The Lab

Global Innovation Lab for Climate Finance

Agricultural Supply Chain Adaptation Facility (ASCAF)

Phase 2 Analysis Summary

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GOAL —
Catalyze private investments in measures that improve the climate resilience of agricultural value chains

CURRENT STAGE —
Concept

SECTORS —
Agriculture and forestry

PRIVATE FINANCE TARGET —
Direct: Global agricultural corporations
Indirect: Small and medium-sized producers and/or processors in corporations' agri-value chains

GEOGRAPHY —
For pilot phase: Latin America and Caribbean region
In the future: Low and middle-income countries globally

The Lab is a global initiative that supports the identification and piloting of cutting edge climate finance instruments.

It aims to drive billions of dollars of private investment in developing countries.

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SUMMARY

The agricultural sector is particularly vulnerable to climate variability and change, as are those whose livelihoods or business operations depend on agriculture. However, small- to medium-sized farmers in developing countries often do not have access to long-term finance for investment in climate resilience, and have limited knowledge of measures that could be implemented to improve their sustainability as well as increase productivity of yields. Long-term financing is in short supply because small- to medium-size producers represent a significant and un-bankable credit risk given their minimal credit history and lack of adequate collateral. Moreover, investments in 'climate-adaptive' agricultural measures can have high upfront costs and longer, more uncertain payback periods, increasing the overall perception of risk.

The Agricultural Supply Chain Adaptation Facility (ASCAF) aims to arm agricultural producers in low- and middle-income countries with finance and improved capacity to enable them to make investments that would increase crop productivity while reducing the climate vulnerability of agricultural value chains.

ASCAF is a 'value chain financing' mechanism that would provide finance back-stopped by donor-backed first-loss guarantees and technical assistance to partner agricultural corporations through Multilateral Development Banks. This would create a platform whereby corporations engage with their supply chains in a longer-term value proposition rendering medium to long-term climate-resilient investments viable by providing longer than market term loans at lower rates, as well as know-how to the small- to medium-sized producers in their supply chains.

Key implementation hurdles will be securing partner corporations' and farmers' buy-in and determining an appropriate portfolio of climate-resilient investments eligible for ASCAF support. If successfully implemented, the Facility could help to offset climate-related agricultural productivity shocks, thereby potentially protecting or increasing the revenues of 63,000 to 420,000 farming households by 2030 (assuming the Facility is scaled and replicated across the Latin America and Caribbean region).

For implementation ASCAF needs:

- Donor resources to assume the first-loss position that MDBs and other market-based lenders are not able or willing to take, and to transfer know-how on climate-adaptive practices;
- MDBs' financing, know-how, and relationships; and
- Agribusiness corporations' buy-in to engage supply chains in longer term horizon for climate-resilient investments by expanding their existing short-term credit operations into medium-to long-term financing for sustainability.

INSTRUMENT DESCRIPTION

By leveraging the shared interest of buyers and suppliers in agricultural supply chains, the Facility aims to reduce credit risks and close capacity gaps that hinder small- to medium-sized farmers from accessing medium-to long-term financing for investments in agricultural measures that could help reduce their climate vulnerability.

Small and medium-sized farmers and processors in developing countries often do not have access to the long-term finance they need to cover the long-term payback periods associated with measures that could help reduce their climate vulnerability, nor do they have the full range of knowledge of measures that could be implemented.

The Agricultural Supply Chain Adaptation Facility (ASCAF) proposed by the Inter-American Development Bank and Calvert Investments is envisaged as a multi-crop and multi-country 'value chain finance' mechanism through which Multilateral Development Banks (MDBs) would employ donor-backed first-loss guarantees and technical assistance to provide supply chain financing via partner agribusiness corporation(s).

ASCAF targets corporations' credit analysis and agricultural extension capacity gaps in order to enable them to extend and service medium to long-term loans (5-7 years) and know-how to their suppliers (small- to medium- size farmers and/or processors) for investments in measures that could improve crop productivity and, ultimately, the climate resilience of supply chains.

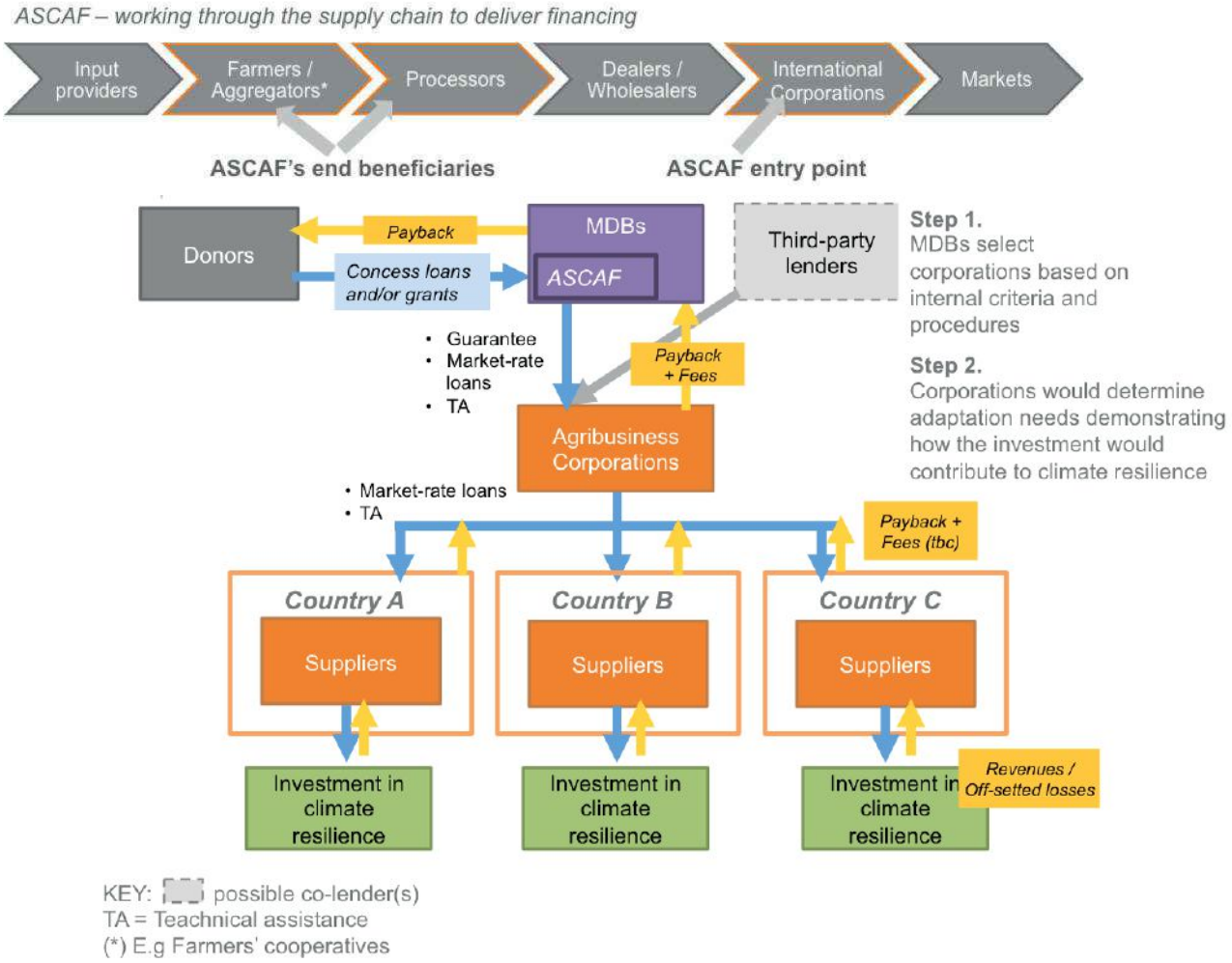
Figure 1 below depicts the structure of the Facility, key stakeholders, and the relationships between them.

