Toward a Climate Compatible Future in Haiti
Private Sector Barriers and Opportunities Assessment Study

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Part I – Mapping exercise of the national and international private climate change portfolio in Haiti

1. Project portfolio of the GCF in Haiti

This first section provides a snapshot of the status of the GCF project portfolio in Haiti to recognize the state of climate funding at country-level. Haiti being the world’s fourth, and first in Latin America and the Caribbean region most vulnerable country to the effects of climate change, the Country is participating in the global effort to reduce emissions to reach the targets of limiting global warming to below two degrees. The country submitted an Intended Nationally Determined Contributions (INDC) plan, which sets out a 31 percent reduction in its emissions (In 2000, Haiti’s greenhouse gas (GHG) emissions accounted for 0.03 percent of all global emissions).

So far, the Readiness Programme has been divided into two Readiness Activities, one project related to the mobilization of the private sector, another related to NDA Strengthening and Country Programming. Besides the Readiness Programme, there is a proposal titled “Global Energy Efficiency and Renewable Energy Fund (GEEREF)” and two Concept Notes geared towards enhancing climate resilience.

Tables 1, 2, 3, 4 and 5 give more information about the projects that have been approved or are still in process of approval in Haiti, and also include a brief summary with the objective and key areas of each of them.

Table 1. Readiness Activities in Haiti – Proposal 1

<table>
<thead>
<tr>
<th>Title</th>
<th>Mobilizing Private Sector to support climate resilient development in Haiti</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>11/12/2017</td>
</tr>
<tr>
<td>Delivery Partner</td>
<td>UNDP</td>
</tr>
<tr>
<td>Readiness Area</td>
<td>Private sector mobilization</td>
</tr>
<tr>
<td>Overall</td>
<td>Implement readiness activities to help the NDA/FP on its efforts to support private sector</td>
</tr>
</tbody>
</table>

1 Haiti intends to reduce its greenhouse gas emissions by 31 percent by 2030 (5 percent: 10 MtCO2e, and 26 percent: 35.24 MtCO2e), relative to the 2030 business as usual (BAU) reference scenario. Haiti’s greenhouse gas (GHG) emissions grew 62 percent from 1990 – 2011, the agriculture sector being responsible for 49 percent of emissions, followed by the energy sector at 39 percent, the waste sector at 7 percent, industrial processes at 4 percent, and land-use change and forestry at 2 percent. Achieving the 2030 target is subject to financial resources, capacity building, and technology transfer. The adaptation context in regard is conditional upon international provision of means of implementation.
mobilization for the development of a program lined up with national policies and needs, alongside extra capacity strengthening for the NDA.

The key areas are:

- Lead effective coordination mechanisms
- Engage with stakeholders
- Identify candidate entities for accreditation
- Explore barriers to private sector investments
- Inform about opportunities of the GCF-PFS
- Promote south-south regional collaboration

**Source:** GCF - [https://www.greenclimate.fund/countries/haiti](https://www.greenclimate.fund/countries/haiti)

**Table 2. Readiness Activities in Haiti – Proposal 2**

<table>
<thead>
<tr>
<th>Title</th>
<th>Green Climate Fund (GCF) Readiness Programme in Haiti</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>05/06/2017</td>
</tr>
<tr>
<td>Accredited entity</td>
<td>UNDP</td>
</tr>
<tr>
<td>Readiness Area</td>
<td>NDA Strengthening and Country Programming</td>
</tr>
<tr>
<td>Overall objective and key areas</td>
<td>Help the government through its GCF Focal Point in reinforcing their national capacities following national policies and priorities, targeting the essential aspects of access to funds and private sector engagement. The main activities to accomplish this will be:</td>
</tr>
<tr>
<td></td>
<td>• Strengthen the institutional capacity of the Focal Point</td>
</tr>
<tr>
<td></td>
<td>• Construct and reinforce the institutional capacity and fiduciary and financial management capacity of national entities</td>
</tr>
<tr>
<td></td>
<td>• Assist Haiti with preparing a country programme including climate change mitigation and adaptation</td>
</tr>
</tbody>
</table>
### Table 3. Projects in Haiti – Proposal 1

<table>
<thead>
<tr>
<th>Title</th>
<th>Global Energy Efficiency and Renewable Energy Fund (GEEREF) NeXt (FP038)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>13/08/2016</td>
</tr>
<tr>
<td>Accredited entity</td>
<td>European Investment Bank (EIB)</td>
</tr>
<tr>
<td>Executing entity</td>
<td>Geeref Next</td>
</tr>
<tr>
<td>Strategy focus</td>
<td>Mitigation</td>
</tr>
<tr>
<td>Overall objective and key areas</td>
<td>GEEREF NeXt will have a structure of funds that will allow it to finance the development, construction, and operation of facilities related to renewable energies as well as the application of energy efficiency measures. The objective is to reduce greenhouse gas emissions, improve access to energy and catalyze private sector financing for the benefit of investment in favor of the climate.</td>
</tr>
</tbody>
</table>

### Table 4. Concept Note in Haiti – Proposal 1

<table>
<thead>
<tr>
<th>Title</th>
<th>Enhanced climate resilience in the Trois-Rivières region of Haiti through Integrated Flood Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>02/01/2018</td>
</tr>
<tr>
<td>Accredited entity</td>
<td>United Nations Development Programme (UNDP)</td>
</tr>
<tr>
<td>Executing entity</td>
<td>Ministry of Environment</td>
</tr>
<tr>
<td>Strategy focus</td>
<td>Adaptation</td>
</tr>
<tr>
<td>Overall objective and key areas</td>
<td>The objective is to reduce climate change-induced flood-related effects through a focused intervention in the Trois Rivières region in Haiti. The Ministry of Environment will coordinate the project with the support of other partners.</td>
</tr>
<tr>
<td></td>
<td>The main approaches are:</td>
</tr>
<tr>
<td></td>
<td>•  Implement a floodproofed infrastructure and soil preservation measures to reduce the effects of outrageous weather events</td>
</tr>
</tbody>
</table>
- Promote the development of an inclusive and equitable governance framework and capacity building of local women and men for climate change resilience.

Source: GCF - https://www.greenclimate.fund/countries/haiti

Table 5. Concept Note in Haiti – Proposal 2

<table>
<thead>
<tr>
<th>Title</th>
<th>Programme Ak-Klima-Tansyon (AKT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>24/12/2016</td>
</tr>
<tr>
<td>Accredited entity</td>
<td>Agence Française de Développement (AFD)</td>
</tr>
<tr>
<td>Executing entity</td>
<td>Ministry of Agriculture, Natural Resources and Rural Development (MARNDR)</td>
</tr>
<tr>
<td>Strategy focus</td>
<td>Cross-cutting</td>
</tr>
<tr>
<td>Overall objective and key areas</td>
<td>The objective of the programme is to contribute to reducing vulnerability in the agricultural sector as well as implementing Haiti’s INDC, considering agricultural and environmental policies adopted by Haiti, particularly the National Strategy for Poverty reduction and growth (DSNCRP). The project also intends to complement current initiatives and to leverage GFC support to acknowledge remaining gaps and needs related to achieving resilience in the agriculture sector, with a particular focus on value chains and productions of coffee and cacao.</td>
</tr>
</tbody>
</table>

Source: GCF - https://www.greenclimate.fund/countries/haiti

2. Relevant stakeholders in the Financial Service Sector

The banking sector in Haiti is well-capitalized, profitable, and gross international reserves are able to cover over three months of imports. The Haitian central bank (BRH) remains to pursue a contractionary monetary policy focused on containing inflation and tightening legal reserve requirements\(^2\). The main challenge of the BRH is to maintain financial stability while public authorities urge it in matters of anti-inflationary measures in response to a chronic budget deficit, the depreciation of the national currency (the Gourde) and increasing global commodity prices.

Foreign direct investment (FDI) inflows in Haiti reached USD 374 million in 2017, a significant increase from FY 2016 (USD 105 million). However, Haiti’s rates of FDI inflow indicate a slow-growing economy and an unstable political environment. In 2006, the Government of Haiti established the Center for Facilitation of Investments (CFI) to improve Haiti’s investment climate, and also to assist investors interested in doing business in Haiti.

Three main banking institutions in Haiti (Unibank, Sogebank, and BNC) hold 80 percent of the total banking sector assets. The three major commercial banks also own 75 percent of the entire loan portfolio, being 70 percent of total loans monopolized by 10 percent of borrowers, causing the Haitian banking system’s vulnerability to systemic credit risk, and also it restricts the availability of capital. In the following table, a list of the most important banks in Haiti in terms of assets is shown accompanied by a brief description.

Table 6. List of largest banks in Haiti in terms of assets.

