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CLIMATE CHANGE LATIN AMERICA AND THE CARIBBEAN

*RISKS FOR THE MICROFINANCE
SECTOR AND OPPORTUNITIES FOR
ADAPTATION*

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Commissioned by >
Inter-American Development Bank



The background of the cover is a close-up photograph of a vibrant green leaf. Several clear, spherical water droplets are scattered across the leaf's surface, some in sharp focus and others blurred. On the right side, a small, realistic globe of the Earth is partially visible, showing blue oceans and green landmasses. The overall composition is clean and nature-oriented, symbolizing environmental themes.

CLIMATE CHANGE

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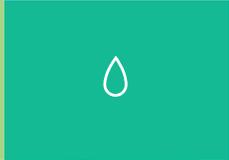
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[01

I N T R O D U C T I O N



01

INTRODUCTION

CLIMATE CHANGE (CC) CONSTITUTES ONE OF THE MAJOR CHALLENGES THAT THE WORLD FACES IN THIS CENTURY, SINCE IT CAN MARK BACKWARD MOVEMENT IN THE LEVELS OF HUMAN DEVELOPMENT AND PUT AT RISK THE MILLENNIUM GOALS, ESPECIALLY IN DEVELOPING COUNTRIES LIKE THOSE OF LATIN AMERICA AND, EVEN MORE SO, IN POOR AND VULNERABLE COMMUNITIES.



The poor population is the group most vulnerable to CC due to the fact that, in many cases, it lacks appropriate infrastructures to allow for optimal use of existing resources or protection from extreme events. In general, this population has less access to information, has less technology and fewer financial resources, and resides or works in areas of high risk in terms of CC (dry zones, with high probability of flooding, such as riverbanks or mountain passes, etc.).

Therefore, CC, more than an environmental problem, is a serious problem for development. Due to the fact that the impacts of CC are diverse and complex, they have the potential to affect social and production sectors, including the microfinance sector, from a multitude of spheres. CC can impact Microfinance Institutions (MFIs) directly and indirectly. The direct damage comes from the impact of extreme climate-related events in the infrastructure and

daily operations of MFIs. The indirect damage, in turn, is the result of the MFIs' own clients' vulnerability to CC. If CC affects the MFIs' clients, their payment capacity for loans and financial services could be limited.

ON THE OTHER HAND, MFIS HAVE PROVEN CAPABLE OF PENETRATING RURAL AND POOR SEGMENTS BY PROVIDING FINANCIAL SERVICES AND HAVE MANAGED TO MEET THE NEEDS OF THOSE MORE VULNERABLE AND REMOTE SEGMENTS.

MFIs have the potential to contribute to adaptation to CC, since they can facilitate instruments that increase their clients' capacity to respond to these changes. Among other things, they are capable of financing the purchase of assets to reduce their vulnerability. Due to their profound knowledge of the needs and characteristics of the vulnerable segments, MFIs even become a source of privileged information when implementing specific adaptation measures.

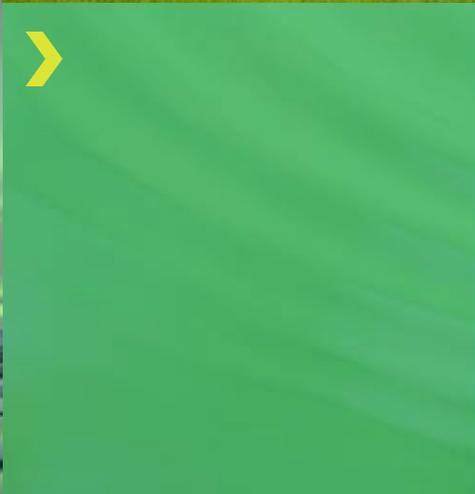
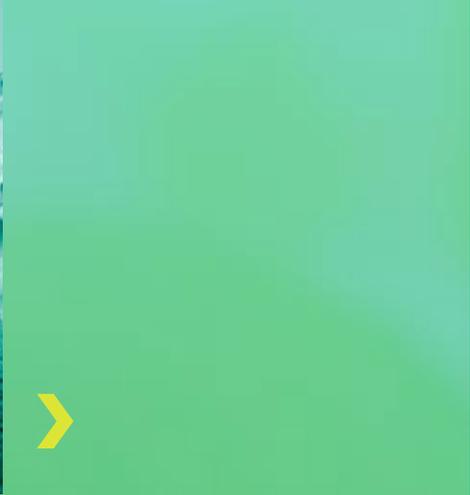
Likewise, climate change can represent an opportunity for MFIs. The growing pressures exerted by CC on the various sectors of development and local or rural communities, require innovation in technical, infrastructure-related and financial solutions in order to adapt to them, thus creating an important niche for the development of MFIs, whether through appropriate products or new partnerships and strategic collaborations.

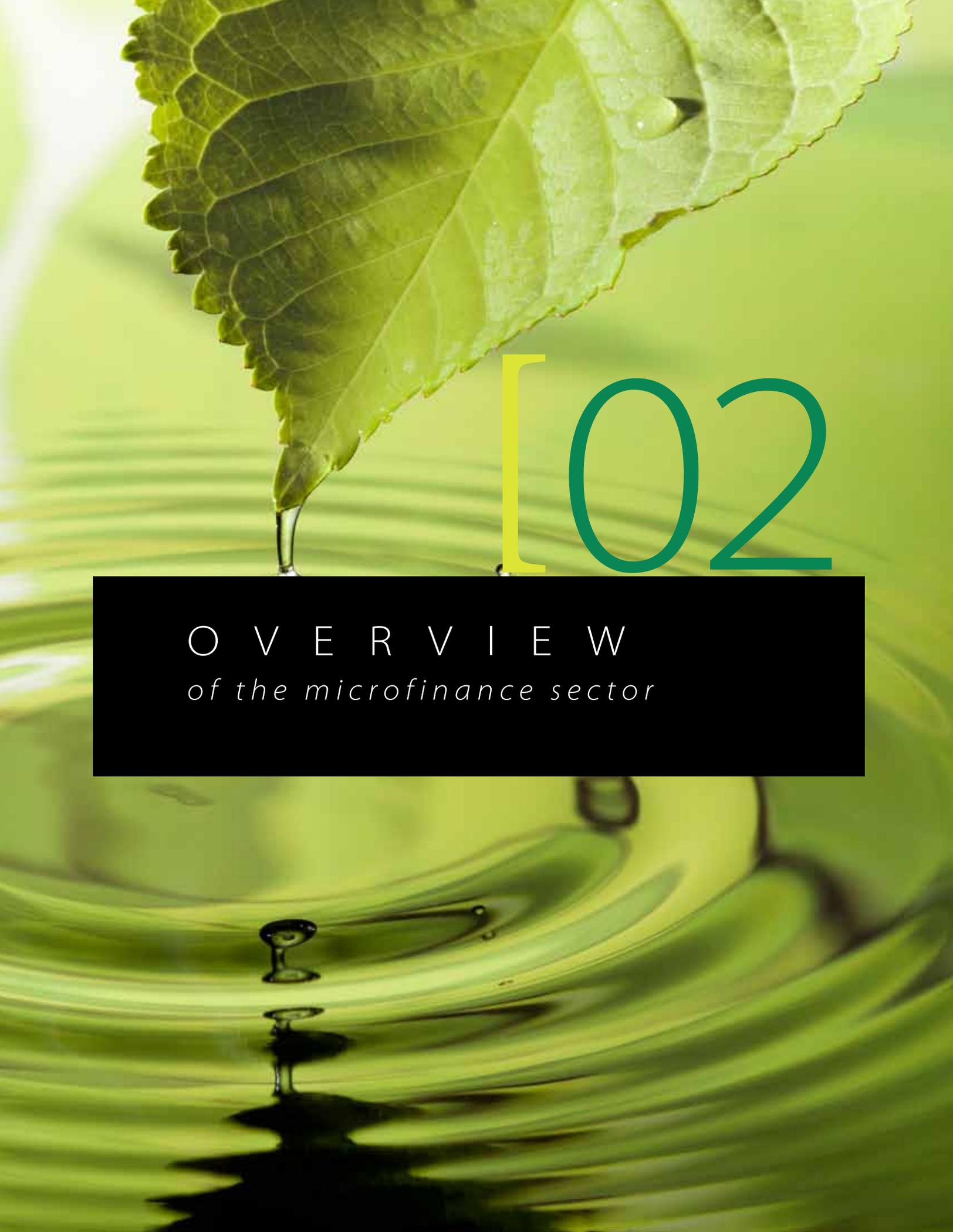


Although microfinance services are not the sole alternative for promoting adaptation to CC, they have the opportunity and capacity to provide incentives for it, in order to reduce the vulnerability of both their portfolio of clients and the MFIs themselves, in addition to satisfying the growing technological and financial needs occasioned by the impact of CC with innovative financial services.

Therefore, the purpose of this study is to show how microfinance services may undergo the impacts of CC, to analyze the opportunities available for MFIs and to propose concrete actions. This paper was commissioned by the Inter-American Development Bank (IDB) in coordination with the Sustainable Energy and Climate Change Unit (ECC) and the Multilateral Investment Fund (MIF), and it was prepared on the basis of bibliographic reviews, experience in the Latin American region, and interviews that were carried out during missions in Peru and Guatemala.







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O V E R V I E W
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02

OVERVIEW

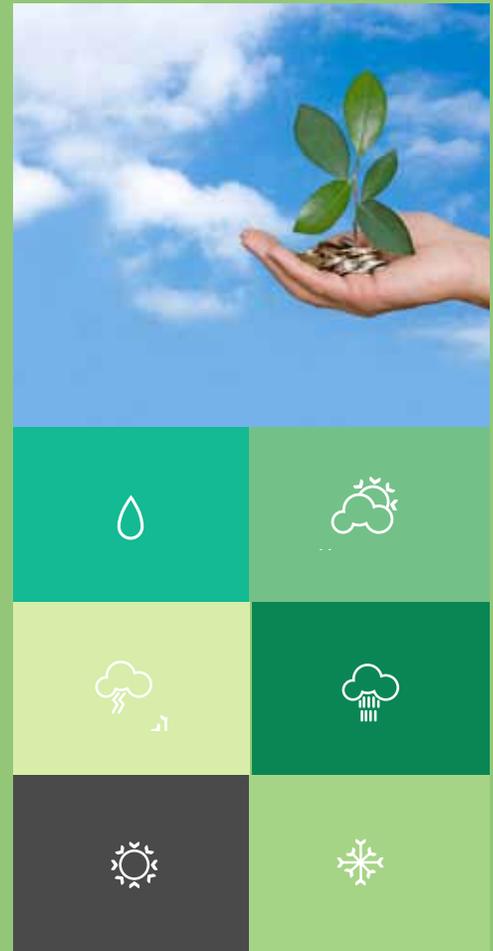
> OF THE MICROFINANCE SECTOR

2.1.

Definition and scope of microfinance

Low-income individuals generally have a hard time accessing basic financial services, since traditional financial institutions tend not to provide them with this type of services. One of the main reasons for this is that the cost of providing service to the poor is too high in comparison with the revenue that this activity would generate. Another significant reason has been the historical perception that these individuals are highly likely to default on payment, whereby addressing their financial needs has been deemed too risky. To that end, traditional banks and financial entities did not initially contemplate low-income individuals as a potential market that they wished to serve.

According to the Consultative Group to Assist the Poor (CGAP)⁰¹, which represents more than 30 donors and international foundations, microfinance is defined as an initiative geared toward offering “poor peo-



01 CGAP: Consultative Group to Assist the Poor: www.cgap.org, consulted 09/08/11



ple access to basic financial services such as loans, savings, money transfer services and microinsurance,” since, “like everyone else,” these individuals “need a diverse range of financial services to run their businesses, build assets, smooth consumption, and manage risks.”

THE ROLE OF MICROFINANCE INSTITUTIONS (MFIS) IS PRECISELY TO RESPOND TO THE DEMAND FOR FINANCIAL SERVICES FROM THE POOREST INDIVIDUALS AND THUS BE ABLE TO SERVE A MARKET SEGMENT NEGLECTED BY TRADITIONAL FINANCIAL ENTITIES.

MFIS can take on different legal forms, undertake various kinds of missions and vary considerably in size. they can also be regulated or unregulated, but all of them have the purpose of offering financial services to low-income individuals.

According to the CGAP, MFIs are defined as different types of organizations that offer financial products and services to the poor, and which range from “non-governmental organizations (NGOs); cooperatives; community-based development institutions (e.g., self-help groups or credit unions);



2.2.

Climate change (CC) threats and opportunities for MFIs

commercial and state banks, insurance and credit card companies; telecommunications and wire services; post offices; and other points of sales”.

Given that MFIs work primarily with low-income individuals who have a low level of education, they need to undertake financial education efforts targeting their clients. This allows them to increase their clients’ capacity to repay a loan and/or to have better financial management of their activities. The financial education activities targeting the poor can be developed and implemented by the MFIs themselves, by organizations independent from them, or through partnerships between both types of institutions.

Other parallel services that are not financial are also identified around the financial activity. These services cover topics like education, hygiene, health, better water management (including drinking water) optimization of agricultural production, new sources of energy access, etc. Such additional services will be of great importance to define the potential role that MFIs will play when it comes to implementing climate change adaptation measures.

MFIs have proven to be profitable, in addition to knowing how to meet the financial needs of low-income individuals. Historically speaking, the default rate in microfinance has been low in comparison with other higher-income segments, which confirms not only that low-income individuals are capable of developing satisfactory financial relationships but also that the microfinance sector’s potential for continuity is high.

However, the clients of MFIs tend to be more vulnerable to certain environmental factors. The effects of climate change, which are already being felt in the region, greatly affect individuals with fewer resources. Furthermore, the majority of





These individuals work in the zones most vulnerable to CC. Extreme climate-related events or the gradual warming of the environment increases the interruptions of their economic activities and, therefore, affects their loan repayment capacity. If nothing is done, MFIs could not only be negatively affected in their loan portfolio (indirect risk of climate change), but may also suffer serious damage to their own infrastructures if they are located in zones vulnerable to CC (direct risks). Currently, the microfinance sector is aware of these risks, but it has not yet found a way to quantify them or incorporate them into business risk management. To reduce this risk, it is urgent to integrate CC as a risk criteria in portfolios and MFI operations, and to offer clients financial products and services that

allow them to reduce their vulnerability and adapt to this change. This, in turn, will reduce the risk of MFI credit portfolios.