ASCAF BUSINESS MODEL

ASCAF would be structured as a donor trust fund administered by the private sector lending arms of MDBs. Through concessional loans or grants from donors, ASCAF would allow MDBs to:

- **Deploy first-loss credit protection** in conjunction with market-rate loans to and through partner agricultural corporation(s), enabling both MDBs and corporations to mitigate potential losses from a high risk portfolio;
- **Provide technical and financial capacity assistance** to strengthen corporations' ability to: (i) originate and service loans by expanding their existing internal credit function; (ii) assess and analyze the associated credit risks; (iii) arm corporations' existing technical training teams to build suppliers' capacity. Corporation(s) and suppliers may be asked to pay fees for the technical assistance services received.

Figure 1. The structure of the Agricultural Supply Chain Adaptation Facility



The first-loss guarantees, extended as partial credit risk guarantees, would provide credit enhancement to the pool of eligible loans, thereby enabling corporations to extend and service loans at longer than market terms and lower risk premiums to their suppliers. Specific risk sharing arrangements between the MDBs, third-party lenders and corporation(s), loan criteria (including loan size and farm size), and eligibility for loans would be determined based on the climate vulnerabilities of specific countries, crops, and value chains on a case-by-case basis. In order to lower the risk of possible moral hazard behavior, i.e. the risk of corporations relaxing credit standards, MDBs expect to ask partner corporation(s) to assume part of the potential first-losses.

The business case for ASCAF hinges on the main benefits that it could generate, namely:

- **For corporations**, more secure supply and/or increased quantity and quality of crop supplies by tackling the climate-related risks that could disrupt their supply chain and, as a result, enhance their ability to more effectively respond to market demand. Benefits can also stem from strengthened and/or improved relationships with suppliers, including the expansion of the corporations' suppliers and/or customer base for those selling agricultural inputs, and the possible reduction of margins paid to intermediaries.
- **For suppliers,** improved ability to access credit at terms and conditions not available in the market to fund investments that would increase crop productivity or avoid crop losses, thereby increasing suppliers' income or making it less vulnerable to climate impacts. Suppliers would also likely benefit from strengthened relationships with corporations through, for instance, the possibility of establishing purchase agreements for predetermined volumes of agricultural produce. In markets that pay certification premiums there may be additional revenues available if certification costs are otherwise onerous.

TARGET INVESTMENT

ASCAF would cover loans for investments that help build climate resilience into agricultural value chains, but that may have high upfront costs, longer and uncertain payback periods and, therefore, higher perceived risks. The portfolio of eligible investments could include, for instance, water-efficient irrigation technologies, the development and use of pest and diseases resistance plant varieties; and the establishment or

upgrade of facilities for storage of agricultural products.[1]

The selection of the portfolio of eligible climate resilience investments at the Facility and project-level would be informed by corporation(s)' self-assessed climate resilience needs, and would follow the criteria of the joint MDBs approach for tracking adaptation finance (see Annex A and AfDB et al., 2013, 2014). Corporation(s) would need to provide MDBs with evidence demonstrating how the proposed investment would contribute to enhanced climate resilience in a specific context, and to commit to avoid deforestation or environmental degradation that could be associated with increasing production. Where downscaled information about projected climate impacts is available, MDBs could support corporations' assessments with technical assistance services to perform forward-looking climate risk analysis. This would help determine how given climate vulnerabilities could change under different climate change scenarios.

ASCAF's business model is suited to high-value crops such as coffee, sugarcane or cocoa in 'tight' value chains, which are characterized by relatively few off-takers and a high degree of supplier loyalty. 'Tight' supply chains create stronger incentives for corporations to engage because of the lower risk of side selling compared with those for subsistence crops or those with looser supply chains. In addition to crops, ASCAF could also be suited to other tight value chain goods such as fruits, dairy and livestock products.

FACILITY SIZE

The size of the Facility will depend on the willingness of donors and corporations to participate in the venture and its potential market size. As an indicative estimate, a pilot with one corporation and with a loan package in the range of USD 30-60 million would require a Facility of USD 6-15 million, assuming a 20-25% first-loss guarantee. If the Facility were extended to, for instance, 10 large corporations across two or three markets, it could be expected to generate loan values of USD 1 billion, which may require a facility of USD 200-250 million. Additional resources would also be needed to cover technical assistance services, whose costs would vary depending on corporations' and related value chain needs. In a similar IDB project (IDB, 2014a), with a relatively advanced market player, the ratio of loans to technical assistance was 50:1.