<table>
<thead>
<tr>
<th>Banking institution</th>
<th>Brief information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banque de la République d’Haïti (BRH)</td>
<td>BRH is the central bank of Haiti. The bank is active in promoting financial inclusion policy and is a member institution of the Alliance for Financial Inclusion. The Central Bank’s main challenge is maintaining sound monetary policy in the context of a larger-than-expected government deficit and a depreciating local currency.</td>
</tr>
<tr>
<td>Unibank</td>
<td>It is one of Haiti’s two largest private commercial banks. The bank was founded in 1993 by a group of Haitian investors. With the acquisition of the Canadian Bank-Scotiabank in 2016, Unibank became Haiti’s largest banking company with a deposit market share of 34 percent. Their total assets are US$ 1.645 billion (2017).</td>
</tr>
<tr>
<td>Sogebank (Société Générale Haïtienne de Banque S.A.)</td>
<td>Sogebank is one of Haiti’s three largest commercial banks. It was formed on November 8, 1985, and currently has 42 branches located throughout the country in the major cities as well as several solely in Port-au-Prince. Their total assets are US$ 1.098 billion (2016).</td>
</tr>
<tr>
<td>Banque Nationale de Crédit (BNC)</td>
<td>Resulting from the separation of the National Bank of the Republic of Haiti into two entities, the other being the Bank of the Republic of Haiti performing the functions of central bank, the BNC was born August 17, 1979 as a commercial bank. The bank’s net profit is HTG 484.9 million (2015).</td>
</tr>
</tbody>
</table>
The bank started its operations in 1986 as a Savings and Loan institution under the name Banque de Crédit immobilier (BCI). It is a commercial bank based in Pétion-Ville, Haiti. It is currently the third largest in term of assets among Haiti’s private commercial banks. Their total assets in 2014 were US$ 264 million.

It is a full-service bank operating in Haiti. Founded in 1973, the first Haitian private bank. BUH currently has a network of ten (14) branches across the country. Their total assets are US$ 193.9 million (2016).

It’s Haiti’s largest microfinance institution serving poor and ultra-poor women in rural Haiti, with 44 branches located throughout the country. The bank’s total revenue in 2016 was US$ 2,784,685 million.

Previously operating as Banque Populaire Colombo Haitienne, began operations on March 1, 1955. It’s a government-owned commercial bank with a share capital of five million gourdes. The Law of December 21, 2008, increased the share capital to 60,000,000.00 Gdes, which has yet to be enacted.

Sources: https://www.export.gov/article?id=Haiti-Banking-Systems

3. Mobilization of the Private Sector in combating Climate Change

This part of the document is divided into four sections. The first addresses the role the private sector has in supporting the fight against climate change. The second describes the different project priorities in which international funding is focused. The third section addresses the gaps found in section two. Finally, the last section describes the strategies of the Green Climate Fund on catalyzing private investment.

3.1 The support of the Private Sector

The private sector plays an integral part in moving to a climate compatible future due to its investment capacity. The development of mitigation and adaptation actions and projects to combat climate change requires significant investments. For example, developing countries will need about $100 billion of new
investments per year over the next 40 years to build resilience to the effects of climate change, and mitigation costs are expected to be in the range of $140–$175 billion per year by 2030. Burdens that the public sector cannot seize. The role of the public sector is also fundamental for setting goals, building the enabling environment and investing in research, public infrastructure and low-emission development and resilience strategies. But due to its insufficient investment capacity, it is necessary the support of businesses, banking institutions and capital markets to reach the required investment levels, and also to create new businesses, jobs and development opportunities.

Haiti is a Small Island Developing State (SID), which makes the country very vulnerable to the effects of climate change worsened by the degradation of its environment and its weak response capacity. Coping with climate change is a special challenge for Haiti because, for many years, it has had to battle first with immediate natural disasters which constitute a significant obstacle to the development efforts of the country. Haiti as other SIDs and low-income developing countries usually do not have sufficient domestic resources and appropriate institutional and technical capacities to reduce the effects of these adverse climatic events on economic, physical and social infrastructure, as well as create conditions for low carbon development. As a result, Haiti requires significant capacity building and financial resources from international sources to take the necessary steps to adapt to climate change, increase resilience to natural disasters and climate change, and to reduce emissions. Additionally, Haiti’s priority will be the adaptation to climate change and the response to loss and damage.

Some barriers have deterred climate compatible investments in developing countries, being most of them country-specific, by sector and industry. Overall, four broad categories were identified:

- Non-climate specific country and currency risks, related to political stability, security of property rights, rule of law, governance or losses from the value of local currency;
- Sector specific barriers, including the sector policy and regulatory framework;
- Technology risks for investments in new and relatively untried technologies and systems;
- Unfamiliarity risks, for example, when there are concerns about developer capacity to execute

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3Categories adapted from Brown, J (2010) and draw from AGF (2010). More detailed and sector specific evaluations of barriers can be found in UNDP 2011, Project Catalyst, WEF (2011); Center for American Progress (2010); Deutsche Bank (April 2010), UNEP (2009), among others.
projects or how to operate in an unfamiliar country.

Apart from these barriers, there are other drawbacks like capacity and knowledge gaps, which is reflected in aspects like the low capacity to prepare and structure projects, the lack of skilled and semi-skilled labor for new industries and/or the inadequate consumer awareness to generate demand for new products.

All the risks mentioned before have been carefully studied; some of the financial products used to address private sector investment barriers are shown in the following figure.

**Figure 1. Financial products that address private sector investment barriers**

<table>
<thead>
<tr>
<th>1 Concessional interest rate loans</th>
<th>Donor funds are used to provide concessional interest rate loans that are used to offset the high costs of early market entrants. This can be applied through direct project loans to project sponsors or via credit lines with domestic banks.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Credit Lines with performance incentives</td>
<td>Donor funds are used to provide performance bonuses or interest rate reductions that provide domestic financial intermediaries with the incentives to achieve certain targets. These instruments target banks that are comfortable with the risk of a new initiative but need incentives either for their clients or loan officers to “kick-start” a new line of business.</td>
</tr>
<tr>
<td>3 Risk Sharing</td>
<td>The risk of a portfolio of sub-projects with a local bank or financial institution is shared by donor funds, giving the local institution comfort that risks are mitigated while they are learning a new line of business. Donor funds cover the losses from the first few defaults (if any) which occur in a portfolio of projects (first loss).</td>
</tr>
<tr>
<td>4 Subordinated Debt and Mezzanine Finance</td>
<td>Loans, which in case of payment defaults or bankruptcy have a lower repayment priority compared to other company or project loans. Leverage is achieved since subordinated debt strengthens a company/project’s equity profile and encourages commercial lenders to provide senior debt financing. Concessional rates could also be used in cases where high capital costs and risk perception barriers are being addressed.</td>
</tr>
<tr>
<td>5 Guarantees and Insurance</td>
<td>Guarantees and insurance products enhance the credit worthiness of a transaction. The guarantor agrees it will cover some, or all, of any defaulted payment or repayment per an original contract. Guarantees can be used to cover risks that the market will not otherwise bare.</td>
</tr>
<tr>
<td>6 Equity</td>
<td>Equity is a capital investment in a company, project or fund. Equity provides unlimited revenue potential if the project is successful, but risks losing part or all of the investment if the project is not successful. Equity encourages developers to undertake risks they otherwise would not.</td>
</tr>
</tbody>
</table>

**Source:** adapted from Sims Gallagher, K. et al. (2018)

Haiti is a country equipped with the basic conditions to proceed on a path of shared growth and development, and now it needs the involvement of the international private sector to help overcome the obstacles and generate a resilient national economy. Improving the investment scope for Haiti requires the enactment of institutional and structural reforms that can improve Haiti’s business and political environment. Funding is available, but it is up to the country to put in place the mechanism to attract these funds. Investing in Haiti
may present some risks, but it also promises significant rewards.

Haiti should use its limited public resources to maximize the support of private funds. It is necessary to take into account that the private sector will deploy their capabilities and capital on low-emission investments only to projects with positive viability. That is the reason why Investors look for countries with good investment climates and well-developed capital markets where the regulatory environment and pricing signals are clear and stable, and where the real economics of projects produce adequate returns.

Haiti has established a number of conditions to reinforce the climate for investment, some of these actions include⁴:

- Reforms on business regulations,
- Improvements in communications infrastructure,
- Improvement of roads and transportation hubs,
- Implementation of a nationwide programme to improve education,
- Financial intermediation through a partial credit guarantee program,
- Social investment funds providing funding to SMEs through low interest rates and long-term loans that are co-financed by local banks.

The GCF could perform a crucial role in working through its network of accredited public and private entities. The foundations of the Paris Agreement state the GCF is meant to support achievement of country targets and efforts to make financial flows consistent with climate-compatible development. To promote this, the GCF Board established a dedicated Private Sector Facility (PSF) to incite and scale private sector investment in climate solutions. With the essential elements of the Fund in place, the GCF is now looking to scale up private sector operations, and direct PSF investments strategically to address key barriers to private sector engagement.

The private sector, as we have seen, possesses a huge potential to improve the situation in Haiti. Despite clear

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challenges, profitable investment opportunities exist today in Haiti, and increased private sector engagement now will create further investment opportunities in the future. The long-term economic vitality of Haiti depends on the involvement of a range of stakeholders, and the private sector is an essential contributor to this development.

3.2 Haiti’s Project Priorities and International Funding

In Haiti, a total of $1.3 billion is currently being invested by international donors in climate change or climate-related (mitigation, adaptation or both) projects. If short-term disaster risk reduction projects are removed from the total, $1.1 billion is the total current climate-related investment in Haiti, being $773 million dedicated to climate change or sustainable energy and the rest to development aid.

According to the National Determined Contribution (2015), National Policy on Climate Change (2017) and National Adaptation Program for Actions (2017), Haiti has 22 diverse priorities, most of them related to adapting to climate change and increasing Haitian resilience to natural disasters. 76 climate and climate-related projects were identified as being funded by international donors, with 50 percent of the projects (38 projects) aiming at addressing adaptation needs, 21 percent (16 projects) at mitigation, and 29 percent (22 projects) at both adaptation and mitigation.