Likewise, the greatest challenge facing MFIs, as explained in section 2.3.2, is the saturation of urban markets, at the same time as sustainable financial models and products are lacking to serve rural areas that remain largely unattended. MFIs need to diversify their client base and offer new products to ensure their growth and sustainability in the region. Offering financial products and services that contribute to adaptation to climate change can be a great opportunity. On the one hand, the new products may help to reach new clients, increase the profitability of MFIs and reduce their vulnerability by reducing the vulnerability of their own clients.





2.3.

Evolution of the microfinance sector and its status in Latin America – Data



2.3.1.

THE GENERAL MICROFINANCE SECTOR

It is estimated⁰² that, worldwide, 4 billion people lack access to a bank account (CGAP, GSMA and McKinsey, 2008). Another more recent study shows similar figures indicating that 2.7 billion adults have no access to a bank account (World Bank, 2010). Despite this significant shortcoming, according to the 2011 report Microcredit Summit Campaign, only 190 million clients received a microcredit in 2009.

INTERNATIONAL EFFORTS TO FIND SUCCESSFUL MEASURES OF ADAPTATION TO CC INCLUDE NEW IDEAS, TECHNOLOGIES AND SOURCES OF FUNDING THAT CONSTITUTE GOOD EXAMPLES FOR MFIS IN LATIN AMERICA. AS WILL BE PRESENTED IN THE FOLLOWING CHAPTERS, CC PRESENTS OPPORTUNITY FOR BOTH MFIS AND THEIR CLIENTS.

⁰² It is difficult to obtain precise statistics on financial inclusion, they are not always reliable or available, in addition to the fact that the definition of “financial services” tends to vary, and not all MFIs report their activities.



According to the diagnostic prepared on the microfinance sector by the Multilateral Investment Fund (MIF, 2010), this reduced supply of financial services worldwide would be due to an unfavorable regulatory system and market restrictions that impede the development of some MFIs⁰³.

2.3.2.

SPECIFIC DATA FOR LATIN AMERICA AND THE CARIBBEAN (LAC) AND EVOLUTION OUTLOOK

Of the 190 million microcredits worldwide, 10,470,969 were granted in Latin America and the Caribbean (IDB, 2010), which represents 31.2% of the poorest families of the region⁰⁴. According to the Mix Microfinance World report (MIX, 2010), the greatest challenge for MFIs in the region is carrying out activities in rural areas, since only 29% of MFI clients live in these areas.

At the same time, the outlook for growth in the region of Latin America and the Caribbean is quite positive. According to The Mix Market (MIF - MIX, 2011), microfinance institutions in Latin America continued their dynamic in 2010, growing 15.9% in their portfolio and 23.3% in their deposits. The number of clients also grew, both borrowers (12.2%) and depositors (17.4%).

.....
 03 54 countries all over the world were analyzed to prepare a ranking on the greatest potential for carrying out microfinance.

04 Microcredit Summit Campaign, 2011 – Figure 6

IN ORDER TO MAINTAIN THE REGION'S POSITIVE OUTLOOK IN THE MEDIUM TERM AND TO ENSURE THAT GROWTH IN THE SECTOR IS CAPABLE OF CLOSING THE GAP BETWEEN THE SUPPLY AND DEMAND OF MICROFINANCE SERVICES, PARTICULARLY FOR RURAL SECTORS, WE WILL CONSIDER THREE RECOMMENDATIONS FOR THE MICROFINANCE SECTOR IN LAC:



01.



The LAC region simultaneously includes the countries that have the best and worst index (according to the MIF ranking (MIF, 2010)). Therefore, the first recommendation will be to focus on the countries that have the lowest ranking.

02.



The LAC region is also known for being a region where the regulatory framework still needs development. For the future, it would be a question of developing a regulatory framework that is better adapted to the sector, for example, basing ourselves on the “good practices” of countries like Peru or Bolivia.

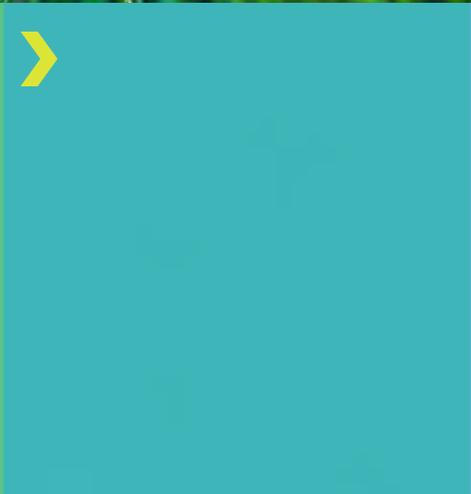
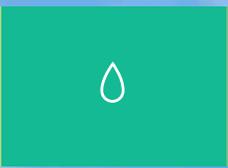
03.



The double need to include CC as one of the risks to consider in the portfolio of MFIs and to adopt CC adaptation measures urgently constitutes the third recommendation for the microfinance sector.



To those three recommendations, we can add that penetration in rural areas is the general challenge that we must tackle in order to maintain the levels of growth of MFI activities in Latin America. As will be presented in the following chapters, those areas are both a challenge and an opportunity. They are a challenge because rural areas are where there is the most vulnerability to CC. And they are an opportunity because CC offers MFIs the possibility to access this market and develop its client base and market activities in a sustainable manner.



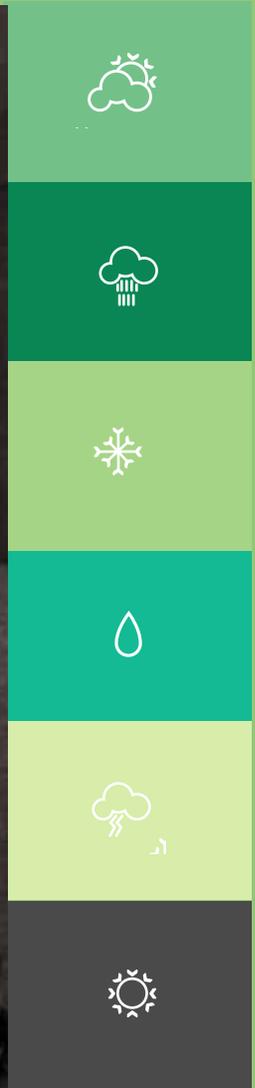
A hand is shown from the bottom, holding a small, young plant with several vibrant green leaves. The background is a clear blue sky with soft, white clouds. The overall image conveys a sense of growth, care, and environmental stewardship.

[03

WHY SHOULD
WE ADAPT THE
MICROFINANCE
SECTOR TO CC?

03

WHY SHOULD WE ADAPT THE MICROFINANCE SECTOR TO CC?





3.1.

WHAT IS CC AND WHAT ARE ITS POSSIBLE IMPACTS?

The United Nations Framework Convention on Climate Change (UNFCCC) defines CC as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods” (Article 1). It is important to note that the UNFCCC makes a distinction between “climate change,” which is attributable to human activities that have altered the composition of the atmosphere, and “climate variability,” which is due to natural causes (UNDP, 2009,a).

CC causes a series of physical climate-related events that may cause damage and which constitute its direct or indirect threats, as shown in Table No. 1.

TABLE N° 1 > THREATS OF CLIMATE CHANGE

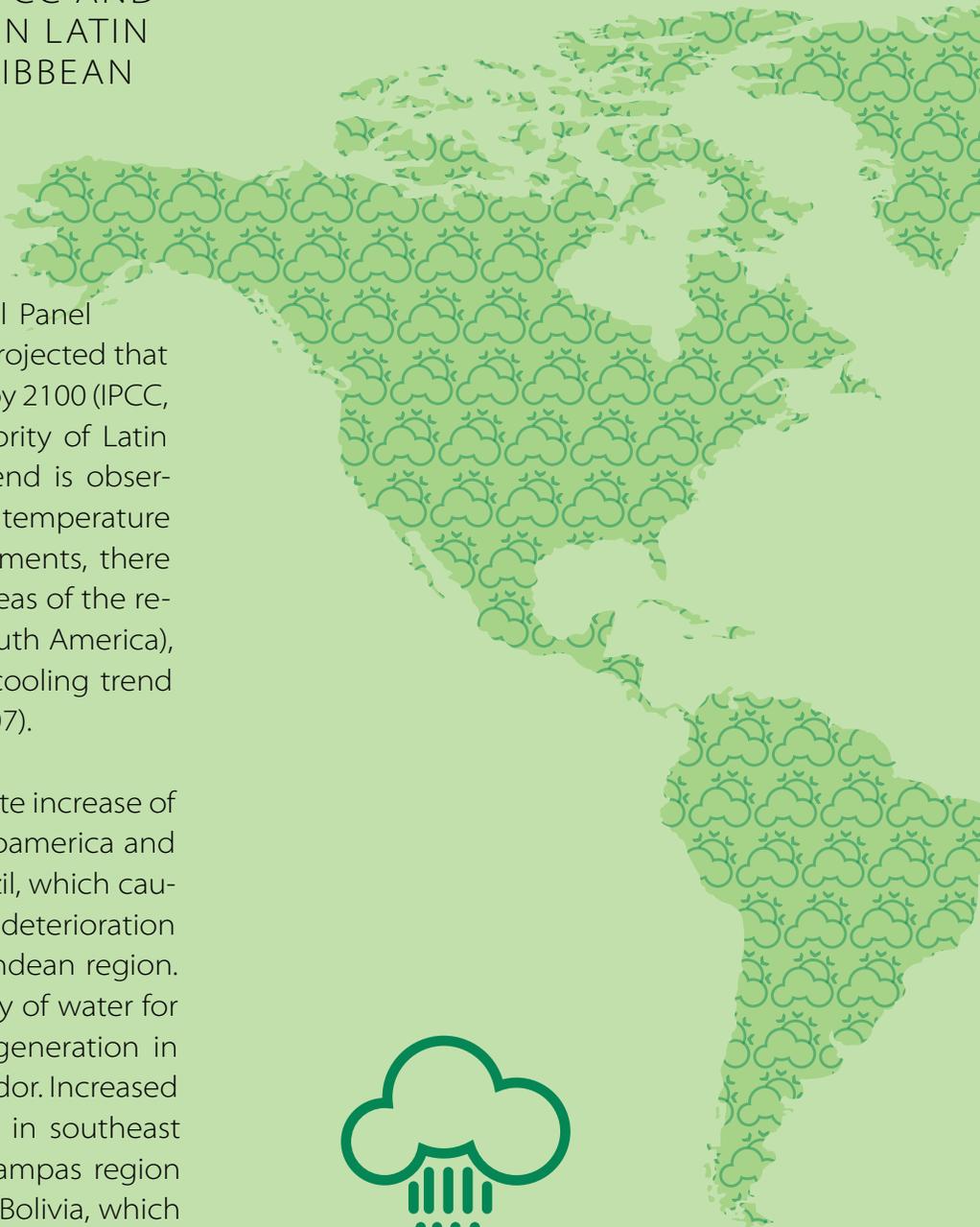
Direct Threats	Indirect Threats or Threats Stemming from CC
<ul style="list-style-type: none"> ▶ Anomalous changes in temperature ▶ Anomalous changes in precipitation ▶ Early or delayed seasons 	<ul style="list-style-type: none"> ▶ Rising of sea level. Changes in salinization. ▶ Increase in the frequency, intensity, duration and changes in the calendar of occurrence of extreme climate-related events or mass wasting events: flooding, droughts, frost, hailstorms, flash floods, landslides, downpours, El Niño and La Niña phenomena. ▶ Deglaciation ▶ Desertification

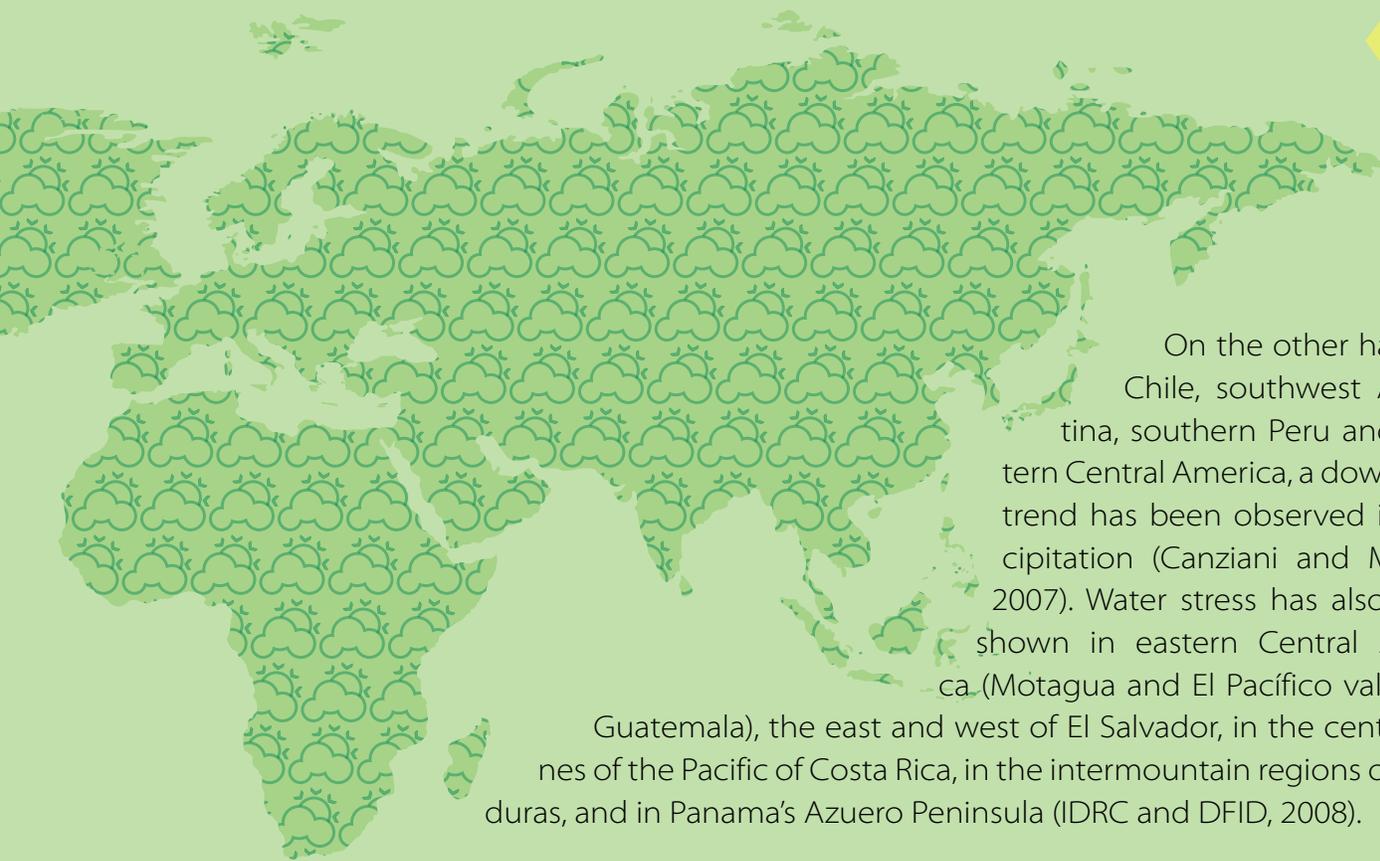
3.1.1.

