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# Estimating mobilized private finance for adaptation: exploring data and methods

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## About CPI

**Climate Policy Initiative** is a team of analysts and advisors that works to improve the most important energy and land use policies around the world, with a particular focus on finance. An independent organization supported in part by a grant from the Open Society Foundations, CPI works in places that provide the most potential for policy impact including Brazil, China, Europe, India, Indonesia, and the United States.

Our work helps nations grow while addressing increasingly scarce resources and climate risk. This is a complex challenge in which policy plays a crucial role.

## About OECD

The **OECD** has a long experience in measuring climate-related development finance in the broader context of financing for development. The DAC statistical framework provides an international standard for tracking development finance, recently capturing integrated statistics on bilateral and multilateral climate-related development finance flows and working on improving its quality and coverage.

The OECD also hosts the Research Collaborative for Tracking Private Climate Finance, which co-ordinates emerging findings on methodologies to estimate mobilised private climate finance. The Research Collaborative has close technical collaboration with the DAC, MDBs, other development finance institutions, countries and expert organisations.

## Executive Summary

How to unlock finance in support of developing countries' low-carbon and climate-resilient growth is a central issue of concern for policymakers around the globe. As evidence grows regarding the negative impacts of climate change on human health, economic activity, natural resources and physical infrastructure, finance in support of climate change adaptation has been attracting more attention, especially for countries that are the most immediately vulnerable to these adverse impacts.

In an effort to address this issue, during the 2009 United Nations Framework Convention on Climate Change (UNFCCC) negotiations in Copenhagen, developed countries committed to a goal of mobilizing jointly USD 100 billion a year by 2020 to address the climate mitigation and adaptation needs of developing countries. This funding is to come from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources.

The OECD, in collaboration with CPI, recently released the report "Climate Finance in 2013-14 and the USD 100 billion goal" which, estimated progress towards this goal. The report includes public bilateral and multilateral finance commitments as well as the private co-financing associated with both (as best-available evidence of mobilized private finance). It estimates 2013-14 average annual bilateral and multilateral public finance from developed to developing countries for adaptation at USD 7.9 billion – just below 20% of total public climate finance – with another USD 3.9 billion (just below 10%) addressing both mitigation and adaptation. The imbalance between mitigation and adaptation finance is therefore estimated to be even greater for private than public finance. There are few known examples where public finance has mobilized private adaptation finance. This is to some extent due to the difficulties in tracking adaptation-related finance. More work is needed to better-understand how to identify, measure, and track public interventions that mobilize private finance for adaptation, and how similar interventions can be most effective in the future.

The OECD-hosted Research Collaborative on Tracking Private Climate Finance, under which this research is conducted, aims to develop more comprehensive methodologies for estimating private finance flows mobilized by developed countries' public interventions for climate action in developing countries. Analysis has, however, so far primarily focused on mitigation, only partly dealing with adaptation due to significant data

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*Of the private finance estimated as mobilized by developed countries' public finance, private adaptation finance is less than 10% of the total, with over 90% of private finance mobilized for mitigation.*

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constraints and methodological challenges. The present study advances our understanding of private finance for climate change adaptation mobilized by public finance interventions by:

- **Taking stock of data availability and on-going efforts** to measure private finance mobilized for climate action in developing countries, including for adaptation activities;
- **Developing and evaluating a range of methodological options** to estimate private finance mobilized by public adaptation finance; and
- **Conducting case study-based pilot measurements** of mobilized private adaptation finance by testing these methodological options on two bilateral public finance adaptation projects.

### Publicly-mobilized private adaptation finance: concepts and scope

We define publicly-mobilized private finance for adaptation as the private finance invested as a result of adaptation-related public interventions, which can typically take the form of finance or policies. For the purposes of this study, the focus is on developed countries' public finance interventions to mobilize private finance for climate adaptation in developing countries. Estimating private finance mobilization requires demonstrating or making plausible assumptions about the causal link between public interventions and the amount of private finance claimed to have been mobilized as a result of such interventions. This paper explores important differences between private finance that is mobilized *directly* (mobilized private co-finance), *intermediated-directly* (e.g. via funds

or credit lines), and *indirectly* (via enabling outputs) by a range of public finance interventions. While the focus of the present analysis is on adaptation-related activities, these differences also apply to private finance mobilized for mitigation action. The need to investigate indirect private finance mobilization, however, appears acute for adaptation since, as noted above, relatively small amounts of directly mobilized private co-finance can currently be tracked for adaptation.

**Direct private finance mobilization** (Figure ES1) is defined as private finance that is co-financed alongside public finance into the same project, program or fund and which is invested as a direct result of the provision of public finance (or guarantee) to that same project, program or fund. In other words, direct mobilization happens “at source” where public finance is being provided. In most cases the private finance mobilization occurs around the same time or shortly after the provision of public finance.

Similar to direct mobilization, **intermediated-direct private finance mobilization** (Figure ES2) is defined as private finance that is *invested alongside public finance* and as a direct result of that public finance, but where the public finance is initially provided *one step upstream* of the private investment, and is intermediated via a fund, a fund of funds, or a bank account (e.g., a credit line). While the public finance may go through different funds before reaching final investment, it is still ultimately invested alongside the private finance and therefore similar to direct co-financing. Private finance can be mobilized at both direct and intermediated direct levels sequentially or in parallel.

**Indirect private finance mobilization** (Figure ES3) is defined as private finance that is invested as a result of a public finance intervention, but where the public finance intervention supports enabling outputs that occur *one or more steps upstream* of the private investment. With indirect mobilization, there is typically a longer time lag between the public intervention and the private finance mobilization, compared with direct private finance mobilization. Given this lag, as well as other factors (policy, market, and financial conditions) that also impact private investments, indirect private finance mobilization is more difficult to measure than direct and intermediated-direct mobilization. Examples of public interventions resulting in enabling outputs that can indirectly mobilize private finance include project preparation assistance to develop a business plan or test feasibility, grant-supported technical assistance for knowledge and capacity building activities, or budgetary support for program or policy development.

Figure ES1: Direct private finance mobilization

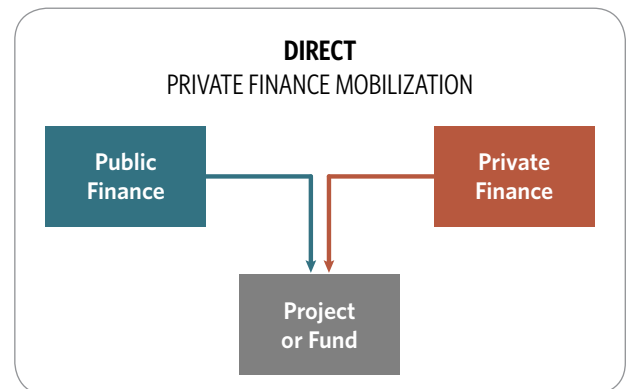


Figure ES2: Intermediated-direct private finance mobilization

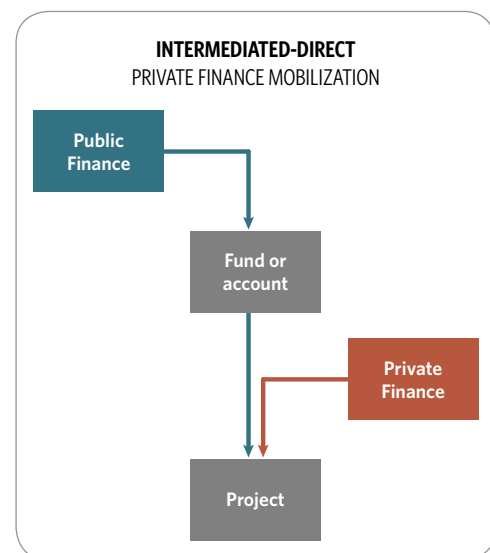
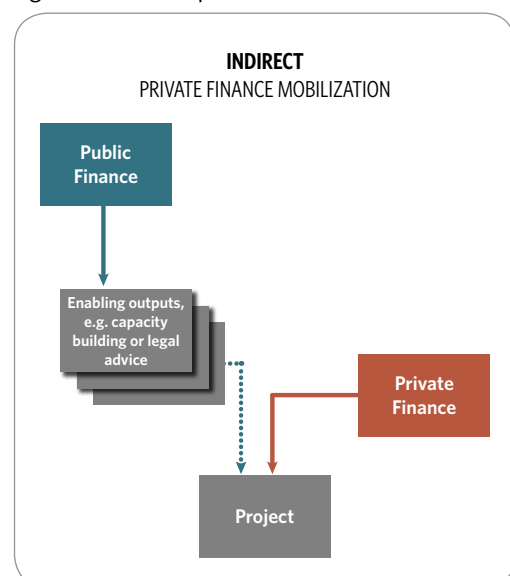


Figure ES3: Indirect private finance mobilization



## On-going efforts to improve data availability and measure mobilized private climate finance

**This study finds that there is currently limited publicly-available data on private adaptation finance mobilized by public interventions in and to developing countries.**

Publicly-available activity-level data on bilateral and multilateral development finance for adaptation only provide an indication of a possible (not actual) private finance involvement. This was estimated to be the case for about 7% of public finance adaptation activities recorded in 2013, both in terms of number of activities and corresponding volumes of finance committed. Commercial investment databases do not provide the contextual information needed to identify whether an investment is adaptation-specific or has adaptation-specific elements, let alone whether or not it was mobilized by a public intervention. One reason for this is that the concept of adaptation is not commonly used by private actors, who tend to consider climate resilience as part of their broader risk management processes.

**Promisingly, development finance institutions are developing methodologies to track private finance associated with their public climate finance interventions, covering both mitigation and adaptation finance.**

Most of these institutions already capture partial information about private co-finance at the fund- and project-level, and some use this data as a proxy for mobilization. Such co-finance data was used as best available evidence for producing an estimate of mobilized private climate finance in the context of the aforementioned report “Climate Finance in 2013-14 and the USD 100 billion goal”. However, efforts to further develop and streamline methodologies to estimate private finance mobilization are still needed. Current methodologies used across developing finance institutions can vary, in particular in how they define climate (including adaptation) activities, set accounting boundaries for the private finance associated with a given public intervention, assess the causal link between public interventions and private finance, and attribute mobilized private finance among public actors involved. There are ongoing efforts by these institutions and the OECD to further develop and harmonize definitions and methodologies. For now, these efforts focus on the measurement of direct and semi-direct mobilization, but do not include an analysis of indirect mobilization.

**Given that private finance for adaptation may be mobilized through interventions that occur upstream**

**of the private finance involvement in the investment value chain (e.g., capacity building, technical assistance, and policy changes), existing tracking efforts will not capture all mobilized private adaptation finance and may overestimate the direct mobilization effect of public adaptation co-finance at the project level.** Public finance institutions acknowledge the importance of measuring indirect mobilization, but underline the practical challenges, the difficulty to agree the attribution of respective mobilization effects among players and transaction costs involved in doing so.

## Exploring methodological approaches to estimate mobilized private adaptation finance

**This study develops four exploratory methodological approaches for measuring mobilized private adaptation finance.** The approaches are based on the OECD Research Collaborative for Tracking Private Climate Finance’s framework of decision points, building on and expanding available methodological approaches for measuring mobilized private finance. They vary in how the following three key decision points are defined:

- *Types of interventions considered*, i.e., what types of public finance interventions we include as relevant in mobilizing private finance (e.g. co-finance, credit lines, public finance via technical assistance, support for capacity building activities, financial support for policy development, etc.).
- *Accounting boundaries*, i.e., the borders around which to include private finance associated with a given public intervention.
- *Causality assessment*, i.e., the process by which we determine whether and to what extent a public finance intervention caused private finance to be mobilized (meaning that private actors would not have become involved *without* the public intervention)

The approaches are described below. While they are tested in this report for adaptation finance, they are also directly relevant to assessing private finance mobilized for mitigation action. Even more broadly, these approaches could also potentially be used to evaluate the mobilization of private finance through public finance interventions for non-climate-specific activities (e.g. health, education, economic development, etc.).



**“Approach 1 — Direct”** only considers interventions that occur “at source” and therefore includes only direct project- or fund-level co-finance. It is assumed that the public co-finance fully caused the private co-finance to be mobilized (blanket causality).

**“Approach 2 — Direct and intermediated-direct”** extends the accounting boundaries of Approach 1 to include public finance to a project or program occurring one step “upstream” from the private finance in the investment value chain, where the initial public finance is provided via a fund or credit line. This approach therefore takes into account direct and intermediated-direct forms of private finance mobilization that may occur. As in Approach 1, this approach assumes that the finance coming via the fund and/or credit line fully caused the private investment i.e. blanket causality is applied.

**“Approach 3 — Direct, intermediated-direct, and indirect”** also includes public finance one step “upstream” from the private investment. However, Approach 3 differs in that it also includes *enabling outputs* resulting from the initial public finance

interventions, such as improved capacity, demonstrated project feasibility, or the development of policies and regulations. This approach therefore allows for the inclusion of more indirect forms of mobilization that may occur, along with the direct and intermediated direct forms.

**“Approach 4 — Direct, intermediated-direct and indirect expanded”** mirrors Approach 3, but extends the boundary *two steps* “upstream” of the private finance being invested and therefore includes two enabling outputs in the investment value chain to be factored in.

The four methodological approaches are summarized in the following table. It is worth noting that Approaches 1 and 2 are quite similar in that they only capture finance that is mobilized “directly” and Approaches 3 and 4 are similar in that they also capture finance that is mobilized “indirectly”. However, we find it important to differentiate them further into four distinct approaches to demonstrate that slight variations in methodologies can significantly change the results of the mobilization assessment:

Table ES1: Methodological approaches to measure mobilized private adaptation finance

APPROACH	TYPES OF INTERVENTIONS CONSIDERED	BOUNDARIES CONSIDERED	CAUSALITY ASSESSMENT
Approach 1: Direct	Public co-finance at the project-, program- or fund- level.	Only captures project- or fund-level co-finance.	Assume blanket causality. In cases with multiple direct/intermediated-direct interventions impacting the same pool of private finance, apply a partial causality assessment to each intervention.
Approach 2: Direct and intermediated-direct	Same as above, plus: public finance to a project or program via an intermediary such as a fund, fund of funds or credit line.	Extends to public finance one step upstream of the private finance in the investment value chain.	
Approach 3: Direct, intermediated-direct and indirect (one step upstream)	Same as Approach 2, plus: public finance for enabling outputs such as technical assistance, support for capacity building activities (including financial support for policy developments).	Extends to public finance /interventions one step upstream of the private finance in the investment value chain and includes one enabling output.	Apply a partial causality assessment.
Approach 4: Direct, intermediated-direct, and indirect expanded (two steps upstream)		Extends to public finance /interventions two steps <sup>a</sup> upstream of the private finance in the investment value chain and includes two enabling outputs.	

a While the assessment could include interventions three or more steps upstream, we stop at two given that assessing causality becomes much more challenging the more intermediary steps are factored in.

