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A Snapshot of Global Adaptation Investment and Tracking Methods

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About CPI

With deep expertise in finance and policy, CPI is an analysis and advisory organization that works to improve the most important energy and land use practices around the world. Our mission is to help governments, businesses, and financial institutions drive economic growth while addressing climate change. CPI has six offices around the world in Brazil, Kenya, India, Indonesia, the United Kingdom, and the United States.

About this paper

This paper was originally submitted to the Global Commission on Adaptation to inform the Commission's September 2019 flagship report: "Act Now: A Global Call for Leadership on Resilience." It now contains a new level of detail on adaptation finance tracked in the Global Landscape of Climate Finance, including breakdowns of adaptation flows by sector and type of finance, a mapping of flows by region in key sectors, and country-level case studies to assess how vulnerability correlates with adaptation finance flows.

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1. Introduction

The intensity and frequency of extreme weather events and chronic climate-related changes are increasing, globally. With these changes, there is a pressing and clear need for communities worldwide to invest in adapting to climate change. According to the UN Environment Programme, in developing countries alone, adapting to climate change will require USD 280 billion to USD 500 billion per year by 2050 (UNEP 2016)¹. The 46 countries that included adaptation cost estimates in their Nationally Determined Contribution (NDC) estimated a total, collective cost for these measures of USD 783 billion by 2030 (World Bank)².

Since 2012, Climate Policy Initiative (CPI) has sought to comprehensively track domestic and international investment in activities that address and respond to climate change through the Global Landscape of Climate Finance (the Landscape). **In our most recent version of the Landscape, we tracked approximately USD 22 billion annually in 2015 and 2016 of public**

adaptation and resilience finance from government and bilateral aid agencies, climate funds, and bilateral, multilateral, and national finance institutions.

High quality adaptation finance tracking can identify gaps and barriers in financing adaptation and resilience solutions globally, drive leaders and stakeholders to invest in or help increase finance flows, hold public and private actors accountable, and support government agencies in developing policy guidance (Figure 1).

This brief outlines the current state of global finance for climate adaptation by sources and intermediaries, sectors, financial instruments deployed, and region of destination. It also presents the significant data and theoretical gaps that exist in adaptation finance reporting and includes a brief overview of potential new data sources and recommendations to improve adaptation finance tracking going forward.

Figure 1. The use cases for adaptation finance tracking

Public Policy

Inform governments and foundations who look at adaptation as a public good.

Big Picture Flows

Help private and public sector actors understand whether investment is sufficient.

Investment Opportunities

Broaden understanding of opportunities in the market and on the pricing of adaptation technologies.

1 UNEP (2017). [The Adaptation Gap Report 2016](#).

2 World Bank Group. 2019. [“Intended Nationally Determined Contributions \(INDCs\)”](#).

2. Context

From an international policy perspective, the need for tracking adaptation finance flows originates from a commitment made by developed countries in 2009 to jointly mobilize USD 100 billion per year in climate finance by 2020 for action in developing countries (UNFCCC, 2009). However, there are several key challenges associated with determining what counts as adaptation finance for tracking purposes:

1. Adaptation finance data cannot be compared to mitigation finance.

In order to accurately assess against international climate finance goals, many adaptation finance tracking methodologies focus on the costs or the expenditure to projects of specific adaptation-related activities. Because of this focus, adaptation finance is significantly lower than mitigation flows, where typically the whole investment cost is tagged.

2. There are significant data gaps among financial actors.

Because adaptation data provision is usually limited to bilateral climate-related development finance from governments and public finance institutions with the capacity to report it, private sector and within-country public sector investment is often missing.

3. There are definitional challenges associated with both how the private sector defines adaptation finance and with the boundaries set between adaptation and broader development finance.

Private sector actors often do not define activities as adaptation finance even when the projects would be designated as such by public actors, leading to an undercounting of private adaptation activity. Public and private sector actors also face challenges in defining projects with purely adaptation activities as compared to projects with broader development outcomes.

4. Ideally, financial flows to adaptation would align with impact metrics, but there are no universally accepted impact metrics.

Impact metrics are crucial for a full accounting of adaptation finance because the incremental cost of adaptation is not reflective of the benefit of that investment. For example, a USD 50 million drought-resilient wastewater investment could have vastly different resilience implications in a drought-vulnerable location than in a region with sufficient projected rainfall. Because impact metrics are not yet established for the global tracking of adaptation, the USD 22 billion annual average in 2015-16 towards adaptation that CPI tracked does not capture the resilience value.

3. Introduction to the Tracking Methodology

CPI has tracked adaptation finance in the Landscape since 2012³. We consider adaptation finance to be resources directed to activities aimed at reducing the vulnerability of human or natural systems to the impacts of climate change and climate-related risks by maintaining or increasing adaptive capacity and resilience.

For determining what constitutes adaptation finance in the Landscape, we rely on current tracking practices from: i) the members of the OECD's Development Assistance Committee and publicly available through the Creditor Reporting System database; ii) dedicated reporting of the group of Multilateral Development Banks jointly reporting on climate finance and the members of the International Development Finance Club⁴; and iii) Climate Funds. A sectoral breakdown of adaptation activities represented in the Landscape data, including a list of examples, is provided in Annex II.

Tracking, aggregating, and reporting adaptation finance continues to pose challenges as different institutions apply different methodologies:

- The Multilateral Development Banks and the International Development Finance Club, a network of 24 national, regional and international development banks, developed 'The Common Principles for Climate Change Adaptation Finance Tracking'. The Common Principles represent a process-based approach to adaptation finance tracking, which is context- and location-specific, conservative, and granular. It follows a three-step process to (a) set out the project's context of vulnerability to climate change, (b) make an explicit statement of intent to address this vulnerability as part of the project, and (c) demonstrate a clear and direct link between the vulnerability and the specific project activities.

- Governments report bilateral climate-related development finance that qualifies as Official Development Assistance and Other Official Flows in the OECD's Creditor Reporting System (OECD DAC, 2018). In this approach, finance reported to the OECD is Rio marked⁵ as having either 'climate change adaptation' as its 'principal' objective, or as having a 'significant' climate change objective.

The Common Principles developed by the MDBs-IDFC have improved understanding of the definition and principles of adaptation finance and have contributed to transparent tracking of data. Similar efforts are underway within other institutions to further harmonize reporting approaches by improving comparability and reducing double counting. For instance, the OECD recently updated its guidance for applying the Rio marker on adaptation by recommending that Development Assistance Committee members use the three-step approach created by the MDB-IDFC to justify their principal score (UNFCCC, 2018).

The adaptation tracking captured in the Landscape, presented in detail in the next section, is an important step in understanding the scope of global adaptation finance and identifying patterns in finance flows. The Landscape also highlights issues related to adaptation finance definitions and tracking methodologies and aims to trigger additional work and discussions to address these issues going forward.