OBSERVED IMPACTS OF CC AND FUTURE PROJECTIONS IN LATIN AMERICA AND THE CARIBBEAN

In the last century, the worldwide atmospheric temperature increased by approximately 0.78 °C and, according to scenarios of the Intergovernmental Panel on Climate Change (IPCC), it is projected that it could rise between 2 and 6 °C by 2100 (IPCC, 2007). Nevertheless, in the majority of Latin America, no clear long-term trend is observed in regard to average surface temperature since, according to IPCC assessments, there is apparent warming in some areas of the region (the Amazon, northeast South America), while in a few cases there is a cooling trend (Chile) (Canziani and Magrín, 2007).

In recent decades, an approximate increase of 1 °C has been observed in Mesoamerica and South America and 0.5 °C in Brazil, which causes, for example, an accelerated deterioration of the tropical glaciers in the Andean region. This compromises the availability of water for consumption or hydroelectric generation in Bolivia, Peru, Colombia and Ecuador. Increased rainfall has also been observed in southeast Brazil, Paraguay, Uruguay, the Pampas region of Argentina and some parts of Bolivia, which has affected the quality of the soil and the performance of crops, in addition to increasing the frequency and intensity of flooding.





On the other hand, in Chile, southwest Argentina, southern Peru and western Central America, a downward trend has been observed in precipitation (Canziani and Magrín, 2007). Water stress has also been shown in eastern Central America (Motagua and El Pacífico valleys in

Guatemala), the east and west of El Salvador, in the central zones of the Pacific of Costa Rica, in the intermountain regions of Honduras, and in Panama's Azuero Peninsula (IDRC and DFID, 2008).

On the other hand, unusual extreme events have been reported, such as, for example, intense rainfall in Venezuela (1999, 2005), flooding in the Pampas of Argentina (2000-2002), drought in the Amazon (2005), hailstorms in Bolivia (2002) and in the area of Greater Buenos Aires in Argentina (2006), the exceptional Cyclone Catarina in the South Atlantic (2004), the record hurricane season in 2005 in the Caribbean Basin (Canziani and Magrín, 2007), or the recent Hurricane Irene (2001) in the western North Atlantic. Moreover, in the region of Mesoamerica, it has been established that climate-related disasters increased 2.4 times between the periods 1970-1999 and 2000-2005 (CEPAL, DFID, 2009).

IN THE LAST CENTURY, THE WORLDWIDE ATMOSPHERIC TEMPERATURE INCREASED BY APPROXIMATELY

0,78 °C

AN APPROXIMATE INCREASE OF 1 °C HAS BEEN OBSERVED IN MESOAMERICA AND SOUTH AMERICA

1 °C

AND 0.5 °C IN BRAZIL

0,5 °C



GRAPHIC N° 1 >

TRENDS IN ANNUAL AVERAGE PRECIPITATION IN LAC





EVEN THE MOST OPTIMISTIC SCENARIOS FORECAST GLOBAL WARMING BY THE END OF THE CENTURY.

In the region of Latin America, in keeping with the different climate models of the IPCC, **AN INCREASE OF BETWEEN 2 AND 6 °C IS FORECASTED**, whereby the frequency of extreme climate-related events is likely to increase (especially hurricanes in the Caribbean Basin), which increases the risk of extinction of significant species in many areas of the tropical zones (part of the tropical jungles of the eastern Amazon and southern Mexico would be replaced by savannas). Conflicts for water are also likely to increase due to cc. **IT IS LIKEWISE FORECASTED THAT THE SEA LEVEL WILL RISE EVEN MORE**, which, combined with climate variability, could severely affect the coastal zones and their associated systems, for example: the low coastal zones of El Salvador, Guyana and the coast of the province of Buenos Aires in Argentina; coastal tourism in Mexico; the coastal morphology of Peru; the mangrove swamps in Brazil, Ecuador, Colombia and Venezuela; the availability of drinking water on the Pacific coast of Costa Rica, Ecuador and the estuary of La Plata River; the coral reefs in Mexico, Belize and Panama or the distribution of shoals in Peru and Chile (Canziani and Magrín, 2007).
nibilidad de agua potable en la costa del Pacífico de Costa Rica, Ecuador y el estuario del Río de la Plata; los arrecifes de coral en México, Belice y Panamá; o la distribución de los cardúmenes en Perú y Chile (Canziani y Magrín, 2007).



3.1.2.

ECONOMIC IMPACTS OF CC ON PRODUCTION AND SERVICE SECTORS

The impacts of CC translate into major economic costs for countries. For example, the increase in the intensity and frequency of extreme events has caused great losses, as is the case

of Hurricane Stan, which cost close to US\$ 3 billion and caused more than 1,500 deaths in Costa Rica, El Salvador, Guatemala, Mexico and Nicaragua, or Hurricane Mitch, with damages



estimated at some US\$ 5 billion in Honduras, Guatemala, Nicaragua and El Salvador, or also the drought of 2001, which logged losses on the order of US\$ 189 million also in those four countries (CEPAL, GTZ, 2009).

THERE ARE STUDIES THAT ANALYZE THE ECONOMIC COSTS OF THE IMPACTS OF CC IN THE COMING YEARS AND SHOW SIGNIFICANT LOSSES IN GROSS DOMESTIC PRODUCT (GDP). BY 2025, BOLIVIA, COLOMBIA, ECUADOR AND PERU could have losses in GDP on the order of 7.3%, 4.5%, 6.2% and 4.4%, respectively, and this is only considering damages in the areas of agriculture, fishing, agro-business, water, electricity and infrastructure (CAN, 2008). Likewise, in the case of Peru, average losses could be logged on the order of 6% of its potential GDP for 2030 and 20% for 2050 due to CC, considering conservative scenarios of increases of 2 °C in the maximum temperature for 2050 and variations of 20% in precipitation (BCR, 2009). With regard to Chile, it is estimated that, by 2100, the country could lose up to 1.1% of its GDP annual under an A2 scenario, which contemplates the images on power generation, supply of drinking and water for irrigation (CEPAL, 2009).

Based on this point, we can extract two initial conclusions: a) "CC is not a problem that affects solely the environment, but rather it seriously affects development"; and b) The observed and projected impacts in the countries of the LAC region attest to the "need to act urgently to confront climate change and its consequences, i.e., to promote adaptation and risk management measures."

3.2.



Risks and vulnerabilities of the microfinance sector with respect to CC

In order to understand the risk and vulnerability of the microfinance sector with respect to CC, we must analyze what each of these terms involves:

Climate risk is the result of the interaction of physically defined hazards with the properties of the exposed systems—i.e., their vulnerability (UNDP, 2005). Risk can also be considered as the combination of an event, its likelihood, and its consequences. In other words, risk equals the probability of climate hazard multiplied by a given system's vulnerability (UNDP, 2005).

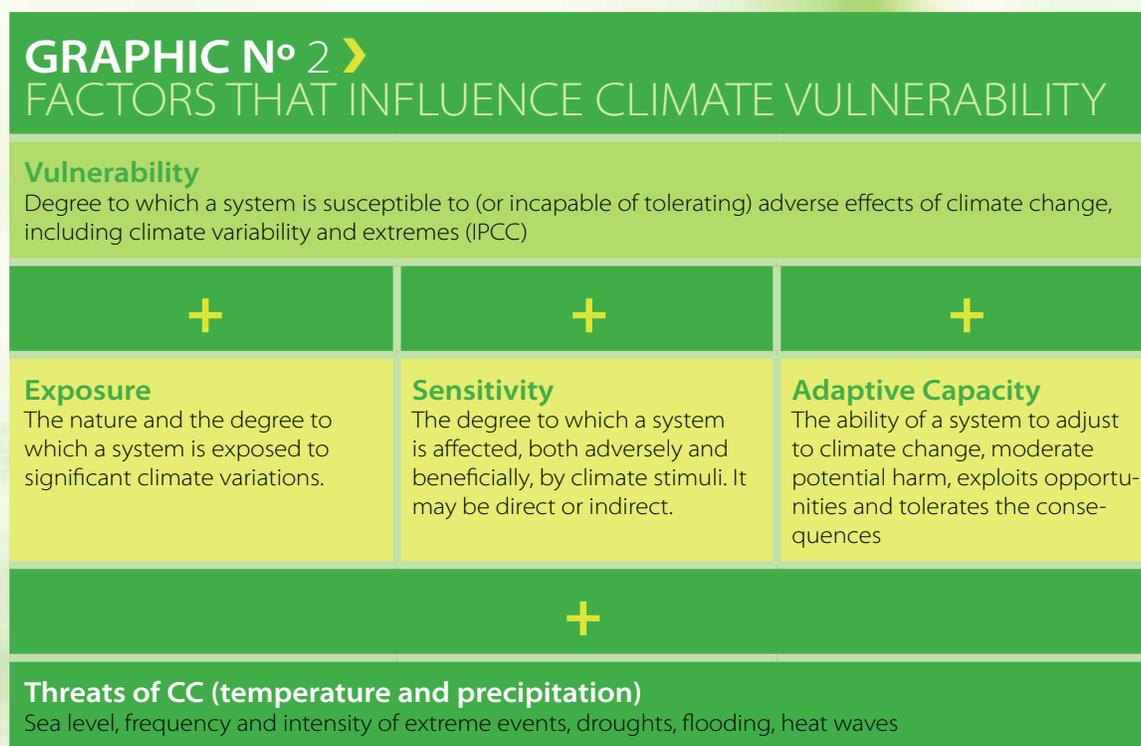
On the other hand, vulnerability, according to the IPCC, is the “degree to which a system is susceptible to adverse effects of climate change, including climate variability and extremes.” The system (or unit of exposure) may be any of the following: a region, group of individuals, community, ecosystem, country, economic sector, home, business or individual. For practical purposes, we will consider three factors that condition the degree of vulnerability of a system with respect to CC, namely, exposure, sensitivity and adaptive capacity.





Exposure to threats: the degree of exposure of a system to climate variations or events like frost, droughts, slides or temperature increases, among others (UNDP, 2005). Sensitivity and/or fragility: the degree to which a system is affected by climate-related stimuli, both negatively and positively (UNDP, 2005). For example, in the case of a temperature increase, the improved crops are more resistant than ordinary crops; although both possess a certain degree of sensitivity, the former is more resistant, whereby its productivity will not be as affected as in the latter.

Adaptive capacity: the adaptive capacity inherent in a system represents the set of resources available for adaptation, as well as the ability or capacity of that system to use the resources effectively (UNDP, 2005). Adaptive capacity is determined by a series of factors such as economic resources, technology, information, infrastructure and institutions, among others.



► **Source:** Peru's Second National Communication on Climate Change, 2010. Adapted from CIFOR, 2008.

A community may be vulnerable to CC if:

▶ a) it is exposed to direct or indirect threats of CC (e.g., droughts or intense rains that cause landslides);

▶ b) if its production or trade activities depend on the behavior of the climate (e.g., non-irrigated agriculture that depends on the rain, or trade that depends on a highway that, in turn, suffers blockages due to landslides, or tourism, which depends on climate conditions);

▶ c) if it does not have the capacity to prevent the impact or to react to it quickly (e.g., non-existence of alerts or timely information to warn of the occurrence of an extreme climate-related event).



As the probability of the threats occurring entails a high level of uncertainty, the key factor is to reduce vulnerability by, for example, improving the adaptive capacity (the construction of mini-reservoirs, the search for alternative transportation routes that involve a lower risk of landslides, the development of early warning systems, guides for risk prevention, etc.).

CC AFFECTS THE MOST VULNERABLE: THE POOR

CC is an imminent fact, and its negative effects will primarily impact the most vulnerable: the poor. Vulnerability is associated with poverty, since the majority of the poor lack suitable housing, are located in areas prone to collapses, slides or flooding, and their economic activity is generally carried out in agricultural areas located on plains exposed to recurring droughts or floods (around 8.4 million individuals in Central America are located in path of hurricanes; Canziani and Magrin, 2007). Consequently, the vulnerability of the poor to these events suggests that it will be very difficult for them to increase or maintain a level of income when CC begins to have an effect. Thus, they will face considerable losses for their economy, which, in turn, will further increase their vulnerability and will put their well-being and development at risk.

The microfinanciers that act in rural areas often constitute the sole financing alternative for the poor. Within this context, and although the main objective of MFIs is not directly related to vulnerability with respect to CC, MFIs represent a potentially interesting instrument for promoting and financing CC adaptation measures. As we will see below, the interest of MFIs' in reducing the vulnerability of their portfolio with respect to the potential impact of CC may be very high.

3.2.1.