## Evaluation of different methodological approaches

The four exploratory approaches are tested on two case studies and evaluated against four assessment criteria defined and used by the Research Collaborative:

- Accuracy: reflects a realistic and complete depiction of which interventions enabled private finance to be mobilized;
- Incentives: encourages the use of public interventions to deliver climate benefits; promotes means to scale up finance for climate action;
- Potential for standardization: applicable to various types of reporting entities; allows for aggregation and comparison; avoids double counting across reporting entities; and
- Practicality: feasible with the data and expertise available; is time- and cost-efficient to report.

The application of the methodologies to the case studies demonstrates that **the amount of private adaptation finance estimated as mobilized changes significantly based on the methodology employed.** The bar charts in Figure ES4 below demonstrate this.

We also find that there is an **inverse relationship between the accuracy of the approaches and the incentives they provide on the one side, and their practicality and standardization potential (including minimizing double counting risks) on the other side.** This is illustrated in the summary evaluation Table ES2 below.

**Direct private finance mobilization is easier to identify and more practical to quantify than indirect mobilization. However, not considering the latter can lead to underestimations of total private finance mobilized, and to overestimating the direct mobilization impact of public financial support.** Our case studies illustrate the limitations of approaches that only include direct and intermediated-direct mobilization (Approaches 1 and 2) in cases where no direct private co-finance is involved at the project level. If we had restricted ourselves to these approaches, we would have concluded that i.e. the African Risk Capacity’s insurance mechanism examined in one of the two case studies did not mobilize any private finance. Therefore, the methodological approach applied may have significant implications for tracking private climate finance for adaptation, given the increasing importance of insurance mechanisms in supporting adaptation, and their potential to involve private sector actors (e.g. reinsurers).

**Importantly, assuming that the provision of public support is in part motivated by the expected private finance mobilized, excluding indirect mobilization may disincentivize the provision of upstream project, technology, and market development support.** These are necessary to create the enabling conditions and that play a key role in mobilizing future private finance. Considering indirect mobilization may therefore incentivize further coordination of public actors towards better combining a wider range of complementary public finance interventions (for capacity building, budgetary support and investments), and relevant policy instruments.

Figure ES4: Illustration of the range of private finance estimated as mobilized for two case studies

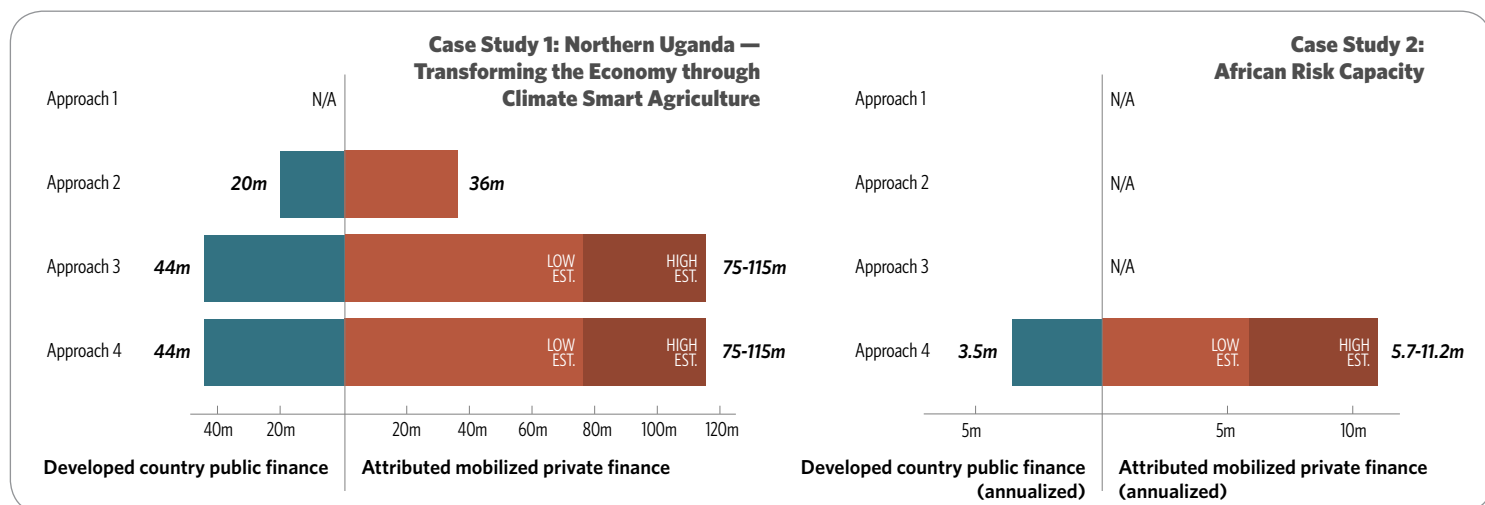




Table ES2: Evaluation of methodological approaches

APPROACH	ACCURACY	INCENTIVES	POTENTIAL FOR STANDARDIZATION	PRACTICALITY OF IMPLEMENTATION
Approach 1: "Direct"	<b>Moderate.</b> May overestimate direct mobilization by disregarding the role played by certain public finance interventions (for e.g. capacity building) in indirectly mobilizing private finance.	<b>Moderate-weak.</b> Encourages the use of public finance interventions that are likely to directly mobilize private co-finance at the project level; does not incentivize the use of public finance interventions that have indirect mobilization effects.	<b>Moderate-Strong</b> In principle easy to standardize across institutions. If approach not standardized, some risk of double counting across entities that are co-financing the same project.	<b>Strong.</b> Feasible with available data for most public finance instruments.
Approach 2: "Direct and intermediated-direct"		<b>Moderate-weak.</b> Encourages the use of public finance that are likely to mobilize private finance directly or in an intermediated manner; does not incentivize the use of public finance interventions that have indirect mobilization effects.	<b>Moderate.</b> Relatively easy to standardize but needed across a wider range of public finance interventions and institutions (e.g. funds) than Approach 1. As such, the risk of double counting across public interventions is slightly higher.	<b>Moderate-strong.</b> Feasible but requires data availability beyond the immediate point of commitment of public finance.
Approach 3: "Direct, intermediated-direct and indirect"	<b>Strong.</b> Takes into account both the direct and indirect mobilization effect of public finance interventions.	<b>Moderate.</b> Can incentivize all public finance intervention types, except those mobilizing private finance with more than 1 intermediary step.	<b>Weak.</b> Given causality assessment is qualitative, the approach could be standardized but results not necessarily consistent from one public actor/project to another. As a result, there is an increased risk of double counting.	<b>Weak.</b> Time-consuming (and therefore costly) to assess partial causality, thus less feasible and practical to implement than Approaches 1 and 2.
Approach 4: "Direct, intermediated direct, indirect and indirect expanded"		<b>Moderate-strong.</b> Can incentivize all public finance intervention types, except those mobilizing private finance with more than 2 intermediary steps.		

**There is a risk of double counting mobilized private finance if different stakeholders involved in the same project use different methodological approaches for estimating mobilized private finance.** Such double counting is more likely to occur when a project involves a broad range of upstream and downstream public

interventions that can claim to have participated in mobilizing the same private finance. In order to avoid this risk, all public actors involved in supporting the same activity would therefore need to apply a coherent methodological approach.

## Conclusions and next steps

**On-going efforts by bilateral and multilateral development finance institutions to more systematically collect private co-financing data will strengthen the ability to understand and analyze how direct mobilization of private climate finance is occurring, including for adaptation.** Climate finance practitioners may in the future choose to explore approaches for measuring indirect mobilization of private finance, which appears to be particularly relevant for adaptation activities and cannot be captured by co-financing data. This research paper aims to help fill the methodological gap. Challenges remain, however, as all four methodological approaches developed and tested have their limitations.

**More work is needed to more accurately assess and make plausible assumptions about the causal relationship between public finance interventions and the private finance they mobilize directly and indirectly. This includes the need to explore options for isolating the mobilization effect of public finance interventions from broader contextual factors.** Future research could explore variations on the methodologies developed here to see how changes to key variables (applying different attribution rules, changes to the causality assessment, etc.) impact the results of the mobilization assessment and what elements of the financial value chain get emphasized or understated. Given the qualitative approaches explored in this paper for capturing indirect forms of mobilization are

time- and resource- intensive, other methodological approaches merit exploration.

In any case, it should be noted that **a coherent use of approaches among public actors supporting an individual activity, project or program is needed to minimize risks of double counting.** This is particularly the case where both upstream (indirect mobilization) and downstream (direct mobilization) public finance interventions can claim to have participated in mobilizing the same private finance.

**Finally, in order to help enable a more comprehensive and systematic measurement of adaptation-related private finance, efforts are needed to improve the identification of the climate-resilient components of mainstream business activities.** As demonstrated by recent research, difficulties in tracking adaptation finance and the private finance mobilized for adaptation are in part related to the fact that activities improving climate-resilience are rarely stand-alone but rather integrated into normal business operations and development activities (for example, “water efficiency improvements”). Due to this integration, private investments in climate resilience are difficult to classify and track as such and therefore rarely reported as “adaptation” beyond the very limited amounts of private co-finance reported by public adaptation finance providers to date. Improvements to define and identify adaptation activities will, over the longer term, allow for better tracking and understanding of private finance mobilized for adaptation.

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## Introduction

How to unlock finance in support of developing countries' low-carbon and climate-resilient growth is a central issue of concern for policymakers around the globe. As evidence grows regarding the negative impacts of climate change on human health, economic activity, natural resources and physical infrastructure, finance in support of climate change adaptation has been attracting more attention, especially for countries that are the most immediately vulnerable to these adverse impacts.

In an effort to address this issue, during the 2009 United Nations Framework Convention on Climate Change (UNFCCC) negotiations in Copenhagen, developed countries committed to a goal of mobilizing jointly USD 100 billion a year by 2020 to address the [climate mitigation and adaptation] needs of developing countries. This funding is to come from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources (UNFCCC, 2010). OECD, in collaboration with CPI, recently released the report "Climate Finance in 2013-14 and the USD 100 billion goal" which, estimated progress against this goal. The report includes public bilateral and multilateral finance commitments as well as the private co-financing associated with both (as best-available evidence of mobilized private finance). It estimates 2013-14 average annual public finance from developed to developing countries for adaptation at USD 7.9 billion – just below 20% of total public climate finance from developed to developing countries – with another USD 3.9 billion (just below 10%) addressing both mitigation and adaptation. **Of the private finance estimated as mobilized by developed countries' public finance, private adaptation finance is less than 10% of the total, with over 90% private finance mobilized for mitigation.** There are few known examples where public finance has mobilized private adaptation finance. This is in large part due to the difficulties in tracking adaptation-related finance. More work is needed to better-understand how to identify, measure, and track public interventions that mobilize private finance for adaptation, and how similar interventions can be most effective in the future.

The OECD-hosted Research Collaborative on Tracking Private Climate Finance, under which this project is conducted, aims to develop more comprehensive methodologies for estimating private flows mobilized for climate action in developing countries. Analysis has so far primarily focused on mitigation (see e.g. Ilman et al. 2014, Hašičič et al. 2015), only partly dealing with adaptation due to significant data constraints and methodological challenges (as highlighted in Buchner et al. 2014; Caruso and Jachnik, 2014; UNEP, 2014; Pauw, 2015). This report helps advance understanding of *publicly-mobilized private adaptation finance* by:

- **Taking stock of data availability and on-going efforts** to measure private finance mobilized for climate action in developing countries, including for adaptation activities;
- **Developing and assessing a range of methodological options** to estimate private finance that has been mobilized by public adaptation finance; and
- **Conducting case study-based pilot measurements** on mobilized private adaptation finance by testing these methodological options on two bilateral adaptation projects.

The report is structured as follows: Chapter 1 introduces key concepts and definitions used for the remainder of the report. Chapter 2 provides information on existing approaches and efforts to improve data availability and quantify private finance mobilized by public climate finance. Chapter 3 introduces four experimental methodological approaches to estimate mobilized private adaptation finance. Chapter 4 tests these methodological approaches on two concrete adaptation projects. Chapter 5 then evaluates these methodological approaches against a set of criteria. Finally, the concluding chapter summarizes key takeaways and next steps.

## Chapter 1: Clarifying concepts and scope

There is currently no single internationally agreed definition for a number of key concepts such as “adaptation activities”, “private finance” or “mobilization”. While different actors have been applying their own definitions to measure and track adaptation finance, there are efforts underway to harmonize definitions and approaches (see Chapter 2). For the purposes of this study, the working definitions introduced below are used.

### Section 1.1: Defining key concepts

#### **Adaptation to Climate Change**

An activity is classified as climate change adaptation if it aims to reduce 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 (OECD DAC, 2011). In practice, adaptation activities are often context-specific as they are dependent on the climate vulnerability context of the project or region, and require an understanding of how the activity compares to a “business as usual” approach. This is in contrast with a number of climate mitigation activities, in particular renewable energy projects, for which the nature of the project or activity itself might be enough to qualify it as having mitigation benefits.

#### **Adaptation finance**

Adaptation finance is any finance that addresses the above activities, covering virtually all types of financial instruments. Examples include: a loan to purchase resilient construction material for storage facilities; a crop insurance or a returnable loan to establish a weather risk insurance pool; a grant to support the purchasing of water-saving technologies for irrigation; a technical assistance grant to develop weather forecasting systems; an equity investment in advanced water management technologies; or a loan guarantee to cover the purchase of a drainage system to cope with weather extremes.

#### **Public and private finance**

Finance is, on the one hand, considered public if the immediate entity providing the finance is a government- or publicly-owned entity as defined in the context of the OECD DAC’s (DAC) development finance statistics. In addition to finance extended by public development finance institutions, this also includes transactions by State-Owned Enterprise (SOEs). On the other hand, finance is considered private if the immediate entity providing the finance is privately-owned. The underlying

principle for considering an entity as public or private is based on who owns more than half of the voting equity securities (OECD DAC, 2013).

#### **Publicly-mobilized private finance**

Broadly speaking, **publicly-mobilized private finance is the private finance invested as a result of a given public intervention, which can typically take the form of finance or policies. Estimating private finance mobilization introduces the notion of causality between public interventions and the amount of private finance claimed to have been mobilized as a result of such interventions.** This can be estimated based on demonstrating or making reasonable assumptions about the causal link between public interventions and private finance.

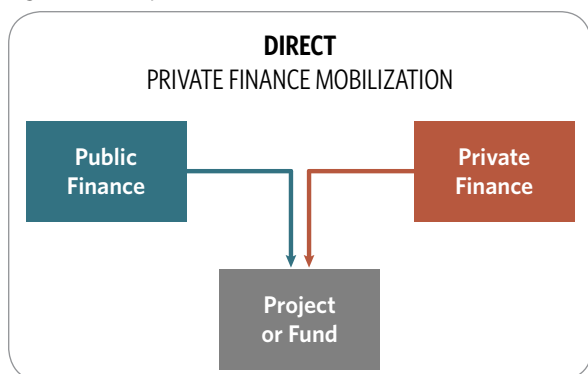
The amount of private co-financing associated with public finance at the project-, fund-, or credit line- level (what we define as direct and intermediated-direct mobilization) is often used as a best available proxy measurement for measuring mobilized private finance (OECD, 2015c; Illman et al., 2014; Caruso and Ellis, 2013). There might, however, be cases when not all private financing can be considered mobilized by a given public finance intervention, for example in cases where private finance was secured *prior to* the involvement of public finance. In any case, estimates of mobilization based only on private finance directly associated with funds, credit lines or projects will be partial insofar as they do not capture private finance mobilized indirectly in the absence of direct public co-finance. Private finance can in particular be mobilized indirectly by targeted domestic climate policy interventions (see for instance Haščič et al., 2015) as well as knowledge and capacity building activities which can be important triggers for subsequent investments (see Vivid Economics, 2015; Trabacchi and Mazza, 2015).

