



Frankfurt School
FS-UNEP Collaborating Centre
for Climate & Sustainable Energy Finance



**MICRO-LOANS
FOR REDUCING THE VULNERABILITY
OF SMALL AGRICULTURAL
PRODUCERS TO CLIMATE
RISKS**

2015

A PERSPECTIVE FROM THE PERUVIAN ANDES

Microfinance: A strategic ally in reducing the vulnerability of small agricultural producers

Title:

Micro-loans for reducing the vulnerability of small agricultural producers to climate risks: a perspective from the Peruvian Andes

Publishers:

United Nations Environment Programme, Regional Office for Latin America and the Caribbean / Frankfurt School – UNEP Collaborating Centre for Climate and Sustainable Energy Finance..

Coordinator and editor:

Jacinto Buenfil, MEbA Project Coordinator

Content, design, illustrations and layout:

Libélula Gestión en Cambio Climático y Comunicación.

Photographs:

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Year:

2015.

Suggested citation:

UNEP-ROLAC / FS-UNEP Centre. (2015). Micro-loans for reducing the vulnerability of small agricultural producers to climate risks: a perspective from the Colombian Andes. A document of the Microfinance for Ecosystem-based Adaptation (MEbA) project. Panama.

Climate change is increasing the intensity and altering the patterns of precipitation, reducing groundwater reserves and producing frequent droughts and flooding in the Andes. Intense rains, combined with agricultural intensification, deforestation and overgrazing, are resulting in soil erosion and less fertile land (Pérez et al., 2010). Consequently, climate phenomena together with environmental degradation processes are weakening ecosystem services that are essential for agricultural activity, thus undermining the means for making a living available to small Andean agricultural producers.

In order to deal with the various risks to which they are exposed, many Peruvian farmers complement their agricultural income by working in other agricultural operations or in non-agricultural activities. However, they typically enter low-skill, low-wage job markets. Few have access to the formal financial system, and without insurance, they seek assistance in the State's social protection networks (UNDP, 2013). Some farmers express their concern over climate change and emphasize the need to confront it proactively. Many have plans to invest in systems for increasing the productivity of their land¹ (Urquiza, 2012). However, such plans require the availability of financing to cover investment costs, and technical assistance

is crucial for the correct implementation of these systems.

Microfinance institutions (MFIs) have enormous potential for closing the gap in access to loans in rural areas, and catalysing the implementation of alternatives for reducing the vulnerability of small agricultural producers to climate change. Unlike commercial banks, MFIs specifically serve human groups that have limited economic resources and that tend to be more vulnerable. These institutions handle a high volume of transactions in small amounts, and are thus able to replicate multiple small-scale actions that translate into major changes (UNEP – ROLAC / FS – UNEP Centre, 2014).

COVER:
Potato production in terraces
Lari, Arequipa
PHOTO: Jacinto Buenfil

¹ Based on a study of the financial behaviour of rural inhabitants in Colombia, the Dominican Republic, Ecuador, Nicaragua and Peru. The field work was conducted during 2009 and 2010, and consisted of focal groups, 20 interviews in each country, and surveys of 600-745 farmers and rural micro-entrepreneurs in each country. The farmers had land plots measuring between 1 and 20 hectares.

Figure 1.

Microfinance and integrated risk management in Ethiopia and Senegal: Rural Resilience Initiative (R4) project

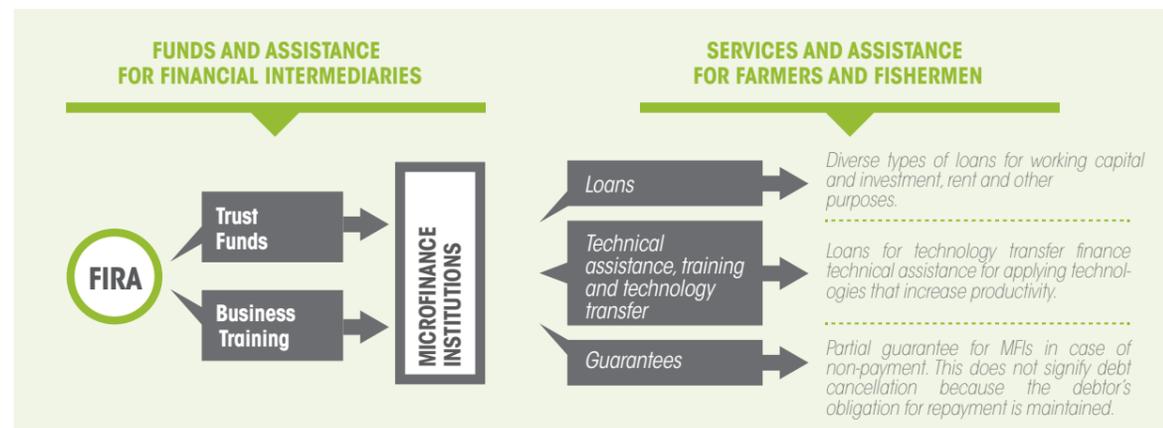
The Rural Resilience Initiative (R4) of the WFP and Oxfam America strengthens the food and income security of poor Ethiopian and Senegalese farmers through four risk management strategies:



Source: (World Food Programme and Oxfam America, 2014).