TARGET COUNTRIES

Noting that the Inter-American Development Bank (IDB) is one of the proponents, the pilot ASCAF would target countries in its area of activity, the Latin America and Caribbean (LAC) region. ASCAF's model could be replicated by MDBs operating in other developing countries.

PUBLIC AND PRIVATE STAKEHOLDERS

ASCAF would rely on the involvement of and partnership between a variety of public and private stakeholders, namely:

- **Interested international donors** (governments), to set up and fund the Facility;
- **The private sector lending arms of MDBs** to administer ASCAF, engage with private and/or public financiers, and provide their own resources to help corporations build the portfolio of eligible loans;
- **International corporations** such as food and beverage companies (e.g., Starbucks, Nestlé S.A., Green Mountain Coffee Roasters), retailers (e.g., Walmart) or commodity trading companies (e.g. Ecom) to originate loans and provide extension services. Such corporations would be selected according to MDBs' internal criteria and procedures, and would need to demonstrate pre-existing credit and/or agricultural extension services;
- **Suppliers** such as small- to medium-sized producers and/or processing companies operating within global value chains to invest in climate resilience;
- **Third-party public or private lenders** such as commercial banks, but also other Development Finance Institutions or dedicated multilateral mechanisms (e.g., Global Agriculture and Food Security Program (GAFSP)) to co-finance the loan package that MDBs would extend to corporation(s).

THE ROLE OF THE LAB

The Lab's role during Phase 3 would be to identify and analyze more deeply key aspects of the proposal and to work with stakeholders and experts to review and refine design specifications of ASCAF. The Lab could also act as a platform to connect the Facility with possible donors interested in supporting the credit enhancement and technical assistance components.

CONTEXT

Agriculture is a major source of income for Latin America and Caribbean economies and millions of family farms. Investments in climate resilience could help reduce their vulnerability to projected climate change impacts, but are constrained by risks and capacity gaps.

Agriculture plays a key role in the Latin America and Caribbean (LAC) economy. It accounts for about 5.5% of regional gross domestic product (GDP) and 17.7% of employment (World Bank, 2014).[2] Food exports in the region represented 19% of all merchandise exports (World Bank, 2014).[3] Regional production of sugar, soybeans and coffee represents over 50% of worldwide exports (FAO, 2014a).

Observed climate change has already posed many

1 Sources: Vergara et al., (2013); IDB (2013a, b); Magrin et al., (2013).

2 Figures refer to 2004-2013 average for LAC developing countries only.

3 Figures refer to 2004-2013 average for LAC developing countries only.

challenges to agricultural production in the region, resulting in crop losses and affecting the functioning of markets (Juárez-Torres et al., 2012). Fernandes et al. (2012) estimates the negative impacts of climate change will reduce the value of annual agricultural exports in LAC by USD 32 billion–USD 54 billion by 2050. While impacts will be differentiated across LAC countries and crops, LAC's agricultural output is expected to fall over the medium- to long-term as a result of combined changes in soil conditions, rainfall and temperatures (Vergara et al., 2013 based on ECLAC 2010; Mendelsohn and Dinar 2009; Tubiello et al., 2008;). Climate change is expected to lead to:

- **Reductions in the yields of some crops:** in Central America, for instance, rice and wheat yields could decrease by up to 10% by 2030 (Marengo et al., 2014 based on Lobell et. al 2008);
- **Contractions of cropland**: for example, areas suitable for coffee production in Nicaragua, and El Salvador may shrink by more than 40% by mid-century (Läderach et al., 2014);
- **Re-distribution of existing plant pests and diseases and increases in their intensity** across cash and subsistence crops throughout the region (Magrini et al., 2014);
- **Increases in the frequency of extreme climatic events**, which can add uncertainty to the productivity and profitability of the region's agricultural sector (Magrini et al., 2014).

Lost productivity in high value crops could greatly affect farmers and SMEs (Vergara et al., 2014), reducing farmers' incomes and increasing food prices and food insecurity. Having more limited resources with which to cope, smallholder farm families will face the most severe impacts (Vergara et al., 2014).

Adaptation investments have the potential to reduce the net impact of these climate consequences. Farmers currently lack or have limited access to long-term finance for investments that improve climate resilience and agricultural productivity, but come with additional risks and collateral requirements. At the same time, climate resilience is a key economic and social development priority in the LAC region, that has climbed up the political agenda as demonstrated by the increasing development of national plans and dedicated strategies (see e.g. GoM, 2013; CKDN, 2010; CIF, 2011).

Agricultural value chain financing is an emerging phenomenon in LACs as a tool to help farmers' and small enterprises to access finance (Coon et al., 2010). The declining share of agricultural credit as a share of agricultural GDP indicates that formal banks are less and less a source of credit to individual farmers in many LAC countries (Coon et al., 2010). Instead, farmers mostly access credit directly from larger agents in the value chain (such as the agribusinesses they supply) or use their own savings to invest in their farms. Being able to demonstrate links with recognized regional, national, or global value chains is increasingly a prerequisite for accessing formal credit in the region (Coon et al., 2010).

Agricultural value chain financing has been implemented in many countries across regions with varying stages of development and differing enabling environments (FAO, 2010). Most of the financing channeled through the value chain, however, is used for working capital purposes (IFC, 2012)[4] rather than investments in improved farming methods.

Agricultural value chain financing is a model that has recently been used by MDBs to help build climate resilience benefits in the LAC region and beyond.[5] Major buyers procuring in the region have recognized that securing supply may be a challenge under changing climatic conditions. To this end, there is evidence that some have already been directly engaging with farmers to improve the yields and quality of crops vulnerable to the adverse effect of climate change (UNFCCC, 2012; Nestle', 2013). MDBs could play a role in engaging these market players, expanding on existing efforts to deliver climate resilience benefits.

INNOVATION AND BARRIER REMOVAL

ASCAF would build on existing mechanisms to target a gap barely addressed in LAC. By providing first-loss guarantees, ASCAF would lower the risk of lending to farmers for climate resilience measures, in turn promoting farm-level investments that could protect the entire supply chain from climate-related shocks.