The term ‘leverage’ takes on different meanings in different contexts (see for example Brown et al., 2011). For the purposes of this study, the term is not used.

**Direct, intermediated-direct and indirect private finance mobilization**

As mentioned above, there is an important distinction between private finance that is mobilized *directly* and private finance that can be mobilized *indirectly*. For the purpose of the present study, the following working definitions are used:

Figure 1: Direct private finance mobilization

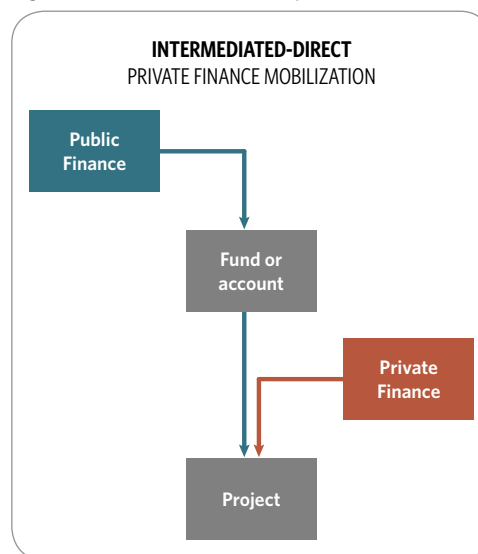


*Direct private finance mobilization* (Figure 1) is defined as private finance that is co-invested alongside public finance into the same project, program or fund and which is invested as a direct result of the provision of public finance (or guarantee) to that same project, program or fund. In other words, direct mobilization happens “at source” where public finance is being provided. In most cases the private finance mobilization occurs around the same time or shortly after the provision of public finance.

Similar to direct mobilization, intermediated-direct private finance mobilization (Figure 2) is defined as private finance that is invested alongside public finance and a direct result of that public finance, but where the public finance is initially provided one step upstream of the private investment, and is intermediated via a fund (e.g., a multilateral climate change fund), a fund of funds, or bank account (e.g., a credit line). While the public finance may go through different funds or bank accounts before reaching final investment, it is still ultimately invested alongside the private finance and therefore not dissimilar to direct co-financing.

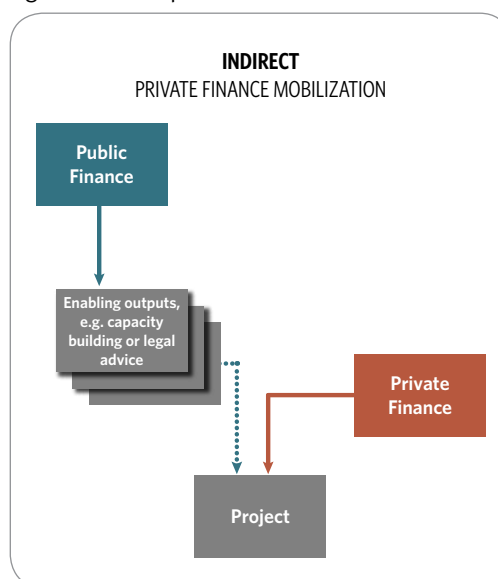
*Indirect private finance mobilization* (Figure 3) is defined as private finance that is invested as a result of some public finance intervention, but where the public finance intervention supports enabling outputs that occur *one or more steps upstream* of the private investment. With indirect mobilization, there is typically a longer time lag between the public intervention and the

Figure 2: Intermediated-direct private finance mobilization



private finance mobilization, compared with direct and intermediated-direct private finance mobilization. Given this lag, as well as other factors (policy, market and financial conditions) that impact private investments as well, indirect private finance mobilization is more difficult to measure than direct and intermediated-direct mobilization. Examples of public interventions resulting in enabling outputs that can indirectly mobilize private finance include project preparation assistance to develop a business plan or test project feasibility; grant-supported technical assistance for knowledge and capacity building activities; budgetary support for program or policy development; and resulting public policies themselves (e.g., introduction of building standards or spatial planning taking into account changing climate conditions).

Figure 3: Indirect private finance mobilization





### **The role of the private sector in investing in adaptation**

Climate change adaptation-related literature often refers to the “private sector” as if it were one homogenous group of actors. In practice, “the private sector” and its role in adaptation finance is wide-ranging (Agrawala et al. 2011; Trabacchi and Stadelmann 2013). The private sector can refer to households, smallholder farmers or small and medium-sized companies who implement adaptation activities, or to private financiers (e.g. equity funds, local and multinational commercial banks) who finance adaptation activities directly, either independently or together with public actors. It can also refer to private insurance and reinsurance companies that cover losses related to extreme weather events such as droughts. All these actors have an interest in taking climate risks into account into their financing

and investments decisions. These investments can take many forms, spanning soft (e.g. improvement in water efficiency in manufacturing processes) and hard (e.g. infrastructure investments) measures (Agrawala et al. 2011; Averchenkova et al. 2015).

***It is not always easy to delineate adaptation activities from general investments and upgrades that companies routinely undertake.*** In many cases, investments that do not have adaptation as a main objective (e.g. increasing efficiency of companies’ operations or improving transport and storage facilities) can also contribute to adaptation (Pauw, 2015). Further, while adaptation strategies can be the most effective when they are integrated into broader national development processes (OECD, 2009), improved integration makes it more difficult to identify and quantify adaptation components and financing flows to them.

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## **Section 1.2: Scope of the study**

Estimating the effect of public finance interventions in directly and/or indirectly mobilizing private adaptation finance is the core subject of this study, particularly from the vantage point of development finance interventions in developing countries. We consider both direct and indirect forms of mobilization. The role of developing country enabling environments, and of their domestic public policy and market contexts, will, however not be measured in this study as such *unless the starting point for measurement is a public finance intervention* to support policy, technology, or market development/formulation (e.g., technical assistance for early-stage market development research or a grant for policy advocacy). This methodological choice is by no means intended to neglect the importance of domestic policies and enabling environment, which has been analyzed (see Haščič et al., 2015) and is being further explored by other research initiatives under

the OECD-hosted Research Collaborative on Tracking Private Climate Finance.

This study is limited to only considering public finance interventions in developing countries, and only those activities that are currently reported as “adaptation finance” by public development finance actors. As such, other types of public finance interventions that may also result in increased climate resilience are not covered. All types of private investors, spanning private financiers to smallholder farmers, as well as all forms of adaptation finance (as defined in Section 1.1) are, however, included in the scope of our analysis.

The following chapter takes stock of on-going efforts within the development finance community to collect better data and develop methodologies for estimating private finance mobilized for climate action.

## Chapter 2: On-going efforts to measure mobilized private climate finance

### Key messages:

- **Bilateral and multilateral finance institutions are working to track private climate finance associated with their public finance interventions.** Most institutions capture information about private co-finance at the fund and project level and some use this data as best-available evidence for reporting mobilized private climate finance.
- **Existing methodologies vary**, in particular on how to define and account for the following: adaptation activities; boundaries of the total private finance considered as potentially mobilized; the causal link between public interventions and private finance; and attribution of mobilized private finance among public actors involved.
- **There are on-going efforts within the international community (the OECD, bilateral and multilateral finance institutions) to further develop and harmonize methodologies to measure private finance mobilized for climate action in developing countries.** For now, these efforts focus on the measurement of direct and intermediated-direct mobilization only. Key actors acknowledge the importance of measuring indirect mobilization but underline practical challenges, increased risks of double counting and transaction costs involved.
- **Given that private finance for adaptation may often be mobilized through indirect interventions, via capacity building, technical assistance and policy changes, a significant share of mobilized private adaptation finance might not be captured by on-going tracking efforts. As a result, there is a need to explore, develop and assess possible methodological options for estimating the indirect mobilization of private adaptation finance.**

Existing publicly-available data provides a fairly comprehensive picture of international public development finance interventions for climate action -including adaptation- in developing countries (OECD DAC, 2015a; Joint-MDB, 2015). There is currently, however, very limited corresponding data publicly-available on private adaptation finance mobilized by these public interventions. As further detailed in Annex I, activity-level data recorded in the OECD DAC statistical system on public bilateral and multilateral adaptation finance only indicate a possible private finance involvement for about 7% of public adaptation finance recorded in 2013 (in terms of both number of activities and volumes of finance committed). Commercial investment databases do not provide the contextual information needed to identify whether an investment is adaptation-specific or has adaptation-specific elements, let alone whether or not it was mobilized by a public intervention (Caruso and Jachnik, 2014). One reason for this is the concept of adaptation is not commonly used by private actors who tend to consider climate risk as part of their broader risk management processes (Pauw et al., 2015; Awerchenkova et al. 2015; Agrawala et al 2011).

Given these limitations, a practical starting point for improving data lies with public finance providers' ability to more systematically monitor private finance associated with their interventions. Promisingly, significant efforts are being undertaken to this end. These efforts have made it possible for the OECD to, in collaboration with CPI, recently release the report "Climate Finance in 2013-14 and the USD 100 billion goal" (OECD 2015c) which assesses progress towards the USD 100 billion goal. It includes, for the first time, an estimate of private climate finance mobilized directly by developed countries for climate action in developing countries based on private co-finance provided by bilateral and multilateral public finance providers as best available evidence of mobilization.

This chapter takes stock of recent and on-going developments, not only to collect more comprehensive data but also to develop and harmonize underlying methodologies to estimate private finance mobilized by public climate finance interventions efforts. These developments serve as a foundation for the expanded methodological approaches proposed later in this report.

## Section 2.1: Existing methods to track mobilized private adaptation finance

*There are notable efforts underway within the development finance community to capture information on mobilized adaptation finance. Development finance institutions currently focus on estimating and tracking direct mobilization.*

In order to better understand the extent to which bilateral and multilateral public actors currently measure and track mobilized private climate finance, a selection of institutions were consulted:

Five bilateral actors with large adaptation finance volumes: the Agence Française du Développement (AFD), Germany's KfW Development Bank, the US Overseas Private Investment Corporation (OPIC), the Dutch Ministry of Foreign Affairs (MFA), and the UK Department of International Development (DFID), and

Four multilateral actors providing adaptation finance targeting the private sector: the European Bank for Reconstruction and Development (EBRD), the Inter-American Development Bank (IDB), the International Finance Corporation (IFC), and the Climate Investment Fund's adaptation funding window i.e. the Pilot Program for Climate Resilience (PPCR).

The interviews revealed that, as of now, development finance actors either work on adaptation but seldom target private sector recipients, or are actively targeting private sector activities but primarily for mitigation purposes.<sup>1</sup> For all consulted actors, the topic of private sector adaptation finance is rather new, which partly explains why tracking is less established than for mitigation activities.

In general, however, the measurement of mobilized private finance for adaptation is not treated separately from attempts to measure mobilized private climate finance more broadly. Different actors are at different stages in their efforts:

1 The Climate Investment Funds are actively targeting private sector adaptation activities through the PPCR (private sector set-aside). Most private sector PPCR projects are still in their early stages.

Among donor governments and their DFI and aid agencies, only a few are comprehensively measuring private finance mobilized by the public climate finance they provide (e.g. UK). Those who do base this measurement on information available to them about private co-financing at the immediate fund- and project-levels. However, a group of bilateral DFIs<sup>2</sup> have jointly reported private finance mobilized by the public climate finance they provide. Over 90% of the mobilized private finance these actors were able to identify to date was for mitigation projects (Stumhofer et al., 2015).

Among multilateral actors, a group of five MDBs<sup>3</sup> is developing an initial methodology for measuring and reporting climate-related leverage based on total public and private co-financing data (International Finance Consulting, 2015). The International Finance Corporation (IFC) had already been systematically tracking mobilized finance (both public and private). IFC tracks and reports total co-finance for activities in which IFC is financially compensated for direct involvement (e.g. IFC serving as the arranger of syndicated finance) -- what it refers to as *core mobilization*. IFC also tracks (but does not report externally) total co-finance for projects in which IFC invests, what it refers to as *catalytic mobilization*, without assigning attribution or identifying who or what caused the co-investments (IFC, 2015 forthcoming).

The four-stage framework developed under the OECD-hosted Research Collaborative for estimating mobilized private climate finance (Jachnik, Caruso and Srivastava, 2015) is used as a basis to show some of the key features of and differences among existing methodologies. The framework itself, presented in Figure 5, structures key methodological decision points (and corresponding options) into four sequential but interrelated stages, noting that choices made at any given decision point influence the availability and feasibility of choices of other decision points.

Stage 1 focuses on key definitions that need to be established in order to subsequently estimate mobilized

2 AFD (France), JICA (Japan), KfW (Germany), OPIC (United States), BIO (Belgium), CDC (United Kingdom), COFIDES (Spain), DEG (Germany), FINNFUND (Finland), FMO (Netherlands), IFU (Denmark), Norfund (Norway), OeEB (Austria), Proparco (France), SBI-BMI (Belgium), SIFEM (Switzerland), SIMEST (Italy), SOFID (Portugal), SWEDFUND (Sweden)

3 African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank, World Bank Group (including the International Finance Corporation and the World Bank)

Figure 5: Four-stage methodological framework and decision points to estimate publicly-mobilized private finance.

STAGE 1. DEFINE CORE CONCEPTS	
<ul style="list-style-type: none"> <li>• Definition of climate change activities</li> <li>• Definition of public and private finance</li> </ul>	<ul style="list-style-type: none"> <li>• Classification of developed and developing countries</li> <li>• Determination of geographical origin of finance</li> </ul>
STAGE 2. IDENTIFY PUBLIC INTERVENTIONS AND INSTRUMENTS THAT CAN BE CREDITED FOR MOBILIZING PRIVATE CLIMATE FINANCE	
<ul style="list-style-type: none"> <li>• Types of public interventions</li> <li>• Specific instruments used for the interventions</li> </ul>	
STAGE 3. VALUE PUBLIC INTERVENTIONS AND ACCOUNT FOR TOTAL PRIVATE FINANCE INVOLVED	
<ul style="list-style-type: none"> <li>• Choice and conversion of currency</li> <li>• Choice of point of measurement</li> <li>• Valuation of different public interventions</li> </ul>	<ul style="list-style-type: none"> <li>• Boundaries and estimation of private finance involved</li> <li>• Availability of climate-specific private finance data or proxies</li> </ul>
STAGE 4. ESTIMATE MOBILIZED PRIVATE CLIMATE FINANCE	
<ul style="list-style-type: none"> <li>• Assessment of causality between public interventions and private finance</li> <li>• Attribution of mobilized private climate finance to public interventions and instruments</li> </ul>	

Source: Jachnik et al., 2015

private finance, including the definition of “climate change adaptation activities” and “public and private finance”. Stage 2 focuses on identifying relevant public interventions and instruments that will be credited for mobilizing private finance in subsequent stages. Stage 3 involves establishing accounting boundaries, i.e. the borders within which to include private finance associated with a given public intervention, as well as determining the monetary value of public interventions and associated total private finance. The fourth and final stage involves assessing causality i.e. determining whether private finance would have been provided in the absence of public interventions. This is followed by a consideration of how to attribute mobilization among public interventions/entities involved.