RISKS FOR THE ACTIVITY OF MFIS

As we mentioned previously, all production and service sectors run a risk with respect to CC, and microfinance is not separate from this reality. It is therefore useful to show the potential risks to which MFIs are exposed, for example, with respect to the occurrence of extreme climate-related events:



01. ↘

Delays and default on payments from clients: CC will lead to a drop in the productivity of many sectors, making them less profitable. It will also cause an increase in mortality and medical care needs among clients, which will consequently reduce their capacity to fulfill their obligations with MFIs.

02. ↘

Greater uncertainty with regard to interest rates: Interest rates depend on various factors like the cost of money for the MFI, operating expenses, the default rate, inflation itself, etc. The extreme climate-related events can cause economic damages to their clients, increasing the level of default of obligations. As a result of the direct damages of CC, MFIs could face a higher cost of money (higher costs to charge clients and a higher level of default), whereby they could abruptly decide to vary their interest rates.

03. ↘

For MFIs that can capture savings, CC could bring about the consequence of the mass withdrawal of savings and a lack of liquidity.

04. ↘

As the risk of CC increases, access to secure products becomes increasingly more difficult, and many clients are likely to end up unsatisfied.

06. ↘

Los posibles efectos macroeconómicos tales como la inflación o la recesión, causados por desastres de gran escala, pueden afectar indirectamente a las organizaciones financieras, de forma general, y a las IMF en particular.

07. ↘

The possible macroeconomic effects, such as inflation or recession, caused by large-scale disasters, may indirectly affect financial organizations, in general, and MFIs in particular.

05. ↘

Extreme climate-related events destroy the culture of good payment, since debts tend to be forgiven: In the future, CC may create pressure on MFIs to forgive debts, which can destroy the culture of good payment that the microfinance institutions have installed in the customers over the years.

Total or partial loss of the MFI's facilities and assets. The increased frequency and intensity of natural disasters can lead to total or partial losses of MFI offices, equipment, information systems and records.





As time goes by, CC increases the risk in a larger number of economic sectors, which become more prone to its impacts. For purposes of MFIs, this risk translates into a reduction of their portfolio “free of non-financial risks.”



3.2.2. Risks in MFI sectors or clients

3.2.2.



RISKS IN MFI SECTORS OR CLIENTS

MFI clients or portfolios, whether urban or rural, merchants, artisans, small industries, tourist operators, microenterprises of tourism, restaurants, farmers or consumers in general, are exposed to the risks entailed by the potential impacts of CC, which may affect their productivity, decrease their income, diminish their well-being, reduce their payment capacity and increase the level of default on obligations, thus causing indirect impacts on the activity of MFIs.



In order to understand how CC may affect the various economic sectors, it is appropriate to mention its multi-dimensionality, i.e., the fact that its impacts affect various dimensions or means of life such as those mentioned in Table No. 2. Likewise, CC may affect urban and suburban zones (such as rural zones), with a greater impact on the latter, since they are more vulnerable and have fewer resources to adapt to the change. It should be mentioned that 29% of MFI clients in Latin America and the Caribbean are located in rural areas (MIX, 2010).





TABLE N° 2 > DIRECT AND INDIRECT EFFECTS OF CC AND THEIR POTENTIAL IMPACTS

Effects of CC	Impacts of CC
<p>Direct Effects</p> <ul style="list-style-type: none"> ▶ Abnormal increase in temperature and precipitation ▶ Abnormal decrease in temperature and precipitation ▶ Early or delayed seasons 	<ul style="list-style-type: none"> ▶ Health. Increase in the incidence of diseases like malaria, dengue fever, leishmaniasis, yellow fever and Chagas disease. In particular, the Andean regions are the most prone to these new epidemics and are zones at risk of a resurgence of malaria. Damages to health infrastructure. ▶ Agriculture. Loss of crops due to effects of soil erosion, desertification and changes in the water regime. Greater risk of flooding and other intensified natural events that affect agricultural production (strong winds, hailstorms, frost, etc.).
<p>Indirect Effects</p> <ul style="list-style-type: none"> ▶ Change in the surface temperature of the sea and the level of salinization; rising sea level ▶ Increased frequency, duration and intensity of extreme climate-related events (flooding, droughts, frost, hailstorms, flash floods, downpours, landslides, El Niño and La Niña phenomena) ▶ Increase of dry zones due to temperature effect ▶ Deglaciation ▶ Desertification 	<ul style="list-style-type: none"> ▶ Water resources and glaciers. Changes in runoff can cause alterations in the flows of surface water, causing problems in water supply and water infiltration in soil and aquifers. Increased evapotranspiration. Melting of glaciers. Risk of flash floods and flooding. ▶ Infrastructure and settlements. The higher frequency of extreme events (particularly flooding, strong rains, strong winds and landslides) may affect infrastructure and unstable settlements located in zones of risk. Increased deterioration of housing conditions and quality of life of the poor and displaced populations. ▶ Ecosystems. Reduction of the snow-capped areas, high-altitude grasslands and high plateaus and, therefore, their environmental services. Changes in reproductive behavior and distribution of the species (migrations). Outbreaks of epidemics affecting native flora and fauna. The impacts on forests can be considerable, but there is still uncertainty as to their resilience or tolerance.

▶ **Source:** Prepared based on Gutiérrez and Espinoza, 2010 (pending citation confirmation with the IDB)

Many times, the impacts of climate change become more evident in economic sectors that closely depend on the climate, such as agriculture and transportation, since the cause-effect analysis is direct for them (e.g., decrease in water – loss of crops; intense rains that produce flooding and landslides – blockage of highways). This does not mean that other sectors do not run risks with respect to CC, but rather that in this case a more extensive cause-effect analysis must be carried out, as shown in the following graphic.

TABLE N° 3 > CAUSE-EFFECT ANALYSIS OF THE CLIMATE RISK IN THE MANUFACTURING SECTOR

Human Necessity	Means and Mechanism	Climate Thread	Direct Impact	Indirect Impact	Exposure Result	Consequence
Textil Production	Water for Dyes + Energy	Rainfall Water Stress	Delay Costs Production	Sales Yield Performance	Less Income Conflicts	Lost of Well Being

► **Source:** Prepared by author.



In general, all economic activity, productive or service-oriented, required natural resources like water, energy, biodiversity (e.g., crops, forests, species) and soil (including the territory and highways), which directly react to the effects of CC, although its most pressing effects become more evident after a time.

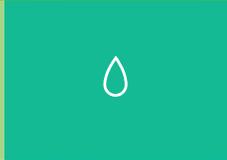
It should be pointed out that rural clients of MFIs are not a closed system, since they do not engage in one sole economic activity during the year. Some share trade and agricultural work, or mining and agriculture, or tourism and agriculture, or another modality related to agricultural and, to a certain extent, tourism, whereby it becomes important to pay attention to the vulnerability of these two activities with respect to CC.

TABLE N° 3 > POTENTIAL RISKS WITH RESPECT TO CLIMATE CHANGE

Agriculture	Tourism
<ul style="list-style-type: none"> ▶ Although agriculture does not represent the greatest percentage of the portfolio of MFIs, the impact of CC on this sector could have an effect on the economy of rural families who are, in turn, clients of MFIs, which could cause their income to diminish, lead to mass withdrawals of their savings, affect their capacity to pay and, in general, contract the market of MFIs. ▶ Less profitability due to negative impacts on productivity and investments. ▶ Increased loss of crops and mortality of livestock due to plagues, droughts or flooding. ▶ Decapitalization of farmers and stockbreeders (mass sale of animals at low prices). ▶ The partial loss of capital may affect the capacity to pay loans and debts of farmers and stockbreeders. ▶ Risk of rural exodus, with all the possible consequences: food insecurity, increased unemployment and marginalization of the poor in urban areas, etc. 	<ul style="list-style-type: none"> ▶ Impairment or obstruction of highways and access routes to tourist centers due to flooding, flash floods and downpours, among other factors, which affects the income of clients of MFIs and their capacity to pay. ▶ Reduced tourist activity due to restricted access to centers or zones affected by extreme events. ▶ Negative effects on the natural appeal of some tourist zones, affecting the demand of the sector (e.g., coral reefs that undergo whitening due to the increased oceanic temperature, erosion and loss of beaches due to the rising sea level, glacier retreat and reduce tourist load capacity, among others). ▶ The activities directly and indirectly linked to tourism are affected by the intensity of the extreme climate-related events (tourist operators, artisans, restaurants, hotels, trade, transport, etc.). ▶ Possible reduction of income from tourist activity and the profitability of related industries or sectors, which affects the capacity to honor loans and payments to MFIs.

▶ **Source:** Prepared by author.

Based on this point, we can extract another two conclusions: c) MFIs are vulnerable to CC directly (damages to their activity and infrastructure) and indirectly (damages that may affect their clients); and d) There is a great adaptation deficit, which becomes a development opportunity for MFIs.





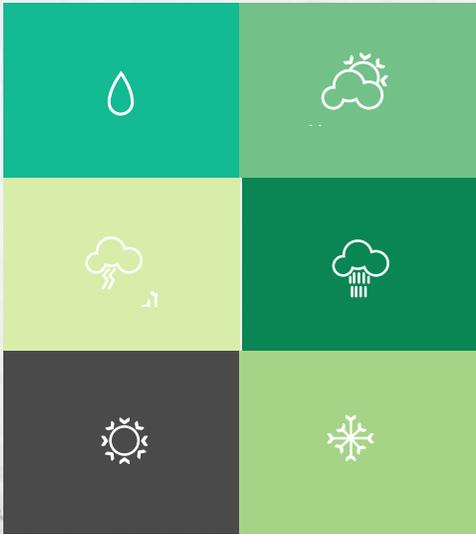
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WHAT CAN WE DO
WITH RESPECT TO
CC IN GENERAL?

04

WHAT CAN WE DO
WITH RESPECT TO
CC IN GENERAL?





4.1.

MITIGATION OF CC: DEFINITIONS AND EXAMPLES

Mitigation refers to human action to reduce emissions of greenhouse gases (GGs) or to increase their absorption through deposits or sinks (IPCC, 2007). The main GGs include carbon dioxide (CO₂), which is generated in the greatest proportion by the burning of fossil fuels (activities that use carbon, gasoline or oil derivatives) and methane (CH₄), a result of the fermentation of organic matter (generated from the production of rice, the breathing of livestock, waste, etc.)

In that sense, the following are examples of mitigation measures: the use of renewable energies (such as wind power, solar power, hydroelectric power or power derived from biofuels) instead of fossil fuels, or energy efficiency, which includes practices to reduce energy consumption (such as the use of energy-saving light bulbs or automatic power-up systems in buildings). Likewise, the mitigation measures include activities that promote the protection of carbon sinks, i.e. forests, vegetation or soil, through reforestation or sustainable forest management projects.

Many of the mitigation measures have immediate socioeconomic co-benefits, since reduced energy consumption represents savings, improvements in yields or increased well-being. In effect, some MFIs have been offering micro-credit services linked to renewable or clean energy projects, geared toward offering energy alternatives in remote areas more than reaching CC mitigation objectives; as well as micro-credits for projects to develop more efficient kitchens, which, in addition to achieving energy savings, has a highly positive effect on the health of the population.

4.

There are two major lines of action to counteract the effects of CC: mitigation and adaptation. Mitigation of CC is achieved by reducing emissions that cause global warming (greenhouse gas emissions). Adaptation focuses on reducing the damage or preventing the impact of imminent CC. Both actions are different but complementary.

4.2.



ADAPTATION TO CC: DEFINITIONS AND EXAMPLES

Adaptation is understood as the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (Figure 2). This definition, introduced by the Intergovernmental Panel on Climate Change (IPCC), attempts to capture the implications of the adaptation process, which requires, among other aspects, the following: capacity for short-, medium- and long-term planning, financing, appropriate institutional agreements and scientific and technical capacities, in order to understand the problems and contribute solutions or measures.

Adaptation measures tend to be of various types: political-regulatory, technical and scientific, financial and tax-related, information- and monitoring-related, technological, educational and awareness-related, skill-building or institutional. We can also classify them as structural and non-structural, where the former are equivalents to technical measures that involve some type of physical construction, while the non-structural one equate to policies, laws or raised awareness.



TABLE N° 4 > TYPES OF ADAPTATION MEASURES

Political-regulatory, which involve changes or proposals of laws or procedures for good practices or which promote tolerance or resistance to climate change;
Technical and scientific, related to the implementation of tools, processes, investigations and technologies that prevent damage and reduce the vulnerability of systems;
Financial and tax-related, relative to instruments to channel resources that fund the adaptation to CC, as well as tax incentives that encourage it;
Information and monitoring, which includes instruments and tools for the generation and systematization of climate information (e.g., Scenarios, forecasts, impacts), as well as systems to ensure follow-up and evaluation
Education and awareness-raising, which ranges from formal education initiatives, training programs and diffusion campaigns to citizen participation and decision-making activities;
Institutional, relative to the enhancement of the capacities of institutions and the promotion of the intersectorality of the focus of adaptation.

► **Source:** Adapted from Gutiérrez and Espinoza, 2010 (this citation is pending confirmation)

MFIS CAN HELP THE POOR AND VULNERABLE POPULATIONS OF THE WORLD IN ADAPTING TO CLIMATE CHANGE BY PROVIDING THEM WITH A MEANS OF ACCUMULATION OF THEIR ASSETS AND MANAGEMENT OF THEIR RESOURCES AND THEIR CAPACITIES IN ORDER TO BE LESS VULNERABLE TO CRISIS, OR BY HELPING THEM TO CONTROL THE IMPACTS THEREOF (HAMMILL ET AL. – IISD, 2008). IN THIS SENSE, IN TABLE NO. 5 EXTENSIVE EXAMPLES OF ADAPTATION MEASURES ARE PROVIDED, WHICH MFIS CAN EVALUATE IN LIGHT OF NEW DEMANDS OR TECHNOLOGICAL NEEDS OF THEIR PORTFOLIOS OF CLIENTS FOR THE SAKE OF ACHIEVING THEIR ADAPTATION TO CC.

4.2.1.