3 World Bank Group. 2019. "[Intended Nationally Determined Contributions \(INDCs\)](#)".

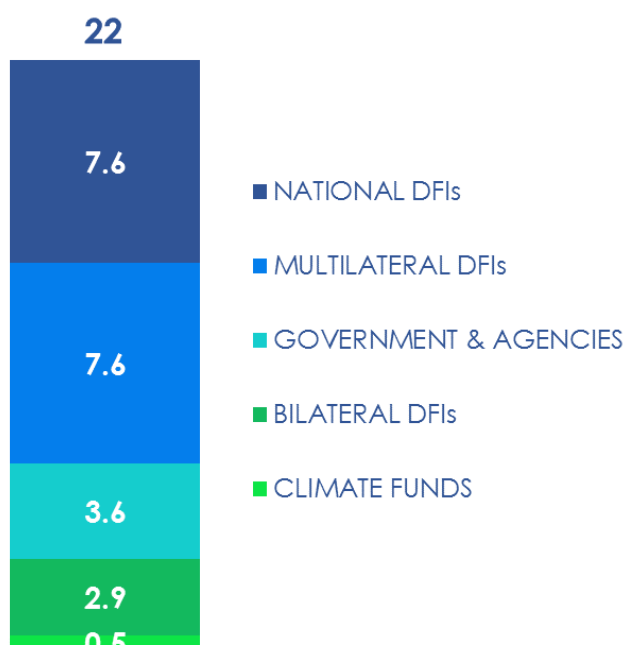
4 See: OECD (2011, 2016); MDB (2015a, 2015b and 2017), WBG (2015a), IDFC (2014, 2017 (forthcoming)).

5 Since 1998, the OECD Development Assistance Committee has monitored development finance flows to address global environmental challenges and ensure sustainable development through Rio markers. The Rio markers inform a scoring system to identify where the official development finance activities should be identified as principally, significantly or not targeted to the objective (i.e., climate change adaptation). See: OECD DAC (2016).

4. An Overview of Adaptation Finance

4.1 Sources and Intermediaries of Adaptation Finance

Figure 2. Adaptation finance by intermediary (2015-16 average, in USD billion)



In 2015-16, national and multilateral development finance institutions were the main source of adaptation financing, accounting for USD 15 billion on average annually, or 69% of the total adaptation finance tracked (Figure 2). Bilateral donor governments and their agencies contributed an additional USD 3.6 billion, on average, annually in 2015-16, while bilateral development

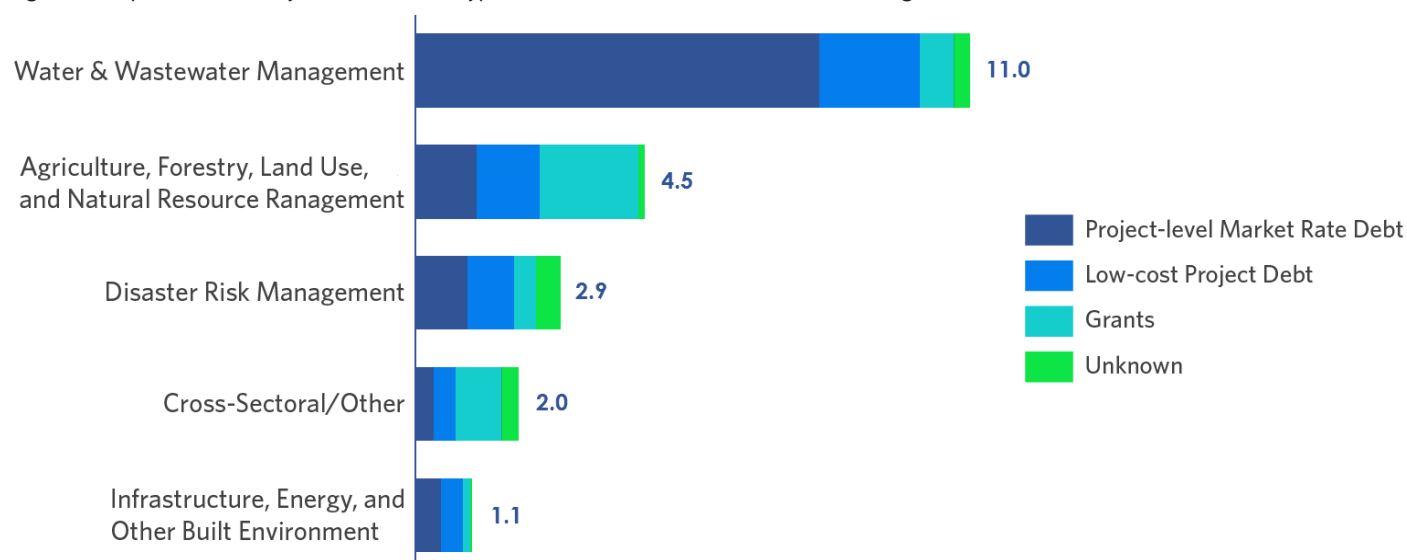
finance institutions contributed USD 2.9 billion and bilateral and multilateral climate funds contributed another USD 0.5 billion. This data reflects the current information availability in the Landscape and illustrates the need for additional adaptation finance data in the private sector and of domestic adaptation flows to track a greater array of financial sources.

4.2 Instruments and Sectors of Adaptation Finance

Water and wastewater management projects attracted 50% of the total volume of adaptation finance tracked in 2015 and 2016, on average. This includes demand-side activities aimed at reducing water consumption or increasing water use efficiency, and supply side management activities, for example, increasing water supply, reducing water losses, or improving cooperation on shared water resources (CPI, 2017). Agriculture, forestry, and land use adaptation activities followed with an average of USD 4.5 billion, 21% of the total. This sectoral distribution represents an increase in diversity of sectoral flows from 2013-14, when 56% of finance flowed to water and wastewater management while agriculture, forestry, and land use received the second-most finance at 11% of the total.

In 2015 and 2016, project-level market rate debt was the main mechanism employed to finance adaptation activities, for an average of USD 11 billion per year. Grants and low-cost project debt comprised USD 5 billion each, while equity finance represented only a negligible amount of total flows. The type of instrument deployed varied significantly between sectors, as

Figure 3. Adaptation finance by sector & finance type (sectors above USD 1 billion, 2015-16 average, in USD billion)



illustrated in Figure 3. The water and wastewater management sector received predominantly project level market rate debt in 2015-16, while the agriculture, forestry, land use, and natural resource management sector received predominantly low-cost project debt and grants.

Water and wastewater management projects are often large infrastructure projects, a status which likely contributes to the ability of such projects to attract market-rate capital. Agriculture, forestry, land use and natural resource management projects, by contrast, are more likely to include substantial non-monetary benefits which are challenging to quantify, but which attract grants and low-cost capital.