There are a number of key differences among existing methodologies, in particular in relation to the following decision points: (i) Definition of climate change adaptation activities; (ii) Boundaries and estimation of private finance involved; (iii) Assessment of causality between public interventions and private finance; and (iv) Attribution of mobilized private climate finance to public interventions and instruments.

Under the existing methodologies applied by international finance institutions, but also those developed by the OECD to date, the main options used to address these four decision points are detailed below. An overview summary of the key characteristics of applied methodologies is provided in Table 1.

**(i) Definitions of “climate change adaptation activities”**

- **Based on objective (and measures):** under OECD DAC’s definition (OECD DAC, 2011) two different ‘adaptation’ markers are assigned depending on whether adaptation is a ‘principal’ or ‘significant’ objective. An activity is eligible for the climate change adaptation marker if the climate change adaptation objective is explicitly indicated in the activity documentation, and if the activity contains specific measures targeting adaptation. This approach is the one used by most bilateral actors (e.g. UK ICF) and their bilateral development finance institutions (e.g. KfW).
- **Based on climate vulnerability(ies) addressed, intent, and linkages between activities and vulnerability(ies):** Under the MDB joint approach, activities are classified as adaptation if they set out to address climate adaptation vulnerabilities, state an intent to address these vulnerabilities and articulate a clear link between the vulnerabilities and specific activities (Joint-MDBs, 2015). A related definition is now part of the Common Principles for Climate Change Adaptation Finance Tracking recently agreed by the MDBs and IDFC (IDFC-MDB, 2015), who also agreed that “adaptation activities should be disaggregated from non-adaptation activities as far as reasonably possible”.<sup>4</sup>

4 One could also argue that there is a methodological difference between the MDB approach to only count the “adaptation specific” component of the private finance mobilized, while, most bilateral actors under the OECD DAC system account a fixed percentage of finance involved a project

**(ii) Boundaries and estimation of total private finance considered involved.** This is a particularly important methodological choice when trying to capture indirect finance mobilized. Private finance may be mobilized outside the scope of a specific activity in which the public intervention was made, due to downstream, spillover, or demonstration effects of the initial public intervention that occur only after some time. Methodological options for defining accounting boundaries include considering:

- **Only direct co-finance:** This approach includes only the private finance that occurs at the level of the project or fund receiving the direct public co-financing. This approach is used by most institutions and methodologies reviewed (see e.g. Stumhofer et al., 2015; OECD, 2015b; ICF, 2015) and was also applied in the context of the recent “Climate Finance in 2013-14 and the USD 100 billion goal” report (OECD 2015c).
- **Traceable private finance (also beyond co-finance):** In addition to direct co-finance, this approach includes private finance that is mobilized further downstream from the public finance/intervention where the private finance is still traceable (e.g. see Stadelmann and Falconer, 2015 for an attempt to identify private finance mobilized by capacity building over time). This approach is not currently widely used due to the methodological challenges and resource implications of carrying this out across a portfolio, but interviewees acknowledge the relevance of looking at finance mobilized outside the immediate project or fund boundaries. The Dutch MFA, GIZ and KfW have investigated such expanded accounting boundaries in recent studies. At this stage, they do not yet include resulting estimates in official reports.
- **All private finance:** This approach aims to capture all downstream investments achieved over the longer-term, within a certain established timeframe, e.g. 10 years. This would include finance mobilized through demonstration and spillover effects, factoring in a discount rate, where public intervention

(mostly 100% for activities with adaptation as principal objective and less for those with adaptation as significant objective). However, in practice, there might hardly be any difference, as bilateral actors can separate out adaptation components as separate activities (interviews), and, when reporting climate finance under the UNFCCC, most countries only include the adaptation-specific portion as opposed to the full value of the activities they report to the DAC (Ockenden and Gaveau, forthcoming).

is assumed to have indirectly caused the investments to occur. None of the institutions interviewed use this approach due to practicality issues as well as data and resource constraints.

**(iii) Assessing causality between public interventions and private finance:** the question relates to how to assess the extent to which decisions of private actors to provide finance are a result of public interventions. Different methodological options include:

- **Blanket causality:** This approach assumes the public finance intervention alone caused the private finance to be mobilized. There are some bilateral and multilateral finance institutions that adopt this approach, e.g. the IFC, the joint-DFI group (Stumhofer and Harnisch, 2015) or OECD DAC (OECD DAC, 2015b). Some interviewed actors (e.g. AFD) are not comfortable with using the term “mobilized” in this context given the difficulty in demonstrating causality. They therefore refer to total “private co-finance” rather than “mobilized finance”. This limitation was acknowledged in the “Climate Finance in 2013-14 and the USD 100 billion goal” report. While using private co-finance as current best-available evidence of mobilization, the report also underlines that co-finance does not necessarily equate to mobilization as it in particular does not capture the indirect mobilization effect of capacity building, budgetary support and domestic policies. (OECD 2015c).
- **Partial causality:** This approach assumes the public intervention mobilized only a portion of the total private finance involved, and considers the role played by other factors that may have also helped mobilize the investment such as public policies and country/market conditions. Partial causality was applied by the OECD in an exploratory econometric approach to estimating mobilized private finance for renewable energy (Haščič et al., 2015), and is embedded in the UK’s methodology for measuring private climate finance mobilized by its International Climate Fund (ICF, 2015; Ockenden et al., 2012)

**(iv) Attribution of mobilized private finance to public interventions and instruments:** once a (partial or full) causal link between public interventions and private finance has been identified, a methodology is used to attribute the amount of private finance considered as



mobilized to the different public interventions involved. Different methodological approaches include:

- **Full attribution:** For this approach, each public actor involved claims full value of private finance mobilized, see e.g. IFC (2015) for the case of 'core mobilization' where IFC acts for instance as the arranger of a loan syndication.
- **Volume-based attribution:** This approach apportions mobilized private finance according to the volume of public finance provided, see in particular Stumhofer and Harnisch, 2015; OECD, 2015b (for guarantees); ICF, 2015; and the "Climate Finance in 2013-14 and the USD 100 billion goal" report (OECD, 2015c).
- **Risk-based attribution:** This approach apportions mobilized private finance according to the respective risk exposure of the public finance provided, e.g. more private finance would be attributed to providers of equity than to providers of senior debt, given the higher risk exposure of equity. This approach is used by the UK's ICF (considered in addition to volume-based attribution) and the OECD DAC for public equity shares in funds (OECD DAC, 2015b).
- **Concessionality level-based attribution:** This approach apportions mobilized private finance according to the concessionality levels of the public finance provided. This option has to date not been implemented but would, similarly to the risk-based approach, make it possible to take into account specific features relating to respective public finance interventions.

- **Time-based attribution:** This approach apportions mobilized private finance according to the respective points of entry of the public financiers into the project/program. There are no known examples to date of implementation of this approach.
- **Role-based attribution:** This approach apportions mobilized private finance according to the public actors' respective role in leading and coordinating a joint initiative. See e.g. IFC, 2015 and OECD, 2015b for attribution methodologies taking into account the role of the arranger of a loan syndication.
- **Statistical attribution:** attribution is based on statistically significant variables in econometric models, with coefficients indicating the average effect of the variables considered on private finance (Haščič et al. 2015).

Table 1 below summarises the methodologies used by different public bilateral and multilateral finance institutions<sup>5</sup> and highlights some of their key definitional and methodological differences, as identified above (definition of adaptation, accounting boundaries, causality and attribution). It also highlights whether specific approaches are applicable to adaptation activities. It is important to note that conducting actual pilot estimates for mobilized private adaptation finance (as done in Chapter 4) requires addressing all definitional and methodological decision points of the four-stage framework. These will be covered in a more systematic manner in Chapter 3.

5 In addition to the aforementioned consultations, this table also bases its findings on publicly available material relating to existing methods to measure mobilized private climate finance. These include, in particular, elaborated methodologies from the IFC (IFC, 2015), the OECD DAC (OECD DAC, 2015b), the above mentioned group of developed country bilateral DFIs (Stumhofer et al., 2015), the group of five MDBs (Joint-MDBs, 2015) and the UK's International Climate Fund (ICF, 2015).



Table 1: Key characteristics of selected methods to estimate mobilized private finance and implications for adaptation

METHOD	DEFINITION OF CLIMATE CHANGE ADAPTATION ACTIVITIES	BOUNDARIES OF PRIVATE FINANCE INVOLVED	CAUSALITY	ATTRIBUTION	APPLICABILITY TO ADAPTATION
Group of developed country bilateral finance institutions <sup>2</sup> (Stunhofer and Harnisch, 2015) and "Climate Finance in 2013-14 and the USD 100 billion goal" report (OECD, 2015c)	Based on Rio marker definitions as well as criteria of the International Development Finance Club (IDFC) approach, and in the future also on MDB-IDFC (2015) common principles.	<b>Private co-finance:</b> Private co-financing at the level of activity, credit line or structured fund.	<b>Blanket causality:</b> At least one financial activity by a participating institution needs to be involved. There needs to be a supporting link to the financial activity by the private institution involved.	<b>Volume-based attribution:</b> Volume-based pro-rata among public sector actors involved independent of the specific instruments used.	The approach applies to both mitigation and adaptation projects, though close to all mobilized private finance identified to date relates to mitigation activities.
International Finance Corporation "core mobilization" methodology (IFC, 2015)	Currently based on IFC's identification of adaptation activities; only the adaptation-specific component is considered where relevant.	<b>Private co-finance:</b> Private co-financing at the activity and fund level.	<b>Blanket causality:</b> In case of 'core mobilization', causality is assumed for all finance where IFC is financially compensated and in case of 'catalytic mobilization' even for all private co-finance.	<b>Role-based attribution (in case of 'core mobilization')</b> : finance is attributed to IFC as paid arranger of loan syndication. <b>Full attribution (in case of 'catalytic mobilization')</b> : All finance identified attributed to IFC.	Method applies in principle to both adaptation and mitigation; though IFC has not observed mobilization for adaptation activities to date.
OECD Development Assistance Committee (OECD DAC, 2015b)	Based on Rio marker definitions for DAC members; MDBs report their climate activities to the DAC based on their joint-MDB approach, and in the future also MDB-IDFC (2015) common principles.	<b>Private co-finance:</b> but accounting boundaries are specified per instrument e.g. syndicated loans; private finance within the syndication.	<b>Blanket causality:</b> Instrument-specific assumptions: e.g. syndicated loans: assumption that private sector would not have engaged without public sector arranging or participating.	<b>Instrument-specific volume-based and role-based attribution</b> , e.g. syndicated loans: 50% to arranger if public; remainder pro-rated among public actors based on share of public portion of syndication.	Methods apply to all development finance reported by the DAC, including mitigation and adaptation-related activities.
OECD econometric approach (exploratory) (Haščić et al., 2015)	Not applicable: the approach was, for the time being, only applied to renewable energy projects i.e. a sub-set of mitigation activities.	<b>Both private co-finance and private finance occurring in the absence of public co-finance</b> (spillover effect).	<b>Partial causality:</b> Tests the mobilization effect of public finance (including spillover effect), domestic policies and enabling conditions.	<b>Attribution based on statistically significant coefficients</b> indicating average effects of the variables considered on private finance.	Econometrics currently not feasible for adaptation due to the absence of systematic data on adaptation-related private finance.
United Kingdom's International Climate Fund (ICF, 2015; Ockenden et al., 2012)	Based on Rio marker definitions but where projects have additional non climate objectives, only the climate-specific portion counted.	<b>Private co-finance:</b> at level of ICF intervention; indirect impacts are in principle not counted as they are picked up by other ICF key performance indicators.	<b>Partial causality:</b> Causality demonstrated against business as usual scenario. Projects may involve several instruments. It may not be possible to accurately report which has greater impact.	<b>Volume-based, risk- and time-based attribution:</b> In principle volume-based pro-rata though adjustments for the risk and/or duration of ICF funding are made depending on instrument.	Method applied at the activity level in principle for both climate mitigation and adaptation.

## Section 2.2: On-going efforts to further develop and harmonize methodologies and remaining gaps

*A number of ongoing and planned efforts are expected to yield improvements in terms of data availability and methodologies for estimating mobilized private climate finance, including for adaptation.*

As noted previously, the OECD DAC has, in consultation with bilateral and multilateral development finance institutions, already developed methods and collected 2012-2014 survey data for a first set of three instruments (guarantees, syndicated loans, and shares in collective investment vehicles). Results from the survey estimate that USD 4.4 billion of private finance was mobilized over this three-year period through these three instruments for climate action in developing countries. This included 58% for mitigation-specific activities, only 3% for adaptation-specific activities, and 39% addressing both mitigation and adaptation (OECD DAC, 2015 forthcoming). Systematic data collection on these instruments and the private finance mobilized as a result will start in 2017 (for 2016 data) and work on other instruments (e.g. mezzanine finance, direct equity, credit lines) will be initiated during the second half of 2015.

The aforementioned group of five MDBs has developed an initial common approach for measuring and reporting leveraged co-financing (both public and private), with first estimates expected before the end of 2015. It focuses on direct private co-financing only and, as a result, mostly on mitigation investments (International Finance Consulting, 2015).

The joint-DFI group, whose methodology for jointly measuring and reporting mobilized private co-finance is featured in Table 1 above, has started reporting estimates covering the 2008-2014 period. Over 90% of the mobilized private climate finance has been for mitigation activities and projects and only less than 10% for activities and projects in the field of adaptation (Stumhofer et al., 2015).

Bilateral, regional and national finance institutions under the broader umbrella of the International Development Finance Club (IDFC)<sup>6</sup> are working together with the group of five MDBs to harmonize their approaches for tracking their own climate finance flows. In July 2015, they agreed on joint principles for tracking public adaptation finance (IDFC-MDB 2015), and are also considering the possibility of harmonizing their approach for measuring mobilized private finance.

In addition, a group of 19 countries<sup>7</sup> providing bilateral climate finance recently released a statement on their common understanding of the scope of mobilized climate finance in the context of the UNFCCC and reporting progress towards the USD 100 billion per year goal by 2020 (Technical Working Group, 2015). The "Climate Finance in 2013-14 and the USD 100 billion goal" report drew on this understanding and data provided based on it (OECD, 2015c).

For now, these on-going efforts focus on the measurement of direct and intermediated-direct mobilization due to practical challenges and transaction costs involved in estimating indirect mobilization. Given that private finance for adaptation may often be mobilized through indirect interventions, via capacity building, technical assistance and policy changes, a significant share of mobilized private adaptation finance may not be captured by these existing tracking efforts. As a result, there is a need to explore, develop and assess possible methodological options for estimating the indirect mobilization of private adaptation finance, which is done in the following chapter.