INSTRUMENT INNOVATION

ASCAF's innovativeness is rated *moderate-to-high*. While the Facility builds on existing funds and value chain financing mechanisms with similar business models and/or objectives, it targets a gap barely addressed by comparable measures in the LAC region.[6]

ASCAF most innovative elements are:

4 IFC (2012) presents key findings observed across case studies in a number of countries, including LAC ones. Most case studies are derived from a stocktaking report compiled by Robobank International Advisory Services for IFC and information compiled from more than 100 cases.

5 Examples include the pilot projects recently developed by IFC, IDB and ADB within the Pilot Program for Climate Resilience (see e.g. IFC 2014, 2013 a,b, c; IDB, 2014 a, b; IDB, 2013a, b; ADB, 2014).

6 E.g. long-term financing gaps is targeted by the IDB Ecom Coffee Renovation Facility (IDB, 2014a), the recently (March, 2014) approved USD 5 million IDB-GEF Climate-Smart Agriculture Fund for the Americas, which inter alia aims to help strengthening the climate resilience of value chains by leveraging private sector lending in climate-smart agriculture in LAC countries (see GEF, 2014). Another example identified is the USD 23 million Coffee Farmer Resilience Fund recently (June 2014) launched by USAID in partnership with Keurig Green Mountain, Inc., Cooperative Coffees, Starbucks and Root Capital (USAID, 2014).

- **Value chain finance model focused on supporting medium- to long-term investments in measures that would help reduce climate risks and increase agriculture productivity.** Few initiatives currently focus on medium- to long-term lending through corporations engagement in LAC.[7]
- **Uniqueness among MDBs' administered trust funds, as it would be the first to be fully dedicated to building climate change-resilient value chains.** While other public and public-private funds with similar aims and approaches do exist,[8] ASCAF would enable MDBs to build a pipeline of these types of private sector climate resilience projects, scaling up beyond current ad-hoc approaches.

We assessed the innovativeness of ASCAF through a preliminary desk-based comparison of its key features against those of existing initiatives targeting agricultural supply chains. Third-party expertise complemented this desk-based review.

BARRIERS

Barriers directly addressed by the instrument include the following:

- **Small- to medium-sized producers/processors lack of access to medium- and long-term credit.** ASCAF aims to address this barrier by using donors' funds to lower the risks that private actors or MDBs would otherwise be unwilling or unable to absorb. This is because:
  - Small- to medium-size producers represent a significant and un-bankable credit risk given their limited credit history and lack of adequate collateral. Credit to farming households is also typically constrained by the high transaction costs associated with reaching them and dealing with small loans, and the exposure to systemic risks due to the concentration of farm businesses and exposure to climate-related risks (IFC, 2012).
  - Long-term credit for investments in 'climate-adaptive' agricultural measures with uncertain and long-term returns (e.g. innovative technologies, timber plantations) is scarce because of the additional risks and collateral requirements they entail.
- **Information, capacity, and incentive gaps.** ASCAF intends to tackle these gaps by building the know-how needed to promote the supply and demand of finance for climate resilience investments along supply chains. By harnessing the alignment of interests existing between buyers and suppliers it creates incentives for investments that would lead to mutual benefits. In fact, many of the region's producers and lenders do not have the technical know-how to implement agricultural best practices or to perform the related credit risk assessments. Lack of awareness and capacity can hinder private financing and investments in climate resilience. It can increase the uncertainty of the expected profitability of the investment as well as increase credit default risk perceptions and associated premiums for financing.

Barriers indirectly addressed by the instrument include the following:

- **Third-party lenders' credit risks.** ASCAF would help MDBs and partnering entities build a track-record of deals, demonstrating the debt service capacity of small- to medium-sized producers to other commercial lenders.
- **Lack of access to inputs and technologies.** Improved seeds, fertilizers, and pesticides, as well as farm equipment, are often unavailable to smaller producers (IDB, 2014b). By strengthening the relationship with corporations, ASCAF may help address this barrier (IFC, 2012; CPI, 2013).

Barriers not addressed by the instrument include the following:

- **Enabling environment gaps.** ASCAF would not address sub-optimal policy and regulatory environments that hinder investments, economic and private actors' incentives. Strengthening relevant policy frameworks might otherwise minimize or eliminate the need for donor finance and/or incentivize private investments in climate resilience;
- **Farmers' access to markets.** ASCAF would not directly help to link farmers to markets by integrating them into high-value chains;
- **Systemic risks.** ASCAF does not help to protect the value chain from possible production shocks associated with extreme events such as droughts or floods.[9]

7 Idem 6.

8 For instance, the recently approved USD 5 million IDB-GEF Climate-Smart Agriculture Fund for the Americas (see GEF, 2014), and the USD 23 million Coffee Farmer Resilience Fund recently launched (June 2014) by USAID in partnership with Keurig Green Mountain, Inc., Cooperative Coffees, Starbucks and Root Capital (USAID, 2014).

9 Weather insurance products could help to hedge these risks, also reducing default risk to lenders, but require appropriate institutional, legal and regulatory frameworks as well as the availability of long-term weather data for e.g. the design of index-based insurance products). There is a gap in the provision of crops and forestry insurance products in LAC. Crop insurance penetration is only 17% of the total cropped area and forestry insurance covers 19% of the area with standing timber forestry plantations.

IMPLEMENTATION AND RELATED CHALLENGES

Assuming donor funding is secured, key implementation hurdles would be associated with obtaining corporations' and producers' buy-in and selecting an appropriate portfolio of eligible climate-resilient investments. ASCAF benefits from engaged proponents who have already engaged in preliminary outreach.

ACTIONABILITY

The timeframe for the setup of ASCAF and the first pilot project would depend on a number of factors associated with (1) donors' willingness to fund the setup of the Facility (2) MDBs' project cycle (3) the proponents' ability to engage corporation(s) and co-lender(s). Moreover, it would also depend on whether the pilot would be concurrent with or subsequent to set up the Facility.