Figure 2.

Loans, technical assistance and guarantees in Mexico: An initiative with demonstrated impact



The Trust Funds Instituted in Relation to Agriculture (FIRA) are four public trust funds administered by the Mexican government to facilitate access to finance through credit and discount operations and by granting credit guarantees to projects associated with agricultural, agroindustrial and fisheries activities in rural areas (FIRA, 2014).

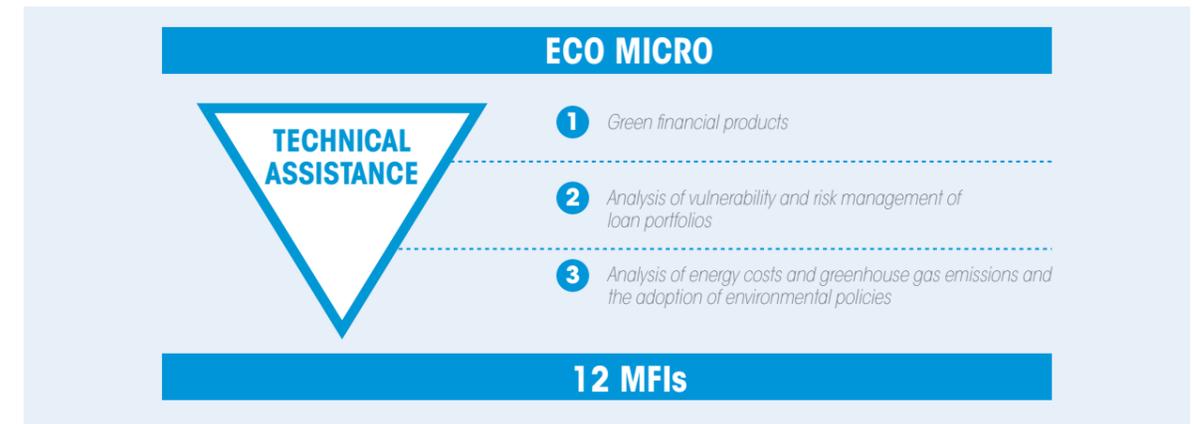
According to an experimental impact assessment, corn growers in Tlaxcala who received technical assistance and financing through FIRA's technological guarantees programme obtained yields of five metric tons per hectare, while those who did not participate in the programme obtained only 2.47 metric tons per hectare (Gamboa, 2013).

870,000 producers in the rural agro-food sector received FIRA financing in 2013 (FIRA, 2013)

Source: FIRA, 2014; developed by authors.

Figure 3.

12 MFIs reduce their own and their clients' vulnerability to climate change



EcoMicro is a programme financed by the Multilateral Investment Fund of the Inter-American Development Bank and the Nordic Development Fund. It provides technical assistance to 12 MFIs in Latin America and the Caribbean for developing "green" financial products that will enable their clients to access clean, renewable energy, increase efficiency in energy use and make investments aimed at adapting to climate change. This programme also assists MFIs in reducing the vulnerability of their loan portfolios to climate change (EcoMicro, 2015). As of August

2014, four MFIs in Latin America and the Caribbean were designing green financial products that facilitate the implementation of measures in the agricultural sector for climate change adaptation (Watson, 2014). EcoMicro was selected to receive a "2014 Lighthouse Activity Award" by "Momentum for Change," an initiative of the UN Climate Change Secretariat (EcoMicro, 2015).

Source: (EcoMicro, 2015); developed by authors.

Reservoir and reforestation

Tarma, Junín
PHOTO: Jacinto Buenfil



Ecosystem-based adaptation

Ecosystem-based adaptation (EbA) consists of the use of biodiversity and ecosystem services as part of a broader strategy for helping people and communities to adapt to the adverse effects of climate change. This focus proposes the sustainable management, conservation and restoration of ecosystems as means for increasing the resilience of ecosystems and the human groups that depend on them (CBD, 2009).

EbA options reduce the risks of disasters, strengthen and maintain livelihoods, conserve biodiversity, capture carbon and contribute to the integrated management of water resources (IUCN, 2009). In addition, EbA measures are notable for being cost effective, and thus an accessible way of reducing poverty and vulnerability to climate risks in developing countries (IUCN, 2009).