6 A group of regional, bilateral and national development banks, see: <https://www.idfc.org>

7 Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Poland, Sweden, Switzerland, United Kingdom, United States, and the European Commission

## Chapter 3: Exploring methodological approaches to estimate mobilized private adaptation finance

### Key messages:

- **Different methodological approaches can be applied to estimate publicly-mobilized private adaptation finance.**
- Building upon the OECD-hosted Research Collaborative on Tracking Private Climate Finance's framework of decision points, **four methodological approaches are developed in this chapter. These different approaches impact the assumptions about how private finance mobilization occurs, and therefore the associated amounts of mobilized private finance.**
- The four approaches developed and proposed vary in how the following three key decision points are defined: *types of public interventions and instruments considered, accounting boundaries of private finance considered, and the causality assessment between public interventions and private finance.*

This chapter explores different approaches that can help capture ways in which public finance interventions help mobilize private investment for adaptation both directly and indirectly, without recommending any approach for international adoption. In doing so, the work also exposes both strengths and challenges associated with different methodological approaches and can provide a starting point from which further methodological design work and exploration can be done.

While these approaches are described and tested for adaptation finance, they also have the potential to be used to assess private finance mobilized for mitigation action, or possibly even more broadly to evaluate the mobilization of private finance through any type of public finance intervention (health, education, development, etc.).

### Section 3.1: Overview of exploratory approaches

The exploratory approaches are presented below, based on the OECD-hosted Research Collaborative's four-stage framework of key decision points developed as a tool towards estimating mobilized private finance for climate action in developed countries, as introduced in Figure 5 in Chapter 2. Stepping through these decision points makes it possible to highlight, in a transparent manner, methodological options used.

As outlined in Table 2 below, we explore variations on three decision points. These decision points vary across the different approaches: *types of public interventions and instruments considered, accounting boundaries, and causality between public interventions and private finance.* All other decision points are treated uniformly across the different approaches<sup>8</sup>.

8 Attribution is also treated uniformly across all approaches. We use volume-based pro-rating across public finance interventions/actors involved. While there are, as highlighted in Chapter 2, possible alternative attribution approaches based on, for instance, risk, role or concessionality

Table 3 below summarizes the exploratory methodological approaches. The section following the table describes each in further detail.

level, these would introduce an additional scenarios and complexity that would be difficult to handle in the context of the present study. Alternative attribution approaches are and will be explored in the context of other research, analyses and initiatives, including the work of the OECD DAC to measure private finance mobilized by official development finance.

Table 2: Overview of decision points across all exploratory methodological approaches, highlighting decision points that vary across approaches

STAGES	SHORT DESCRIPTION OF METHODOLOGICAL DECISION POINTS
1. DEFINE CORE CONCEPTS	<p><b>Climate change activities:</b> Inclusion of project is based on the mitigation and adaptation Rio markers (for projects of bilateral agencies) and/or MDB-IDFC (2015) approach (for projects of MDBs and IDFC members); and considers both a full and component cost approach as relevant, considered on a case by cases basis, and depending on data availability.</p> <p><b>Public and private finance:</b> Official transactions are considered public when undertaken by public entities at their own risk and responsibility, as defined in the DAC reporting directive. Entities are considered public if they are part of the government or if governments own the majority of shares. All other entities/transactions are considered private, including entities that share public and private ownership but where private ownership is majority.</p> <p><b>Country classification:</b> developing countries are defined as countries that are included in the DAC list of Official Development Assistance Recipients<sup>a</sup></p> <p><b>Geographical origin of private finance:</b> All private finance regardless of origin is included, but international and domestic sources are separately identified where technically possible. Geographical origin is assigned using the concept of “residence” based on the center of economic interest (rather than nationality or legal criteria) of the transactor (i.e.; immediate provider of finance), as defined under the IMF Balance of Payments Manual (IMF 2009).<sup>b</sup></p>
2. IDENTIFY PUBLIC INTERVENTIONS AND INSTRUMENTS	<p><b>TYPE OF PUBLIC INTERVENTION: VARIES BY METHODOLOGICAL APPROACH (SEE TABLE 3 BELOW)</b></p> <p><b>Specific instruments:</b> Includes some or all of the following public finance instruments grants, concessional loans, non-concessional loans, equity, mezzanine financing, guarantees, and insurance.</p>
3. VALUE PUBLIC INTERVENTIONS AND ACCOUNT FOR TOTAL PRIVATE FINANCE INVOLVED	<p><b>Currency and conversion:</b> Volumes of finance are reported in USD; OECD official exchange rates are used to convert into USD.</p> <p><b>Point of measurement:</b> Commitment or board approval data is used to measure finance. Where disbursement data might be available, a comparison of volumes measured at commitment and disbursement will be made.<sup>c</sup></p> <p><b>Value of public interventions:</b> Public finance interventions are accounted for at their face value<sup>d</sup></p> <p><b>BOUNDARIES: VARIES BY METHODOLOGICAL APPROACH (SEE TABLE 3 BELOW)</b></p> <p><b>Data availability:</b> Will vary for each portfolio analyzed based on the degree to which institutions able to provide granular information about private finance associated with its interventions</p>
4. ESTIMATE PRIVATE FINANCE MOBILIZATION	<p><b>CAUSALITY: VARIES BY METHODOLOGICAL APPROACH (SEE TABLE 3 BELOW)</b></p> <p><b>Attribution:</b> Volume-based pro-rating across public finance interventions/actors involved (no adjustment for concessionality or risk)</p>

a <http://www.oecd.org/dac/stats/daclist.htm>

b “An institutional unit has a centre of economic interest within a country when there exists, within the economic territory of the country, some location, dwelling, place of production, or other premises on which or from which the unit engages and intends to continue engaging, either indefinitely or over a finite but long period of time, in economic activities and transactions on a significant scale.” (IMF, 2009).

c We may consider private finance that is likely to be committed in the future (in cases where robust data exists to estimate likely future investment), though this runs the risk of failing to factor in future interventions and policy and market variables that may affect the timing and scale of any future private investment commitments.

d While practical, this approach does not make it possible to take into account instrument-specific characteristics. On-going work within the development finance community, including the OECD DAC, may provide alternative methods.

Table 3: Methodological approaches to measure mobilized private adaptation finance

APPROACH	TYPES OF INTERVENTIONS CONSIDERED	BOUNDARIES CONSIDERED	CAUSALITY ASSESSMENT
Approach 1: Direct	Public co-finance at the project, program or fund level	Only captures project- or fund-level co-finance	Assume blanket causality. In cases with multiple direct/intermediated-direct interventions impacting the same amount of private finance, apply partial causality assessment to each intervention. See Box 1.
Approach 2: Direct and intermediated-direct	Same as above, plus: co-finance to a project or program via an intermediary such as a fund, fund of fund or credit line	Extends to public finance one step upstream of the private finance in the investment value chain	Apply partial causality assessment. See Box 1.
Approach 3: Direct, intermediated-direct and indirect (one step upstream)	Same as above, plus: public finance for enabling outputs such as technical assistance, support for capacity building activities (including financial support for policy developments).	Extends to public finance /interventions one step upstream of the private finance in the investment value chain and includes one enabling output	Apply partial causality assessment. See Box 1.
Approach 4: Direct, intermediated-direct, and indirect expanded (two steps upstream)		Extends to public finance/interventions two steps <sup>a</sup> upstream of the private finance in the investment value chain and includes two enabling outputs	

a While the assessment could include interventions three or more steps upstream, we stop at two given that assessing causality becomes much more challenging the more intermediary steps are factored in.

The differences across methodological approaches can be further explained through a hypothetical case in order to demonstrate the strengths and shortcomings of each approach. We use real institutions simply to make the example as clear as possible.

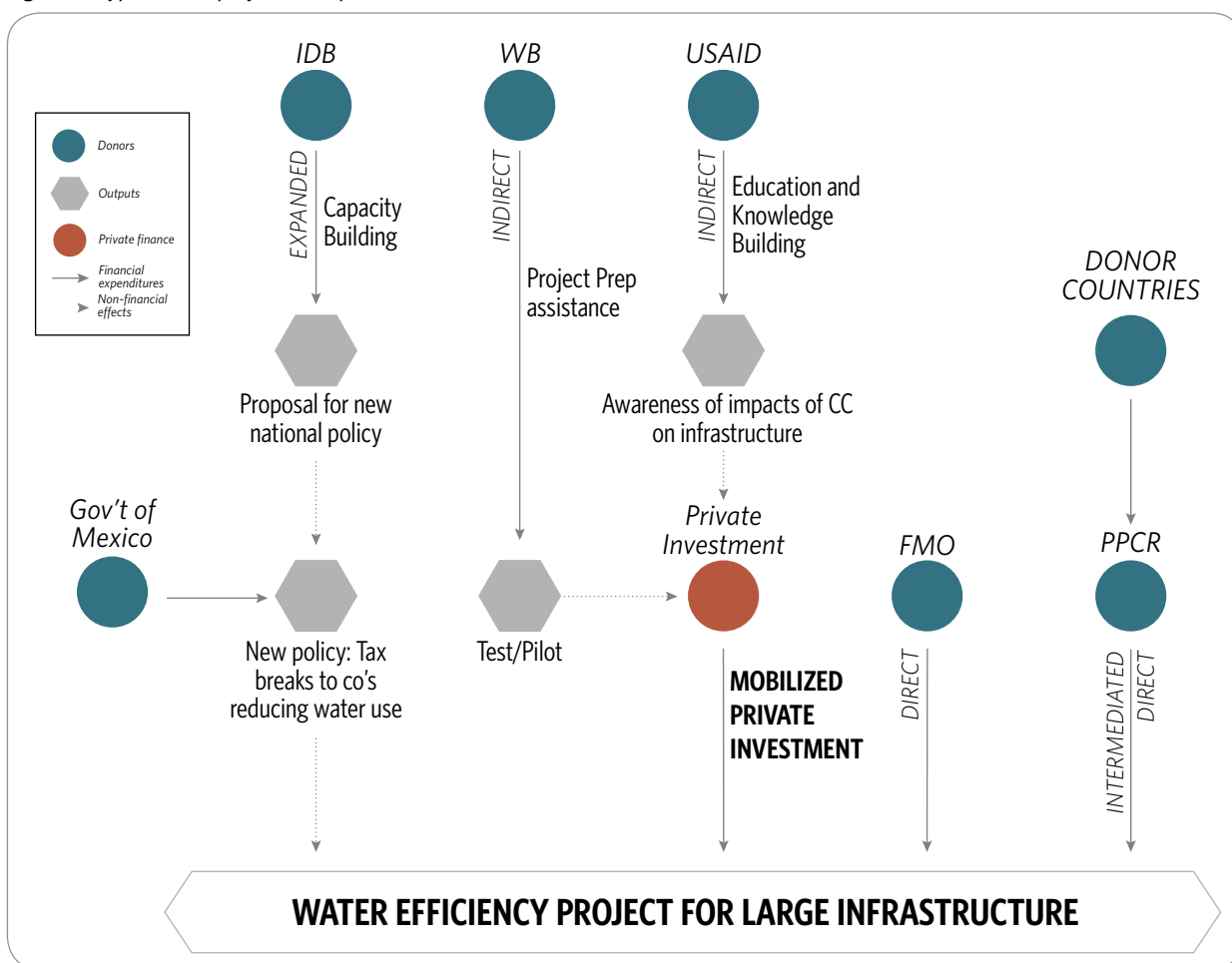
Consider a case involving several development institutions working in Mexico (see figure 6 below). The U.S. Agency for International Development (USAID) helps build private companies' knowledge regarding impending climate threats to infrastructure. At the same time, IDB has been working in the country to provide capacity building support for the development of a new national policy proposal to provide tax breaks to all companies that lower water use. The new policy is nationally adopted and encourages private investment in water efficient technologies.

In addition, an international project preparation facility set up by the World Bank provides a grant to a project

developer who uses the grant to develop and test a water efficiency technology for a large infrastructure project in an area in Mexico that is threatened by extreme drought. Once the technology is fully tested, the project developer secures direct public finance from the Netherlands Development Finance Company (FMO), as well as intermediated-direct finance via the PPCR (provided by Australia, Canada, Denmark, Germany, Japan, Norway, Spain, UK, and U.S. — all donors to the PPCR). This project-level public finance support which de-risked the investment, along with the project preparation support from the World Bank, knowledge building support provided by USAID and policy support provided by IDB, all helped to secure the private finance necessary to get the water efficiency off the ground.

The different methodological approaches detailed below use this hypothetical case above to elucidate the differences across approaches.

Figure 6: Hypothetical project example

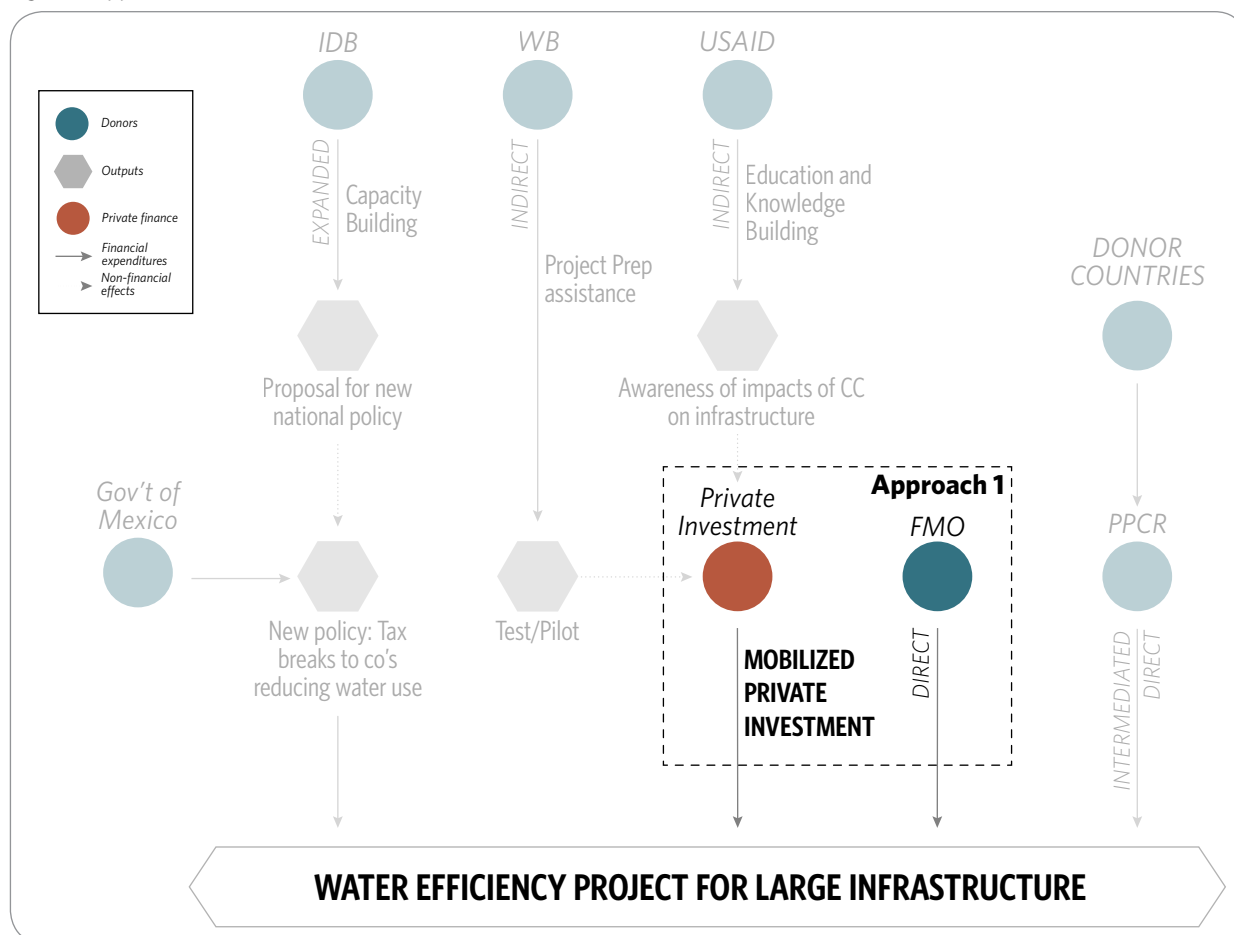


### Section 3.2: Description of the four proposed approaches

#### APPROACH 1 – DIRECT

This approach only considers interventions that occur “at source” and therefore includes only direct project- or fund-level co-finance. It is assumed that the co-financing support fully caused the private finance to be mobilized (blanket causality).