4.3 Geographies and Instruments of Adaptation Finance

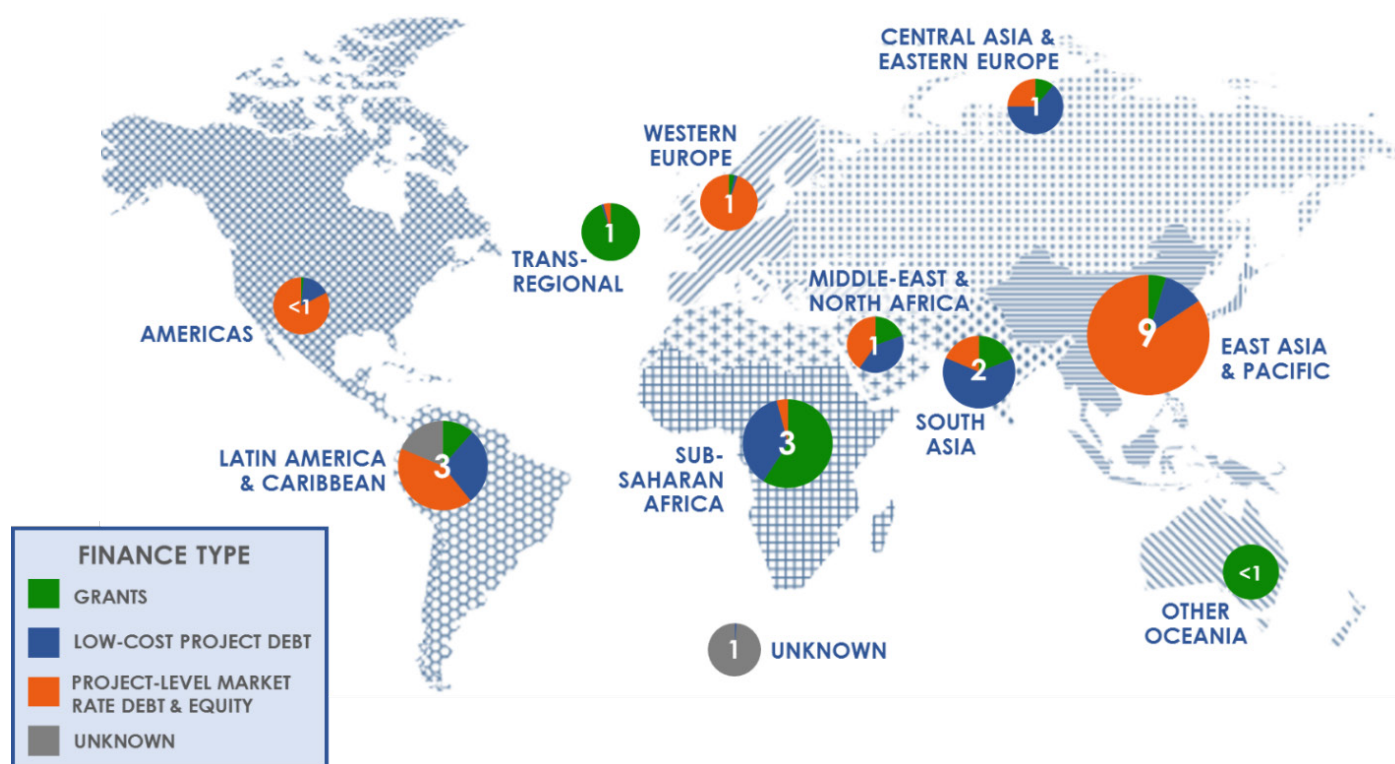
The largest portion of adaptation finance in 2015 and 2016 tracked in the Landscape flowed to the East Asia and Pacific region (USD 9 billion annually), followed by Sub-Saharan Africa and Latin America and the Caribbean (USD 3 billion each), as shown in Figure

4. Most of the finance tracked flowed to non-OECD countries, likely reflecting both the identification of significant need in those countries as well as the state of data on adaptation finance, which is largely available from international and domestic development finance institutions.

While the majority of finance that flowed to the East Asia and Pacific region in 2015 and 2016 was project-level market rate debt or equity, the vast majority of the finance that flowed to Sub-Saharan Africa in that same period was through grants and low-cost project debt. Additional details on the categorization of financial instruments is available in Annex IV⁶.

Two of the three top regional recipients of finance tracked in the Landscape align with the most vulnerable regions, as measured by Notre Dame's Global Adaptation Initiative Country Index (ND-GAIN, index averaged across countries in the region). Both Sub-Saharan Africa and East Asia and the Pacific rank in the top three by regional country average vulnerability index (per ND-GAIN as measured by exposure, sensitivity, and adaptive capacity)⁷.

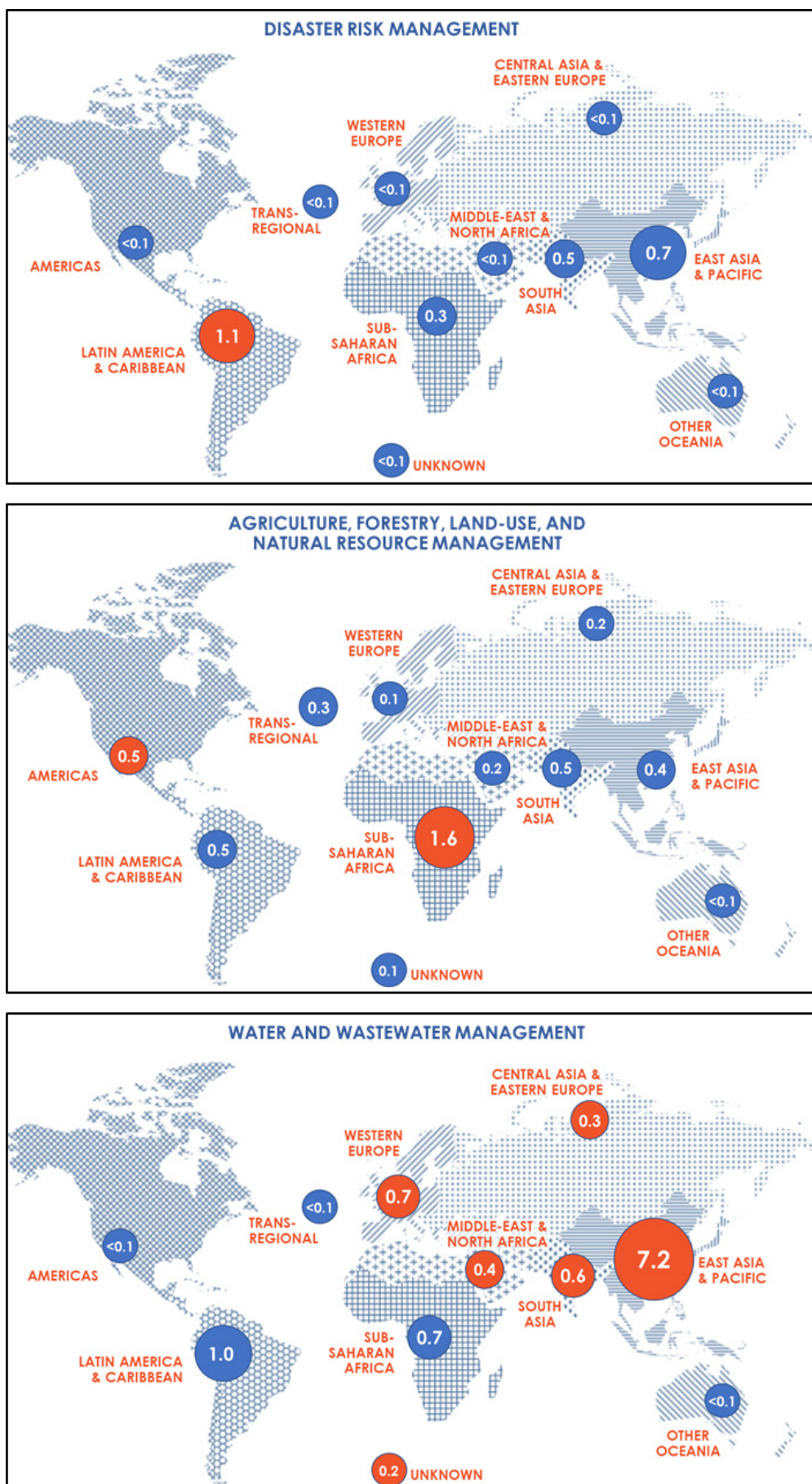
Figure 4. Adaptation finance by region (2015-16 average, in USD billion)