RELATIONSHIP BETWEEN ADAPTATION AND MITIGATION OF CC

There are actions that, in promoting adaptation to the impacts of CC, help to mitigate the causes thereof at the same time. For example, the production of alternative energy (like solar panels or mini-hydroelectric plants) to provide electricity to remote households or to drive engines for irrigation in arid zones, reduces vulnerability but also helps to reduce CO₂ emissions, in replacing the use of oil or its derivatives, thus helping to mitigate CC.

Likewise, there are also actions whose main objective is to reduce GG emissions or to expand their reservoirs, but which at the same time promote adaptation to CC or reduce the vulnerability of a system. Such is the case of reforestation for purposes of carbon sequestration, which at the same time serves as a natural barrier for landslides or intense rains in high zones⁰¹.

On the other hand, there are mitigation actions that may increase the vulnerability of a system and, in that sense, become a poor adaptation, like, for example, the production of biofuels in regions where the water resource is scarce. To that end, it is advisable to bear in mind the intrinsic relationship between adaptation and mitigation of CC in the formulation or financing of a project.

.....
⁰¹ Mitigation projects also have the possibility of accessing additional financial resources if they are designed within the framework of the carbon market, where reductions or sequestration of GG are considered carbon credits, and they may receive monetary compensation for it. See more at <http://finanzascarbono.org/>.







4.2.2

POTENTIAL CONTRIBUTION OF MFIS TO ADAPTATION TO CC



There is an intrinsic relationship between adaptation and development, since both promote the improvement of the capacities of the population, which helps to reduce their vulnerability. Thus, it is not simple to separate a CC adaptation measure from a measure or action intended to promote development itself.



Although this debate is complex, the urgency that the potential impacts of global warming represent obliges us to urgently tackle the fight against poverty, the upgrading of infrastructure or the application of a certain technology if we want to face climate change.



Instead of considering the adaptation as something separate, we must see it as an additional cost or complexity for reaching development goals (Dowla, A. 2009). Indeed, the fact of rejecting the impacts of CC in development interventions may yield the result of weak, poorly adapted and unsustainable development, which would lead to negative effects on the investment of vulnerable groups.



Therefore, MFIs can perform a key function in promoting CC adaptation measures (see Table No. 4), for example, facilitating financing, and can contribute in this way to achieving the development of clients, locations or regions with which they work and, consequently, guarantee the sustainability of the microfinance sector.



Based on this point, we can extract another two conclusions: e) CC adaptation measures are diverse and related to development; and f) MFIs can help their clients to adapt or reduce their vulnerability, thus ensuring their own sustainability.



TABLE N° 5 > ADAPTATION MEASURES THAT COULD REQUIRE MFI SERVICES. PROPOSED ADAPTATION MEASURES

TOURISM

- i. Design of preventive and contingency plans to ensure resources (water, energy and biodiversity) that allow for continued operations in the case of extreme climate-related events.
- ii. Construction, lining and reinforcement of containment barriers and structures (dikes and breakwaters) in critical zones throughout tourist routes.
- iii. Conditioning of natural barriers for protection of tourist infrastructure in the case of extreme climate-related events (e.g., use of shrubs or forests as protection from intense rain or landslides).
- iv. Diversification of new attractions and conditioning of tourist routes that are less exposed and less vulnerable to extreme climate-related events.
- v. Implementation of early warning systems for tourist operators.

AGRICULTURE

- i. Technical irrigation that optimizes the water resource in zones of drought.
- ii. Setup of mini-greenhouses for production of CC-sensitive species (e.g. fruit trees and vegetables).
- iii. Instalación de minicentros de acopio para protección de insumos y productos expuestos a eventos climáticos.
- iv. Diversification of crops and/or species more tolerant to CC, depending on each ecosystem.
- v. Use and training on improved seeds and varieties of crop resistant to water or thermal stress.
- vi. Relocation of crops in zones with more favorable climate conditions, which involves preparation of the soil and tests with the crop.
- vii. Protection of the soil to improve its richness and performance through tree-planting.
- viii. Construction of islands or platforms as irrigation systems.
- ix. Development of agricultural insurance for small and medium-sized farmers.
- x. Installation of flood warning systems, through the implementation of communication guides, information systems, hiring of research institutions to provide the information, etc.
- xi. Development of a local-level agricultural information system.
- xii. Improvement in soil management and in the use of organic pesticides, which reduces soil erosion and pressure.
- xiii. Setup of local mini-desalinization systems.
- xiv. Construction of small infrastructures to serve as barriers against the wind and as crop protection.
- xv. Construction and/or lining and reinforcement of dikes and breakwaters for crop protection.
- xvi. Installation of tree cover against risks of lateral erosion of rivers and flooding.

TRANSPORTATION

- i. Reinforcement of structures and barriers throughout critical stretches (dikes and retaining walls, among others).
- ii. Protección de rutas de transporte con barreras naturales (árboles).
- iii. Adaptación de nuevas rutas (carreteras) alternativas

ENERGY

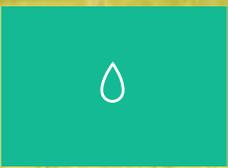
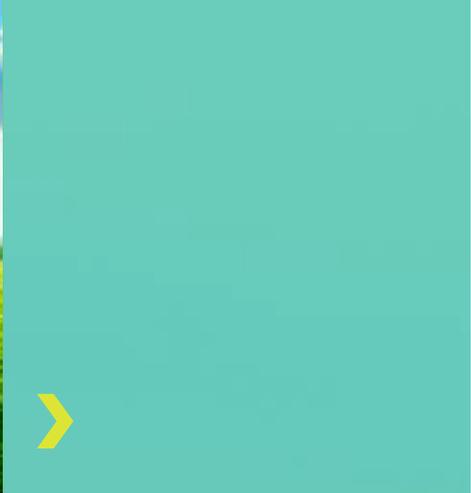
- i. Use of biodigestors for production of electricity in rural areas.
- ii. Installation of solar panels for power general linked to the use of technical irrigation.
- iii. Construction of mini-hydroelectric plants.
- iv. Use of renewable power sources (solar, wind, biomass, waste, hydraulic, etc.) in order to reduce vulnerability.

BIODIVERSITY AND COASTAL ZONES

- i. Reforestation and afforestation.
- ii. Relocation of threatened facilities in coastal zones.
- iii. Design of early warning and evacuation systems in the case of extreme climate-related events in coastal zones.
- iv. Insurance against risks.
- v. Improvement and/or protection of water and drainage systems in coastal zones threatened by salt-water intrusion.
- vi. Construction of structures for the protection of coastal zones (dikes, tidal barriers, separate breakwaters).
- vii. Restoration and/or creation of small ecosystems to serve as a natural barrier (dunes, wetlands, mangrove swamps).

WATER AND SANITATION

- i. Application of water capture, conduction and distribution techniques; financing of both infrastructure and training.
- ii. Installation of infrastructure and use of rainwater collection or storage techniques (reservoirs, ponds, natural wells), as well as ancestral techniques (sowing and harvest of water).
- iii. Use of practices for the reuse of water and training on the efficient management thereof.
- iv. Construction of infrastructure of application of techniques for the protection and restoration of springs, wet meadows and wetlands.
- v. Installation of infrastructure for the strengthening of lagoons and the defense of villages in areas of high vulnerability to glacier retreat.
- vi. Improvement and construction of mini-drainage systems for evacuation of storm water.
- vii. Installation of an infrastructure to increase the reservoir capacity (construction of mini-dams).
- viii. Application of devices and repairs to reduce leaks in drinking water and sewer systems.





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OPPORTUNITIES FOR
MFIS TO PROMOTE
ADAPTATION TO CC

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OPPORTUNITIES FOR MFIS TO PROMOTE ADAPTATION TO CC

5.

Though climate change entails risks for MFIs and their clients, it also provides new opportunities for MFIs to promote adaptation to CC. This chapter outlines the potential benefits for MFIs, including expanding their markets, facilitating penetration in rural areas, improving access to other sources of financing, providing new services and products to another public, and fostering an interrelation or synergy between adaptation and mitigation (see section 5.1 below). Given adequate financing, these opportunities allow the poor not only to diversify their subsistence strategies but to reduce their vulnerability and thereby escape poverty in a sustainable manner.

In order to take advantage of these opportunities, MFIs must implement specific strategic actions, such as establishing partnerships and adapting their products. (These strategies are explored in detail in section 5.2 below) As well, in order to





achieve maximum benefit, MFIs need to strengthen their reporting and training capacities and enlist the help of other sectors. (These factors are explored in section 5.3 below).

By facilitating adaptation to CC, MFIs will have the opportunity not only to expand their market but to increase the sustainability of their sector, take preventive measures to protect themselves against the effects of CC, and reduce the vulnerability of poor people, thereby increasing their number of profitable clients. In this context, MFIs could play a key role in fostering the transition toward a global economy that is cognizant of and resistant to CC.



5.1

WHAT ARE THE SPECIFIC OPPORTUNITIES FOR MFIS



5.1.1.

EXPANDED DEMAND FOR MFI SERVICES

For example, microcredits for: a technical irrigation system that optimizes water resources in drought zones; installation of mini-greenhouses to produce species sensitive to water stress (e.g., fruit trees and vegetables); mini storage centers to protect inputs and products exposed to climate events; use of improved seeds and crop varieties that are resistant to thermal stress; installation of solar panels to generate power for technical irrigation; mini water reservoirs to ensure adequate supply in regions of drought; or biodigestors to produce electricity in rural areas that reduce their vulnerability. (See also Figure No. 5.)



➤ FOR EXAMPLE, MICROCREDITS FOR: A TECHNICAL IRRIGATION SYSTEM THAT OPTIMIZES WATER RESOURCES IN DROUGHT ZONES; INSTALLATION OF MINI-GREENHOUSES TO PRODUCE SPECIES SENSITIVE TO WATER STRESS (E.G., FRUIT TREES AND VEGETABLES); MINI STORAGE CENTERS TO PROTECT INPUTS AND PRODUCTS EXPOSED TO CLIMATE EVENTS; USE OF IMPROVED SEEDS AND CROP VARIETIES THAT ARE RESISTANT TO THERMAL STRESS; INSTALLATION OF SOLAR PANELS TO GENERATE POWER FOR TECHNICAL IRRIGATION; MINI WATER RESERVOIRS TO ENSURE ADEQUATE SUPPLY IN REGIONS OF DROUGHT; OR BIODIGESTORS TO PRODUCE ELECTRICITY IN RURAL AREAS THAT REDUCE THEIR VULNERABILITY. (SEE ALSO FIGURE NO. 5.)

This represents an opportunity for MFIs to expand their services and develop innovative, profitable financial products adapted to their clients' needs. Furthermore, the development of CC-related products opens up new business opportunities in which MFIs can participate.

➤ GRAMEEN SHAKTI (AN OFFSHOOT OF GRAMEEN BANK IN BANGLADESH) ILLUSTRATES HOW CC-RELATED OPPORTUNITIES CAN BE TAKEN ADVANTAGE OF. GRAMEEN SHAKTI OPENED A TRAINING CENTRE WHERE WOMEN ARE TAUGHT AND EMPLOYED TO PRODUCE COMPONENTS AND PROVIDE SERVICES RELATED TO RESIDENTIAL SOLAR POWER SYSTEMS. THIS INITIATIVE EARNED GRAMEEN SHAKTI AN ASHDEN AWARD FOR SUSTAINABLE ENERGY (WWW.ASHDENAWARDS.ORG/WINNERS/GRAMEEN). THE ORGANIZATION IS CURRENTLY INVESTIGATING HOW THE ENERGY PRODUCED IN A BIOGAS PLANT CAN BE USED IN SMALL BUSINESSES.



5.1.2.



PENETRATION IN RURAL AREAS

As previously mentioned, clients in rural areas are most susceptible to the impacts of CC because their economic activities (such as agriculture) and their assets in general are more vulnerable to changes in climate. Consequently, they require greater technical and financial resources in order to adapt their practices. Adaptive measures designed for rural clients can serve as a vehicle to penetrate this segment.

It should be added that the rural sector continues to be the segment least served by MFIs: in Latin America, for example, only 29% of MFI clients reside in rural areas (MIX, 2010). This situation turns the sector into a goal for many MFIs (COPEME, 2009), particularly in countries where the urban market is becoming saturated.

Adaptation measures are the key to guaranteeing the profitability—for both MFIs and their clients—of the products to be financed in these rural areas. Well-designed adaptation measures also tend to improve the results of the clients' activities, improve the efficiency of processes, optimize the use of resources, etc. For example, as noted in chapter 3, agricultural adaptation measures include using seeds that are tolerant of water or thermal stress, thereby substantially increasing yield per hectare.





5.1.3.



ADDITIONAL SOURCES OF FINANCING

Worldwide, MFIs receive a total investment of around US\$ 4 billion in the form of debt and risk capital on the part of different specialized funds (Reille, 2008). Some MFIs with a more social mission receive additional financial and technical aid from other sources. Moreover, there are various financial mechanisms intended for investing in tools and technologies to combat CC, among them the Global Environment Facility (GEF) and the Climate Investment Funds (CIF). (See also Table No. 6.) Such mechanisms represent an opportunity for MFIs to access additional sources of financing to develop products intended for adaptation. These funds can provide valuable assistance, especially considering that the amount bound directly for the private sector decreases as the level of economic development of the countries decreases.





TABLE N° 6 > FINANCING FUNDS RELATED TO CC

THE GLOBAL ENVIRONMENT FACILITY (GEF), WHICH MANAGES THREE TRUST FUNDS: the Global Environment Facility Trust Fund (GEF), the Least Developed Countries Fund (LDCF), and the Special Climate Change Fund (SCCF). www.thegef.org/gef/node/2855

THE ADAPTATION FUND. www.adaptation-fund.org

THE WORLD BANK CLIMATE INVESTMENT FUNDS (CIF), which comprises the Strategic Climate Fund (SCF) and the Clean Technologies Fund (CTF). www.climateinvestment-funds.org/cif

In fact, in late 2010, at the Conference of the Parties of the UNFCCC (COP 16), the member countries agreed to establish quick start-up financing of \$30 billion provided by industrialized countries to support climate change adaptation and mitigation in developing countries for the 2010-2012 period. Likewise, it was decided to collect \$100 billion in long-term funds for the year 2020. To that end, the members agreed to establish a Green Climate Fund under the Conference of the Parties, governed by a board with equal representation from developing and developed countries.