Figure 7: Approach 1 – Direct



In our example, with Approach 1, only the direct project level co-finance provided by FMO would be included as an intervention playing a role in mobilizing private investment.

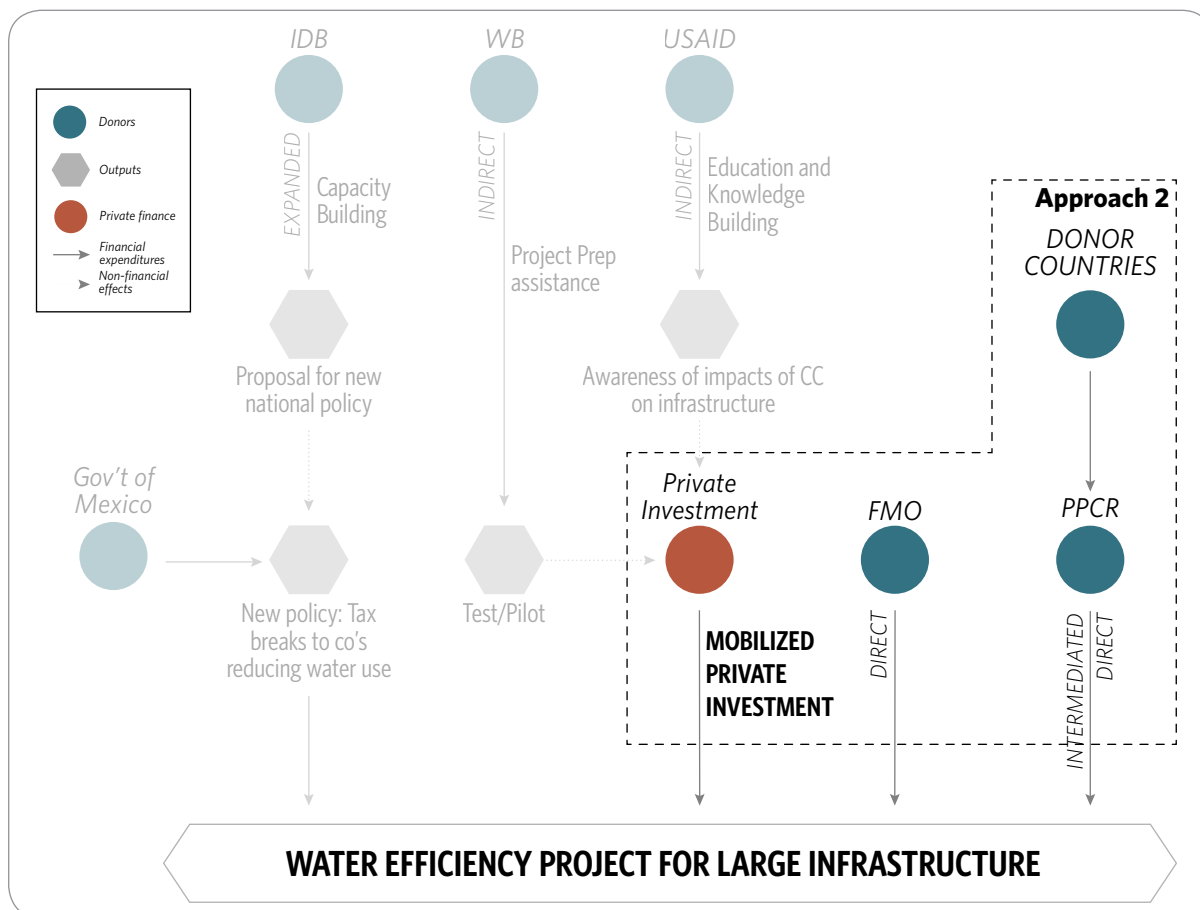


**APPROACH 2 — DIRECT AND INTERMEDIATED-DIRECT**

The approach considered here extends the accounting boundaries of Approach 1 to include public finance to a project or program occurring one step “upstream” from the private finance in the investment value chain, where the initial public finance is provided via a fund or credit line. This approach therefore takes into account direct and intermediated-direct forms of mobilization that may occur. As in Approach 1, this approach assumes the finance coming via the fund, fund-of-fund or credit line fully caused the private investment and blanket causality is applied.

With Approach 2, both the direct project level co-finance provided by FMO and the finance provided from the PPCR would be included as public finance interventions that played a role in mobilizing the private investment.

Figure 8: Approach 2 — Direct and intermediated-direct

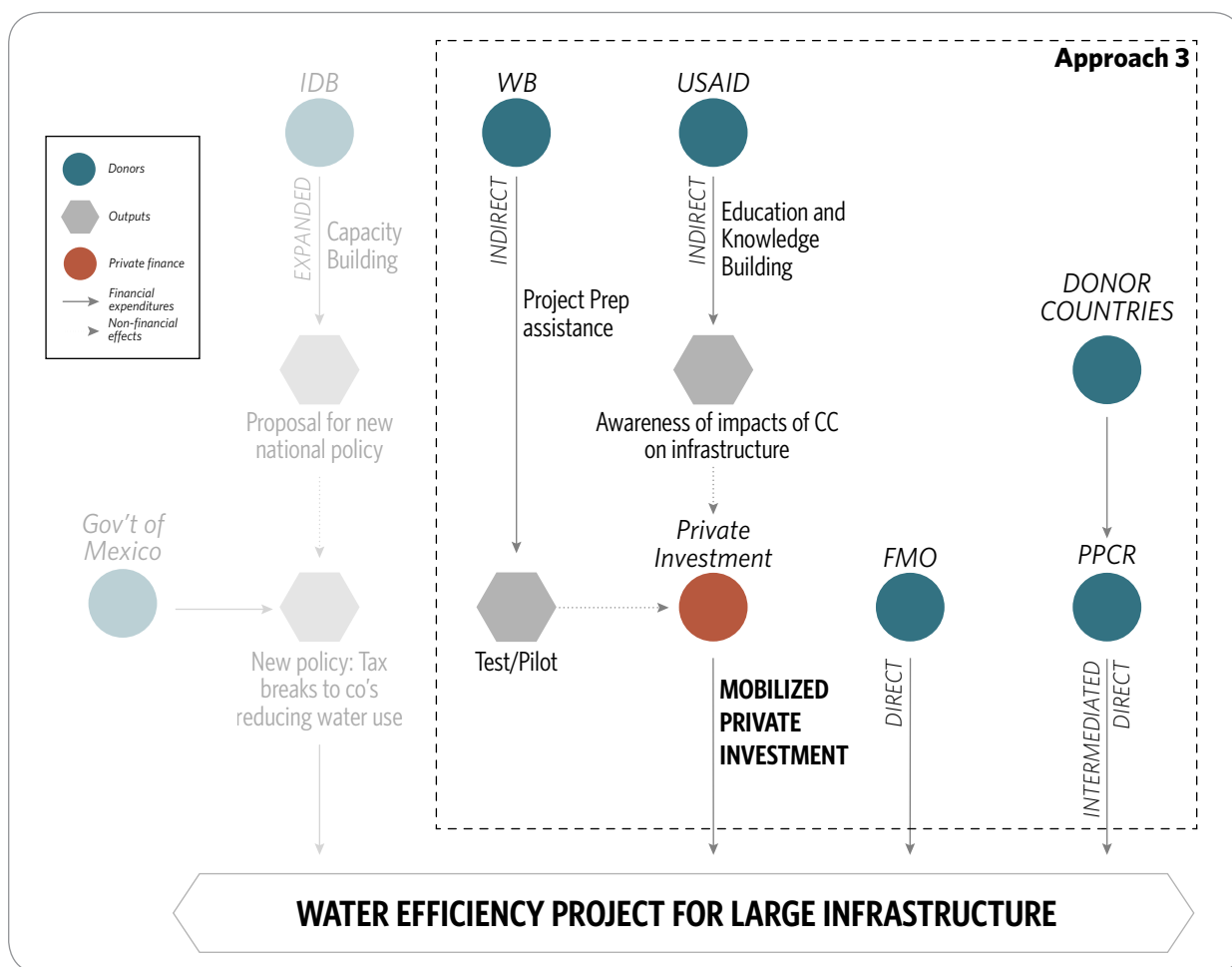


**APPROACH 3 — DIRECT, INTERMEDIATED-DIRECT, AND INDIRECT (ONE STEP UPSTREAM)**

Similar to Approach 2 above, Approach 3 also includes public finance one step “upstream” from the private investment. However, Approach 3 differs in that it also includes enabling outputs resulting from the initial public finance interventions, such as capacity building, technical assistance, grants for project feasibility testing, and financial support for the development of policies and regulations. This approach therefore allows for the inclusion of more indirect forms of mobilization that may occur, along with the direct and intermediated direct forms.

With this approach, the direct project level co-finance provided by FMO, the finance provided from the PPCR, the knowledge building support from USAID and the project preparation assistance provided by the World Bank would all be included as public finance interventions that played a role in mobilizing the private investment.

Figure 9: Approach 3 — Direct, intermediated-direct, and indirect

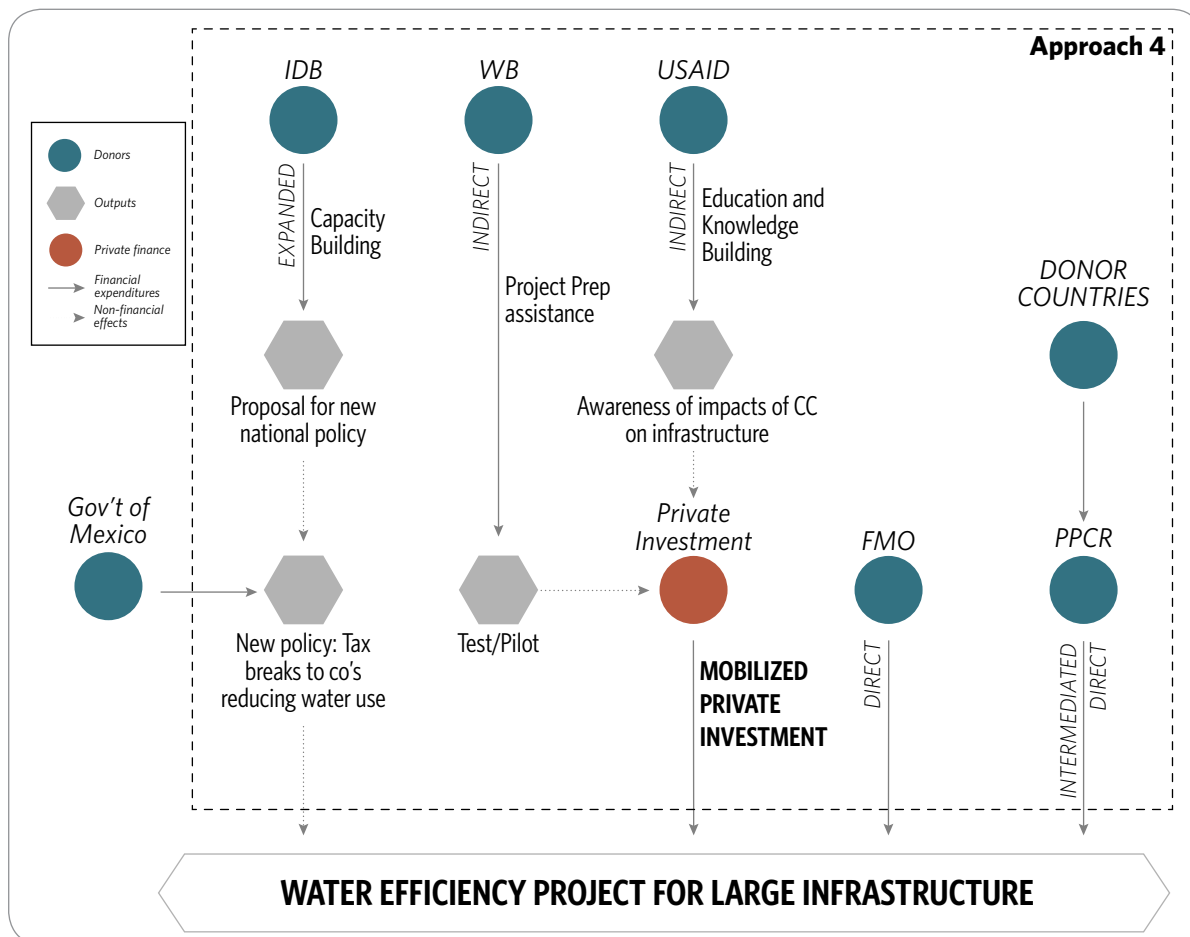


In terms of determining causality, this approach applies a *partial causality assessment* for two reasons: (a) it is unlikely that public interventions which occur upstream will fully mobilize private investment given the time lag between the intervention and the investment and (b) partial causality allows for the ability to consider other contextual factors, such as country and market conditions (though these are not directly assessed for their own causal role, as this is outside the scope of this study), and allows for different causality assessments to be done for the different interventions involved. The approach for determining partial causality is explained in Box 1.

**APPROACH 4 – DIRECT, INTERMEDIATED-DIRECT AND INDIRECT EXPANDED (TWO STEPS UPSTREAM)**

Approach 4 mirrors Approach 3, but extends the boundary two steps “upstream” of the private finance being invested and therefore includes two enabling outputs in the investment value chain to be factored in. Based on the example laid out above, all forms of public finance support – the direct project level co-finance provided by FMO, the finance provided from the PPCR, the knowledge building support from USAID, the project preparation assistance provided by the World Bank, and the policy support provided by IDB (where the public finance intervention occurred two steps upstream, first IDB supported the policy proposal, then the proposal led to the policy adoption, which helped trigger private investment) – would be included as factors playing a role in mobilizing the private investment.

Figure 10: Approach 4 – Direct, intermediated-direct, and indirect expanded



In approach 4, the assessment of partial causality is done in the same way as for Approach 3 (as explained in Box 1). Given an additional step is factored in and needs to be assessed, Steps 2-5 in the partial causality assessment needs to be repeated in order to assess the additional intermediary causal link.