EbA measures

Ecosystem-based adaptation includes diverse measures and technologies for managing natural resources. For example, infiltration pits, filter dams, fog catchers and efficient irrigation systems help to assure water supply when drought occurs. Contour trenches and drainage systems reduce the risk of flooding, while living fences or wind-break barriers, and soil restoration, through revegetation and reforestation techniques, prevent soil erosion. Some EbA measures, such as agroecology, pest management, family orchards, and agrosilvopastoral systems contribute directly to increasing agricultural yields and ensuring food supplies (UNEP – ROLAC / FS / UNEP Centre, 2013).

EbA at multiple scales

Ecosystem-based adaptation is applied at multiple scales in ecosystems ranging from family farms to regional landscapes. There are different EbA measures, intervention mechanisms and stakeholders for every scale. At the farm level, small agricultural producers may use micro-loans to invest in an agroforestry system or in an efficient irrigation system or to produce organic fertilizer. At the local level, a municipality may allocate public funds to reforest the higher-elevation areas in a basin, thus reducing surface runoff and diminishing the risk of landslides. Also at the local level, a community may build agricultural terraces to expand the land area for agricultural use and to avoid landslides. At the regional- landscape level, a State may establish a natural protected area to protect a basin's water catchment areas. Also, the State may establish a regulatory framework for

payment for environmental services, so that water users in the lower-elevation areas of a basin economically compensate the communities located at the higher-elevation areas for adopting practices that maintain water regulation and purification services. Lastly, in order to maintain ecosystem services it is vital that the State harmonize all human activities in a territory through an effective system of environmental impact assessment and an adequate process of land-use zoning.

Successful case:

Infiltration pits recharge aquifers in Mexico

On the slopes of the Popocatepetl and Iztaccihuatl volcanoes in Mexico, the government, organized civil society and private business have installed the first rainwater harvesting field. With the construction of 162,500 infiltration pits, water can be harvested and infiltrated into the Mexico Basin aquifer (Cota, Marín & Balcazar, 2011).

Successful case:

Integrated management of natural grasslands in Peru reduces surface runoff

In Apurimac and Cusco, the Climate Change Adaptation Programme promotes integrated management of natural grasslands to reduce surface runoff and increase infiltration. These water securement systems make water available during the dry season and help to stabilize agricultural production (PACC, 2014).



The importance of markets and transportation and telecommunications infrastructure in an integrated adaptation strategy

EbA measures implemented both on farms and upstream allow small agricultural producers to obtain predictable, stable production despite severe weather. Nonetheless, in order to access financing, make sound production-related decisions and place their products on the market, small producers will need means of transportation, weather information systems, and telecommunications infrastructure. These services are the State's responsibility and are just as important as ecosystem services.