Provided they meet the requirements and match the thematic priorities and intended use of a certain fund, MFIs can access the fund either directly or through public-private partnerships (with the invention of the second-floor bank or the channeling from the public sector). For more information or help in accessing these funds, the IDB-FOMIN should be contacted, since in most cases they are collaborators of said funds.

www.iadb.org/en/topics/climate-change/secci,1449, www5.iadb.org/mif

5.1.4.



NEW BUSINESS: MFIS AS INFORMATION CENTRES

Given the significant penetration of some MFIs in remote and/or CC-vulnerable areas, they are in a position to provide valuable information to the government, private-sector stakeholders and international funds concerning the impacts and pressures of CC and the particular conditions and needs of specific areas and groups, and to propose optimal adaptation measures for those areas and groups.

In that sense, using profiles from their portfolio, MFIs could prepare reports and analyses of the impacts of CC on emerging or rural markets and of the needs of these markets, which becomes an additional product to offer other companies, the government or potential investors. Not only could MFIs benefit by receiving monetary compensation from other stakeholders for this information, but they could secure technical cooperation for projects to be financed in the future.

5.1.5.

RELATIONSHIP AND/OR SYNERGY BETWEEN ADAPTATION AND MITIGATION

The role of MFIs in adaptation to CC is to finance technologies, products and activities and/or to develop additional sources of income that will reduce their clients' vulnerability to CC. Certain technologies and services whose main objective is to reduce greenhouse gas (GG) emissions—i.e., to help mitigate CC—can also reduce the vulnerability or increase the adaptive capacity of producer associations or microenterprises (see reference in chapter 3).

This is the case, for example, in areas where energy production relies on hydroelectric plants that are negatively affected by climate change (reduced water availability). In order to maintain agricultural production in these areas or to develop additional







production activities that diversify producers' sources of income, alternative forms of electricity production are required. Financing various kinds of small facilities that generate electricity from renewable but non-water sources (solar panels, for example) would not only mitigate emissions but would also reduce the producers' vulnerability to decreased water supply. Moreover, by maintaining or increasing the level of access to energy through these alternative sources, producers could even apply new technologies to use water more efficiently, such as certain forms of irrigation and electric pumps. Providing mini-loans for these technologies would help to increase adaptive capacity to changes in the availability of water.

THE REDUCTION OF CO2 EMISSIONS THROUGH THE USE OF CLEAN ENERGY PRODUCTS WILL ALSO PROVIDE MFIS WITH ADDITIONAL INCOME IN THE FORM OF CARBON CREDITS IN INTERNATIONAL MARKETS.

In theory, reductions in GG emissions resulting from the substitution of clean energy for conventional energy (energy generated from diesel, coal or gasoline) could be applied to the Voluntary Carbon Market, income being obtained for each reduced unit of emission. These reductions are orchestrated through carbon





credits. However, the intervention requires extensive documentation and resources and forms part of a complex process referred to as a “programmatic approach.” In order for this process to be profitable, the scale must be large enough to generate sufficient return on the investment of resources and time required to conduct studies, develop legal provisions and arrangements between stakeholders, and carry out reviews and verifications. For a detailed case study of a rural programmatic project for CC mitigation, see www.microsol-int.com/cocina-mejorada-peru (site in Spanish only). (This case does not count as a component of adaptation and therefore serves simply as an illustrative example.)

5.2

WHAT SHOULD MFIS DO TO PROMOTE ADAPTATION TO CC

In order to take advantage of these opportunities, MFIs must: i) better understand the risks of CC and ii) guide their clients in reducing those risks; iii) promote strategic partnerships; and, most important, iv) adapt their financial products. Section 5.2.1 below outlines some steps MFIs can take to address these challenges, using examples from MFIs in Peru and Guatemala that have begun the process of adaptation.



5.2.1.

UNDERSTANDING THE RISKS OF CC

In order for MFIs better to understand the risks related to the potential impacts of CC and promote appropriate adaptation measures, it is recommended that they:

Produce a more accurate breakdown of the composition of their portfolio, especially in rural areas.

Most MFIs classify their portfolio into broad categories such as, for example, agriculture, industry and production, trade, etc. Very few compile more detailed information broken down by sub-sector or activity, so that the precise level of risk of each activity can be determined and specific adaptation measures proposed. For example, if within the agricultural sector an MFI classified its portfolio according to the chain of vegetables, fruit trees, rice or poultry, it could recognize which clients might be more exposed to a CC-induced shortage of water.

SOME MFIS DO OPERATE AT THIS LEVEL OF DETAIL—FOR EXAMPLE, THE CRISOL FOUNDATION IN GUATEMALA, WHICH RECOGNIZES THE VULNERABILITY OF TRADITIONAL, NON-IRRIGATION CORN AND BEAN FARMERS AS OPPOSED TO PRODUCERS OF VEGETABLES GROWN IN MINI-TUNNELS OR GREENHOUSES; OR THE MFI IDESI OF PERU, WHICH HAS NOTED THAT CHANGES IN PRECIPITATION AND TEMPERATURE HAVE AFFECTED SOME OF ITS CLIENTS IN CERTAIN AMAZONIAN AND HIGH-ANDEAN REGIONS. THIS INFORMATION CAN EASILY BE INCORPORATED INTO THE APPROPRIATE SECTION OF THE DETAILED PORTFOLIO.

Segment their portfolio by activity so that specific products promoting adaptation to CC can be designed. Different regions have different adaptation needs: for example, in some Andean areas, more efficient irrigation systems may be required, whereas other tropical areas may need seeds or species that are more tolerant of temperature increases. Based on such data, MFIs could propose specific financial products, such as microcredits, to address specific needs. These financial products are outlined in section 5.2.4.

Generate information that incorporates climate variables in the MFIs' risk analysis. Prepare a "climate risk screening"⁰¹ of the MFI client portfolio by sector, so as to identify the risk level of each sector's activity with respect to climate change. The climate risk screening would be in addition to the stan-

⁰¹ Climate risk screening is a methodology used to determine the nature and magnitude of climate risk by analyzing potential impacts of climate change and evaluating existing conditions of vulnerability that may enhance the threats to people, assets, livelihoods and the environment on which they depend (UNDP, 2009, b). More information at www.careclimatechange.org/cvca/CARE_CVCAHandbook.pdf.

standard financial risk analysis of the portfolio. Likewise, climate risk screening should be incorporated into the methodologies used for loan disbursement and credit monitoring, so that climate risk is taken into account at every stage of the lifetime of the loan.

SOME MFIS HAVE ALREADY INITIATED CLIMATE RISK STUDIES (E.G., CDRO COMMUNITY FINANCIAL NETWORK OF GUATEMALA: STUDY ON ENVIRONMENTAL RISKS AND WATER RESOURCES; FONDESOL: STUDY ON THE IMPACT OF TROPICAL STORM AGATHA ON ITS PORTFOLIO) THAT CONSTITUTE A FIRST STEP TOWARD MAINSTREAMING CC IN THE PROVISION OF THEIR FINANCIAL SERVICES.

Promoting these actions will also generate indirect benefits for MFIs. By segmenting their portfolios, taking climate risk into account, and incorporating climate risk screening into the provision of financial services, they will produce much more useful data and promote better transparency and accountability for their processes.

5.2.2.

ORIENTATION OF MFI CLIENTS

MFIs represent a key vector for orienting clients toward activities that reduce their vulnerability and promote adaptation to CC. MFIs are therefore advised to raise their clients' knowledge level by:

Raising awareness and increasing outreach.

Several studies have shown that certain practices and products are more resistant to the impacts of CC and can generate benefits with regard to efficiency, performance and economic savings. Nevertheless, proposed adaptation measures should be specific to the particular characteristics and conditions of the area, community or economic activity in question.



THE GUATEMALAN MFI FONDESOL (SOLIDARITY DEVELOPMENT FUND), AWARE THAT PRESSURES ON ITS RURAL CLIENTS ARE EXACERBATED BY THE IMPACTS OF CC (E.G., DROUGHTS OR INTENSE RAINS), PROMOTES PRACTICES THAT REDUCE THOSE CLIENTS' VULNERABILITY: FOR EXAMPLE, USE OF ORGANIC INPUTS INSTEAD OF PESTICIDES TO HELP NOURISH THE SOIL AND ENSURE BETTER YIELDS; DIVERSIFICATION OF AGRICULTURAL PRACTICES BY LIVESTOCK FARMERS THAT ARE MORE TOLERANT TO CC; AND USE OF DROUGHT-RESISTANT CROPS IN GUATEMALA'S DRY CORRIDOR.

TABLE N° 7 > SOURCES OF INFORMATION

Numerous online databases and platforms are available to MFIs, providing a set of CC adaptation measures that can be used to guide MFI clients.

These include:

www.undpcc.org,
<http://climatetechwiki.org/>,
<http://www.undp.org/climatechange/adapt/apf.html>
<http://www.asocam.org/index.shtml>
<http://www.adapts.nl/publications/>
<http://www.adaptationlearning.net/>
<http://www.elanadapt.net/es>



Section 4, Table No. 5 lists several CC adaptation measures that could require MFI services. MFIs should also seek out partnerships with key stakeholders or specialized institutions that can advise them in that respect. (See also section 5.2.3 below.)

DIRECTING THEIR CLIENTS TOWARD ADAPTATION.

By tailoring their financial services, MFIs can encourage their clients to adopt practices that reduce their vulnerability or promote adaptation to CC. For example, they can gear their loans toward economic activities that reduce the risk of loss, and consequently the possibility of payment default or loan default.

MFIs have the potential to raise awareness and direct their customers toward mutually beneficial

choices—for example, by limiting their services to activities that do not affect the environment (e.g., landfills or deforestation). Raising their clients' awareness about reducing their vulnerability to CC thus becomes an integral part of the MFIs' activities.

IN RESPONSE TO DROUGHT-RELATED CROP LOSSES AMONG ITS RURAL CLIENTS IN A HIGH-ANDEAN REGION, THE PERUVIAN MFI IDESI , AN NGO, PROMOTED MICROCREDITS FOR AGRICULTURE WITH TECHNICAL IRRIGATION, THUS DISCOURAGING NON-IRRIGATED AGRICULTURAL PRACTICES WHICH, BEING RAINFALL-DEPENDENT, ARE HIGHLY VULNERABLE TO CC. LIKEWISE, THE GUATEMALAN MFI GÉNESIS EMPRESARIAL PROMOTES THE DIVERSIFICATION OF ACTIVITIES IN THE COUNTRY'S DRY CORRIDOR (WHICH HAS RECENTLY EXPERIENCED CHANGES IN PRECIPITATION) BY FINANCING LOANS FOR MINI-GREENHOUSES FOR THE PROTECTION AND PRODUCTION OF VEGETABLES INSTEAD OF CROPS THAT ARE EXPOSED TO THE CLIMATE.

5.2.3



PROMOTION OF STRATEGIC PARTNERSHIPS

MFIs specialize in financial products and, in many cases, lack specific technical knowledge about CC. Therefore, it can be useful to establish partnerships with stakeholders that do possess this knowledge and may be interested in helping MFIs and their clients.

The first type of partnership involves stakeholders who can offer MFI clients better access to the market—for example, by helping the owner of a microenterprise deliver a new product intended for new markets.

IN PERU'S ICA REGION (SOUTH OF LIMA), PRODUCTION OF ASPARAGUS BEGAN THANKS TO THE REGION'S IDEAL CLIMATIC CONDITIONS. HOWEVER, THE HIGH MARKET PRICE OF ASPARAGUS MADE IT MOST SUITABLE FOR THE LUXURY AND/OR EXPORT MARKETS. IN ORDER TO PENETRATE THOSE NEW MARKETS, SMALL PRODUCERS HAD TO ASSOCIATE WITH ONE ANOTHER AND CREATE PARTNERSHIPS WITH LOCAL SUPERMARKETS AND/OR INTERNATIONAL BUYERS.

The second type of partnership helps MFIs avert major liquidity problems related to extreme climate events by taking out insurance and/or forging a partnership with another financial entity or entities.

THE HAITIAN MFI FONKOZE ASSOCIATED ITSELF WITH THE REINSURANCE COMPANY SWISSRE SO THAT, JOINTLY WITH THE MICRO PLATFORM, WHICH ABSORBS CLIENTS' BASIC RISK, THEY WOULD SHARE THE RISK AND BE ABLE TO OFFER MICROINSURANCE SERVICES TO THE PEOPLE OF HAITI AFTER THE 2010 EARTHQUAKE. ALTHOUGH EARTHQUAKES ARE NOT DIRECTLY CAUSED BY CC, THIS MODEL CAN BE APPLIED TO CATASTROPHIC EVENTS BROUGHT ON BY CC. IN THIS CASE, FONKOZE WAS INSURED THROUGH SWISSRE AND THUS OFFERED COVERAGE TO ITS BORROWERS. (SEE MORE ABOUT THIS CASE IN FIGURE NO. 8, INSURANCE INITIATIVES RELATED TO CLIMATE RISKS.).

The third type of partnership brings MFIs together with public-sector agencies that can provide funds or financial services to help the poorest individuals purchase this insurance. (See also Figure No. 8, Insurance initiatives related to climate risks.) In this scenario, the feasibility of green subsidies (permitted within the framework of the WTO) or public extension programs could be studied.

IN GUATEMALA, BOTH THE FONDESOL AND GÉNESIS EMPRESARIAL MFIS ADJUSTED THEIR FINANCIAL PRODUCTS WITH HELP FROM SPECIALIZED INSTITUTIONS: THE APPLICATION OF INTEGRATED PEST CONTROL IN AGRICULTURE WAS ACHIEVED IN COORDINATION WITH AN AGROCHEMICAL INSTITUTION, WHILE A UNIVERSITY SUPPORTED THE INITIATIVE OF MINI-GREENHOUSES FOR VEGETABLES. ALSO, WITH FOMIN'S HELP, THE SALCAJA SAVINGS AND CREDIT COOPERATIVE HAS BEEN PROMOTING MICROCREDITS FOR DRIP IRRIGATION AND PURCHASE OF INPUTS IN PARTNERSHIP WITH THE SNOW PEA MARKETER UNIESPECIES, WHICH ENSURES THE PURCHASE OF THE PRODUCTION.