![Figure 2. Percentage of Climate and climate-related projects funded by international donors](source: Sims Gallagher, K. et al. (2018))

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When examined the amount of international funding assigned by type of investment (adaptation, mitigation, both), the differences are noticeable, with just 15 percent of the funding going to mitigation, 68 percent to adaptation, and 17 percent is synergistic.

*Figure 3. Percentage of current international funding for climate and climate-related projects.*

Out of the 23 priorities identified for Haiti (including disaster risk reduction), 86.7 percent of Haiti’s international funding its focused-on six sectors, Food security, Disaster risk reduction, Renewables, Integrated water system management, Watershed management and soil conservation, and Coastal resilience/zone management. It is important to mention that while significant resources have been invested in the food security sector (23.5 percent of funds), many of these projects do not have the addressing of climate change as its main objective. The remaining 13.3 percent of funds are divided into the remaining priority sectors with some of them not even receiving funds at all. Figure 4 shows the irregularities mentioned before.

*Source: Sims Gallagher, K. et al. (2018)*
When comparing the number of projects being developed by type of priority sector, 85.5 percent of them are integrated by the same six sectors with the highest funding and another two sectors, Capacity building, and Agricultural adaptation or resilience. Figure 5 shows the distribution of the number of projects between the different priority sectors of Haiti, the gap regarding the distribution of the number of projects between the categories in this figure seems to be tighter compared with the chart above that showed the allocation of funding between the different priorities.
The primary source of funds for the projects that are no climate-specific (43 percent) but are related to climate change mitigation or adaptation comes primarily from the World Bank, IDB, Switzerland, and Japan. For climate-specific and energy projects (57 percent), the funds come from the Global Environment Facility (GEF) (including the Least Developed Country Fund), Germany, Climate Investment Funds (CIF), and the Scaling Up Renewable Energy Program in Low-Income Countries (SREP) fund.

### 3.3 Gaps in Haiti’s Project Priorities

There are some gaps that have being identified in some of Haiti’s priorities in relation to international climate finance, some of these gaps are reducing reforestation and land degradation, waste management, information and education, costal zone management, integrated water system management, agricultural adaptation, and institutional strengthening and capacity building.

#### Deforestation and land degradation

Projects aimed at reducing deforestation and land degradation lack international funds. Even though forests...
represent 4 percent of the total land area of Haiti, and one of Haiti’s NDCs mitigation actions for 2030 is to have 10,000 Ha of sustainable forest management, 137,000 Ha of afforestation, and 60,000 Ha of agroforestry, there are only 2 projects related to forest protection, and reforestation/afforestation, representing 3.3 percent of the total international funds. Projects aimed at reducing deforestation and land degradation could bring multiple co-benefits such as enhancement of watershed management, and reduction of run-off and mudslides during extreme rainfall events if more funds were destined to this area.

One of the main challenges in Haiti for this area to improve is deforestation, the cutting down of forests to produce charcoal (the main source of energy in Haiti) eventually increases CO2 emissions. Haiti needs more diversified, sustainable sources of energy in order to reduce the use of charcoal and firewood as its primary source of energy, which causes considerable environmental damage. There are no projects explicitly focused on producing efficient energy contrary to the country’s NDCs planned mitigation actions to deploy 1,000,000 efficient light bulbs and sourced 47 percent of the country’s electricity from renewable energies. This sector presents a number of opportunities for international businesses.

**Waste management**

Projects related to waste management are categorized as a priority in Haiti’s National Program of Action on Adaptation and the National Climate Change Policy, but few funds have been assigned to this area. Waste management has assigned 0.6 percent of international funds and has only one project related to its area. Inadequate control of solid waste causes clogs in urban waterways and leads to the spread of diseases. Being Haiti constantly struck by natural disasters and being Port Au Prince the largest city in the world without a sewer system¹, there should be more projects related to waste management. For international investments, this type of project could bring synergies by improving other areas such as water supply, sanitation, and health.

**Information and education**

This type of project is another category with no funds or projects under implementation, even though education is listed as one of the adaptation actions in Haiti’s NDCs.

**Costal resilience and coastal zone management**

Even though this area has 6 projects and has 7.2 percent of international funds, it might need more attention due to the vulnerability of Haiti to natural disasters and also because the majority of the population live in coastal areas because one of its main commercial activities relies on fisheries. Projects in this category should address the diversification of fisheries areas, improvement of infrastructure, conservation and protection of marine biodiversity, improvement of security and coastal surveillance to boost tourism, among others.

**Integrated water system management**

Integrated water system management has 5 ongoing projects, and $172,950,000 of total international funds assigned, but it’s still an area that needs more attention and projects aimed at localization of water management systems and broader watershed management initiatives.

**Food security and Agricultural adaptation**

Even though food security is the category with most funds assigned, 23.5 percent of total international funds, and 12 projects, the category still lacks focus on agricultural adaptation. For the 60 percent of Haitians who live in rural areas, agriculture is the main source of income. Improving efficiency of the sector could dramatically increase production, raise export volumes and at the same time reduce drought and crop losses.

**Energy security enhancement**

Only 25 percent of the Haitian population has access to electricity. The private sector still relies on electricity from contractual arrangements. Energy security is a category with no funds and no projects assigned. There should be more projects related to this area aimed at Improving access to power, reforming governance structures including improving transparency in the sector’s financial flows, better management of the public utility company and investments in of generation, transmission, and distribution.

As seen in many parts of the developing world, corruption and excessive red tape stifle investments in renewable energy and other climate-friendly projects. At the same time the low price of fossil fuels makes it hard for renewables to compete. Governments must remove these barriers and create an environment in which the private sector can thrive and in which investments in renewable energy become viable. The private

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9 World Bank Group. (January 2016). Climate change is a threat – and an opportunity – for the private sector.
sector should play a role in pushing for these reforms, which have the potential to unlock billions of dollars’ worth of investment opportunities.

Aside from the gaps mentioned before there are gaps that remain in Haiti related to investment opportunities for corporations with specialized expertise. Investing in Haiti represents risks but, as a number of multinationals have demonstrated, there is the potential for win-win opportunities for local and international businesses, and for the citizens of Haiti.

3.4 Strategies of the Green Climate Fund to catalyze and support the Private Sector

Public sector financial support for private sector climate investments should set ambitious goals that go beyond the financing of climate compatible projects, trying to strengthen a market that attracts private sector investment at a sufficient scale to achieve significant reductions in greenhouse gases (GHG) without recourse to subsidies. While the more ambitious vision may take years to materialize, the end game should aim to have public instruments phase-out as domestic and international investors and capital move in.

The many factors that affect the private finance can be grouped within three broad categories:

*Figure 6. Factors that affect the private finance*

<table>
<thead>
<tr>
<th>01</th>
<th>02</th>
<th>03</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supporting readiness for investment</strong></td>
<td><strong>The provision of finance</strong></td>
<td><strong>The delivery channels for climate finance</strong></td>
</tr>
</tbody>
</table>
| Through technical assistance and building national capacity. | Including financial instruments and the level of risk appetite to address risks, cost and capacity constraints faced by the private sector. | Including the operations of International Finance Institutions (IFIs) that support engagement with the private sector.

1) **Supporting readiness for investment**

National policies and institutions must create the right incentives for private investment in low-carbon activities. While addressing financing barriers is critical, it is often not sufficient to catalyze private investment. In many cases, the experience of IFIs demonstrates that successfully engaging the private sector requires an
integrated approach that combines direct project financing with broader policy and market reforms, capacity building, and technical assistance that can enhance the investment context.

To this end, three critical areas for support emerge:

- improving national and sector policy frameworks;
- strengthening the financial system;
- and supporting the development of a strong project pipeline through technical assistance.

Private firms make investment decisions based on the project’s commercial viability. Prospective investments are thus expected to cover the full costs of the project, including the cost of capital, and achieve a return proportionate with the risks associated with a particular project. Policy support is necessary to catalyze private investment in climate change related projects. Public support typically takes the form of regulation or policy that creates an incentive to move a market in the desired direction. It is important to make a contrast between policy frameworks that make a project economically viable and frameworks that enable commercialization and scale up by addressing the business environment, financing barriers, transaction costs and risk perceptions. Both are necessary to encourage investment in climate change.

**Gaps on Supporting readiness for investment**

Some of the gaps identified in this category are:

- The lack of bankable projects that may be due in part to the relatively high risks associated with the early stages of project development.
- The capacity of local financial institutions to structure project finance and assess risks.
- The banks often being hesitant to lend in what they consider unfamiliar and potentially risky areas.

2) **The provision of finance**

Climate funds have played a central role in providing financing and financial instruments that help reduce risks and boost returns to attract private sector investment in low-carbon projects. The experiences of Climate funds have found that, flexibility in financing structure and instrument choice can help Funds channeling
concessional funds address specific project risks and barriers that vary by country and sector, as well as match financial instruments to needs at different stages of the project lifecycle. Also, least concessionality can help minimize distortions in the market and avoid crowding-out private investment. In the other hand de-risking instruments can play a pivotal role in catalyzing private investment, even when subsidies in the form of concessional financing are not required or justified to induce private sector investment, real and perceived risks may serve as a major deterrent to private sector engagement.

Box 1: Spotlight on Green Innovations across the Globe

While large green infrastructure plays a major role in shifting economies to more sustainable pathways, smaller-scale initiatives can also catalyze models of technological, economic, and social approaches to transformative change— which can be critical inputs for innovation by related industries and sectors, private sector and civil society.