Once donor resources are secured, the first pilot would take a minimum of 12-18 months to take off. This includes two subsequent steps of approximately:

- Six months to setup the Facility, which would be mainly dependent on: (i) availability of donors' resources and associated processes; (ii) the negotiation of conditions under which the Facility would operate (e.g. eligibility criteria, funding size per project, co-financing requirements, etc.); (iii) MDBs' procedures for the setup of the related administrative requirements;
- Six to 12 months for a project under the Facility to run through MDBs' project cycle and get Board approval. This would also depend on prompt engagement of corporations and co-lenders.

Possible partner corporation(s) has/have been identified and preliminary associated scoping dialogues have started, but the engagement process could be lengthy. Target crops, countries and climate resilience measures eligible for the first-loss coverage in a possible pilot project have not yet been selected. These would be determined once the corporation(s) is/are engaged.

Proponents have determined draft characteristics of the Facility but, given its early stage of development, additional analytical work and substantial outreach/market research is needed to develop a more detailed proposal, which would require additional time.

ASCAF benefits from engaged proponents. In particular, one of the private sector arms of IDB – the Structure and Corporate Finance Department – is interested in sponsoring the pilot project and Calvert Investments in supporting the businesses engagement strategy.

The proponents also have experience with instruments similar to ASCAF. IDB Structure and Corporate Finance Department has developed jointly with IFC a special purpose facility engaging a global commodity trading and processing company to channel long-term loans to the farmers in its supply chain to invest in the renovation of coffee plants in Nicaragua (IDB, 2014a; IFC, 2014). Furthermore, with backing from the Pilot Program for Climate Resilience, the IDB group is piloting and exploring supply chain finance mechanisms to build climate resilience into agriculture-dependent businesses and livelihoods in Haiti, Bolivia and Saint Lucia (see IDB, 2014c; 2013a,b). These projects are at an early stage of development and implementation.

Calvert Investments has proven experience in engaging socially and environmentally responsible private investors, and could act as an amplifier to facilitate the scaling and replication of the Facility in LAC and other regions.

IMPLEMENTATION CHALLENGES

The key challenges associated with the Facility identified in the preliminary scoping analysis include:

- **Securing adequate donor funding** and negotiating the related conditions, which could influence MDBs' ability to achieve the Facility's intended objectives.
- **Identifying and engaging the most appropriate 'entry point' in the supply chain, supply chain members' needs, respective incentives, and investment potential.** The choice of the most suitable partner corporation(s) within the supply chain would be dependent on the structure of the supply chain, which varies across crops and countries. Lessons emerging from existing climate resilience and 'development-as-usual' initiatives (see e.g. FAO (2010) and PWC (2012)), suggest that systemic analysis of the entire value chain is a prerequisite to establishing value chain financing mechanisms; this is needed to design the most suitable financial and technical intervention, as well as to engage all the players key to the Facility's objectives (e.g. agricultural inputs and technology providers in addition to traders).
- **Determining the portfolio of climate-resilient investments eligible for ASCAF support.** Climate change vulnerability studies may be needed to validate corporations' assessment of the climate resilience risk in supply chains and the suitable associated intervention measures. The availability of local and reliable climate data, as well as limitations in current knowledge, can influence actors' ability to identify best suited measures. Building climate-resilient value chains may call for holistic approaches integrating multiple considerations, from the quality of agricultural inputs such as seeds, to weather information, through to post-production measures and access to markets. These, in turn, may call for complementary measures which could operate in synergy with ASCAF to maximize potential benefits.
- **Engaging interested and suitable partner corporations.** ASCAF would need to be aligned with corporations' strategies. Corporations may not have existing internal credit operations or, as highlighted

by Coon et al. (2010), could see financing as a distraction from their core business. Performing legal, financial, environmental, and social due diligence as well as negotiating the terms and conditions of partner corporations' involvement in the Facility could be a lengthy and challenging process. Partnering with existing private clients could help MDBs to lower outcome risks as could engaging with local commercial financial institutions in a tripartite relationship.

- **Engaging end-beneficiaries and generating an adequate deal flow.** ASCAF relies on a 'buyer-driven' model, and the technical assistance services that partner corporation(s) are expected to provide to suppliers should stimulate the demand for, and adoption of, climate-resilient investment. Farmers' socio-cultural inhibitors to change, attitudes towards risk, and specific constraints, may influence their willingness to apply for loans for eligible investment. Smallholders tend to be highly risk averse and unwilling to adopt new practices if outcomes are uncertain and benefits manifest in long timeframes (IFC, 2013d).
  - Additional measures may be required at the farm-level, both in the design and implementation of the Facility, including the design of training packages tailored to producers, follow-up training sessions, technical backstopping, and demonstration plots. Demonstration at the farm-level, in particular, has proven to be effective in motivating the adoption of suggested practices/technologies (IFC, 2013d).
- **Avoiding corporations' moral hazard behavior.** Literature on risk management instruments underscores that first-loss protection coverage should strike a careful balance.[10] Limited protection or scope may fail to appeal to users in the market, but high protection can encourage corporations to assume more risk than they would otherwise with their own resources. The cost of first-loss protection mechanism can also tip the balance in terms of demand and utilization (Frisari et al., 2012; IEG, 2009).
- **The establishment of an effective monitoring and evaluation (M&E) system** would be critical in avoiding the financing of business as usual or 'maladaptation' activities, measuring instrument efficacy and enabling adjustments. Proponents would rely on the data flow from partner corporation(s)' monitoring systems and their own independent mid-term evaluation. The former necessitates a well-established relationship between the company and suppliers, and corporations' integrity. Corporations, however, may not have the adequate incentives or tools for assessing climate resilience.
  - The assessment of results for project beneficiaries against a 'counterfactual', i.e. what would have been observed in the absence of the project, may require quasi-experimental impact evaluation with control-group farmers as well as in-field data gathering from independent evaluators (see e.g. IFC, 2013b). The results of this evidence-based learning exercise would provide much needed information on the commercial viability of the program and its replicability potential.