⁶ We capture grants, low-cost (including concessional) and market term loans, project-level equity, and balance sheet financing (i.e. a direct debt or equity investment by a company or finance institution). The share of climate finance allocated to different categories of financial instruments may not fully reflect reality, as our categorization is based on the quality of the data sources we can access.

⁷ Notre Dame Global Adaptation Initiative. 2019. "[Country Index](#)".

Figure 5. Adaptation finance in top 3 sectors by region (2015-16 average, in USD billion)



The maps in Figure 5 illustrate the finance flows to the top three sectors as tracked in the Landscape. The most common sectors to which finance flows differs between regions. Disaster risk management is the most common sector for Latin America and the Caribbean, agriculture, forestry, land use, and natural resource management is the most common sector for Sub-Saharan Africa flows, and water and wastewater management is the most common for East Asia and the Pacific flows.

In Latin America and the Caribbean, investment in disaster risk management aligns with increased tropical storms, hurricanes, and flooding including at least USD 90 million in damages associated with Hurricane Maria in 2017⁸. In Sub-Saharan Africa, the plurality of finance flowing to agriculture and land use projects aligns with vulnerabilities identified in ND-GAIN, where seven of the top 10 most food vulnerable countries (as measured by projected change of cereal yields, food import dependency, agriculture capacity, among other criteria), are in Sub-Saharan Africa.

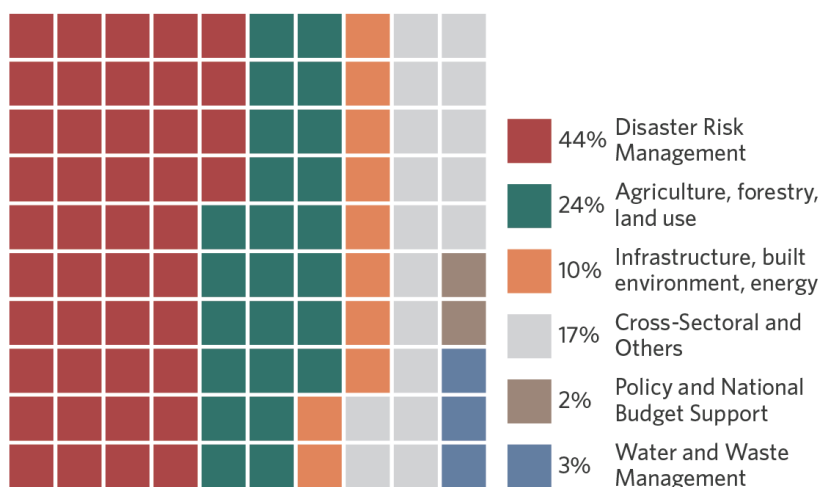
The significant portion of water and wastewater management finance flowing to East Asia and the Pacific is perhaps the most difficult of the three to assess from a vulnerability alignment perspective. Because water and wastewater projects are often sizable infrastructure projects, the high percentage of flows to water and wastewater may be more reflective of project type than a specific vulnerability assessed as compared to other vulnerabilities in East Asia and the Pacific.

4.4 Country-Level Findings

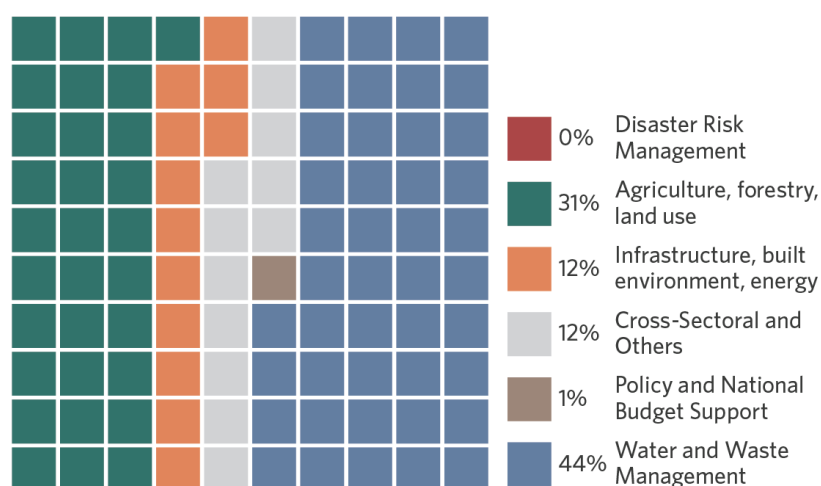
Applying adaptation finance tracking at the country-level can help determine whether flows are directed towards the most vulnerable sectors and whether total adaptation finance meets the investment need. This section illustrates this approach by assessing the adaptation finance that flowed to three particularly vulnerable countries as

Figure 6. Country-level Adaptation Finance by Sector (Percent of total annual average 2015-16)