Ocean Cleanup: Floating system powered by ocean currents acts as artificial 100-meter coastline catching and concentrating debris of the Great Pacific Garbage Patch
http://www.abc.net.au/news/2016-07-06/ocean-clean-up-technology-garbage-patch/7573326

Udaipur: Leading smart cities in 100% LED street lights deployment

Water-Saving toilets: Yiyuan Environmental Group patented technology for toilets saving up to 83% of water compared to conventional 6-liter models
http://www.makingitmagazine.net/?p=8090

Compostable Stretch fabric: Regionally sourced blend of linen, hemp, and modal made into 100% compostable, biodegradable fabric and garments with thread and selvage

Safe Water Books: Combined safe instruction manual and recyclable, biodegradable bacteria-killing silver and copper nanoparticles water filter cleaning dirty water into 99.9% pure drinking water without head, electricity, or pumping needs

Byfusion: Low-emission and non-toxic transformation of all types of plastic waste into a 100% recycled building material alternative with modular technology platform
https://www.indiegogo.com/projects/transforming-plastic-to-save-our-planet#

Sources: As indicated in the text.

Gaps on the provision of finance

The gaps identified in the provision of finance are related to:

- Minimizing concessionality, where the issue of whether the principle is being properly and consistently used to avoid market distortion.
• De-risking instruments, which sometimes fall short in addressing real and perceived risks faced by project investors.

• Local currency and interest rate risk tools related to many local project developers and companies are forced to borrow in foreign currency while the project generates revenues in the local currency.

3) The delivery channels for climate finance

Climate funds are playing an increasingly important role in supporting climate-related activities, and many took on more ambitious financial commitments ahead of the Paris Conference of Parties in 2015. As their role evolves, many institutions have taken steps to reshape their internal operations to promote the effective provision of climate finance. Their experience suggests that, internal institutional drivers can enhance the impact of climate-related projects on private flows and promote institutional learning. This might include making changes to internal governance and incentive structures through target-setting, instituting systems to track and measure progress, reviewing fee structures and timelines, and coordinating across divisions. Processes and procedures should be transparent, efficient and predictable. Clear selection criteria and a transparent and timely process for approval and disbursement can attract private sector participation in climate projects.

Gaps on the delivery channels for climate finance

In the area of Internal incentives and governance the gaps are related to:

• Policies and accounting rules that prevent the use of guarantees, and investment policies that favor large-scale project and low-risk projects.

• Lack of a clear mandate and technical capacity to engage the private sector.

In the area of timeline, transparency, and predictability of approval processes and policies, the issues revolved around:

• Overly complicated and lengthy approval processes.

• Lack of clear or consistent policies deter private sector investors.
Data collection and finance tracking presents issues with:

- Data collection and monitoring of climate finance, particularly for direct private sector financing and mobilizing private sector investment, this may be due in part to restrictive information disclosure policies for private sector entities.

Additional Gaps

Some advisories of the private sector identified some opportunities to engage the private sector in adaptation actions, including\(^\text{10}\):

- The consideration of focusing on transfer instruments, which includes insurance as a financing modality.
- The facilitation of blended finance and public–private partnerships.
- The support of a broader enabling framework for private sector involvement in LDCs and SIDS.
- Support the conception, production and dissemination of consistent and relevant climate data and projections.
- Involve the private sector in the development and implementation of national adaptation plans.
- Identify and partner with existing financial intermediaries that are expanding their businesses.
- Request the Secretariat to undertake deeper analysis of the business models of private sector concept notes and funding proposals related to adaptation.
- Focus efforts on developing funding proposals that target specific gaps in private sector adaptation investment.

3.4.1 The GCF Private Sector Facility

In order to scale up GCF’s activities and meet climate change challenges, the GCF has set up the Private Sector Facility.
Facility (PSF) to fund and mobilize institutional investors and leverage GCF’s funds to encourage corporates to co-invest with the Fund. This Fund is aimed at creating support for developing countries in the investment of climate change mitigation and adaptation projects. The **value proposition** of the PSF is based on:

- Aiming to de-risk the movement of global capital to solve climate challenges in developing countries.
- Special focus on Least Developed Countries, Island Developing States, and African states.
- Provide expertise to help assess the potential climate benefits of project ideas.
- Offer long-term funding through various instruments.
- Be strategic and flexible.

The GCF makes investments in eight strategic areas that are in line with country priorities. These areas are:

*Figure 7. Current international donor funding for Haiti’s climate priority sectors*

![Diagram showing current international donor funding for Haiti’s climate priority sectors]

In order to work with the Fund there are many options available, first the Fund works through Accredited Entities (AEs) to channel resources to projects, entities can apply for GCF accreditation or work in partnership with an established AE, the Fund also issues Requests for Proposals based on specific private sector programmes – and these may be open to entities who are not yet accredited\(^\text{11}\). Additional to this, the Fund looks for 6 criteria in order to fund projects, the impact potential of the project, the paradigm shift potential,

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the sustainable development potential, the needs of the recipient, country ownership, and last efficiency and effectiveness.

Part II – Analysis of climate risks on Haitian businesses and supply chain

The aim of this section is to explore the connections between climate change and the supply chain, by identifying the potential impacts that climate change can have on companies’ supply chains primary objectives, how the different economic sectors are affected by climate change, also outlining how companies can enhance the resilience of their supply chains and operations, and how to address climate risks. While climate risks differ considerably by industry, this section is intended to be consistent across most sectors.

1. Potential impacts that climate change will have on company’s supply chains primary objectives

Supply chain management plays an integral part of a business’s success since it allows a company to quickly and certainty deliver quality goods and services to the end user for a low cost. Supply chain management has four primary objectives: Reduce the overall cost of production, enhance the speed and responsiveness of delivery, enhance the quality of goods and services produced, and manage the uncertainty of major disruptions.

Modern supply chains have become more vulnerable to climate change due to their new characteristics such as:

- Global reach: companies with global supply chains that transport goods across great distances are subject to more geographical risks, than those who move goods locally.

- Specialized products and services (only made in specific parts of the world): companies become more vulnerable to the stability of the place where the good is made.

- Minimum inventories (to comply with just in time production): the reduction of inventories means that the companies are more exposed to goods shortage when a climate aversion hits.

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12 For more information on the criteria of the GCF to fund projects: https://www.greenclimate.fund/how-we-work/funding-projects

The following section describes some examples of how climate change affects each of the four primary objectives of supply chain management.

**Cost**

Climate risks will force significant cost changes in many supply chains, whether from physical impacts that increase the cost of infrastructure maintenance, agricultural inputs, and worker health, or from policy and legal changes that affect the cost of fuel, energy, and other high-carbon inputs. Actual costs will vary considerably by value chain, region, and other variables, but the impact of climate risks to cost cannot be ignored\(^\text{14}\). Transport costs will rise as climate impacts damage infrastructure and regulation increases the price of high-carbon transport. According to the U.S. General Accounting Office, climate change may result in US$7.4 billion in avoidable adaptation costs per year to U.S. roads\(^\text{15}\).

**Speed**

Climate change will have a variety of impacts on the speed at which suppliers can deliver goods and services, and therefore on a company’s ability to respond to market demand in a timely fashion. Changes to transportation infrastructure will also affect speed of delivery.

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\(^{15}\) http://www.gao.gov/assets/690/687466.pdf
Quality

Quality goods and services meet or exceed customer expectations. Quality is a key factor that affects the likelihood of repeat business from customers, the cost of warranty repairs or recalls, and a range of other issues. Climate change affects the existing quality of goods and services in some cases, and in other cases it is changing customer expectations.

Box 4: Examples of impact in quality caused by climate change.

In 2014, Cyclone Hudhud damaged India’s silk industry, and the cocoons that survived were of low quality. A more limited ability to control indoor environments in India means that silk production relies on strains of silkworms that are more resilient to warm temperatures and fluctuations in humidity but produce lower-quality silk. [https://www.bsr.org/en/our-insights/report-view/climate-change-implications-and-strategies-for-the-luxury-fashion-sector](https://www.bsr.org/en/our-insights/report-view/climate-change-implications-and-strategies-for-the-luxury-fashion-sector)

Growing wheat, rice, barley, or potato in high-CO2 concentrations reduces the protein content by between 10 percent and 14 percent. Some crops may also show reduced mineral and micronutrient concentrations. [https://www.bsr.org/reports/BSR-Cambridge-Climate-Change-Implications-for-Agriculture.pdf](https://www.bsr.org/reports/BSR-Cambridge-Climate-Change-Implications-for-Agriculture.pdf)

Higher temperatures in Ethiopia and elsewhere may result in lower-quality coffee beans. [https://www.nature.com/articles/nplants201781.epdf](https://www.nature.com/articles/nplants201781.epdf)

Sources: As indicated in the text.

Uncertainty

The increasing magnitude and variability of climate impacts, combined with the increasing complexity of supply chain networks, exacerbate the uncertainty of disruption to supply chains. As a result, there is an overarching business benefit to addressing these issues together through the supply chain as a system, rather than addressing them piecemeal.
2. The impacts of climate change by business sector

Haiti is amongst the 5 countries in the world most affected by climate risks. Studies looking at the short-term effects of storms found that small states are particularly affected, with an average annual GDP loss from natural disasters and climate change of 16% in Latin America and the Caribbean, and 11% of the population affected (vs. 2.5% GDP loss and 1% of population affected for larger countries)\(^\text{16}\).