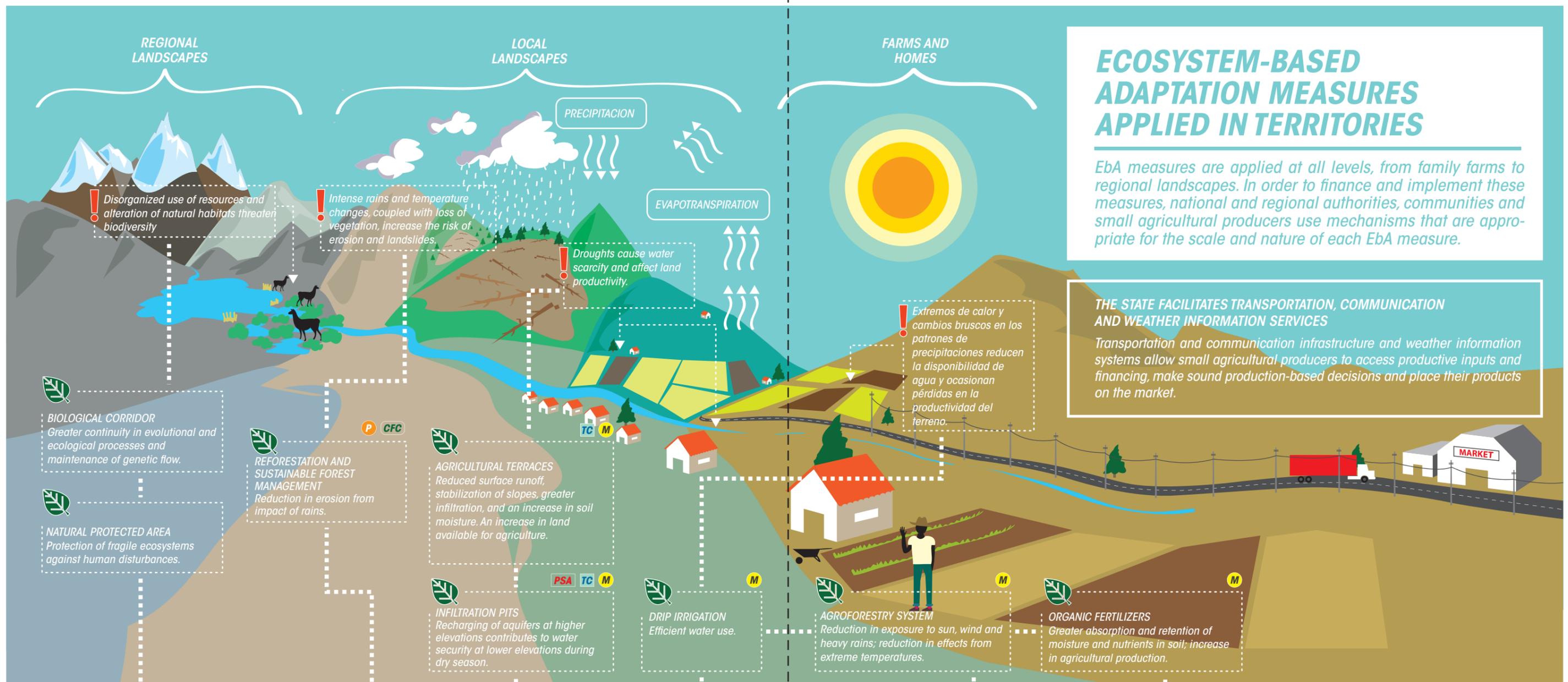
**Crops in terraces
Valle del Colca, Arequipa
PHOTO: Jacinto Buenfil**

ECOSYSTEM-BASED ADAPTATION MEASURES APPLIED IN TERRITORIES

EbA measures are applied at all levels, from family farms to regional landscapes. In order to finance and implement these measures, national and regional authorities, communities and small agricultural producers use mechanisms that are appropriate for the scale and nature of each EbA measure.

THE STATE FACILITATES TRANSPORTATION, COMMUNICATION AND WEATHER INFORMATION SERVICES

Transportation and communication infrastructure and weather information systems allow small agricultural producers to access productive inputs and financing, make sound production-based decisions and place their products on the market.



PUBLIC POLICIES SUPPORT FOR EbA MEASURES



The State protects water harvesting areas, establishing a natural protected area. To protect biodiversity, the State connects two natural protected areas with an ecological corridor.



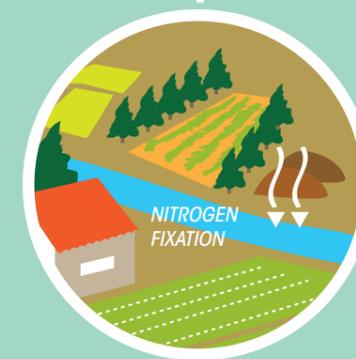
The State invests public resources and promotes sustainable forest concessions for reforesting eroded slopes.



The State establishes a legal framework for payment for environmental services.



The State facilitates microfinance by fostering availability of funds from second-tier banks, providing guarantees and offering unrestricted access to agro-climate and market information.



! THREAT / IMPACT
🌿 EbA MEASURE

MECHANISMS FOR FINANCING AND IMPLEMENTATION

- IP** Public Investment
- CF** Forestry Concessions
- TC** Community Work
- PSA** Payment for environmental services
- M** Microfinance

An enabling environment

The greatest challenges in the microfinance sector in providing services to small agricultural producers lie in the inherent risks in this sector and the high operating costs in addressing remote areas. These challenges can be overcome through the coordinated actions of a number of stakeholders and by taking advantage of information and communications technologies (ICTs).

Robust methodologies and information make it possible to understand and manage the main risks associated with small agricultural producers

The main risks confronting small agricultural producers are associated with (i) the volatility of the demand and prices of inputs and products on the market, and (ii) disturbances in productive processes, including climate-related threats. By granting loans to small producers, MFIs assume these risks partially or completely. An initial challenge for MFIs lies in determining how to estimate risks. Markets for small producers are typically scattered, and the level of integration in value chains is inadequate. Furthermore, systematized knowledge of traditional practices, soil conditions and agro-climate factors is limited. Accessing data that is accurate, systematized and updated in these dimensions is one of the major challenges for estimating risks in a reliable way.