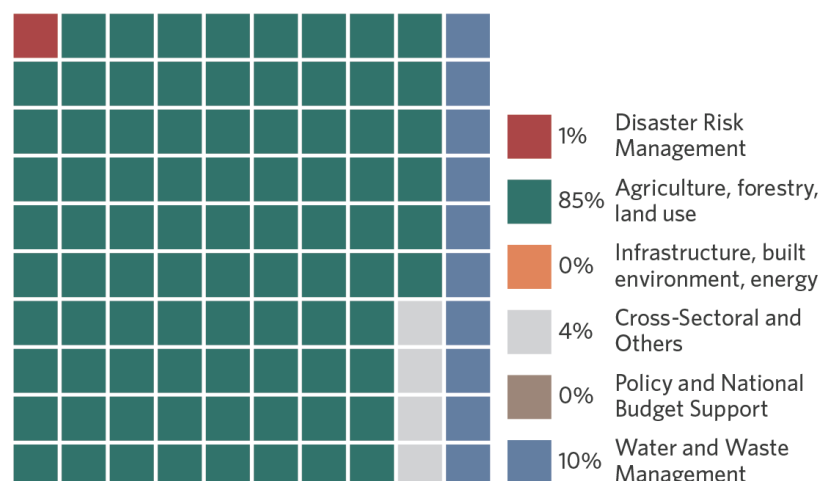
Pakistan



Zambia



Niger



8 NOAA National Centers for Environmental Information. 2019. ["Billion-Dollar Weather and Climate Disasters: Table of Events"](#).

assessed by ND-GAIN: Pakistan, Zambia, and Niger⁹. According to ND-GAIN's country vulnerability index by sector, Pakistan is the fifth most vulnerable country in the infrastructure sector, Zambia is the third most vulnerable in the water sector, and Niger is the most vulnerable in the food sector.

The ND-GAIN criteria used to assess sectoral vulnerability are included in Annex V. Pakistan, Zambia, and Niger were selected for this analysis for their combination of high vulnerability and sufficient adaptation finance data in the Landscape (greater than USD 40 million annually) to yield meaningful conclusions.

As indicated in Figure 6, for both Zambia and Niger, the sector of highest vulnerability as assessed by ND-GAIN (water for Zambia and food for Niger) is indeed the sector to which the plurality of finance flowed as tracked by the Landscape in 2015-16. If disaster risk management is taken as a form of indirect infrastructure investment because it can have an impact on the resilience of infrastructure to climate-related disasters, then Pakistan also received a plurality of finance as tracked by the Landscape to its most vulnerable sector (disaster risk management and infrastructure, energy, and built environment as proxies for the ND-GAIN infrastructure sector). Though this information is not sufficient to judge how well the proportions of adaptation finance tracked in the Landscape align with each country's needs, it does indicate that broadly, adaptation finance in each of the three countries is directed to the most vulnerable sectors.

Both Zambia and Niger have NDCs for adaptation that include an expected total implementation cost. For Zambia, the total implementation cost for 2015-30 is USD 20 billion (USD 1.3 billion per year), and for Niger

it is USD 1.6 billion (USD 107 million per year) over the same time period. In 2015 and 2016, the Landscape tracked approximately USD 45 million in adaptation finance flows to Zambia, annually, and 200 million, annually, to Niger. Notably, the finance flowing to Zambia, as tracked in the Landscape, is significantly less than the estimated cost per year assessed in its NDC (USD 1.3 billion in the NDC as compared to USD 45 million tracked) while the finance flowing to Niger exceeds the estimated cost (USD 107 million in the NDC as compared to USD 200 million tracked). These findings should be assessed with some skepticism as the estimated costs for implementation of the NDCs are not calculated in a consistent way across countries. However, this analysis does serve as an indication of the need and the gap in finance present in some vulnerable countries.

Through analysis of the tracked adaptation finance flows and country vulnerability assessments of Pakistan, Zambia, and Niger, we find that, while each of the countries received adaptation finance flows in alignment with their most vulnerable sectors, the total annual tracked adaptation finance flowing, at least to Zambia, is insufficient to meet the stated need in its NDC.

A detailed understanding of sectoral vulnerabilities and needs can inform on the ground decisions regarding adaptation finance. More work is needed on this front to assess country-level adaptation finance need and to pair evaluations of country or downscaled climate vulnerability with adaptation finance flows.

9 ND-GAIN is one of several efforts to assess country-level vulnerability to climate impacts. Other assessments of note include the International Institute for Sustainable Development's assessment of adaptation action in 15 African and Asian countries, the U.S. Climate Resilience Toolkit, Germanwatch's Global Climate Risk Index which analyzes country-level impact of weather-related loss events, and HSBC's assessment of climate risks to 67 countries. ND-GAIN's coverage of 191 countries and analysis of sector-level vulnerability were deemed most useful for this analysis.

5. Recommendations

Data gaps in private and domestic public sector adaptation finance limit the ability of stakeholders to hold public and private actors accountable, hinder government agencies' capacity to develop policy guidance, and reduce the quality of information available to support targeted investment.

Significant efforts are underway to improve adaptation reporting and tracking. These efforts include the mainstreaming of the Task Force on Climate-related Disclosures recommendations into regulatory and policy decisions, implementation of Article 173 in France, and the establishment of the European Union's IORP II regulation¹⁰. Furthermore, the European Commission Sustainable Finance taxonomy is moving towards implementation, and the IDFC and Multilateral Development Bank community have established, and are exploring methods to further improve, common principles for adaptation which can contribute to consistency in private adaptation finance reporting. The Climate Bonds Initiative is also developing an adaptation and resilience bond taxonomy which will contribute to consistency and quality of reporting and tracking.