Small islands, like Haiti, are highly vulnerable to extreme weather events, changes in sea level, increases in air and surface temperatures, and changing rainfall patterns. Deterioration in coastal conditions, such as beach erosion and coral bleaching, will likely affect local resources such as fisheries, as well as the value of tourism destinations. Sea level rise is projected to worsen inundation, storm surge, erosion, and other coastal hazards. These impacts would threaten vital infrastructure, settlements, and facilities that support the livelihood of island communities.

According to UNFCCC, Haiti is affected primarily by floods, storms and droughts. The following chart shows the distribution of such natural disasters.

\(^{16}\) https://blogs.iadb.org/transporte/en/this-is-how-the-transport-sector-is-being-affected-by-climate-change/
The adverse effects of climate change have an impact on many economic sectors; the following section discusses the effects on some of them.

### 2.1 Agriculture and food supply

Agriculture is one of the primary sectors in Haiti’s economy, generating more than 25 percent of Haiti’s Gross Domestic Product (GDP) and employs more than 60 percent of the country’s population\(^\text{18}\). Agriculture and fisheries are highly dependent on the climate. Agriculture is highly vulnerable to climate variability, particularly to floods and droughts affecting the country periodically. Thus, reducing vulnerability to climate change is of utmost importance in the agricultural sector in Haiti, considering the role the sector plays in food security and livelihoods of rural populations.

 Increases in temperature and carbon dioxide can increase some crop yields in some places. But to realize these benefits, nutrient levels, soil moisture, water availability, and other conditions must also be met. Changes in the frequency and severity of droughts and floods could pose challenges for farmers and ranchers and threaten food safety. Meanwhile, warmer water temperatures are likely to cause the habitat ranges of many fish and shellfish species to shift, which could disrupt ecosystems.

Overall, climate change could make it more difficult to grow crops, raise animals, and catch fish in the same ways and same places as we have done in the past. The effects of climate change also need to be considered

\(^{17}\) [https://unfccc.int/files/adaptation/workshops_meetings/nairobi_work_programme/application/pdf/haiti.pdf](https://unfccc.int/files/adaptation/workshops_meetings/nairobi_work_programme/application/pdf/haiti.pdf)

along with other evolving factors that affect agricultural production, such as changes in farming practices and technology.

According to the First National Communication and to general circulation models, the following climatic changes with relevance to agricultural sector are expected to happen in Haiti:

a) **Increases in temperatures**: it is probable that the temperature will increase by 0.8 – 1 °C by the year 2030 and by 1.5 - 1.7 °C by the year 2060, with the highest increases occurring during the month of June for 2030 and during the month of June, July and October for the year 2060.

b) **Decreases in precipitations**: the precipitations are expected to decrease by 5.9 - 20% by 2030 and by 10.6 - 35.8% by 2060. The highest decrease will be registered during the month of July by the year 2030 and during the month of June by 2060. The scarcity of water resulting from this will lead to less water for irrigation purposes. For example, a reduction in annual rainfall coupled with more intense storm events will likely decrease agricultural productivity in Haiti for corn, rice, and potatoes and exacerbate food security issues.

**Crops**

Crops grown in Haiti are critical for the food supply in the country. Changes in temperature, atmospheric carbon dioxide (CO2), and the frequency and intensity of extreme weather could have significant impacts on crop yields. For any particular crop, the effect of increased temperature will depend on the crop's optimal temperature for growth and reproduction.

- Higher CO2 levels can affect crop yields. Some laboratory experiments suggest that elevated CO2 levels can increase plant growth. However, other factors, such as changing temperatures, ozone, and water and nutrient constraints, may counteract these potential increases in yield. For example, if temperature exceeds a crop’s optimal level, if sufficient water and nutrients are not available, yield increases may be reduced or reversed. Elevated CO2 has been associated with reduced protein and nitrogen content in alfalfa and soybean plants, resulting in a loss of quality. Reduced grain and forage quality can reduce the ability of pasture and rangeland to support grazing livestock.

- More extreme temperature and precipitation can prevent crops from growing. Extreme events, especially floods and droughts, can harm crops and reduce yields.
• Dealing with drought could become a challenge in areas where rising summer temperatures cause soils to become drier. Although increased irrigation might be possible in some places, in other places water supplies may also be reduced, leaving less water available for irrigation when more is needed.

• At middle to high latitudes, cereal crop yields are projected to increase slightly, depending on local rates of warming and crop type. At lower latitudes, cereal crop yields are projected to decrease. The greatest decreases in crop yields will likely occur in dry and tropical regions such as Haiti.

• According to a vulnerability study for the agricultural sector, realized for the National Adaptation Plan of Action, whereby the temperature is estimated to increase by up to 1 °C by 2030 and up to 1.7 °C by 2060 and the precipitations to decrease by up to 20% by 2030 and up to 35.8% by 2060, the following yield decreases are expected to be observed on irrigated crops: a) corn: 4% decreases by 2030 and 7.7% decreases by 2060; b) rice: 9% decreases by 2030 and 15% decreases by 2060 and c) potato: 5% decreases by 2030 and 10% decreases by 2060

• Climate change might limit the availability of water and potential interruption of supply to irrigation systems.

• Equipment and other investments, as well as expertise of farmers and workforce, are linked to specific crops, which may become unprofitable or may no longer be viable.

• Quality issues related to overheating of grain, or availability of water for pre-washed products could occur.

• Climate change also affects the access to land during flood or extreme rain conditions.

Box 6: Example of climate change effects on Crops

Hurricane Mitch, which hit the country in 1998, had a damaging impact on between 15 and 20% of crops, 80% of banana plantations and 100,000 small livestock, according to FAO. The storms affecting Haiti in recent years have led to agricultural losses totaling US$ 61 million countrywide, resulting in reduced food production

Source: NAPA préparation document, Ch.III: Vulnérabilité à adaptation aux changements climatiques. secteur: agriculture.

Livestock

Changes in climate could affect animals both directly and indirectly.

- Heat waves, which are projected to increase under climate change, could directly threaten livestock. Over time, heat stress can increase vulnerability to disease, reduce fertility, and reduce milk production.

- Drought may threaten pasture and feed supplies. Drought reduces the amount of quality forage available to grazing livestock. Some areas could experience longer, more intense droughts, resulting from higher summer temperatures and reduced precipitation. For animals that rely on grain, changes in crop production due to drought could also become a problem.

- Climate change may increase the prevalence of parasites and diseases that affect livestock. The earlier onset of spring and warmer winters could allow some parasites and pathogens to survive more easily. In areas with increased rainfall, moisture-reliant pathogens could thrive.

- Potential changes in veterinary practices, including an increase in the use of parasiticides and other animal health treatments, are likely to be adopted to maintain livestock health in response to climate-induced changes in pests, parasites, and microbes. This could increase the risk of pesticides entering the food chain or lead to evolution of pesticide resistance, with subsequent implications for the safety, distribution, and consumption of livestock and aquaculture products.

- Increases in CO2 may increase the productivity of pastures but may also decrease their quality. Increases in atmospheric CO2 can increase the productivity of plants on which livestock feed. However, the quality of some of the forage found in pasturelands decreases with higher CO2. As a result, cattle would need to eat more to get the same nutritional benefits.
Fisheries

Many fisheries already face multiple stresses, including overfishing and water pollution. Climate change may worsen these stresses. In particular, temperature changes could lead to significant impacts.

- Climate change is affecting many fisheries around the world. Increasing ocean temperatures have shifted some marine species to cooler waters outside of their normal range. Fisheries are important for the food supply and economy of many countries. Projected reductions in water flows and increases in sea level may negatively affect water quality and fish species in regions like these, affecting the food supply for communities that depend on these resources.

- Some marine disease outbreaks have been linked with changing climate. Higher water temperatures and higher estuarine salinities have enabled an oyster parasite to spread farther in some areas.

- Changes in temperature and seasons can affect the timing of reproduction and migration. Many steps within an aquatic animal's lifecycle are controlled by temperature and the changing of the seasons.

- In addition to warming, the world's oceans are gradually becoming more acidic due to increases in atmospheric carbon dioxide. Increasing acidity could harm shellfish by weakening their shells, which are created by removing calcium from seawater. Acidification also threatens the structures of sensitive ecosystems upon which some fish and shellfish rely.

Increases in the frequency and severity extreme weather events can also interrupt food delivery and resulting spikes in food prices after extreme events are expected to be more frequent in the future. Increasing temperatures can also contribute to spoilage and contamination.

Box 7: Example of climate change effects on Livestock

Agriculture is responsible for almost 73% of all methane (CH4) emissions in the country. Of these, 68% (62.71Gg) are due to enteric fermentation from farm animals and 28% (26.06Gg) are emissions from flooded rice field. The National Adaptation Plan of Action identifies the following activities related to livestock: i) banning of free animal grazing and ii) construction of ponds used as a source of drinking water for livestock.

According to the Ministry of Agriculture, Natural Resources and Rural Development, the storm of Hurricane Mitch resulted in the loss of approximately 3% of total livestock in the country, representing around 100,000 livestock.

2.2 Energy

Haiti’s largest industry, the charcoal business, generated US$300 million in 2012 according to the Office of Mines and Energy. This industry lacks transparency\(^\text{20}\), between 30 and 50 million trees are consumed in Haiti each year, equivalent to 4.3 million tons of wood. Carbon production is done by farmers in wooded areas in Grand’Anse, on the country’s southern and northwestern sides. The wood, turned into carbon, satisfies 70% of the country’s energy needs and is used to cook, in laundromats and bakeries, among others.