Key challenges related to target countries include:

- **Unfavorable or unanticipated changes in policy and regulations**, such as changes in land-use policies or trade duties, as well as lack of land titles, may negatively alter investment risk-return profiles and private actors' incentives to invest. Ongoing dialogue with governments and policy advisors could help to improve the investment climate as well as to strengthen relevant policy frameworks to incentivize private investments in climate resilience. To this end, the private sector arms of MDBs have the opportunity to work in synergy with their public sector counterparts.

PRIVATE FINANCE MOBILIZATION POTENTIAL AND OTHER POSSIBLE IMPACTS (SCALE AND SCOPE)

Variability in agricultural productivity across the LAC region suggests there is a considerable potential for productivity gains. Unlocking these through targeted investments, amounting to an estimated USD 2.5 to USD 4.4 billion, could also lead to strengthened climate resilience and development outcomes.

UNSUBSIDIZED FINANCIAL PERFORMANCE

Donor funding is needed to provide first-loss backing and finance technical assistance services. MDBs and corporations financing would occur at market-rate terms, potentially at reduced interest rates compared to current sources of debt for small- to medium- sized producers/processors in the region, thanks to the reduced risks.

Two main developments are required to phase out ASCAF's publicly-backed guarantee:

- First, MDBs, who ultimately bear the credit risk of the portfolio, become comfortable in lending to corporations without donors' backing;
- Second, commercial lenders become comfortable taking on the risk, thereby lending without credit enhancement mechanisms and MDBs co-participation in the deal.

This would occur over time, as portfolio performance becomes clearer, corporations become more experienced in assessing and managing credit risks, and a track record of loan repayments demonstrates farmers' debt service capacity to commercial lenders.

Moreover, to enable commercial lenders to get experience and

10 Frisari et al., (2012) and IEG, (2009).

take part in the deal, MDBs – who typically have co-financing requirements – would have to gradually engage them in structuring and negotiating with corporation(s).

CATALYTIC

PRIVATE FINANCE MOBILIZED

The private finance mobilized by ASCAF would mainly depend on (1) the volume of donors' resources available to provide first-loss protection (2) corporations' appetite and the number of corporations and commercial lenders engaged (3) markets reached and (4) the costs of the eligible climate resilience investments and possible farmers'/processors' balance sheet contributions.

Assuming that donors would provide USD 6-15 million first-loss coverage triggering a loan package of USD 30-60 million for the engagement of one company, **private finance[11] mobilized could range between USD 6-12 million if we assume**:

- MDBs and public lenders finance 80% of the loan package;
- Private co-financing in the order of 20%;[12]
- Climate adaptive measures are fully financed with debt.

For simplicity, the baseline considered for this indicator assumes that no private climate resilience investments are currently occurring.

TRANSFORMATIVE POTENTIAL

To narrow down the scope of the analysis, we assessed market and adaptation potential by exploring possible contexts in which ASCAF could be scaled up and replicated by multiple players.

We selected coffee, soybean, maize and sugarcane as target crops on the basis of their relatively high climate vulnerability, contribution to the LAC economy in terms of their relative relevance to the regions' exports, and interest of potentially targeted corporations.

We selected LAC producing countries with highest productivity gain potential determined based on the assessment of their 'productivity gap' ,that is the difference between a country-specific yield and the regional average yield for each crop.

MARKET POTENTIAL

The maximum market potential for investments in improvements in climate resilience for a sample of four crops, up to 2030,[13] is estimated to be USD 2.5 billion to USD 4.4 billion in total investments, or USD 170 – 296 million of total investments per annum over approximately 15 years of operation. This estimate considers a 'realizable potential' factor of 35% that according to IDB (2014) is the approximate share of land cultivated by ASCAF's target beneficiaries (small and medium size farmers in LAC).[14]

The actual potential might be lower given several uncertainties such as which measures could deliver the specified productivity gains and resiliency improvements.

We assess market demand though a proxy approach estimating the level of investment required to achieve potential productivity gains.[15] In-depth studies would be needed to assess the actual market demand for the Facility.

ADAPTATION POTENTIAL

This indicator estimates:

1. **The extra revenue (or revenues protected from possible losses)** stemming from the possible productivity gains that could be achieved with investments in agricultural improvements at USD 1.2 billion per annum for a sample of four crops, considering a 'realizable potential' factor of 35%.
2. **The potential number of farms reached by the Facility** over 15 years could range between 63,000 to 420,000. This range is based on the area of land cultivated by farmers targeted by the Facility, as described immediately above, and considering an average farm size between 10 and 67 hectares.[16]

The estimates of extra revenue (or revenues protected from possible losses) are based on the approach used for the market potential and consider that increased agricultural productivity may help suppliers to better cope with the adverse effects of climate vulnerability and change.

MITIGATION POTENTIAL

There are synergies between adaptation and mitigation in the agriculture and forestry sectors and the potential for generating emission reductions in these sectors is significant. For instance, Costa Rica estimates that the improvements in coffee production planned in the country's Nationally Appropriate Mitigation Action have an aggregated emission reduction potential amounting to

11 Private finance is here defined as financial resources provided by entities with a full, or majority of, private ownership structure.

12 Share determined based on IFC (2014), IDB (2014c), IDB (2013a), and ADB (2014).

13 We assume that investments in improved agricultural productivity up to LAC region's average levels are implemented over a 15 year period, from 2015-2030.

14 See Annex B for more details on the methodology.

15 See Annex B for details on the methodology.

16 The lower bound is based on LAC-specific estimates from Hazel et al. (2007), the upper bound on Kabait et al. (2014). See also Berdegué, and Fuentealba (2011), and Nankhuni and Paniagua (2012) for average farm size estimates based on regional context and farm characteristics.

1.85 million tons CO_2e over 20 years.[17]

OTHER IMPACTS

Alongside potential adaptation and mitigation benefits, ASCAF could lead to positive economic, social and environmental benefits. Positive likely socio-economic impacts include:

- **Improved macro-economic resilience of LAC economies:** Agriculture generates a significant portion of GDP and export value. Over the last ten years, it provided nearly 5.5% of GDP (or roughly USD 225 billion on average per year), and 19% of merchandize exports for LAC countries (World Bank, 2014).[18] In a possible pilot targeting coffee production in Colombia, coffee represents almost 22% of the country's agricultural GDP (Läderach et al., 2010).
- **Improved job security** by helping to mitigate climate risks that could reduce the long-term sustainability of locally operating business and farm operations, thereby maintaining existing sources of income and livelihood (agriculture employs 17.7% of LAC active population (World Bank, 2014)).
- **Knowledge and capacity transfer.** ASCAF supported activities could help to empower farmers, serve as a catalyst for farmers financing, improve the use and management of natural resources (land and water), and promote agricultural best practices.