It is only possible to minimize the major risks in a sustainable manner on the basis of a reliable, systematic estimate of such risks. Currently, unfavourable tendencies such as the appearance of pests or climate and market shocks discourage MFIs from providing services to the affected sectors. This is detrimental to even the most resilient clients, specifically those who have mechanisms for managing such risks. Clearly, the lack of systematized, detailed knowledge of clients and client segments ends up "penalizing" both resilient clients and vulnerable clients in high-risk situations. Thus, what is needed is information tailored to the needs of the financial sector, to make the focused, informed and balanced management of

risks operational. This involves having sophisticated data models that typically cannot be integrated when traditional methodologies for credit analysis are used. Data on price tendencies in different markets and crop vulnerability, as well as geo-referenced data on climate projections, soil characteristics, topography and ecosystems is available but not used.

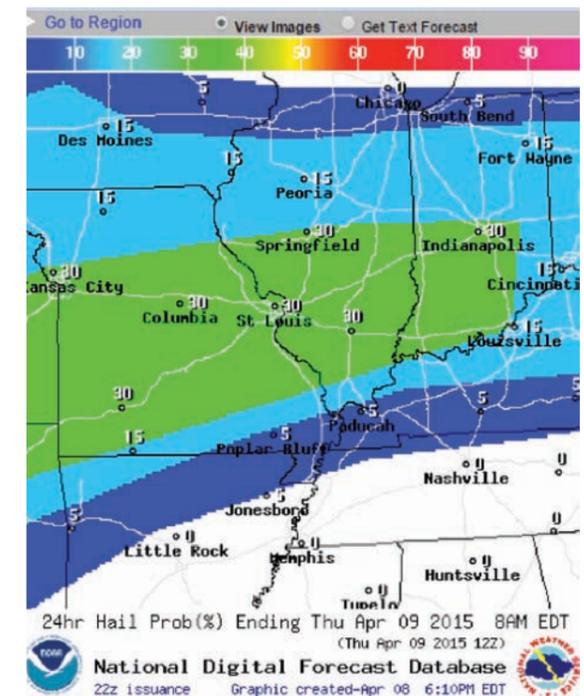
The challenge for the microfinance sector consists of accessing data in a sustained manner and at low cost, and processing and interpreting this data with support from information and communications technologies (ICTs), in order to obtain a precise understanding of clients and to provide them with services in line with their needs. After establishing risk levels and the factors generating such levels, MFIs can design loans that finance EbA measures for assuring ecosystem services and sustaining production systems. NGOs, municipalities and rural development projects may provide technical assistance on EbA technologies to small farmers, thus facilitating their correct implementation.

It is very important that the government promote and finance the generation of and unrestricted access to data regarding the market, climate and ecosystem services relevant for agriculture. As well, the government may propose incentive mechanisms for MFIs to adjust their interest rates in line with their clients' risk profiles, based on robust information on their levels of vulnerability.

Figure 5.

The US data.gov platform and Climate Data Initiative

In 2014 the US federal government launched the Climate Data Initiative, placing a formidable amount and variety of information and digital tools on climate available to the public. This information was divided into five topics: coastal flooding, vulnerability of ecosystems, resilience of food systems, human health and water. The initiative stimulates innovation and entrepreneurship in the private sector to support the country's readiness process for addressing climate change (Executive Office of the President, 2013) (DATA.GOV, 2015).



The data.gov platform contains databases and tools, with **560 databases under the "climate" classification**, many of them georeferenced, and over **125 197 databases on agriculture, businesses, climate, consumption, ecosystems, education, energy, finances, health, local government, manufacturing, oceans, public security and research** (DATA.GOV, 2015).

Source: (NOAA, 2015)

ICTs reduce operating costs and expand financial inclusion in rural areas

According to the Centre for Financial Inclusion, the primary barrier to financial inclusion in Peru is the high cost of providing financial services in remote, rural, poor areas. In response to this obstacle, new schemes in mobile banking based on information and communication technologies (ICTs) are beginning to produce results in Peru. The model aims to place financial services within the population's reach, using cellular telephones and agent banking (Clamara, Peña & Tuesta, 2014). The new Law No. 29985, which regulates the basic

characteristics of electronic money as a financial inclusion instrument, will allow the population that has been excluded from financial services to conduct financial transactions by cellular phone, thus reducing the transportation costs and time associated with accessing these services (ALIDE, January-March 2013). With this alliance between the government and communication services providers, it will be possible to continue to promote the use of ICTs in the micro-finance sector.