In Haiti, land-use change, and forestry are the largest contributors to GHG emissions in the country, due to intense deforestation activities. The forestry sector continues to be highly vulnerable due to ongoing clearing of forests, as a source of charcoal and fuel wood. The uncontrolled tree-cutting leads directly to deforestation and causes erosion, landslides and floods.

Over the last century, the country’s natural forest cover has declined from 60% of the land area to 4%, according to the United Nations’ Food and Agriculture Organization (FAO.) Deforestation has damaged the integrity of ecosystems, increased the risk of natural disasters and threatens biodiversity, which is essential for the healthy production of several agricultural and forestry species.

Energy plays an important role in many aspects. For example, electricity is used for lighting and cooling. Fuel is used for transportation, heating, and cooking. Energy production and use are interconnected with many other aspects of modern life, such as water consumption, use of goods and services, transportation, economic growth, land use, and population growth.

- Climate change is likely to both increase electricity demand for cooling in the summer and decrease electricity, natural gas, heating oil, and wood demand for heating in the winter. New infrastructure investments may be necessary to meet increased energy demand, especially peak demand during heat waves caused by climate change.

- Climate change could affect the amount of water available to produce electricity or extract fuel, in areas where water is already scarce, competition for water between energy production and other uses could increase.

• Sea level rise and more frequent intense storms could disrupt energy production and delivery by damaging electricity infrastructure, fuel delivery infrastructure and equipment, power plants, or storage facilities.

• Peak energy demand due to warmer and more frequent hot days could, in some regions, exceed the maximum capacity of current transmission systems and will be combined with systems stresses due to heat.

• Increased risk of damage to facilities and infrastructure from extreme and unpredictable weather conditions.

• Uncertainty over energy output from hydroelectric plants due to potential water shortages.

2.3 Transportation

The transport sector is particularly exposed and vulnerable to the impact of natural disasters, and climate change is expected to exacerbate future risks. Transport infrastructure exhibits significant vulnerabilities to extreme weather – including coastal storms, landslides, inland flooding, and extreme temperatures, for example. Such events may disrupt and damage the vital connections that provide access to economic opportunities, to education, to healthcare, and facilitate social interaction. These impacts may fall most heavily on vulnerable populations, particularly in areas where the availability of alternative routes or other transport options is poor, such as in the case of Haiti.

Climate change can damage or even destroy road, rail, port, and airport infrastructure. Furthermore, climate change social and economic impacts can change levels and patterns for transport demand. CEPAL, the Economic Commission for Latin America and the Caribbean estimates that almost 7,000 km of the region’s roads would be damaged by a one-meter rise in sea level, the UNDP estimates that CARICOM members would lose almost 600 km of roads and every fourth airport\textsuperscript{21}.

\textsuperscript{21}https://blogs.iadb.org/transporte/en/this-is-how-the-transport-sector-is-being-affected-by-climate-change/
Climate change is likely to damage transportation infrastructure through higher temperatures, more severe storms and flooding, and higher storm surges, affecting the reliability and capacity of transportation systems.

Coastal roads, railways, ports, tunnels, and airports are vulnerable to sea level rise, which could lead to delays as well as temporary and permanent closures.

Climate change impacts will likely increase the cost of the nation’s transportation systems.

More refrigerated distribution and storage required, and problems with livestock transportation in summer heat.

Storm damage to bridges and rail systems disrupting companies’ ability to ship product and/or receive supplies.

Since ports serve as the gateway of overseas trade, supply chains will become particularly vulnerable to climate impacts from extreme weather events associated with rising sea levels and tropical storm activity. Even if goods manage to make it through ports, getting them to production or distribution facilities will also become more challenging.

Heat waves can also limit construction activities, particularly in areas with high humidity. With these changes, it could become costlier to build and maintain roads and highways.

As temperatures increase, many types of vehicles can overheat, and tires will deteriorate more quickly. Periods of extreme heat can affect aircraft performance and may cause airplanes to face cargo restrictions, flight delays, and cancellations. In the winter and spring, increased rains and flooding may also disrupt air travel. Storms can force entire airports to close.
• Shipping lanes experiencing sea level rise will be able to accommodate larger ships, reducing shipping costs. However, higher sea levels will mean lower clearance under waterway bridges. In inland waterways where water levels are expected to decline, ships could face weight restrictions, as channels become too shallow.

2.4 Water resources

Water resources are important to both society and ecosystems. People depend on a reliable, clean supply of drinking water to sustain their health. Also, they need water for agriculture, energy production, navigation, recreation, and manufacturing. Many of these uses put pressure on water resources, stresses that are likely to be exacerbated by climate change.

As climate changes, water is very likely to become scarce at least part of the time in many areas. The availability of water is strongly related to the amount and timing of runoff and precipitation. The global mean temperature has been warming nearly the doubled since 1975 to 1.5–1.8 °C per century, according to the international State of the Climate in 2017 report\textsuperscript{22}, annual average streamflow is projected to increase by 10-50% at high latitudes and in some wet tropical areas. When it does rain, more precipitation is expected to fall in extreme heavy precipitation events. Increases in heavy precipitation events would not increase water supply, but instead result in increased flooding.

• Large rainstorms may cause large amounts of pollutants to enter rivers and estuaries, as excess water may overwhelm wastewater systems and natural buffers. Increased pollution as well as increasing water temperatures can cause algal blooms and potentially increase bacteria in water bodies.

• In coastal areas and small islands such as Haiti, freshwater resources along the coasts face risks from sea level rise. As the sea rises, saltwater moves into freshwater areas. These impacts may require communities to begin treating their water in order to provide safe water resources for human uses.

• Warming temperatures, changes in precipitation and runoff, and sea level rise have affected and will likely continue to affect water supply and quality.

• Changes to the water resources affect many sectors, including energy production, infrastructure, human health, agriculture, and ecosystems.

\textsuperscript{22} https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature
• As temperatures rise, people and animals need more water to maintain their health and thrive. Many important economic activities, like producing energy at power plants, raising livestock, and growing food crops, also require water. The amount of water available for these activities may be reduced as Earth warms and if competition for water resources increases.

3. Climate risks

Climate change presents a wide range of risks to businesses and the communities on which they depend. Some risks result from direct physical changes to the environment. Others are indirect and result from our collective response to climate change and our efforts to transition to a low-GHG economy. Climate risks affect critical supply chain issues of cost, speed and responsiveness, quality, and the uncertainty of disruption.

There are, in broad terms, six different kinds of climate risks that affect businesses. These risks can be divided into two interconnected groups: value-chain risks and external-stakeholder risks.

Figure 9. Types of supply chain's risks related to climate change

3.1 Value-chain risks

Physical risks

Physical risks can be categorized in acute and chronic. Acute physical risks are event-driven, such as cyclones, hurricanes, and floods; and chronic physical risks are from longer-term shifts in climate patterns, such as sea-level rise, drought, and chronic heat waves. Both acute and chronic physical risks affect the cost, speed, or quality of supplier inputs to a company, as well as the uncertainty and resilience of supply.

Acute physical risks such as unexpected flooding or water shortages can force the temporary shutdown of a power plant, mine, or transportation route. Chronic physical risks, such as rising temperatures or changing
rainfall patterns, can alter the yield of agricultural commodity inputs and degrade infrastructure and will require a shift away from past transportation routes.

Such physical risks are impossible to control, but companies can take steps to prepare for the changes that could occur in years to come. First, it helps to forecast a range of reasonable scenarios; doing so may require the help of specialized climate modelers. Climate forecasting can highlight high-level risk probabilities by region, such as for flood, drought, or sea-level rise, and for long-term changes in such factors as temperature, humidity, or rainfall patterns. The scenarios should help reveal which parts of the business are vulnerable.

Box 9: Example of physical risks

In 2012, for example, Cargill, one of the world’s largest food and agricultural companies, posted its worst quarterly earnings in two decades, in large part because of the US drought.

Western Digital Technologies, a major supplier of hard disk drives, posted a sharp decline in revenues in 2011 after flooding in Thailand, where most of its production was located. That loss of production meant global supply slumped, with severe reverberations for computer manufacturers.


Price risks

Refer to the increased price volatility of raw materials and other commodities. Drought can raise the price of water; climate-related regulation can drive up the cost of energy. High-tech and renewable-energy industries, for example, face price risks in the competition for rare earths, which are used in the production of computer hard drives, televisions, wind turbines, solar photovoltaic systems, and electric vehicles.

For more than a decade, the prices of many resources have been both rising and volatile. An unstable climate could ratchet up the pressure further, forcing companies to cope with uncertainty around inputs to production, energy, transport, and insurance.
Product risks

It refers to core products becoming unpopular or even unsellable. Climate change affects customer demand for various types of goods and services. Effects could range from losing a little market share to going under entirely. Alternative cooling technologies, for example, could conceivably displace air-conditioning systems. Regulatory and production costs could raise the price of coal in some markets above that of lower-carbon competition, with ripple effects for mining-equipment manufacturers and related industries. Reduced snowfall in mountainous may result in fewer tourists and reduced sales for winter sports.

These risks cascade into supply chains as suppliers change their production in response to market signals. Market uncertainty may lead companies to seek greater supply chain flexibility. This kind of risk is familiar, related to the concept of new products displacing older ones. The difference is that responding to climate-related pressures can change the entire context in which a business operates, not just a specific segment.