As well, by facilitating production linkages and economies of scale and shortening marketing chains, these partnerships with complementary economic sectors can help reduce the vulnerability of MFI clients.

The fourth and final type of partnership involves technical institutions that provide data and specialized information about CC and adaptation measures, and that can be financed by MFIs.

In line with the interrelation between adaptation and mitigation mentioned in section 5.1.5, MFIs could also finance the production of clean energy, which reduces emissions and can help reduce the vulnerability of communities. In this case, they would require specialists to advise them on the purchase of technology best suited to their needs and geographic situation, and support to carry out the technical maintenance of the product (solar panel, wind power, mini-hydroelectric, etc.). According to the SEEP Network (2007), the most successful option for energy-related loans would be a partnership with an energy company, notably because it would provide both training and access to financing through a loan and/or subsidy centre for end users. Likewise, once producers have access to power, they can use it to implement CC adaptation measures such as technical irrigation and other mechanisms mentioned above.

5.2.4.

ADAPTATION OF FINANCIAL PRODUCTS

By customizing their financial services, MFIs can issue microcredits to promote adaptation measures to their customers, while allocating other services (such as savings, insurance and mobile banking) to reducing vulnerability. The following recommendations identify various ways MFIs can adapt their financial services to promote adaptation to CC.

SOME MFIS USE TERM EXTENSION AS AN IMMEDIATE AID FOR THEIR CLIENTS. FOR EXAMPLE, THE PERUVIAN MFI EDYFICAR EXTENDED THE TERMS FOR ITS FARMER CLIENTS IN THE NORTHERN REGION OF PIURA WHEN THE IRREGULARITY OF RAINS AFFECTED MANGO SALES; BECAUSE OF THE EFFECTS OF TROPICAL STORM AGATHA, THE G&T CONTINENTAL BANK OR FONDESOL USUALLY APPLIES THESE MEASURES IN CASE OF CATASTROPHES.

DESIGN NEW TYPES OF MICROCREDITS TO PROMOTE ADAPTATION.

Increase the flexibility of credit lines to extend payment terms in the event of extreme climate-related incidents, without affecting the client's credit record if the payment default occurs after the impact or damage of CC has taken place.

Increase loan amounts in order to be able to finance the implementation of adaptation measures. Set a lower interest rate in order to be able to finance investments for medium- and long-term adaptation projects.

Incorporate mandatory insurance into the loans. This is particularly important in situations of extre-

me climate-related events, where insurance policies are activated both to alleviate the damages the clients suffer and to protect MFIs.

FOR EXAMPLE, MIBANCO, ONE OF PERU'S LARGEST MFIS, ASSOCIATED MULTI-RISK INSURANCE WITH ITS MICRO-CREDITS. IN JANUARY 2010, WHEN HEAVY RAINS AND LANDSLIDES BLOCKED ACCESS ROUTES TO MACHU PICCHU (THE COUNTRY'S MOST POPULAR TOURIST DESTINATION), AFFECTING TOURIST OPERATORS AND MANY OTHER SMALL COMPANIES RELATED TO TOURISM THAT FORMED PART OF MIBANCO'S PORTFOLIO, THE INSURANCE WAS ACTIVATED AND THE CLIENTS WERE COMPENSATED.

Incorporate climate risk assessment into loan disbursement methodologies, especially in cases of imminent risk, in order to prevent MFI clients from taking out loans that they will not be able to repay.

Design, implement and monitor pilot projects for a line of microcredits in a specific vulnerable zone in order subsequently to develop, manage and monitor new products intended to raise clients' awareness about the threats of CC and the benefits of implementing adaptation measures, and to finance those measures. Pilot projects should address the needs of the client by analyzing the profitability of the project to be financed, ensuring funds and strategic partnerships, and evaluating the project's suitability for funding.

One example of a product could be a "Rural Irrigation Credit Line" to provide initial capital for adapting drip and sprinkler irrigation, in the medium and long term, in areas of water stress. This would require the MFI to establish partnerships, first with an organization or an institution that provides technical assistance, and subsequently with banks and/or sustainable investment funds. In addition to monitoring the results, the MFI would take what is financed as security and/or work with leasing companies.

MAKE SAVINGS PRODUCTS MORE FLEXIBLE

Provide MFI clients with easy access to their savings in the event of CC impacts, so that the funds can be used as a guarantee and/or liquidity to implement or promote urgent adaptation measures.

Combine savings products with insurance in order to reduce the risks associated with climate change.

ALLIANZ LIFE INDONESIA IS HELPING TAMADERA (A GROUP INSURANCE PLAN COMBINING PROTECTION AND A SAVINGS PLAN) TO HELP POOR PEOPLE ACCUMULATE FUNDS FOR THEIR CHILDREN'S EDUCATION AND PROTECT THOSE FUNDS FROM DAILY RISKS. AFTER AN INITIAL CONTRIBUTION OF US\$ 1, CONTRIBUTIONS ARE PAID WEEKLY FOR FIVE YEARS, AFTER WHICH THE SAVED FUNDS ARE RETURNED TO THE CONTRIBUTOR. DURING THE PAYMENT PERIOD, TAMADERA PROVIDES LIFE INSURANCE AND OTHER BENEFITS, SUCH AS A CASH AMOUNT THAT GOES TO THE HOSPITAL IN CASE OF CRITICAL ILLNESS (MICROINSURANCE FOCUS, 2011). THIS MODEL COULD BE APPLIED TO CC, PROTECTING THE INVESTED FUNDS AND USING THE INSURANCE ONLY IN CASE OF DAMAGE CAUSED BY CC.

TAKE ADVANTAGE OF INSURANCE TO REDUCE CLIMATE RISKS.

Explore commercial insurance focused on more vulnerable activities, at the initiative not only of the MFIs themselves but of the public sector. Ideally, the public sector would launch initiatives in which MFIs could participate—public catastrophic insurance, for example, where MFIs can help distribute compensation funds. (See Figure No. 8.)

Some MFIs have responded to climate risks by reducing their activities in areas of greater risk, restricting their products, or increasing the guarantees required, leading not only to the increased vulnerability of these segments of the population, but to a loss of portfolio. In order to avoid this scenario, MFIs should have insurance against CC. Given the administrative costs of traditional insurance, the moral hazard and the problem of adverse selection in remote areas, index-based insurance could be a viable alternative.

Compared to more traditional types of insurance, index-based insurance has lower administrative costs and allows the asymmetry of information between the insurer and the insured. It is based on the correlation between a given index (rain, temperature, humidity, etc.) and its impact (for example, on a harvest or the income from a production activity). When the correlation is high and the index reaches a predetermined threshold, the compensation is calculated proportionally. Because there is no relationship between the chosen index and moral hazard or adverse selection, an index-based insurance system is unaffected by those factors. Furthermore, the cost of evaluating damages (and the administrative costs) is reduced, since the variance in the index is sufficient for the calculation to be made and for the insured to be compensated.⁰² Figure No. 8 shows some insurance initiatives in developing countries that can be related to climate risks.

.....
⁰² For more information about index-based insurance, see <http://i4.ucdavis.edu>.



FIGURE N° 8 > INSURANCE INITIATIVES RELATED TO CLIMATE RISKS

01. ↘

Parametric insurance in Haiti (MICRO, 2011):

After Haiti's 2010 earthquake, a microinsurance platform was created, known as MICRO (Microinsurance Catastrophe Risk Organization), which receives funding from donors and uses its own capital to absorb the basic risk that may arise (coverage with respect to actual loss). Through MICRO, MFIs can associate with local insurers to provide parametric insurance (triggered by losses due to catastrophes). For example, the MFI Fonkoze was insured against catastrophes (storms, hurricanes, earthquakes) and, in turn, provides loan-linked coverage to its clients. www.swissre.com/clients/governments_ngos/MICRO_Haitis_grassroots_entrepreneurs

02. ↘

The La Positiva insurance company in Peru (La Positiva, 2009)

created an insurance mechanism indexed to El Niño, a phenomenon that especially batters the northern coastal zone with heavy rains. The trigger in this case is the increase in the ocean temperature, which is directly related to the increase of evapotranspiration and, consequently, the occurrence of heavy rains. In this preventive insurance, if the buoys of the North American Agency NOAA register 24 °C or more in the nearby seas in the months of November and December, La Positiva compensates the insured in January and February so that they can invest in preventive actions against the rains, which normally occur in March and April. However, the lack of receptivity in the north of the country, due primarily to the high cost of the insurance and the complexity of the modality, has required its reformulation. www.lapositiva.com.pe/generales/noticias/noticia/25/la-positiva-lanza-al-mercado-seguro-contra-el-fenomeno-de-el-nino (website in Spanish only)

03. ↘

The Ministry of Agriculture of Peru (MINAG, 2010),

through Emergency Decree No. 076-2010, approved the granting of catastrophic insurance to the poorest farmers from five regions in the country. MINAG contracted private insurance companies (e.g., La Positiva and MAFRE) to develop insurance packages in consultation with the regional governments. MINAG's reporting institutions provide alerts with regard to catastrophes, and MINAG and the contracted private insurers jointly determine whether the damages to the cultivated areas exceed the established indicator (40%). If so, the affected farmers receive direct compensation. This recent initiative has received a certain amount of criticism, including comments that in practice the compensation covers only subsistence expenses and not capital expenses, and questions about how the damage is assessed. www.minag.gob.pe/boletin-del-seguro-agrario-catastrofico (website in Spanish only)

04.



In Mongolia (Mommens, X., 2006),

a country that has suffered extensive losses due to climate disasters, index-based insurance was introduced that would pay all livestock farmers in the same region the same amount of compensation if the regional livestock mortality rate exceeded 6.5%. To make this possible, it was necessary to quantify the correlation between mortality and climate and to compile complete historical data on mortality for all species of livestock for at least 30 years (annual censuses in Mongolia). www.iblip.mn/pages/7/page7.php?vlang=en, www.microfinancegateway.org/p/site/m/template.rc/1.9.25675

05.



Agroasemex, a company of Mexico's federal government

that specializes in agricultural insurance, offers a "catastrophic insurance" product intended to cover financial deviations caused by catastrophic climate events. Unique compensations, premiums and insured sums are determined for an entire region, and compensation is triggered by a predetermined level of rain per crop for each phase of the vegetative cycle. The critical values correspond to a level of rain that affects the performance of the crop such that it is not profitable for the producer to continue with the investment. www.agroasemex.gob.mx/index.php/en/services/servseguro



USE CELL PHONES TO INCREASE FINANCIAL INCLUSION IN COUNTRIES WHERE MICROFINANCE REGULATIONS CONTEMPLATE ITS USE.

As the experience in Kenya and the Philippines has demonstrated, cell phones (mobile phones) can be very effective in improving financial inclusion and reducing the vulnerability of beneficiaries. Thanks to the lower cost and the decreased risk involved in the transport of money, the reduced need for intermediary agencies, the automation of the accounting system, etc., cell phones can help deliver financial services to a greater number of clients at a lower cost (CGAP focus note #66, 2010). Indirectly, by optimizing virtual transportation, cell phones can increase MFI clients' productivity and reduce their environmental impact.

With regard to promoting adaptation to CC, cell phones facilitate much swifter payment and enhanced liquidity, especially in cases of extreme climate-related events. As well, cell phones can improve the adaptive capacity of MFI clients living in remote areas: for example, they can be used to access climate information or alerts, allowing clients to take short-term preventive measures.

KILIMO SALAMA (SWAHILI FOR "SECURE AGRICULTURE") IS A PARTNERSHIP BETWEEN THE SYNGENTA FOUNDATION FOR SUSTAINABLE AGRICULTURE, UAP (INSURANCE COMPANY) AND SAFARICOM (TELCO) INSURANCE. THE PROJECT PROVIDES 11,000 FARMERS WITH INSURANCE AGAINST SIGNIFICANT LOSSES IN CASE OF DROUGHT OR EXCESSIVE RAIN. A NETWORK OF SMALL SOLAR-POWERED STATIONS MEASURES THE CLIMATE DATA, AND THE AFFECTED FARMERS RECEIVE COMPENSATION VIA M PESA—IN OTHER WORDS, THEIR CELL PHONE. (CGAP FOCUS NOTE #66, 2010.)

However, and as analyzed extensively in other studies, the viability of "mobile banking" depends on proper regulations, adequate user training, and cost control, among other aspects.⁰³

03 For more information about the challenges of mobile banking, see CGAP focus note #66, 2010 (see references at the end of this document).