Guarantees and insurance assist in managing residual risks

MFIs use funds borrowed from second-tier banks to grant micro-loans to their clients. They charge a higher interest rate with the expectation of obtaining earnings. When they grant loans to small farmers, MFIs assume a portion of production and market risks. Even when risk management mechanisms are implemented, there is considerable residual risk that must be minimized in order for MFIs to offer these micro-loans for large-scale implementation of EbA measures in rural areas. This residual risk is controlled through risk transfer mechanisms such as guarantees and insurance. Insurers will be motivated to participate to the degree that there are information tools and systems for measuring and monitoring risk. It is therefore important for the government to work toward generating these enabling conditions.

Many stakeholders work in a coordinated manner so that microfinance may catalyse investments in EbA measures

MFIs are excellent strategic allies for catalysing the implementation of EbA measures and increasing the resilience of small agricultural producers. Nonetheless, MFIs encounter serious obstacles in rural areas and in order to overcome them, it is necessary for multiple stakeholders, both public and private, to work together in a coordinated manner, from the international arena to the local level.

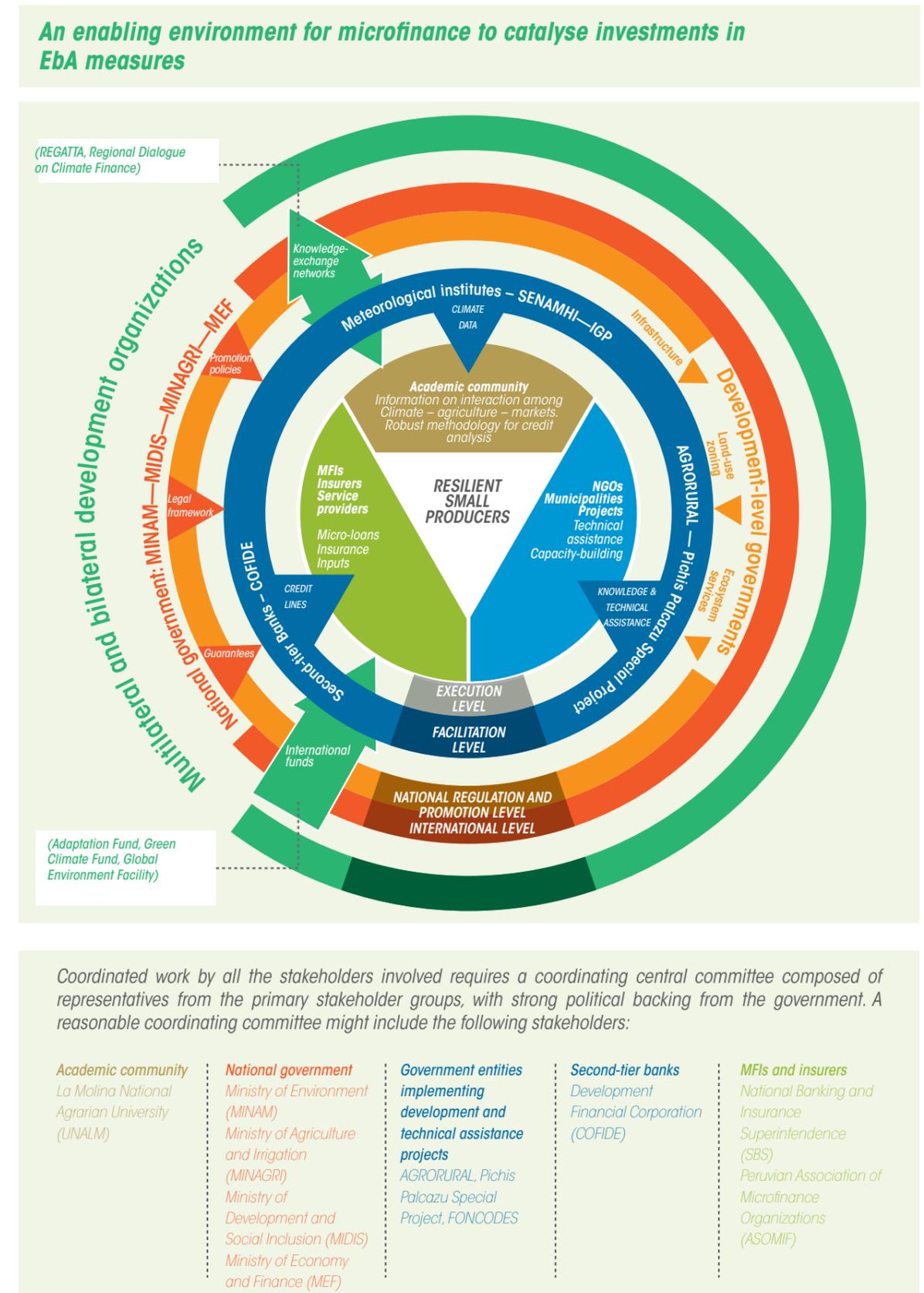
The national government is responsible for regulating the financial system. In addition it can promote microfinance and ecosystem-based adaptation through public policies, and it can facilitate the creation of credit lines for the rural sector in alliance with development banks. Within a national legal framework, regional and municipal governments are responsible for land-use zoning, infrastructure services and the implementation of projects that assure the provision of ecosystem services at regional and local levels (for example, soil conservation, reforestation and water securement projects). Second-tier banks can channel funds for MFIs through credit lines, while meteorological institutes can generate and disseminate climate data for informing better decisions on

investments in family farms as well as regional landscapes.

