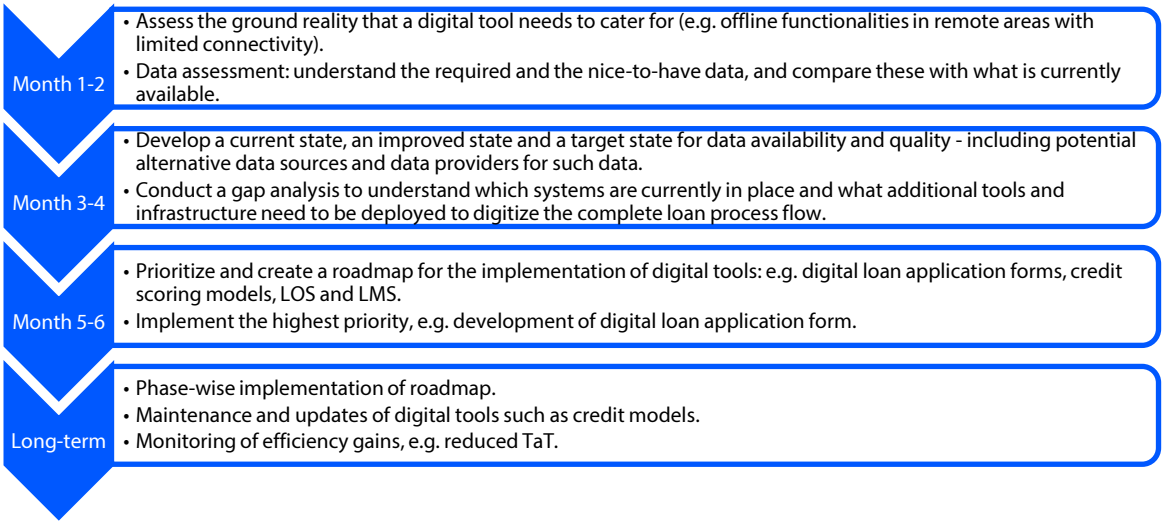


Figure 24: Suggested roadmap towards digital financial services and channels for LBP. Source: Rabo Partnerships, 2025.

8.6.3.3 Insurance

While insurance may not currently be LBP's top priority, existing schemes are largely limited to rice farmers and the available schemes may face funding challenges in the future. This presents an opportunity for LBP to collaborate with other insurers to expand coverage to other crops and livestock, as well as to enhance support for rice farmers. However, given the dominant role of the PCIC and the country's vulnerability to natural disasters, attracting commercial insurers could prove difficult. In this context, LBP could explore partnerships with multilateral organizations, such as ADB, UNDP and World Bank, to pilot innovative insurance models. For example, a livestock insurance scheme similar to the one implemented by PKSF in Bangladesh, or a weather-based crop insurance pilot, could offer promising pathways for expanding agricultural insurance in the Philippines.

9 Annex B: Definitions and sources of country data

Category	Indicator	Scale	Definition	Source	Year
1. Social- and institutional hurdles	a. Adults that feel insecure about land tenure	0% (no adults feel insecure) - 100% (all adults feel insecure)	Measures perceived land tenure insecurity.	Prindex, https://www.prindex.net/data/	2024
	b. Strength of legal rights	0 (weak) - 12 (strong)	Measures how well collateral and bankruptcy laws protect borrowers and lenders.	World Bank, https://data360.worldbank.org/en/indicator/WB_SSGD_LEGAL_RIGHTS_IDX?country=	2019
	c. Gender inequality	0 (equal) - 1 (unequal)	A composite measure reflecting inequality in achievement between women and men in three dimensions: reproductive health, empowerment and the labour market.	UNDP, https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index#/indicies/GII	2023
	d. Informal employment	0% (no informal employment) - 100% (only informal employment)	Informal employment (% of total employment; International Labour Organization; hamonized series).	World Bank, https://www.worldbank.org/en/research/brief/informal-economy-database	2020
	e. Rural adults' account ownership	0% (no adults 15+, rural, with account) - 100% (all adults 15+, rural, have account)	The percentage of respondents who report having an account (by themselves or together with someone else) at a bank or similar financial institution (see the definition for "bank or similar financial institution account") or report personally using a mobile money service in the past year (see the definition for "mobile money account").	World Bank, https://www.worldbank.org/en/research/brief/informal-economy-database	2024

2. Infrastructure- and market access	a. Quality of trade- and transport related infrastructure 1 (low) - 5 (high)		Quality of trade- and transport related infrastructure.	World Bank Logistics Performance Index, https://data360.worldbank.org/en/search	2023
3. Environment- and climate changes	a. Adults who experienced natural disaster or severe weather event	0% (no adults 15+ experienced this) - 100% (all adults 15+ experienced this)	The percentage of respondents who report they personally experienced a natural disaster or severe weather event in the past three years.	World Bank Findex, https://data360.worldbank.org/en/search	2024
	b. Environmentally sustainable agriculture score	0 (environmentally unsustainable practices) - 100 (environmentally sustainable practices)	Higher scores indicate better performance in sustainable agricultural practices from an environmental perspective.	SAM, https://research.al.umces.edu/sam/	2021
4. Knowledge- and technology gaps	a. Rural adults who made or received digital payment	0% (no digital payments made/received by 15+ adults in rural areas) - 100% (all adults of 15+ in rural areas made/received digital payments)	The percentage of respondents who report using mobile money, a debit or credit card, or a mobile phone to make a payment from an account--or report using the internet to pay bills or to buy something online or in a store--in the past year.	World Bank Findex, https://data360.worldbank.org/en/search	2024
	b. Adults who use phone/internet for weather/agri information	0% (no adults) - 100% (all adults)	The percentage of respondents who earn income from the sale of agricultural products who use a phone or the internet to access information such as weather updates, pest control, or farming tips.	World Bank Findex, https://data360.worldbank.org/en/search	2024
	c. Agricultural irrigated land	0% (no irrigated land) - 100% (all land is irrigated)	Agricultural irrigated land refers to agricultural areas purposely provided with water, including land irrigated by controlled flooding.	FAO, https://data360.worldbank.org/en/search	2021