TABLE N° 9 > IMPACTS OF CC, NEEDS FOR ADAPTATION AND NEW MFI PRODUCTS

Effects of CC	Impacts of CC	Technological needs for adaptation	Offering of new MFI products
<p>Direct effects</p> <ul style="list-style-type: none"> > Incremento anómalo de la temperatura y las precipitaciones. > Decrecimiento anómalo de la temperatura y las precipitaciones. > Adelanto o retraso de las estaciones. 	<ul style="list-style-type: none"> > WATER > Decreased availability (reduced flows). > Changes in the quality and quantity of available water. > Discrepancy between supply and demand of water and conflict between sectors for the use of the resource (agriculture, energy, consumption, etc.). > Change in the supply for hydro-electric power. > Flooding that affects harvests and infrastructure. > > BIODIVERSITY > Increase in insects and pests that cause diseases in flora and fauna. > Changes in reproductive behaviour and species distribution (migration). > Effects on marine species of changes in the sea, although there is not yet a clear impact (highly divergent climate scenarios). > > SOIL > Damage to and blockages of highways. > Damage to infrastructure and poor settlements located in zones of risk (flooding, rains, landslides). > Worsening of housing conditions. > Change in soil nutrient levels (arid soil) causing loss of crops. > Intense erosion due to effects of water and winds. 	<ul style="list-style-type: none"> > CC-resistant (tolerant) seeds. > Technical irrigation systems. > Mini storage centers. > Mini-greenhouses (tunnels). > Soil management (organic fertilizers, erosion control). > Use of live barriers¹ (trees, coral, pastures, etc.). > Construction of dikes and/or retaining walls. > Diversification of tourist routes. > Preparation of manuals/plans for managing climate risk. > Management of micro-basins. > Alternative energies for production (energy poverty). > Diversification of the energy matrix. > Mini-staggered sowing. > Mini water reservoirs. > Recovery of platforms. > Water sowing and harvest. > Systems for monitoring and controlling climate-sensitive diseases. > Modification of sowing and planting calendars. > Use of crop varieties resistant to water or thermal stress and/or relocation of crops. > Cleaning of riverbeds. > Implementation of migratory biological runners. 	<ul style="list-style-type: none"> > In the event that MFIs manage to gain access to longer and/or more flexible credit lines, they could offer: > A "Rural Irrigation Credit Line" to provide initial capital for adaptation of drip and sprinkler irrigation, in the medium and long term. > In the event that MFIs do not gain access to longer credit lines, they could help their clients obtain credit for adaptation products by: > Proposing a partnership with a bank or sustainable investment fund specifically for financing CC issues. > Proposing a collaboration with leasing companies. > Organizing the guarantee process for the benefit of a bank. > Demonstrating that the end client is well trained (and therefore a good repayment prospect). > Regardless of the term of the credits, MFIs could also: > Introduce index-based insurance for MFIs or their clients. > Increase the number of clients by providing cell phone access to financial services. > With regard to investments in community infrastructures, MFIs could identify a counterpart in local labour.
<p>Indirect effects</p> <ul style="list-style-type: none"> > the surface temperature of the sea, level of salinization, and sea level > Increased frequency, duration and intensity of extreme climate-related events (flooding, droughts, frost, hailstorms, avalanches, landslides, downpours, El Niño and La Niña phenomena) > Increase of dry zones due to temperature effect > Deglaciation > Desertification 			

5.3

WHAT DO MFIS NEED TO PROMOTE ADAPTATION TO CC?

By implementing the actions recommended in the previous section, MFIs could channel their financial services toward adaptation to CC, and thus benefit from market expansion and penetration, among other opportunities. However, in order for these new financial products to be viable and effective, MFIs and their clients will need to strengthen the capacities described below.

5.3.1

SPECIFIC NEEDS OF MFIS

Though the objectives of individual MFIs may vary according to their bylaws or mission, they generally do not include adaptation to CC. In order for MFIs to focus on adaptation to CC, they require various resources, including information, training, financial and regulatory requirements.

INFORMATION AND TRAINING: Within the microfinance sector, there is limited awareness of the implications of CC, its potential impacts, and preventive and adaptive measures. Many MFIs recognize climate problems in certain areas or activities, but have not yet systematically incorporated



CC as a factor in assessing risks, analyzing their portfolios, or developing products or lines adapted to these new conditions. Therefore, more information and training are required in several areas:

- ▶ The risks associated with CC, locally and regionally, and their effects on vulnerable sectors and specific products. Although projections of the potential magnitude or frequency of future CC events (whether on a local scale, district-wide or in micro-basins) are highly uncertain, the global scenarios employed by the Intergovernmental Panel on Climate Change have proven conservative in comparison to what is currently happening. To that end, we must have information on past, current and projected climate risks.
- ▶ Scientific climate information. It can be challenging to obtain projections of the future impacts of CC, but this must not limit the preventive actions taken by MFIs. It is recommended that the scientific data be supplemented with historical information about past events and information about community attitudes to climate risk.

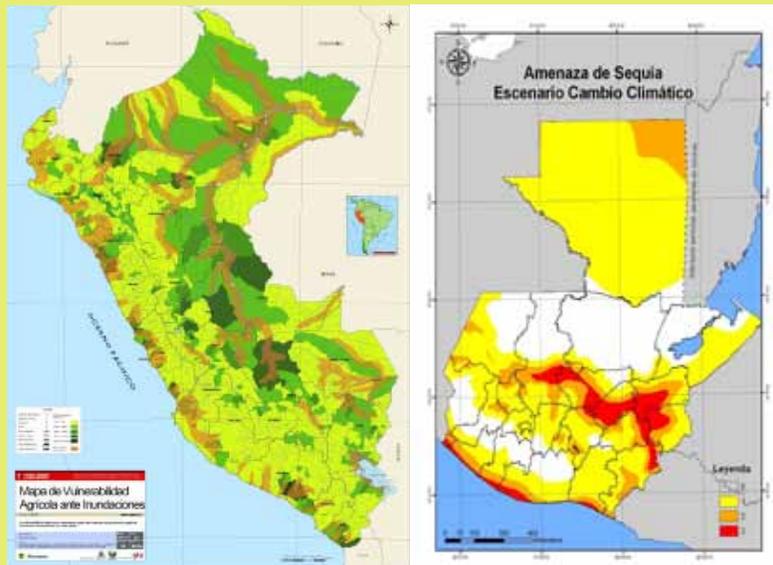
Training on climate change tools for analyzing CC (including vulnerability maps, climate scenarios, risk analysis and climate screening) and on making CC the focus of their financial activities.

- ▶ Training on how to incorporate CC into the processes and operations of MFIs. This training must be comprehensive, and must cover the disbursement of credits, the evaluation of climate risk during the life of a loan, and the new applications of information systems by risk/management control departments in order to manage not only credit and commercial, operational and macroeconomic risks, but climate risks.
- ▶ Information on alternatives and technologies for CC adaptation by certain subsectors or activities receiving financing from MFIs (such as, for example, those included in Section 4, Table No. 5), as well as information about risk management that MFIs themselves must apply in light of extreme climate-related events.
- ▶ Information on the use of credits in order to maximize transparency and traceability with respect to CC. Many MFIs do not know whether a credit was used to carry out an activity that will ultimately be productive, or used for the home. In light of this lack of information, there is no way of knowing whether a financial service has actually promoted adaptation to CC.
- ▶ Information that identifies and eliminates poor adaptation practices, i.e., those that involuntarily increase vulnerability. For example, promoting agricultural credits without first carrying out an ecosystem analysis to determine future water availability can cause economic losses and loss of initial capital. Checklists and questionnaires can be developed to help prevent such losses.

- ▶ Dissemination of experiences and lessons learned with regard to new products (e.g., micro-credits for new crops, insurance against climate risks, etc.) and the type of financing used. Technical assistance to help MFIs understand the risks and opportunities that CC represents for them, and increase awareness among the ultimate beneficiaries of CC-related products.

FIGURE N° 10 > MAP OF VULNERABILITY OR CLIMATE RISK

Maps of vulnerability or climate risk are useful tools in designing and developing financial products and making investment decisions. They use geographic information to map the territory, illustrating the current status of ecosystems or life zones as well as geo-referenced socioeconomic activities and climate change trends and projections. Two examples are shown below: a map of agricultural vulnerability to flooding in Peru, and a map of threats of drought in Guatemala under climate scenarios projected to 2050.



In many cases, such maps are based on spoken information provided by experts or representatives of a community or region.



FINANCIAL REQUIREMENTS:

In order to design specific financial products (e.g., longer-term microcredits), MFIs need to have: i) a regulatory system that allows them to capture savings, offer insurance and make transfers, and ii) investment funds that grant long-term credit lines.

As risks increase, profitability often decreases; therefore, MFIs need some kind of financial guarantee. Guarantee funds and catastrophic funds are examples of financial tools that could be applied to CC, and used directly or indirectly (for example, by supporting insurance companies) in the event of extreme climate-related incidents.

**TABLE N° 11 > CONSIDERATIONS REGARDING
GUARANTEE FUNDS**

There have been negative experiences where Guarantee Funds have not worked in countries. This is due, among other things, to high operating expenses, poor public management, a risk that was not shared between the beneficiary and the guarantee fund (moral hazard), a low price quote level of beneficiaries when the fund is public (or that is considered as a donation from the State), too long a compensation period to return to being productive, etc. Therefore, we recommend taking the following considerations into account when it comes to designing Guarantee Funds, so as to allow for sharing the risk with MFIs with respect to climate-related events:

In order to prevent its misuse, the Guarantee Fund must share the risks with other financial stakeholders, like the MFIs themselves.

Operating expenses must be very low, for example, leaving the work of assessing the damage, the most affected areas, etc., to the MFIs.

It should be very clear who is going to assume the operating expenses of the Fund.

Given the type of risk covered by the Fund, the compensation should be able to be delivered as soon as possible, with the intention of reestablishing the local economy as soon as possible. Once damage occurs, the small farmer or microenterprise owner needs to receive his compensation as soon as possible because, in being poor, he does not have the necessary capacity to resume his work (buying seeds, tools, machinery, etc.) if he does not receive it..



REGULATORY REQUIREMENTS:

Although MFIs cannot change the regulations concerning microfinance, they can act jointly and in coordination (or in an organized way) to generate pressure and influence on the Regulatory Agencies in order to generate a change in legislation to help them promote adaptation to CC. This change in legislation means a flexible regulatory system that incorporates the variable of CC and involves:

- ▶ Establish a regulatory environment that allows MFIs to be able to expand their activities with new products (e.g., payment by cell phone, index insurance) and offers specific products in relation to CC.
- ▶ Be more flexible with respect to the potential impacts of CC. For example, the Superintendence of Banking and Insurance in Peru authorized debt rescheduling in light of the earthquake in the south of Lima in 2007, so that it would not affect the client's rating. Although the earthquake is not related to CC, this is a good experience where regulations are made more flexible to respond in the case of extreme events.
- ▶ Organize a risk center on a national scale in order to have better information with respect to the debts of potential clients, thereby avoiding over-indebtedness. With regard to CC adaptation measures, this aspect of indebtedness is very important, since it is a question of small credits for investments that involve a longer term.

5.3.2.

SPECIFIC NEEDS OF THEIR CLIENTS

- ▶ As mentioned previously, a large proportion of MFI clients are poor and vulnerable to CC. In order for them to be able to combat the risks and benefit from the opportunities of CC, they are going to need support with regard to:
 - ▶ Receiving specific information about current and future climate risks with respect to CC in their locality or region, as well as appropriate technologies or ad-hoc practices that allow them to promote adaptation to CC.
 - ▶ Accessing training on the technical description and implementation of measures for adaptation and planning of the required investment.
 - ▶ Obtaining more of a financial education, particularly if they have to make a medium-term investment: understand the consequences, know its equilibrium point, manage its stock, etc.
 - ▶ Internalizing a culture of insurance.

5.3.3.



COMPLEMENTARY CROSS-SECTOR ACTIONS

In addition to the specific needs of MFIs and their clients to promote and internalize adaptation among their activities, the complementary support from other sectors of development is needed. As mentioned in chapter 3, there are various types of adaptive capacities (like information, financing and organization), but there is also a structural type, i.e., actions pertaining to regulations, infrastructure, taxes, etc. Therefore, the joint participation of the public and private sector is needed to promote:

- ▶ In addition to the specific needs of MFIs and their clients to promote and internalize adaptation among their activities, the complementary support from other sectors of development is needed. As mentioned in chapter 3, there are various types of adaptive capacities (like information, financing and organization), but there is also a structural type, i.e., actions pertaining to regulations, infrastructure, taxes, etc. Therefore, the joint participation of the public and private sector is needed to promote:
- ▶ Risk management and prevention, as well as construction and/or adaptation of infrastructure, helping to reducing the impacts of climate change (e.g., alternative highways, dikes, retaining walls, water drainage channels in case of flooding, dams, etc.).
- ▶ The organization and consolidation of information relative to CC (risks and opportunities nationwide). On the one hand, the costs of CC and the necessary investments for adaptation must be evaluated and disseminated; and, on the other hand, studies must be conducted and information must be generated to help develop climate scenarios and projections in the local sphere, enhance hydro-meteorological stations and implement early alert systems.
- ▶ The dissemination of knowledge and raising the awareness of those who make decisions to close the gap between scientific knowledge and the perception of climate risk.
- ▶ The development of a standardized breakdown, on a national scale, of the portfolio of MFIs, by sector and subsector (or economic activities), which can help in the analysis of potential impacts of CC and help to structure products or strategies to reduce said risks.
- ▶ Cross-sector coordination of economic sectors at the level of the government and the inclusion of civil society in local plans and debates for adaptation to CC. To that end, we must have instruments that allow for planning development, taking a territorial organization and areas of greater vulnerability into account, in order to avoid the implementation of projects of infrastructures in areas of high climate risk. Cross-sector coordination and the use of said instruments will facilitate the mainstreaming of the risk of CC in transport policies, industry, trade, tourism, health and infrastructure, among others.

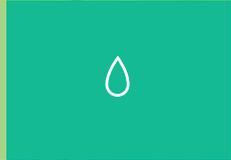
- ▶ The development of financial instruments or tax incentives at the national level for purposes of reducing vulnerability to CC (e.g., green subsidies or lowering taxes for activities that promote adaptation to CC) or to reactivate the local economy after an extreme climate-related event (e.g., a speedy rehabilitation system for damaged highways and infrastructure).

As noted, multidisciplinary actions are required from various public authorities, national and local (ministries that regulate the issue of CC; the Superintendence of banking; ministries of infrastructure, economy and territorial planning; research institutions, etc.), which aid the actions of MFIs and the clients from their portfolios to promote effective adaptation to CC.

FINAL REFLECTIONS

The need for implementing preventive actions or “CC adaptation measures” is high and will be even more pressing as information about CC is spread and/or its damages and impacts are accentuated. These circumstances will generate greater demand for technical and financial resources not only on the part of rural communities but also urban communities, consumers, producers, entrepreneurs and all those whose economic activity and livelihood depends on how the climate changes, or the natural systems sensitive or exposed to the threats of CC. Therefore, it is key that MFIs know and analyze the degree of vulnerability of their clients and their own activities with respect to CC, in order to be able to address and take advantage of this niche of opportunities, adapting their microfinance services and/or creating ad-hoc products that reduce the new risks.







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