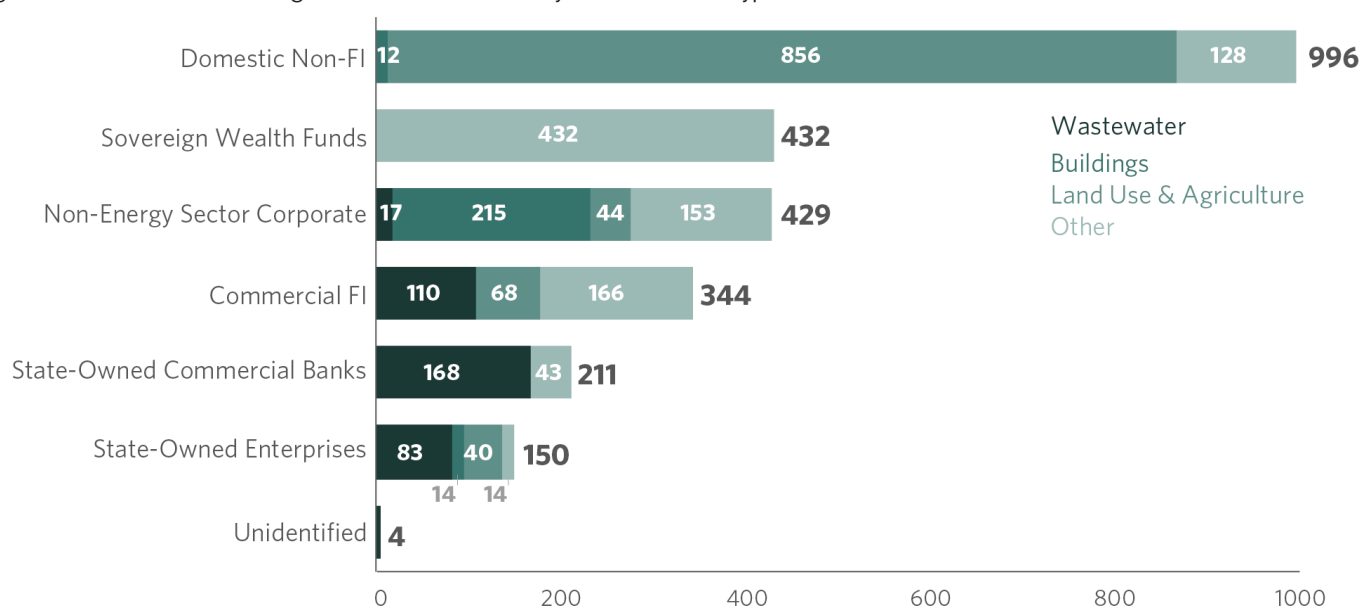
The following recommendations outline additional actionable steps data providers, governments, companies, and financial institutions can take to improve adaptation finance tracking.

5.1 Emerging Opportunities to Improve Adaptation Finance Tracking

To fill the data gaps in the Landscape, CPI has begun to assess additional datasets and methods that could provide more private sector and domestic public finance adaptation finance information (Hallmeyer & Richmond, forthcoming). This includes proposed methods to fill data gaps in adaptation tracking in the Landscape, including technical approaches to identify flows in imperfect datasets as a starting point for future iterations of adaptation finance tracking.

CPI assessed more than a dozen potential datasets for possible use in adaptation finance tracking and identified two sources with potential to inform the Landscape: Climate Bonds Initiative (CBI) labeled bonds data and CDP (formerly Carbon Disclosure Project) Climate Change questionnaire response data. CDP and CBI datasets are promising potential additions to the Landscape and other tracking efforts and would add much needed insight on public domestic sector and private finance, though further scoping work is necessary.

Figure 7. Climate Bonds Initiative: green bonds (new issuers) by sector and issuer type (in USD million)



¹⁰ Article 173 passed in August 2015 and requires publicly traded companies, banks and credit providers, asset managers, and institutional investors in France to report on climate-related physical and transition risk impacts to their activities and assets. The European Union adopted IORP II on December 8th, 2016. IORP II requires pension funds to complete a risks assessment that includes climate-related risks and applies to the more than 14,000 EU pensions funds. January 13, 2019 was the deadline for EU Member States to transpose IORP II into their national laws.

5.1.1 CLIMATE BONDS INITIATIVE

New Green Bond Issuers data from CBI indicates that since 2015, there have been USD 2.6 billion in bonds issued by new issuers with proceeds specifically allocated to adaptation and resilience (Figure 7). Of this, USD 1 billion was allocated to land use and agriculture, USD 380 million to wastewater, and USD 240 million to infrastructure, while the remainder was allocated to other or unspecified sectors.

The three most common issuer types of adaptation and resilience bonds in this period were domestic non-financial institutions, sovereign wealth funds, and non-energy sector corporate actors. Because this data is based on pre-issuance which only specifies the eligible categories of proceeds with intended expenditure and not actual spending, it is important to track the actual private adaptation finance through information on management of proceeds for a full picture of adaptation finance flows.

The Landscape does track adaptation and resilience finance from governments, their agencies, and development financial institutions at the project level, so some of the bond issuances tracked in the CBI data may already be counted in the Landscape through the underlying projects. Though double counting is possible, the public sector data from domestic governments and sovereign wealth funds presents the possibility of increased tracking of domestic public finance which would add significant value to adaptation tracking. The bonds reported in the private sector (non-energy sector corporate and commercial financial institutions) are not at risk of double counting with data already in the Landscape because it does not currently track any private adaptation finance.

5.1.2 CDP

139 companies received an “A” rating for their response to CDP’s Climate Change questionnaire in 2018. CPI’s analysis includes only A-list responders to CDP in 2018 because their “A” rating indicates a high-level of quality in their overall response and lends credibility to their assessment of the cost of managing climate-related risks. These 139 A-list companies identified USD 13.9 billion in costs associated with managing physical climate-related risks in 2018 (CDP question 2.3a)¹¹.

CDP respondents have significant latitude to report anticipated costs over a timeframe of their choosing so the USD 13.9 billion value does not reflect the A-list companies’ annual investment in climate change. Despite this limitation, it is a significant step in identifying the scale of expected investment by private sector leaders in climate change. As companies continue to report climate-related risks and risk mitigation strategies, their ability to quantify, track, and report adaptation finance will substantially improve.

Companies’ responses to the CDP questionnaire also present an opportunity to collect sales data on adaptation technologies and services, including costs and demand that could inform adaptation tracking. As companies improve their disclosure of climate-related risks and management costs, including pricing of specific adaptation measures, new private sector data on investment in adaptation projects may become available for climate adaptation finance tracking.

5.2 Public Sector Tracking Recommendations

Domestic public finance likely represents a large share of overall adaptation investment, however, information on domestic climate-related finance is currently available only through limited sources, including Biennial Update Reports (BURs) from the UNFCCC, Climate Public Expenditure and Institutional Reviews (CPEIRs), and other independent studies. Despite these studies, there is no detailed or standard format for developed and developing countries to report on domestic climate adaptation finance.

Public sector entities, including municipalities and sub-national governments, are facing increased incentives to assess their climate-related risks and report climate adaptation investments. By the end of 2019, 82% of cities surveyed by Moody’s indicate that they will have a climate risk action plan in place, and 83% reported climate mitigation or adaptation projects, with flood mitigation effort accounting for 60% of climate change resilience projects (Moody’s 2019). Increased awareness of the credit and other financial risks associated with climate change may increase domestic public sector reporting on climate adaptation investment.

To improve domestic public finance tracking, national and sub-national governments should:

11 Nearly 7,000 companies responded to the CDP Climate Change questionnaire in 2018. Question 2.3a in the 2018 Climate Change questionnaire is: “Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.” Part 13 of Question 2.3a is “Cost of management”. CPI counts all reported costs of management for risks reported as “Physical” to 2.3a.