At a more executive level, the various national and local stakeholders can join efforts to place EbA measures within the reach of small agricultural producers. Local NGOs and municipal governments can offer technical assistance to small producers to facilitate implementation of EbA measures, whether independently or with technical support from entities responsible for carrying out national projects such as AGRORURAL, FONCODES and the Pichis Palcazu Special Project. MFIs, for their part, can finance EbA measures through micro-loans. In order to make sound credit decisions, MFIs should be able to assess the production and market risks of their clients. In this aspect, the academic community can develop a robust methodology for credit analysis based on agro-climate and market information. Also, the academic community can conduct studies on the interaction between climate and agriculture, to assist local NGOs and municipal governments in refining their technical assistance services.

Throughout this process, multilateral and bilateral development organizations provide funds and facilitate the exchange of knowledge with other countries, with the aim of orienting initiatives toward success.

Figure 6.



Source: Developed by authors.

Microfinance and ecosystem-based adaptation in national policies and programmes

Public policies are the primary mechanism for promoting any development process. There are various policy instruments that may serve as a framework for promoting microfinance as a strategic ally in promoting ecosystem-based adaptation.

National Adaptation Plans (NAPs)

National Adaptation Plans (NAPs) are national policy instruments that have been promoted since COP17 in Durban. Their purpose is for developing countries to identify their adaptation needs in the medium and long term, and to plan strategies and programmes for addressing these needs. The instrument is focused on integrating adaptation to climate change into national development plans (Least Developed Countries Expert Group, 2012). Also, in accordance with the final decisions from COP20, held in Lima, the Green Climate Fund will be an important source of financing for formulating and implementing NAPs (United Nations Framework Convention on Climate Change, 2015). If Peru decides to develop a NAP and include initiatives that promote microfinance, ecosystem-based adaptation and the corresponding enabling conditions (guarantees, ICTs, insurance, funding, climate information, technical assistance, etc.), it will be taking an important step in promoting sustainable adaptation by Andean small farmers.

Programme for Assistance to Small and Micro Enterprises (PAME)

FONCODES' Programme for Assistance to Small and Micro Enterprises (PAME) provides public treasury funds in the form of loans to MFIs to enable them to assist small agricultural producers and micro-entrepreneurs who are surviving in poverty or extreme poverty conditions in marginalized urban and rural areas and who do not have access to formal banks (FONCODES, 2014; Coriat, 2014).

There are three components of PAME resources: loans, guarantees and technical training and assistance. During the first half of 2014, twenty-five MFIs granted 20,096 loans for a total amount of S/. 59.8 million, with an average loan amount of S/. 3,158 (FONCODES, 2014).

MFIs allied with PAME assess their clients according to their own credit analysis methodologies which, as explained earlier, may fail to precisely recognize the risk factors faced by their clients. There is a great opportunity to train these MFIs in applying robust methodologies for credit analysis that are based on agro-climate and market information, and supported by information technologies. This will diminish the risk of non-payment for MFIs. And in some cases it might be possible to lower the interest rate and expand loan coverage. The State can facilitate the training process, providing free climate information to MFIs associated with PAME and promoting support from the academic community to develop and disseminate the methodology.

Table 1.

PAME summary	
Programme coverage	21 regions 137 provinces 794 districts
Loans granted as of June 2014	20,096 loans S/. 59.8 million
Number of participating MFIs	25 ²
Funding rate ³	Varies between 3% and 7% annually, according to MFI risk rating.

Source: (FONCODES, 2014) and developed by authors.

2. Participating MFIs are: IDER César Vallejo, FONDESURCO, Cártilas Felices, AMA, IDESI Ayacucho, Edaprospe, MIDE, ADIRA, Compartamos, Proempresa, Nueva Visión, Solidaridad, Raíz, Los Andes Cotarasi, Prestasur, San Martín de Porres, Norandino, Creditorida, Santo Cristo de Bagazán, San Francisco, Nuestra Señora del Rosario, Santa María de Magdalena, Virgen de las Nieves, Credinka, Los Andes S.A.