In the following chapter, we apply the different methodological approaches to two adaptation projects in order to understand how the different approaches change the outcomes of how much private investment is deemed mobilized as a result of both direct and indirect public finance interventions. The approaches are then evaluated against key principles in Chapter 5.

### Box 1: Assessing partial causality

Based on the methodological approaches developed here, partial causality assessment is applied in cases of indirect mobilization, or where there is more than one direct/intermediated-direct intervention claiming to have mobilized the same amount of private finance. In order to assess partial causality, the causal relationships between the public finance inputs, the intermediary steps involved, and the final private investment must be assessed. For instance, using our example above, an international project preparation facility set up by the World Bank provides a public grant to develop and test a water efficiency technology for a large infrastructure project in an area threatened by extreme drought. Once the technology is fully developed and tested, the project developer is able to secure private investors to get the technology off the ground. The steps involved (public finance supporting the technology development, and the developed technology then causing the private investment) both need to be assessed for their causal impact in mobilizing private finance. The following method is used to determine the causal impact of each step:

1. Define the output of a specific public finance intervention (in the example above, the technology development and testing).
2. Based on interviews with the public finance provider, assess the extent to which the output (e.g., the technology development) was enabled by the public finance intervention. This assessment can be supported by reviewing relevant project documentation and evaluation reports. The identified causal link can be:
  - a. Public finance fully enabled the output (100% causality)
  - b. Public finance mainly enabled the output (range of 50-99% causality)
  - c. Public finance partially enabled the output (range of 1-49% causality)
  - d. Public finance did not participate in enabling the output (0% causality)
3. Confirm, through an interview with a stakeholder involved with the output (e.g., the company responsible for the technology), the above assessment of the causal link between the public finance intervention and the output. *If there are differences in the assessment of the causal link, use the more conservative causal link identified* (e.g., if the public finance provider states that the public finance fully enabled the technology to be tested and developed but the stakeholder states only a partial influence, then it is assumed that the public finance “partially enabled” the technology development).
4. If a causal link has been established, identify the reasons mentioned in interviews (e.g. overcoming barriers, improving capabilities, etc.) to explain the link.
5. Conduct the same assessment (steps 2-4) to identify the causal link between the output and the private investment.
6. Finally, confirm through interviews that the private investment did in fact contribute to adaptation or increased climate resilience (as there may be cases in which the public intervention is aimed at adaptation, but the outcome of the support leads to maladaptation or business as usual).

Based on the assessment of the two causal links (the link between public finance and technology testing, and the link between the technology testing and the private equity investment), the causal link between the public finance intervention and the private investment is established.

Annex 2 provides a more thorough breakdown of how to calculate partial causality, and how to mathematically arrive at the amount of private finance mobilized by a certain intervention or donor.

## Chapter 4: Case studies

We apply the different methodological approaches to two case studies: (1) Northern Uganda: Transforming the Economy through Climate Smart Agribusiness (NU-TEC); and (2) the African Risk Capacity (ARC). The aim is to understand how the application of different approaches can improve our understanding of the origination and scale of mobilized private adaptation finance and the relative impact of different public finance interventions in mobilizing these investments.

### Section 4.1: Case study 1 — Northern Uganda - Transforming the Economy through Climate Smart Agribusiness (NU-TEC)

#### Project background and components

Northern Uganda is highly vulnerable to climate change. The region's heavy dependence on rain-fed agriculture with little access to agricultural inputs and output markets as well as the lack of income diversification make it sensitive to the increased risk of extreme droughts and floods caused by climate change. Improvements in agricultural productivity and increased opportunities for purchase agreements can help make the farmers and the region as a whole more resilient to a changing climate. However, significant levels of adaptation-smart investments and underlying behavioral changes are required to this end.

In 2014, DFID initiated the Northern Uganda - Transforming the Economy through Climate Smart Agribusiness (NU-TEC) initiative, which aims to support Northern Uganda's transition from a region that has low levels of development and is highly vulnerable to climate, to a wealth creating economy with higher climate resilience. It aims to increase the adaptive capacity, productivity and market access of agricultural businesses ("agribusinesses") and smallholder farmers in the region. This is intended to be done by, for example, improving smallholders' access to input and output markets, improving crop diversification, enabling water or crop storage, replacing rain-fed agriculture with crop irrigation, and developing non-farm income sources. Overall, NU-TEC aims to influence investment decisions to increase climate-resilient agricultural practices in the region.

In 2014, DFID committed a total of GBP 48 million (USD 79 million<sup>9</sup>) to NU-TEC over the period of 2014-2022. NU-TEC, which is only just getting off the ground, will target agribusinesses in order to have a more effective structural impact on the agricultural sector, with

smallholders as the ultimate beneficiaries as suppliers to and consumers of agribusiness products.<sup>10</sup>

There are three major financial components of NU-TEC:

#### **Component 1: Technical assistance for market development: GBP 15 million (USD 25 million)**

DFID has committed GBP 15 million (USD 25 million) in technical assistance through Palladium, an international development company, to support a climate-smart market and business model development for small and medium agribusinesses over a five-year period. This will enable agribusinesses to develop new products, expand geographically, or purchase new crops. The resulting diversification and expansion of input and output markets will increase farmers' income, improve livelihoods and increase climate resilience. This technical assistance is expected to help mobilize private investment. By helping develop and prove commercially sound business models to existing agribusinesses, these companies can then use their own balance sheets to invest in new business opportunities.

#### **Component 2: Long-term capital provided through AgDevCo: GBP 12 million (USD 20 million)**

DFID has committed GBP 12 million (USD 20 million) to AgDevCo, a non-profit venture capital organization that provides early-stage capital in the form of debt and equity to commercial opportunities in the agricultural sector. AgDevCo functions as a project developer and takes a hands-on project development role (including identifying projects, securing access to land, linking smallholder farmers to markets) and mitigates many of the front-end risks that deter private investment

<sup>9</sup> All figures are converted into USD based on the OECD's 2014 official exchange rate: 0.6077.

<sup>10</sup> For example, NU-TEC can support a seed distributor to set up a new distribution system for drought-resistant seeds. The smallholders benefit, as there is a new, climate-resilient seed available for purchase. If NU-TEC works with agribusinesses to expand to a new area, this creates new demand and potential profits for smallholders in that new area.

into African agriculture. Through AgDevCo, DFID will fund investment capital and the scoping costs, market analysis, and delivery of technical assistance to attractive agribusiness ventures in Northern Uganda to support climate smart agribusiness activities. AgDevCo is expected to mobilize private investment by raising third-party capital for these ventures.

**Component 3: Short and medium-term (debt) capital: GBP 10 million (USD 16 million)**

DFID has committed GBP 10 million (USD 16 million) to expand the financial sector's range of agribusiness financial services. Banks in the region have typically maintained very conservative lending practices, targeting only well established, large businesses, and avoiding agricultural production. DFID will work with a financial institution to fund as well as establish new financial products and services that are attractive to agribusinesses in Northern Uganda with the objective that these products and services can later be incorporated into normal business lending operations. Procurement is still in process, but DFID plans to provide funds to a financial institution with a strong network, balance sheet and client base that can lend to the target market. The funds will in turn provide financing (e.g., loans and credit lines) at commercial rates (e.g., 20-25%) in order to be market-oriented and have commercial sustainability. Borrowers may include traders, cooperatives and farms that want to

purchase cleaning, drying and storage equipment, for example. While this financing may help mobilize private investment (for example through co-investment, or the financial institution's adoption of these products as part of normal commercial operations) this mobilization is not being monitored by DFID at this time.

**Additional set-aside: GBP 10 million (USD 16 million)**

DFID has set aside GBP 10 million (USD 16 million) which may be allocated, at a later date, to any of these three components and their related investments based on impacts achieved. DFID is also providing GBP 1 million (USD 2 million) for ongoing monitoring and evaluation of the initiative.

**Projected private finance investments**

As this initiative is just now getting started and, as a consequence, no results have yet been achieved, any figures on finance mobilization are forward looking estimates and likely to require adjustments once project activities get underway. Based on existing estimates by DFID, it is expected that the project will help secure up to GBP 70 million (USD 115 million) in private investment commitments in climate-resilient agribusiness enterprises and activities. Of this amount, it is expected that AgDevCo will secure GBP 22 million (USD 36 million) in private sector co-investment and up to GBP 48 million (USD 79 million) will be secured through technical assistance for market development.



Figure 11: NU-TEC's financial value chain

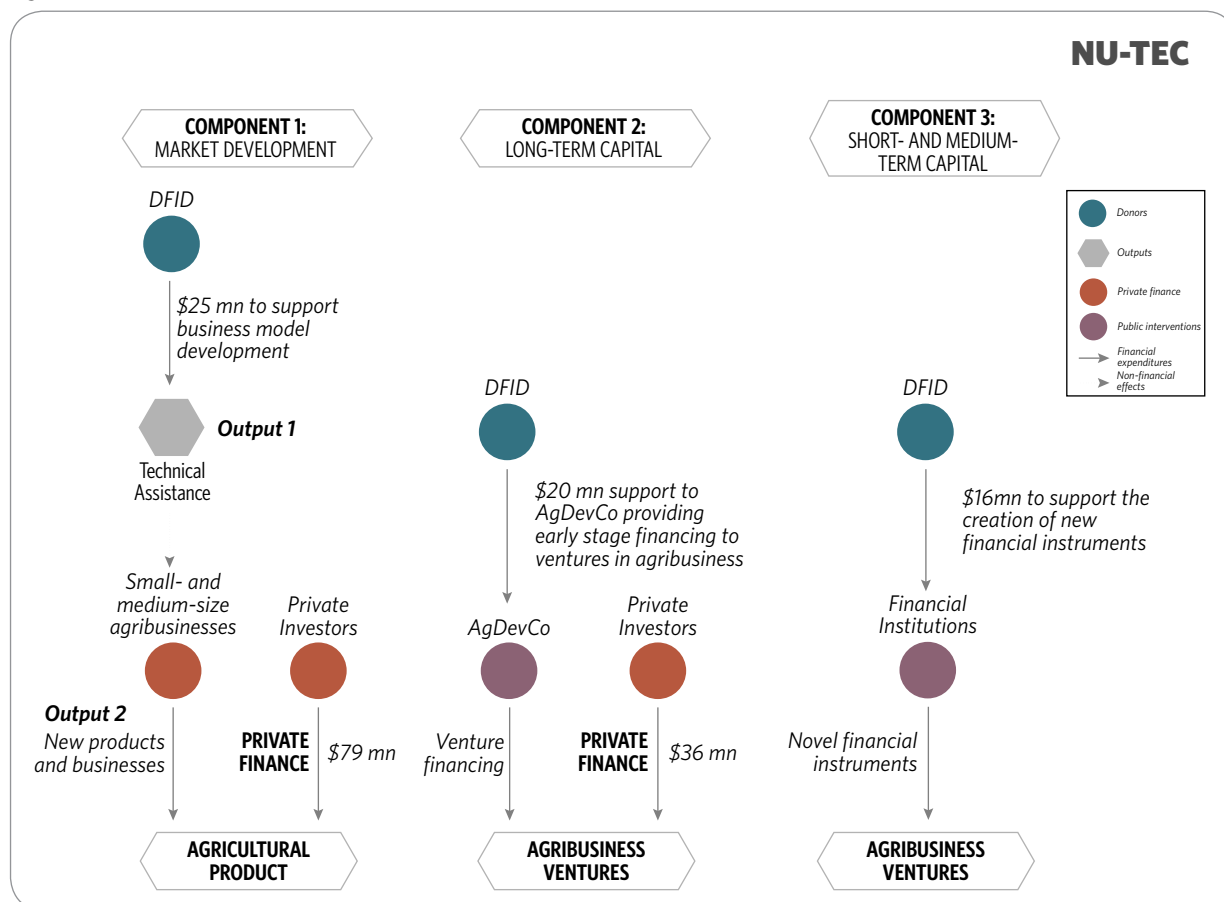


Table 6: Summary of NU-TEC components and investments

COMPONENT	AMOUNT COMMITTED BY DFID	INSTRUMENT PROVIDED BY COMPONENT	AMOUNT OF TARGETED PRIVATE INVESTMENT
1: Market Development for climate-resilient agribusiness enterprises and activities	GBP 15 million (USD 25 million) provided through contract to Palladium	Technical assistance	GBP 48 million (USD 79 million)
2: Long-term capital	GBP 12 million (USD 20 million) provided to AgDevCo	Long-term finance 70% equity or debt (provided via AgDevCo's capital fund), 30% technical assistance	GBP 22 million (USD 36 million) through private sector co-investment
3: Short and medium term capital	GBP 10 million (USD 16 million) provided to a financial institution operating in Northern Uganda	Likely to be short to medium-term loan or credit line, but could be any financial service product (e.g., guarantee, insurance). To be determined by winning bidder.	
Additional capital set aside for best performing component(s)	GBP 10 million (USD 16 million)	Depends on where money is invested	
Monitoring & evaluation (M&E) support	GBP 1 million (USD 2 million)	Contract with M&E provider	
<b>Total</b>	<b>GBP 48 million (USD 79 million)</b>		<b>GBP 70 million (USD 115 million)</b>

## Estimating mobilized private finance for adaptation mobilized by NU-TEC

The following section applies the four methodological approaches outlined in Chapter 3 to the NU-TEC case in order to see how much private finance participation the initiative is likely to attract, and how much of that can be considered as mobilized by and attributed to DFID's interventions. The decision points that vary across the four methodological approaches (type of public intervention, boundaries, causality, and attribution) are detailed below. For the full list of methodological decision points uniformly applied across all four methodological approaches, see Annex 3.

**Approach 1: Direct** – cannot be applied, as there is no private co-finance directly associated with the public interventions. Therefore, using Approach 1, no private adaptation finance is identified and estimated as mobilized.

### Approach 2: Direct and intermediated-direct

DECISION POINTS	DESCRIPTION
<b>TYPE OF PUBLIC INTERVENTION</b>	<ul style="list-style-type: none"> <li>• USD 20 million debt and/or equity capital via AgDevCo (NU-TEC's Component 2), which is expected to mobilize USD 36million from third party private investors in agribusiness ventures.</li> <li>• USD 16 million provided via financial institutions (NU-TEC's Component 3) is not included here as no private finance mobilization is estimated associated with this intervention.</li> </ul>
<b>BOUNDARIES</b>	Includes any public co-finance at source (none for NU-TEC) or via funds or credit lines one step upstream of the end investment (NU-TEC's Component 2).
<b>CAUSALITY</b>	According to the methodology for Approach 2, blanket causality (100%) is assumed.