Integrate adaptation efforts into existing national planning and evaluation systems to improve domestic public-sector tracking. As countries have multiple layers of reporting requirements, integrating adaptation within existing national planning and evaluation systems would help streamline workflow, standardize reporting formats, and generate ‘buy-in’ from the people responsible, see for example (IIED, 2018).

Apply in-depth approaches for tracking domestic public climate finance, including budget analyses, public expenditure reviews, and budget tagging systems (Resch et al. 2017; see Table 2). All three approaches analyze the allocated expenditure of government budgets from domestic sources for their climate relevance. They then identify climate change relevant budget lines / codes for selected sectors by reviewing detailed budget reports from those sectors and/or analyzing the accounts and interviewing key government officials and donor organizations.

Systematically incorporate national development banks and other national actors at the margins of climate action into tracking initiatives to build a more complete picture on their climate efforts. Many national development banks are likely to have provided climate relevant finance (Abramskiehn et al, 2017). However, it is not tracked systematically due to their lack of measurement and reporting, leaving data gaps in the capture of public expenditures from domestic “South-South” cooperation towards adaptation (Mazza et al. 2016).

5.3 Private Sector Tracking Recommendations

As established throughout this brief, adaptation finance tracking is universally challenging, particularly in the private sector due to a variety of factors including:

- Difficulty in distinguishing adaptation investments from general flows or broader risk management;
- Data required to assess context-dependency is often confidential;
- Adaptation investments, particularly in the private sector, are difficult to distinguish from general investment flows. This is a dynamic problem, with climate impact scenarios changing constantly, and with no agreed baseline to adapt from, or future scenarios to adapt to;

- Any mispricing of climate-related physical risks will feed into mispricing of assets, misallocation of capital and may cause valuation risk to businesses.

To address these gaps and improve private adaptation tracking, stakeholders should:

Define and track a list of key services and technologies by adaptation sector. In order to address these challenges, stakeholders (including executives and regulators) must work together to define a list of technologies and services for which pricing and sales data could be collected to either estimate adaptation and resilience cost within a project or track increased sales over time as a proxy for adaptation and resilience uptake. This approach would be helpful in identifying which technologies are used for adaptation and resilience across regions and would also allow tracking of pricing trends. Further, this could enable identification of opportunities and creation of appropriate financial products for increasing private investment in adaptation and resilience technologies and services. Some of these technologies and services include geospatial imagery, cold chain equipment (in emerging markets), seed treatments, soil treatments, precision agriculture tools, water harvesting systems, and smart water management software and hardware.

Work with key data providers to improve data availability. CBI, CDP, and other organizations that track financing flows could be initial partners to address data gaps in the private sector. For example, if in future CDP Climate Change questionnaires, respondents were asked to report on investment in specific adaptation and resilience projects and indicate a dollar amount, that data would be very valuable for use in the Landscape and in other tracking efforts.

Build on the momentum of the Task Force on Climate-Related disclosures recommendations to drive mainstreaming of climate-related risk and opportunity analysis. Regulatory and policy decisions including implementation of Article 173 and the establishment of the European Union’s IORP II regulation can help drive a market shift of the private sector towards increased awareness and quality of data on climate-related risks and risk mitigation activities. As reporting of climate-related risks and private sector activities to address climate change become more mainstream, collecting adaptation finance data in the private sector will become increasingly feasible.

6. Conclusion

Despite its critical importance, adaptation finance is a nascent field and suffers from gaps in knowledge and investment. This brief provides a snapshot of the data on adaptation finance currently tracked in CPI's Global Landscape of Climate Finance and provides practical recommendations to improve adaptation finance measurement approaches in order to fill knowledge gaps and drive investment towards adaptation and resilience.

Further scoping is needed in the public and private sectors to identify additional promising approaches to understand adaptation finance. Ultimately, improving information availability and quality on investment in adaptation will provide the necessary analytical foundations for increasing investment in climate adaptation from both the public and private sectors, helping to reduce the impacts of climate change on human and ecosystem health and well-being.

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Annex

I. Climate Finance Definition

In the absence of an internationally-agreed definition of what qualifies as climate finance, we limit this mapping exercise to **capital flows directed towards climate resilient development interventions with direct or indirect adaptation benefits**. These flows include support for capacity building measures as well as for the development and implementation of policies.

In particular, for determining what constitutes adaptation finance we relied on the tracking methodologies and reporting followed by: i) the members of the OECD's Development Assistance Committee (DAC) and publicly available through the Creditor Reporting System (CRS) database; ii) the group of Multilateral Development Banks (MDB) jointly reporting on climate finance; iii) the members of the International Development Finance Club (IDFC)¹²; and iv) Climate Funds. As a result, for adaptation finance, we consider: Adaptation Finance as resources directed to activities aimed at reducing the vulnerability of human or natural systems to the impacts of climate change and climate-related risks, by maintaining or increasing adaptive capacity and resilience.¹³

II. Sectoral Breakdown of Adaptation Finance

WATER AND WASTEWATER MANAGEMENT

Demand-side management activities reducing water consumption or increasing water use efficiency and supply side management activities enabling (e.g., the expansion of supplies, reducing water losses, or improving cooperation on shared water resources). Project-specific examples include:

- Improvement in catchment management planning and regulation of abstraction to address negative climate change impacts on water supply;
- Installation of domestic rainwater harvesting equipment and water storage where water supply is negatively affected by climate change, including the provision of microfinance for their purchase;
- Rehabilitation of water distribution networks and building pipelines to improve water resources management, to address changes in water flows/quality caused by climate change, etc.;
- Changes in design of sanitation and storm-water management systems in response to extreme weather events arising from climate change.

AGRICULTURE, FORESTRY, LAND USE, AND NATURAL RESOURCE MANAGEMENT

¹² See: OECD (2011, 2016); MDB (2015a, 2015b and 2017), WBG (2015a), IDFC (2014, 2017 (forthcoming)).

¹³ It is worth noting that data collected from the group of MDBs jointly reporting on climate finance reflect their process-based approach to adaptation finance tracking, which is context- and location-specific, conservative and granular. In July 2015, these MDBs and the members of the IDFC established "Common Principles for Tracking Adaptation Finance".

- Provision of information on crop diversification options to farmers
- Increased production of fodder crops to supplement rangeland diet affected by climate change;
- Improved management of slopes and basins to avoid/reduce the impacts caused by increased soil erosion;
- Identification of protected areas and establishment of migration corridors to maintain or increase climate resilience of ecosystems;
- Adoption of sustainable aquaculture techniques to address changes in fish stocks resulting from climate change impacts and supplement local fish supplies, etc.

INFRASTRUCTURE, ENERGY AND OTHER BUILT ENVIRONMENT

Adaptation components in projects to improve the climate resilience of existing infrastructure e.g., transport infrastructure, energy infrastructure, riverine infrastructure (including built flood protection) and human settlements (e.g., housing – if not part of a wider disaster risk management strategy).