On the positive side, however, greener products are emerging in a number of industries. The construction and infrastructure sectors are developing new products and services that cater to cleaner cities, such as electric-vehicle charging infrastructure, renewables integration, smart metering, smart grids, congestion-fee systems, and high-performance building technologies. In the business-to-consumer sectors, especially retail and consumer products, new segments are making inroads as people make it clear they are willing to pay for greener products.

Companies can adapt to product risks, by adopting a “design to sustainability” approach, in which new products are designed to minimize waste and to be broken down for reuse or recycling. Another is to redefine

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Box 10: Example of price risks

Some companies are taking significant steps to get ahead of price risk concerns.

IKEA is in the process of substituting conventional sources of energy with renewables; in time, it hopes to be largely self-sufficient with regard to power. In that event, the retailer will have a good idea of what price it will pay for power and will insulate itself against global and regional energy price spikes.

Volkswagen is doing something similar. To hedge against the possibility of rising fossil-fuel prices, the German car maker is investing €1 billion in renewable-energy projects and is aiming to power its manufacturing sites mainly through on-site production.

corporate strategy to align business interests with climate-change mitigation and adaptation.

Box 11: Example of product risks

Siemens has developed a dedicated “environmental portfolio” of carbon-efficient products, while Saint-Gobain, the construction and packaging giant, puts sustainable housing technologies at the core of its product-development strategy.


3.2 External-stakeholder risks

Rating risks

Rating risks are defined as the possibility of higher costs of capital because of climate-related exposure such as carbon pricing, supply-chain disruption, or product obsolescence.

While the ratings risk varies widely between and within industries, even companies with carbon-intensive activities can start to manage it. As an action to prevent rating risks more than 4,000 organizations are reporting their exposure to the CDP, the CDP is an organization based in the United Kingdom which supports companies and cities to disclose the environmental impact of major corporations. It aims to make environmental reporting and risk management a business norm, and drive disclosure, insight and action towards a sustainable economy, which could be a first step in dealing with the issue of rating risks. A number of oil majors also use an internal carbon price to guide some of their strategic decisions.

Regulations risks

Regulation risk refers to government action prompted by climate change. This can take many forms, including rules that add costs or impede specific business activities, subsidies in support of a competitor, withdrawal of subsidies, policies to reduce GHG emissions, policies that indirectly impose a carbon price, policies that promote resilience to physical climate risks, and climate-related legal action brought before the courts. In many industries, government plays a crucial role in setting the rules of the game; with climate change in mind, many of those rules are changing. These risks increase supply chain costs related to GHG emissions, driving up the price of high-carbon energy inputs, and they also increase supply chain costs as companies work to ensure legal compliance.
One complication is that, on the national and international level, climate-change policies often change, sometimes with the speed of an election result. That makes it difficult for businesses to make long-term investment and operating decisions. Businesses can, however, take the initiative in managing regulation risk. The first step in preparing for and helping to shape future regulation is to understand the policy options. The second step is to develop an internal strategy on climate change to put the company in a position to react effectively to regulations and policy changes. The final step is to work with external stakeholders, such as regulators and industry groups, to get their perspectives.

**Reputation risks**

Reputation risk can be direct, stemming from a company-specific action or policy, or indirect, in the form of public perception of the overall industry. In the climate change context, reputation risk can be understood as the probability of profitability loss following a business’s activities or positions that the public considers harmful. A poor reputation on climate can hurt sales through consumer boycotts or local community protests. It could damage the regulatory environment and investor relationships. And it could make the company less attractive to current or future employees.

One of the latest trends is changing expectations of stakeholders. Investors are asking for disclosure of carbon emissions and starting to lodge concerns about “stranded” assets—those that become unusable due to climate-policy regulation or physical climate change. Many employees want sustainability to be part of the day-to-day operations of their companies. Nongovernmental organizations are getting more prominence when it comes to their ability to measure and compare corporate actions.

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**Box 12: Example of regulation risks**

Around the world, governments are responding to the possibility of climate change in ways that necessarily affect business prospects:

- China is launching carbon-trading programs in seven regions in preparation for a potential national plan by 2020.
- Most US states have introduced renewable portfolio standards, which require a certain proportion of the state’s electricity to be produced from renewable sources.
- Ethiopia has charted a course to become a middle-income country through low-emissions growth with its Climate-Resilient Green Economy strategy.

4. How companies can address climate risks

Companies can address climate-related risks in their supply chains, create value, and potentially develop a competitive advantage by identifying and acting where they have the greatest impact and influence. The following framework was first introduced in BSR’s 2015 report Business Action for Climate-Resilient Supply Chains.23

**Identify climate priorities**

The assessment of the supply chain can help companies prioritize aspects that offer the most significant opportunity for creating supply chain resilience (including areas of high GHG emissions and areas of high climate vulnerability) since for companies, the decision to where to focus in a supply chain can be a challenge. One method to prioritize parts of the supply chain according to risks suggested by BSR is to assess business-critical spend categories against quantity of emissions generated and level of vulnerability to physical climate...
risks. Companies also can determine the scope by focusing on categories such as, high spend, high priority, business-critical suppliers and key raw materials.

**Take action and develop targets**

Considering the urgency of climate change, companies should first set targets and then take action. In practice, the processes tend to happen iteratively. Climate action takes many forms, and companies can be more efficient by adopting a structured approach to identify those actions with the highest potential for impact.

There are three types of supply chain climate actions that companies can take:

- **Internal actions**: working with teams in procurement and related functions to improve requirements and processes to more successfully consider climate impacts in sourcing and procurement decisions.

- **Actions with suppliers**: setting requirements and encouraging suppliers to reduce their emissions, develop adaptive capacity, and participate in programs with these goals.

- **Actions in broader collaboration**: joining, leading, or starting initiatives with other businesses and stakeholders. These initiatives can be commodity-focused, industry-focused, or community-focused.

Setting measurable, time-bound targets helps companies focus and drive their actions to address their supply chain climate risks. It also helps companies reduce these risks faster and more profitably than acting without concrete targets. Targets should focus on identified supply chain priorities, including both emissions reductions to address transition risks and strengthening areas that are vulnerable to physical climate risks.

While quantitative emissions-reduction targets across the supply chain are ideal, many companies may not yet be ready to commit to quantitative goals. Some examples of qualitative targets to address transition risks include:

- Establishing energy-management systems.

- Take steps toward emissions reduction.

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• Conduct a return-on-investment analysis of a range of potential emissions-reduction activities to identify quick wins.

• Develop an emissions-action plan and implement GHG-reduction projects.

• Include GHG-reduction criteria in supplier selection and product design.

Goals to address physical climate risks are more qualitative in nature, such as commitments to build capacity, partner with relevant stakeholders, and develop projects in local areas. For example, food, beverage, and agriculture companies might set targets that focus on sustainable agriculture training for farmers, or investments in R&D to breed drought-resistant crops for their suppliers.

Evaluate impact

Monitoring, evaluating, and reporting helps a company understand how well different actions contribute to achieving targets and effectively addressing supply chain climate priorities and whether there is any need for a company to amend its path. Metrics can help a company understand the outcomes and impacts of its climate actions and adjust targets over time. Even though metrics may vary by industry, they can be based on existing carbon accounting and reporting standards.

Standardized supply chain emissions metrics are best when linked to science-based targets for emissions reductions. Metrics for adaptive capacity could include the amount of supplier financial investment in infrastructure that helps minimize the impact of climate change, or the number of suppliers with climate preparedness plans.

BSR has identified six capital assets, to help identify priorities, establish areas for action and targets, and evaluate results.

4.1 Recommendations to address climate change by sector

Reducing supply chain risks presented by climate change is not a long-term thought experiment but an imperative that must be addressed today. While much of the popular discussion around climate change focuses on reducing risks through emissions mitigation, from a supply chain planning perspective, reducing risk through adaptation actions is also an essential consideration. The following section presents a series of recommendations that businesses might take to address the impact of climate change.

Table 7. Recommendations for businesses to address climate change

<table>
<thead>
<tr>
<th>Recommendations for businesses to address climate change</th>
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<tbody>
<tr>
<td>Agriculture and Food supply</td>
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<tr>
<td>• Build resilience to shocks through climate-sensitive agriculture; also implement water management schemes as well as drought- and flood-resistant seeds.</td>
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<tr>
<td>• Promote climate resilient green agriculture, by mobilizing local communities and undertake natural resource conservation and management activities like forestry development as well as soil and water preservation.</td>
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<tr>
<td>• Invest in agriculture, upgrading of small-scale farmers’ equipment (many farmers still seed, weed and harvest by hand).</td>
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<tr>
<td>• Develop strategic plans that include alternative livelihood activities (industry, tourism, and services) in order to reduce the demographic pressure on agriculture.</td>
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</tbody>
</table>
| **Energy** | • Adopt new crop varieties better suited to the changing climate, such as drought-resistant, short-cycle, and salt-tolerant varieties, as well as new cultivation practices.
• Reinvigorate and rehabilitate agricultural research, extension, and training structures and improved farmer access to financial services.
• Provide farmers and traders with incentives to develop market links conducive to spontaneous adoption of sustainable natural resource management. |
| **Energy** | • Build conscience to rationalize the use of coal. The charcoal should pass through a rational and sustainable production and the use of alternatives, like other forms of coal or a portion of propane and agricultural waste.
• Increase forest policies and security by hiring well equipped forest guards.
• Increase the regulations of coals and firewood’s supply chains, due to the easiness and cheap cost to produce them.
• Reduce the amount of charcoal and firewood use in households and microenterprises (that include restaurants, bakeries, laundry and distilleries).
• Implement the process of massive distribution of stoves and gas tanks so that people would change the consumption of firewood and coal for gas.
• Improve leadership and financial assistance from the state to promote preservation and restoration of forests.
• Policies on protected areas should emphasize engagement of local people in the design and management of the zones, which could also create job opportunities in eco-tourism.
• Produce alternative energy sources including, crop residues, solar and wind power. |
| **Transportation** | • Build resilient road infrastructure. Resilient transport interventions |
and policies can significantly reduce future losses in assets and well-being.