Potential negative development impacts could include adoption of maladaptive practices, because not adequately tailored to farmer needs or to site and crop specific climate risks. This underlines the importance of robust assessment procedures by corporations and MDBs to determine eligible adaptation measures that can be constructed in accordance with already established MDB joint reporting criteria (see Annex A and AfDB et al, 2013, 2014).

CONCLUSIONS AND NEXT STEPS

ASCAF adopts a 'value chain financing' model that is already being used to overcome the financial constraints of the agricultural sector in developing countries, but would address a gap barely addressed in the Latin American and Caribbean region. By providing finance back-stopped by donor-backed first-loss protection and technical assistance ASCAF applies this model to reduce the costs and risks of financing to small and medium-size farmers, and building capacity for projects that would help strengthen the climate resilience of the entire value chain.

With the backing of donors' funds, MDBs and partner corporation(s) and/or third-party co-lenders would have increased capacity to:

- Provide long-term financing, not currently available commercially;
- Reduce credit default risks perceptions thereby lowering the overall cost of loans and possibly giving farmers' access to more affordable loans;
- Build technical and financial know-how about 'climate adaptive' practices.

In the longer-term, the Facility will also have a demonstration effect, showing the viability of long-term financing to farmers. ASCAF has the potential to build a "business case" for private actors to invest in climate-resilient agricultural practices beyond the life of the Facility.

While the Facility will be piloted in LAC countries, it could also be replicated in other low and middle- income countries where MDBs or other Development Finance Institutions have market presence and experience, and appropriate corporations participate in local supply chains. However, it would need to be tailored to context-specific conditions to tackle related climate vulnerabilities and manage the associated implementation challenges.

In any context, complementary measures might be needed to maximize its potential, as building climate resilience typically requires a set of climate risk management measures.

To take off ASCAF will require:

- Context-specific analysis to identify the most adequate portfolio of eligible investments options;
- Donor resources to assume the first-loss credit risks MDBs and other market-based lenders would normally not be able to take, and to assess climate risks and build know-how on 'climate-adaptive' practices;
- MDBs' financing, know-how and networks;
- Corporations' buy-in to become the driver for climate resilient investments by expanding their existing seasonal or ad-hoc credit operations into medium to long-term lending/servicer functions and their extension services.

In the **Phase 3**, analysts will assess the remaining instruments in greater detail based on the San Giorgio Group case study approach,[19] which can include:

- Development of an indicative implementation plan including a more detailed assessment of the market potential, etc.
- Financial modeling including: target fund size and limits on project exposure.
- Risk assessment per ASCAF stakeholders.

17 The scope of the Nationally Appropriate Mitigation Action (NAMA) of Costa Rica's coffee sector is 93,000 hectares of coffee cultivation. The activities planned include: plants renovation with resilient varieties, increased tree coverage on coffee farms, improved use of fertilizers, and use of energy saving technologies in coffee processing. Emissions reductions of 250,000 tons CO2e are directly attributable to the NAMA Support Project (source: nama-database.org; GoCR (2012).

18 Figures refer to 2004-2013 average for LAC developing countries only.

19 For more information see www.climatepolicyinitiative.org/sgg.

INDICATOR ASSESSMENT SUMMARY

CRITERIA	INDICATOR	ASSESSMENT	COMMENTS/RATIONALE
Innovative	Addresses: Small/medium producers' lack of access to credit at adequate terms	High	Develops a value chain financing mechanism with the involvement of corporations Provides donor-backed first-loss guarantees in conjunction with loans
	Addresses: Financiers' and investors' capacity gaps	Moderate-High	Envisages "training of trainers" at corporate level, providing know-how to partner corporations, who are then expected to transfer it to their suppliers Additional measures at the farm-level may be needed
	Addresses: Climate change risks of ASCAF participants	Moderate-High	Climate resilience needs determined on a case-by-case basis, according to corporations' assessment of climate risks, possibly complemented with additional climate vulnerabilities assessment The availability of local climate data may influence vulnerabilities assessment
	Instrument innovation	Moderate-High	ASCAF builds on existing initiatives, with similar business models and/or objectives, but it targets long-term finance needs for tackling climate risks, a gap barely addressed by comparable measures in the LAC region
Actionable	Time to implementation	Minimum 12-18 months	Assuming two subsequent steps of approximately: • 6 months to setup the Facility • 6-12 months for a project to run through MDBs' project cycle and get Board approval. This would also depend on prompt engagement of corporations and co-lenders Possible partner corporations have been identified, but the engagement process could be lengthy.
	Strength of implementation plan	Moderate	Proponents have determined draft characteristics of the Facility and identified potential corporations to work with in the possible pilot phase. Given its early stage of development, additional analytical work and substantial outreach/market research would be required.
	Strength of implementing organization	Moderate-High	IDB is interested in being the sponsor for the pilot phase and Calvert Investments in supporting the businesses engagement strategy IDB has experience with similar instruments which, however, are still at early stages Calvert Investments has networks and experience in engaging socially responsible private investors
	Fit to national policy environment	Moderate-High	Adaptation is a high policy priority in many LAC countries. Some have developed dedicated strategies, plans and/or mitigation actions consistent with ASCAF[1] A context-specific assessment would be needed for this indicator, as adaptation strategies, land-use and trade policies, inter alia, may influence ASCAF's outcomes