Building resilience into infrastructure such as protection systems for dams to reduce vulnerability to extremes caused by climatic changes.

(OTHER) DISASTER RISK MANAGEMENT

- Early warning / emergency response systems to adapt to increased occurrence of extreme events by improving disaster prevention, preparedness and management and reducing potentially related loss and damage;
- Construction or improvement of drainage systems to adapt to an increase in the frequency or severity of floods;
- Monitoring of disease outbreaks and development of a national response plan (to adapt to changing patterns of diseases that are caused by changing climatic conditions).

COASTAL PROTECTION

- Building of improved or new dykes to protect infrastructure and to enhance the climate resilience to increased storms and coastal flooding, and sea level rise;
- Mangrove planting to build natural barriers to adapt to increased coastal erosion and to limit salt water intrusion into soils caused by sea level rise;
- Additional or improvements in coastal and riverine infrastructures (including built flood protection infrastructure) in response to increased flood risks.

INDUSTRY, EXTRACTIVE INDUSTRIES, MANUFACTURING & TRADE

- Manufacturing (e.g., design of climate-resilient equipment);
- Increased cooling requirement in food processing distribution & retail resulting from more extreme heat events (e.g., increased water-efficiency in processing);
- Climate resilience investments or programmes in extractive industries (oil, gas, mining, etc.).

POLICY AND NATIONAL BUDGET SUPPORT & CAPACITY BUILDING

Dedicated budget support to national or local authorities for implementation of climate change adaptation policies; and other technical assistance activities, including awareness raising and capacity building (if not included elsewhere).

OTHERS / CROSS-SECTORAL

This category can include, for instance:

- Other eligible activities that cannot be classified in the above categories for example, cross-sector activities such as financial services like incorporation of climate risk assessment in ministerial investment appraisal processes (if not included in the categories above);
- Health systems' adaptation to changes in disease vectors or other climate change health impacts (e.g., development of a national response plan for diseases outbreaks).

III. Countries Classification by Region

REGION	COUNTRY
Middle East and North Africa	<u>Non-Annex I Parties under the UNFCCC</u> : Algeria, Bahrain, Egypt, Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine*, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, United Arab Emirates, Yemen <u>Not listed as party to the UNFCCC</u> : West Bank & Gaza
Sub-Saharan Africa	<u>Non-Annex I Parties</u> : Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Republic of Congo, Dem. Rep. of Congo, Côte d'Ivoire, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, São Tomé & Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, South Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia <u>Overseas regions/ territories belonging to Annex I Parties</u> : Mayotte, Saint Helena, Réunion
South Asia	<u>Non-Annex I Parties</u> : Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka
East Asia and Pacific	<u>Non-Annex I Parties</u> : Brunei, Cambodia, China, Cook Islands, Fiji, Indonesia, Kiribati, Korea PDR, Lao PDR, Malaysia, Marshall Islands, Fed. States Micronesia, Mongolia, Myanmar, Nauru, Niue, Palau, Papua

	<p>New Guinea, Philippines, Samoa, Singapore, Solomon Islands, Thailand, Timor-Leste, Tonga, Tuvalu, Vanuatu, Vietnam</p> <p><u>Overseas regions/ territories belonging to Annex I Parties:</u> American Samoa, Guam</p> <p><u>Not listed as party to the UNFCCC:</u> Taiwan</p>
Central Asia and Eastern Europe	<p><u>Annex I Parties:</u> Belarus, Bulgaria, Latvia, Lithuania, Romania, Russian Federation, Ukraine</p> <p><u>Non-Annex I Parties:</u> Albania, Armenia, Azerbaijan, Bosnia & Herzegovina, Georgia, Kazakhstan, Kyrgyz Republic, FYR Macedonia, Moldova, Montenegro, Serbia, Tajikistan, Turkmenistan, Uzbekistan</p> <p><u>Not listed as party to the UNFCCC:</u> Kosovo</p>
Latin America & Caribbean	<p><u>Non-Annex I Parties:</u> Antigua & Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, St. Lucia, St. Kitts-Nevis, St. Vincent & Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela</p> <p><u>Overseas regions/ territories/ constituent countries related to Annex I Parties:</u> Anguilla, Aruba, Cayman Islands, Curaçao, Falkland Islands, French Guiana, Guadeloupe, Martinique, Montserrat, Puerto Rico, St. Barthélemy, Saint Martin, Turks and Caicos Islands, Virgin Islands, West Indies</p>
Western Europe	<p><u>Annex I Parties:</u> Austria, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom</p> <p><u>Non-Annex I Parties:</u> San Marino</p>
Americas	<p><u>Annex I Parties:</u> Canada, United States of America</p> <p><u>Non-Annex I Parties:</u> Chile, Mexico</p>
Japan, Korea, Israel	<p><u>Annex I Parties:</u> Japan</p> <p><u>Non-Annex I Parties:</u> Korea, Israel</p>
Other Oceania	<p><u>Annex I Parties:</u> Australia, New Zealand</p> <p><u>Overseas regions/ territories/ constituent countries related to Annex I Parties:</u> Tokelau</p>

Note: Listing of Annex I/ Non-Annex I Parties to the Convention based on UNFCCC (2017).

IV. Definition of Financial Instruments

Grants	Transfers made in cash, goods or services for which no repayment is required.
Loans	A debt evidenced by a note which specifies, in particular, the principal amount, interest rate, and date of repayment.
- of which low-cost	<ul style="list-style-type: none"> Loans extended at terms preferable to those prevailing on the market. This category can also include concessional and ODA loans i.e. loans extended on terms substantially more generous than market loans. The concessional can be achieved either through interest rates below those prevailing on the market or longer maturity or grace periods, or a combination of those. Concessional loans typically have long grace periods. According to the OECD, the 'grant element' of ODA loans is of at least 25%.
- of which market rate	Loans extended at regular market conditions.
Equity	A stock or any other security representing an ownership interest.
Guarantees, Insurance or other	A financial instrument designed to cover full or partial financial losses arising out of a non-repayment event.

V. ND-GAIN Sectoral Vulnerability Criteria

Sector	Exposure	Sensitivity	Capacity
Food	Projected change of cereal yields	Food import dependency	Agricultural capacity (Fertilizer, Irrigation, Pesticide, Tractor Use)
	Projected Population Change	Rural Population	Child malnutrition
Water	Projected change in annual groundwater runoff	Fresh water withdrawal rate	Access to reliable drinking water
	Projected change of annual groundwater recharge	Water dependency ratio	Dam capacity
Infrastructure	Projected change of hydropower generation capacity	Dependency on imported energy	Electricity Access
	Projection of sea level rise impacts	Population living under 5m above sea level	Disaster preparedness