- Spending on transport infrastructure maintenance can prevent damage caused by frequent floods and storms, and thereby reduce user costs and repair needs.
- Upgrading construction standards for critical bridges and culverts can reduce the impact from less frequent but higher impact events.
- Implement the use of new Information and Communications Technology strategies (ICT) in freight transportation in order to increase capacity utilization and, therefore, lead to reductions in energy usage.
- Include efforts to improve the storage of harvested crops and the roads needed for transport.
- Implement the use of sustainable methods of transportation.

### Water resources

- Support government initiatives to establish national watershed management guidelines and identify strategic watersheds to target for long-term interventions to diminish flooding vulnerability.
- Implement hazard mapping to alert for landslides, and floods.
- Implement more natural and built infrastructure to store and deliver water, and to protect against drought and flood.
- Improve water governance to meet social, economic and environmental goals.
- Nature-based solutions such as mangroves protecting shorelines from storms, lakes storing large water supplies and floodplains absorbing excess water runoff, should be implemented.
- Support actions at scale to build climate resilience by combining watershed management, sustainable infrastructure, empowerment and learning through adaptive institutions.

### Supply chains overall

- Commit to continuous improvement by a partnership with the clients to give more importance to environment.
• Increase supply chain visibility by enlisting the help of a software provider that specializes in the area. A software that would enable procurement organizations to visualize their end-to-end supply chains through geographic maps and network graphs. By loading supplier and purchase data into a centralized platform, consolidating supply chain data from not only tier 1 suppliers but also suppliers several tiers below. This will allow companies to consolidate siloed corporate data, creating a single version of the truth about a business’ risk exposure to climate-related effects.

• Reframe organization’s idea of adaptation from a one-time effort to an iterative process. This will help organizations assess risks and vulnerabilities from climate change, take actions to prevent or mitigate those risks, and improve over time.

• Implement new Information and Communications Technology strategies (ICT) in order to assist in the decarbonization of many processes.

• Companies should consider more than just the flood risk when relocating warehouses. They might also select locations that put the facility near transportation hubs. A shorter distance between logistics bases and warehouses will reduce miles traveled, saving on gas and reducing carbon output.

• Promote political will, leadership, transparency, coordination, and consultation of citizens.

Part III – Market study of the financial service sector and climate investment opportunities

This section points to a number of opportunities to enhance private sector investment in support of NDC implementation in Haiti. Overall, these institutions, in their mobilization of private sector finance, should aim to drive action and build capacities in areas that are not already being served by existing support channels. To this end, climate funds and direct access entities (DAEs) should look to increase their current
capacity and appetite to take on risk, including making significant upstream investments to improve enabling environments and build project pipelines, encourage domestic private institutions to participate in new areas of climate-friendly lending, advance innovative financial instruments and de-risking tools, and help create “new” markets.

To this end, four key priorities have been identified, and a set of near-term implementation opportunities for each have been proposed, including potential approaches relevant for the GCF.

1. Strengthen support for project identification and development

In many cases, the lack of a strong pipeline of bankable projects, and not a lack of capital, is the main barrier to private sector investment. Creating this pipeline often requires policy and regulatory changes to create favorable conditions for low-carbon investment. In addition, securing the support needed to prepare high-quality projects can be challenging, particularly for upstream policy planning and early-stage project development, and small-scale projects where transaction costs are high.

Comprehensive platforms that integrate project financing with technical assistance can help address multiple risks and facilitate investment by the private sector. Climate funds can support these kinds of “one stop shops” at the national level (e.g. Morocco’s MASEN), or through in-house project preparation facilities (within the country) that offer private sector developers financial expertise, technology advice, and access to finance.

In the case of the GCF, the Fund can offer countries support through its Readiness Program (taking place in Haiti) for the development of long-term investment plans that help countries identify their best options for engaging the private sector. The Fund can also scale up the provision of support for project development through the PPF, expedite access to these resources and ensure sufficient funding is made available for early-stage project development. However, project preparatory funding must be channeled through accredited entities, leaving private sector developers without direct access to early-stage funding. To increase private sector participation and promote innovation, the GCF should consider establishing a project preparation vehicle for private sector proposals that is accessible to a wider set of entities, including those looking to partner with GCF accredited entities or those intending to seek accreditation. More generally, the PSF should consider how it can encourage private sector entities not yet accredited to the Fund to bring forward robust ideas.
Strengthen domestic financial institutions

A list of the most relevant domestic financial institutions has been developed in section 2, some of the findings are:

- Enhancing the capacity of domestic financial institutions to finance climate activities can create domestic markets for low-carbon investment.

- The evolution of local financial institutions can be complicated and take time, and many will need support to overcome barriers.

- Key areas for assistance include improving capacity to assess the benefits and risks of climate-related investments, helping to structure climate investment vehicles and adopt new business models, and sharing of best-practices and tools to monitor and evaluate climate investments.

- The objective is to create national accredited entities.

All entities seeking to access GCF resources must be accredited by the GCF Board. This means, the entities must go through a 3-stage process that seeks to demonstrate that they meet the Fund’s standards. The accreditation process entails assessment of entities’ capabilities, competencies, and track records in having and undertaking financial, environmental and social risk mitigation measures required by GCF. Any subnational, national, regional, public or private agency can apply to become accredited as an implementing entity provided it fulfills the following requirements:

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*Box 14: Success story, Morocco’s Agency for Sustainable Energy (MASEN)*

As a central player committed to making optimal use of renewable resources, Masen transforms natural power into power for progress. The integrated model Masen has devised aims to establish self-sustaining and financially viable ecosystems.

In addition to generating electricity through major projects and raising the funds required to do so, Masen seeks to act as a catalyst for the development of a competitive economic network that employs existing skills efficiently and helps create new ones. At the same time, the development of applied research and the promotion of technological innovation are encouraged.

The local development strategy Masen has developed – a true reflection of its integrated approach – helps the regions that host its projects to achieve territorial equity and sustainable growth.

Finally, its constant concern for protecting the environment and reducing greenhouse gas emissions underpins Masen’s entire approach.

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27 AEs are accredited by the GCF Board during regularly scheduled Board meetings (IIED, 2016)
GCF recognizes that interested entities have various capacities hence they can qualify for different levels of accreditation, depending on their ability to demonstrate a track record of fiduciary, environment and social standards. It is on this basis that GCF established a “fit-for-purpose” approach for accreditation process which classifies applicant entities according to the intended scale, nature and risks of their proposed activities.

What routes can Haiti use to access GCF resources? Which entities are eligible to apply for GCF resources?

The GCF stipulates that eligible countries can access GCF resources through national, regional and international implementing entities accredited by the GCF Board (popularly referred to as Accredited Entities). All Accredited Entities can be Executing Entities (EEs) however the reverse is not possible. Following this explanation, it is important to underscore that all AEs can receive funds directly from GCF whereas not all EEs can receive funds directly from GCF.

The GCF establishes three (3) distinct modalities of accessing GCF resources by eligible countries. These are: Direct access; Enhanced Direct Access; and International Access²⁸.

3. Enhance risk appetite

The GCF has the mandate to use a wide-range of risk mitigation instruments to unlock investments in emerging economies and low-income countries. This includes guarantees and other credit-enhancement mechanisms, as well as equity financing and subordinated debt. However, more can be done to mitigate risks faced by project developers and private investors in making low-carbon investments.

Risk capital (e.g. including equity), subordinated debt and long-term loans can play an important role in

²⁸ For more information the GCF offers a guide on how to access the GCF resources. Link: https://www.greenclimate.fund/gcf101
lowering risks while incentivizing high performance by project proponents. In some cases, these instruments may be sufficient to catalyze private investments that generate commercial returns, lessening the need for below market rate loans to the private sector that can lead to market distortions.

Addressing currency risk also has a high potential to accelerate climate action and strengthen local markets. Expanding the use of guarantees instruments that bear currency risks is one option.

4. Replicate and standardize proven climate approaches

A number of climate solutions have proven successful in many contexts, but still face barriers to wide-scale deployment. For example, although large-scale renewables are already commercially available in many markets, they face barriers when faced with traditional utilities. Small-scale renewables and energy efficiency approaches face higher transaction costs and are less familiar to investors, despite being cost-effective.

To help meet the objectives of the Fund, the GCF Strategic Plan identifies the development of “replicable approaches and potentially standardized products” to accelerate deployment of proven approaches. More recently, the PSF highlighted the nascent stage of programmatic approaches in the GCF as a key barrier to scaling up private sector investments. The PSF can work with accredited entities to develop programmatic, replicable offerings that provide regulatory support to governments and a suite of technical solutions, business models and financing tools to private sector developers, vendors and investors.
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