CRITERIA	INDICATOR	ASSESSMENT	COMMENTS/RATIONALE
Catalytic	Private finance mobilized	$6-12 million	Assuming $6-15 million in donor-backed first-loss, $30-60 million loan package financed: • 80% from MDBs and public co-lenders and • 20% from private lenders, and • None contributions from farmers' balance sheets.
	Public finance needed	Guarantees and technical assistance	Financing for first-loss guarantees and technical assistance
Transformative	Market potential up to 2030	$2.5 billion to $4.4 billion in total investments or $170 – 296 million per annum over ~15 years of operation	Total market potential assuming ASCAF could increase the productivity of 35% of the land currently under coffee, soybean, maize and sugarcane production that shows possible productivity gain potential in LAC countries The level of investment required to achieve potential productivity gains is the proxy used for estimating the market potential
	Mitigation impact (potential)	N.E.	Improvements in agricultural practices/technologies may lead to significant emission reductions. Example: Costa Rica estimates that improvements in coffee production have an aggregate emission reduction potential of 1.85 million tons CO2e over 20 years[2]
	Adaptation impact (potential) up to 2030 1) Increased/ protected revenues 2) Farms reached	1) $1.2 billion per annum 2) 63,000 to 420,000	Assuming ASCAF could increase the productivity of 35% of the land currently under coffee, soybean, maize and sugarcane production that shows possible productivity gain potential in LAC countries, and that: 1. Additional crops would fetch 2012 producer price over time 2. Average farm size range between 10 and 67 hectares
	Local development impact	• Improved macro-economic resilience of LAC economies • Improved jobs & income security • Knowledge and capacity transfer	Positive indirect impacts are likely to be mainly socio-economic, with possible negative indirect impacts if maladaptive practices are not avoided
	Unsubsidized financial performance	ASCAF would enable commercial returns, but donor capital is required to provide first-loss protection and technical assistance	• ASCAF would require publicly-backed first-loss and finance for technical assistance services, but MDBs' lending would be at market rates. Corporations/target farmers may pay for the technical assistance services • Public support would be phased out once portfolio performance becomes clearer and commercial lenders gain experience in assessing and managing credit risks.

Footnotes

1 These include: National Appropriate Programmes of Actions (NAPA) developed under and according to the UNFCCC (e.g. Haiti); Strategic Programs for Climate Resilience under the Pilot Program for Climate Resilience (SPCR) (e.g. Jamaica, Bolivia and Haiti); some countries have also focused their National Appropriate Mitigation Actions (NAMA) on the agriculture sector (e.g. Peru, Costa Rica, Honduras and Uruguay).

2 Scope: 93,000 hectares of coffee cultivation. Activities planned include: increased tree coverage on coffee farms, improved use of fertilizers, and use of energy saving technologies in coffee processing. Emissions reductions of 250,000 tons CO2e are directly attributable to the NAMA Support Project (source: nama-database.org; GoCR (2012)).

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ANNEX A - 'Process-based' approach for the selection of eligible climate-resilient investment

At the Facility level the process for determining eligible climate-resilient investment would be informed by the criteria of the joint MDB approach for tracking adaptation finance (AfDB et al., 2013; 2014). At the project level the selection would be determined on a case-by-case basis according to the context-specific climate risk and identified response measures.

According to the joint MDBs approach an activity qualifies as 'adaptation' if and only if demonstrating through robust evidence-based analysis to potentially tackling current and future climate-related risks identified in a given context.

Specifically, the methodology encompasses the following main steps:

- Setting out the context of vulnerability to climate variability and change using a robust evidence base (e.g. climate vulnerability assessment analysis undertaken as part of the preparation of a project, or existing analyses and reports);
- Laying out how the project intends to address the context- and location-specific climate change vulnerabilities as outlined in the project's vulnerability assessment or in existing analyses and reports;
- Articulating a direct and clear link between the context of climate vulnerability and the specific project activities.

ANNEX B - Methodological approach for the assessment of ASCAF's market and adaptation potential indicators

The market and adaptation potential indicators rely on a preliminary analysis of coffee, soybean, maize and sugarcane production (tonnes) and land area cultivated (hectares) for the period from 2003 to 2012 (FAOSTAT, 2014).

Countries showing productivity gain potential were selected. We estimated this potential for each crop by calculating the average productivity over the period 2003-2012 for individual producer countries in the LAC region (tonnes / hectare), then compared countries' productivity in 2012 (since current productivity and land area is the base from which the Facility begins) to the regional average for the 2003-2012 period.

Market potential indicator: the possible production gains obtained are multiplied by 35% of the harvested area in 2012, and subsequently by producer price in 2012 to estimate extra revenue from productivity increases (in USD) for each LAC country where productivity in 2012 is below the regional average for 2003-2012. The capital investment cost is back calculated assuming:

- ASCAF target beneficiaries cultivate 35% of the land under coffee, soybean, maize and sugarcane production based on IDB (2014);
- The majority (75%) of extra revenue from productivity improvements during the loan payback period will cover investment and associated financing costs;
- Loans have a 7 year payback period including a crop-specific grace period (until the crop becomes productive) (see Figure 2 for illustrative example);
- 5/15/25% interest rates (for sensitivity analysis) based on loan rate ranges reported in Coon et al. (2010).

Assumptions are based on literature and advice of proponents. These preliminary calculations are simplistic (e.g. no discounting applied), and are subject to considerable change in outcome depending on the assumptions made. More complex models should be used to simulate potential options and outcomes.

Adaptation potential indicator: The possible number of farms reached is calculated taking 35% of land under coffee, soybean, maize and sugarcane cultivation in 2012 by small- to medium-sized farmers, divided by an estimated average farm size of 10 to 67 hectares. The lower bound is based on research from Hazel et al. (2007) and the upper from Kabait et al. (2014). A range is presented here to demonstrate uncertainty in the actual average farm size for this combination of crops in LAC.

In addition, below are important assumptions and caveats for the adaptation as well as market potential indicators:

- In the pilot phase implementers may learn that a particular farm size and level of sophistication is best suited for the Facility, which we cannot yet capture here.
- We assume that no change in cultivation area, number of farms, or commodity prices would occur through 2030.
- We do not constraint on the size of the Facility itself or consider the transaction costs and other barriers associated with scaling up and replicating the Facility in other contexts. As such, the numbers presented here should be treated as rough theoretical maximums based on reaching productivity gains across our 4 sample crops.

Figure 2. Illustration of method used to calculate investment costs.