Table 2

Policy instruments for use in promoting microfinance and ecosystem-based adaptation in Peru				
Policy instrument	Current/Potential	Entity responsible for instrument	Description of instrument	Importance of instrument for promoting microfinance for EbA
National Adaptation Plan	Potential	MINAM	Establishes national adaptation priorities; proposes specific actions with time periods and responsible entities; facilitates access to international funds for achieving national adaptation goals.	If the NAP proposes microfinance as one of the financial instruments for EbA, it will facilitate obtaining international financing for this purpose and will promote EbA as a strategic guideline.
National Programme for Managing Climate Change	Potential	MINAM	Tests initiatives for climate change adaptation and mitigation; and promotes their large-scale implementation, channelling financing.	This instrument may generate strategic alliances among MFIs, technical assistance providers, government development programmes and other potential allies through a multi-sector platform.
Programme for Assistance to Small and Micro Enterprises	Current	FONCODES	Provides funds to 25 MFIs for loans, guarantees and technical assistance and training for large-scale rural development.	MFIs may apply robust methodologies for credit analysis based on agro-climate and market information. This could reduce the risk of non-payment and expand micro-loan coverage.
Programme for Responsible Investments	Potential	COFIDE	Promotes a sustainable national financial system.	EbA investments may obtain a lower risk rating and can expect better acceptance in the country.

Sources: (Least Developed Countries Expert Group, 2012); (United Nations Framework Convention on Climate Change, 2015); (United Nations, 2015); (FONCODES, 2014); (Coriat, 2014); (Avendaño, 2014); developed by authors.

National Programme for Managing Climate Change (PRONAGECC)

The National Programme for Managing Climate Change (PRONAGECC) is a multi-sector platform and mechanism that guides, channels, facilitates and advises the formulation, financing and implementation of public and private (or mixed) climate change projects. In its initial phase, PRONAGECC will provide follow-up to pilot projects for adapting to climate change and will promote alliances for implementing them at a large scale, with participation by public and private actors. Based on the results from the pilot phase of the Microfinance for Ecosystem-based Adaptation (MEbA) project, (4) PRONAGECC's multi-sector platform may promote strategic alliances among MFIs, technical assistance providers, government development programmes and other potential allies. These partnerships may assist in expanding the use of micro-loans for implementing EbA measures at the family farm level.

Programme for Responsible Investments (PIR)

The Programme for Responsible Investments (PIR) is an initiative of the Development Financial Corporation (COFIDE) created for implementing a set of principles promoted by the United Nations for building a sustainable global financial system by considering environmental, social and governance risks. Investments that minimize negative and maximize positive socio-environmental impacts will be more sustainable and more beneficial in the long term (Avendaño, 2014). When these principles are established, investments in ecosystem-based adaptation processes should obtain a lower risk rating and can expect better acceptance in the country.

3. The funding rate is the interest rate the MFI is charged by the trust fund.

4. More details on the MEbA project can be found in the last section of this document.

Microfinance for Ecosystem-based Adaptation (MEbA) project

The MEbA project's mission is to offer options for sustainable management of ecosystems and their services through microfinance products and services. The central objective is to increase climate change resilience among the Andean population in Colombia and Peru, consisting primarily of small agricultural producers.

The project is focused on integrating a better understanding of climate risk into microfinance credit methodology. Risk information does not only assist MFIs in improving their risk management, but it is also valuable information for clients. Farmers are presented with options for ecosystem-based adaptation that will assist them in decreasing climate and production risks through improved agricultural practices, income diversification and maintenance of the ecosystem services that support their activities. This leads to greater stability in farmers' economic flow, and consequently, financial risk for MFIs is diminished (UNEP – ROLAC / FS – UNEP Centre, 2014).

The MEbA project is financed by Germany's Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and is

implemented by UNEP, with assistance from the Frankfurt School – UNEP Collaborating Centre for Climate and Sustainable Energy Finance. In alliance with three Colombian MFIs (Crecamos, Bancamía and Contactar) and two Peruvian MFIs (Solidaridad and Fondesurco), the MEbA project is piloting EbA practices and credit methodology, in anticipation of scaling up this model through many other MFIs in the future.



Potato farmer
Ichupampa, Arequipa
PHOTO: Jacinto Buenfil

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Reforestation nursery

Tarma, Junín

PHOTO: Carlos Membreño

For more information, visit:
<http://www.pnuma.org/meba>

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Content and design developed by:
Libélula Gestión en Cambio Climático y Desarrollo



Frankfurt School
FS-UNEP Collaborating Centre
for Climate & Sustainable Energy Finance



Supported by:



Federal Ministry
for the Environment, Nature Conservation,
Building and Nuclear Safety

based on a decision of the German Bundestag