» **Result: Using Approach 2, it is estimated that USD 20 million of DFID's investment in NU-TEC will mobilize USD 36 million in private finance.**

### Approach 3: Direct, intermediated direct, and indirect

DECISION POINTS	DESCRIPTION
<b>TYPE OF PUBLIC INTERVENTION</b>	<ul style="list-style-type: none"> <li>• USD 20 million debt and/or equity capital via AgDevCo (NU-TEC's Component 2), which is expected to mobilize USD 36 million from third party private investors in agribusiness ventures.</li> <li>• USD 25 million in technical assistance via Palladium (NU-TEC's Component 1), which is expected to mobilize USD 79 million in agribusiness investments.</li> <li>• USD 16 million provided via financial institutions (NU-TEC's Component 3) is not included here as no private finance mobilization is estimated associated with this intervention.</li> </ul>
<b>BOUNDARIES</b>	Includes: <ul style="list-style-type: none"> <li>• Any co-finance at source (none for NU-TEC)</li> <li>• Co-finance via funds or credit lines one step upstream of the end investment (NU-TEC's Component 2)</li> <li>• Enabling outputs provided one step upstream in the investment value chain (NU-TEC's Component 1)</li> </ul>
<b>CAUSALITY</b>	Based on interview with public investor (DFID): DFID "fully enables" AgDevCo's support, and is likely to "fully enable" the private co-investment achieved. Based on interview with AgDevCo, DFID "fully enabled" AgDevCo to conduct its business in Northern Uganda, and AgDevCo's project-level involvement is likely to "fully enable" the private investment to be made as AgDevCo de-risks the investment with its early stage patient capital. Therefore, full causality is applied to Component 2. Based on interview with public investor (DFID): DFID "fully enables" Palladium's support, and believes Palladium's support will "mainly enable" private agribusinesses to invest in climate-resilient activities (factoring in market conditions, the role of other donors in providing financial aid, etc.). Based on interview with Palladium, DFID "fully enabled" Palladium's technical assistance work in Northern Uganda, and Palladium's technical assistance is likely to "mainly enable" private agribusinesses to invest in climate-resilient activities for the same reasons stated by DFID. Therefore, there is a 50-99% causal link applied to Component 1.

» **Result: Using Approach 3, it is estimated that USD 44 million of DFID's investment in NU-TEC will mobilize USD 36 million, and will mobilize an additional USD 39-79 in private investment.**

**Approach 4: Direct, intermediated direct, indirect, and indirect expanded**

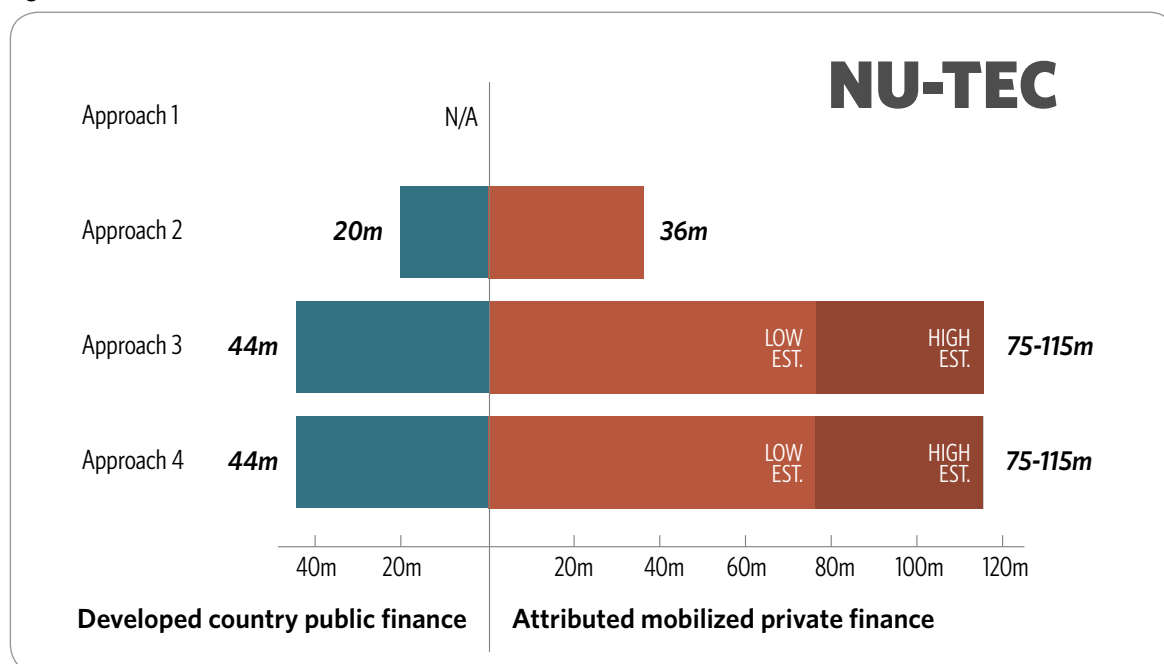
DECISION POINTS	DESCRIPTION
<b>TYPE OF PUBLIC INTERVENTION</b>	<ul style="list-style-type: none"> <li>• USD 20 million debt and/or equity capital via AgDevCo (NU-TEC’s Component 2), which is expected to mobilize USD 36m from third party private investors in agribusiness ventures.</li> <li>• USD 25 million in technical assistance via Palladium (NU-TEC’s Component 1), which is expected to mobilize USD 79 million in agribusiness investments.</li> <li>• USD 16 million provided via financial institutions (NU-TEC’s Component 3) is not included here as no private finance mobilization is estimated associated with this intervention.</li> </ul>
<b>BOUNDARIES</b>	<p>Includes:</p> <ul style="list-style-type: none"> <li>• Any co-finance at source (none for NU-TEC)</li> <li>• Co-finance via funds or credit lines one step upstream of the end investment (NU-TEC’s Component 2)</li> <li>• “Soft” intermediary outputs provided one step upstream in the investment value chain (NU-TEC’s Component 1)</li> <li>• “Soft” intermediary outputs provided two steps upstream in the investment value chain (none for NU-TEC)</li> </ul>
<b>CAUSALITY</b>	<p>Full causal link identified for Component 2 (as explained in Approach 3 above). Therefore, full causality is applied to Component 2.</p> <p>Main causal link identified for Component 1 (as explained in Approach 3 above). Therefore, there is a 50-99% causal link applied to Component 1.</p>

» **Result: Using Approach 4, it is estimated that USD 44 million of DFID’s investment in NU-TEC will mobilize USD 36 million, and mobilize an additional USD 39-79 million in private investment.**

Result is the same as Approach 3, as there are no public finance interventions two steps upstream in the investment value chain.

Figure 12 below shows the range of estimated private finance mobilized associated with NU-TEC across the four different methodological approaches.

Figure 12: NU-TEC Private Finance Mobilized



## Section 4.2: Case study 2 — the African Risk Capacity (ARC)

### Project background and components

The current domestic and international systems for responding to natural disasters and extreme weather events in Africa are not as effective as they could be. Funding, often secured as an emergency response, predominantly arrives after disaster strikes. This often means that more resources are depleted, infrastructure is damaged, and livelihoods are compromised than need be the case.

Insurance is one potential solution for dealing with disaster risks but private insurance for sovereign risk is either unavailable or too expensive for most countries in Africa. This is demonstrated by the low rate of insurance cover for direct losses from natural disasters in Africa. Only around 5% of losses from natural disasters in low-income countries are covered by insurance compared to around 40% in developed countries. Sub-Saharan Africa sits well below this 5% average.

In response to this, the African Union, in partnership with international donors as well as with technical assistance from the United Nations World Food Programme (UN WFP), established the African Risk Capacity (ARC) in 2012. ARC aims to enable African governments to better prepare for and respond to food security risks caused by extreme weather events and natural disasters that will likely be amplified by climate change. ARC consists of two entities: ARC Agency, a specialized Agency of the African Union (AU) and a financial affiliate, ARC Insurance Company Limited (ARC Ltd).

ARC Agency, established in 2012, builds risk management capacity amongst countries, supports country-driven drought response, assures and monitors the quality and implementation of contingency plans. It builds governments' capacity to take out insurance products offered by ARC Ltd. The contingency plans can also play a role in incentivizing policyholders to invest in adaptation measures that aim to reduce climate risks.

In a second stage, ARC Ltd was established in late 2013, and capitalized in early 2014 as a licensed and regulated mutual insurance company which sells disaster (currently drought, soon to expand to flood and tropical cyclone) insurance to participating states.

ARC Ltd aims to address drought impacts by:

- **Providing drought insurance to African**

**governments, thereby transferring part of their extreme climate risk onto ARC.** By pooling risk across Africa, the cost of insurance is reduced by half compared to what it would be if countries approached reinsurers directly. Countries then use their insurance payouts to address the impact of drought on vulnerable populations, based on pre-approved contingency plans.<sup>11</sup>

- **Enabling more timely payments to policyholders by providing funds at times of natural disaster when they are most needed.** Africa RiskView, ARC's in-house risk modelling platform, is used to estimate crop losses and consequent national response costs. Payouts are triggered automatically if rainfall has been insufficient without requiring policyholders to go through the lengthy process of claiming for specific losses caused by the drought.<sup>12</sup>

As an insurance risk pool, ARC Ltd's objective is to capitalize on the natural diversification of weather risk across Africa, allowing countries to manage their risk as a group in a financially efficient way. While these approaches are not necessarily new, they are being applied here in an innovative way to help to lower overall costs and increase access:

- ARC Ltd's initial funding comes from Development Capital<sup>13</sup> contributions from DFID and KfW Development Bank, with countries holding insurance policies contributing their share of premiums over time.
- Premiums are risk-based to ensure fairness across the pool, with all participants benefiting from diversification of the portfolio across the continent. Countries are able to choose how much cover they take.
- In order to spread the risk and protect against insolvency, ARC Ltd purchases reinsurance from the private reinsurance markets.

11 Countries participating in ARC Ltd can customize their drought cover by choosing parameters such as which crop to use in the model and at what threshold losses are triggered. To join, a country must have a Certificate of Good Standing, including a pre-approved contingency plan setting out how any insurance pay-outs will be used.

12 The parametric insurance does not indemnify the pure loss, but ex ante agrees to make a payment upon the occurrence of a triggering event or based on loss evaluated within a pre-agree model.

13 This Development Capital is returnable after 20 years, interest free.

Reinsurance is the primary mechanism for transferring risk from primary insurance providers to international markets.

The ARC insurance premiums are affordable to African governments because ARC (a) receives initial capital from donors under concessional terms, (b) diversifies risk across African countries, and (c) transfers risk to the international private reinsurance markets by purchasing private reinsurance.

### Public finance contributions to ARC Agency and ARC Limited

Donor finance was essential to support the creation and running of both ARC Agency and ARC Ltd. ARC Agency has received USD 42.32 million in support from donor institutions.

For ARC Ltd, DFID and KfW Development Bank collectively committed just under USD 100 million (each donor committing equal amounts), which serves as the initial capital base for the pool. They have pledged further support, which can be paid in on the basis of need and performance (DFID pledged a total of up to GBP 90 million, while KfW's likely further pledge is expected shortly). It is projected that after 20 years of operations, ARC Ltd will be self-sustaining, and able to reimburse donors' initial interest-free investments .

### Insurance coverage and payouts

Over the first year of ARC Ltd's operations, four African governments – Niger, Senegal, Mauritania and Kenya – paid in premiums of USD 17 million (Kenya paid a premium of USD 9 million, while the other three countries collectively paid a total of USD 8 million) in exchange for USD 129 million in drought insurance coverage. ARC Ltd secured USD 55 million of capacity from the international private reinsurance markets in order to cover part of the USD 129 million. ARC Ltd paid USD 5.5 million in premiums to 13 private reinsurers to obtain this. At the end of the policy year, ARC Ltd reported USD 26.3 million of claims liabilities that were paid to Niger, Senegal and Mauritania as payout (USD 3.5 million to Niger, USD 16.5 million to Senegal, and USD 6.3 million to Mauritania). To cover this payout, USD 11.3 million was paid by private reinsurers and the remainder was paid from ARC Ltd, producing an underwriting loss of USD 3.5 million (without expenses). This amount (USD 3.5 million) was drawn down from DFID and KfW's contributions to the capital pool. Figure 13 below summarizes premiums and liability payouts for ARC's first year.

For the purposes of this case study, we use the value of the private reinsurance payout (USD 11.3 million) as the total amount of private finance under consideration for the mobilization assessment. This amount corresponds to the value of private finance coverage actually disbursed at the country level. However, it

Figure 13: ARC Ltd's operations for the 2014/15 policy year

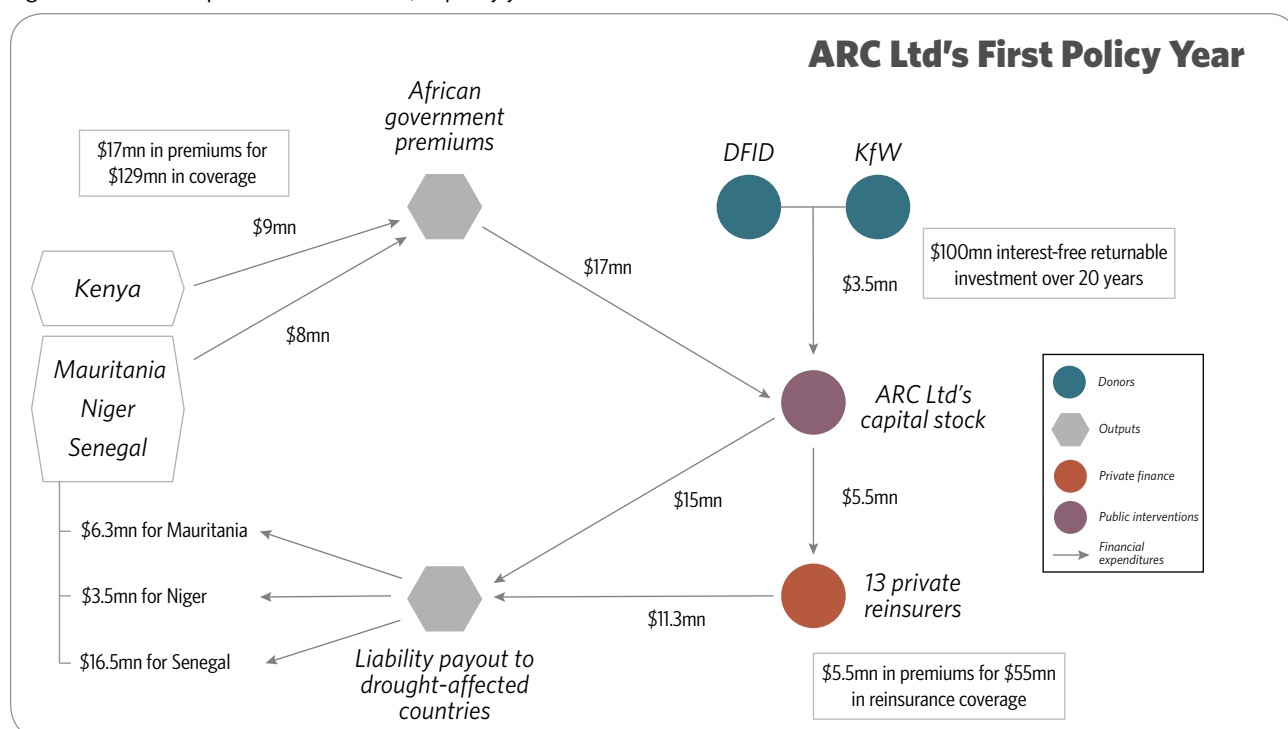
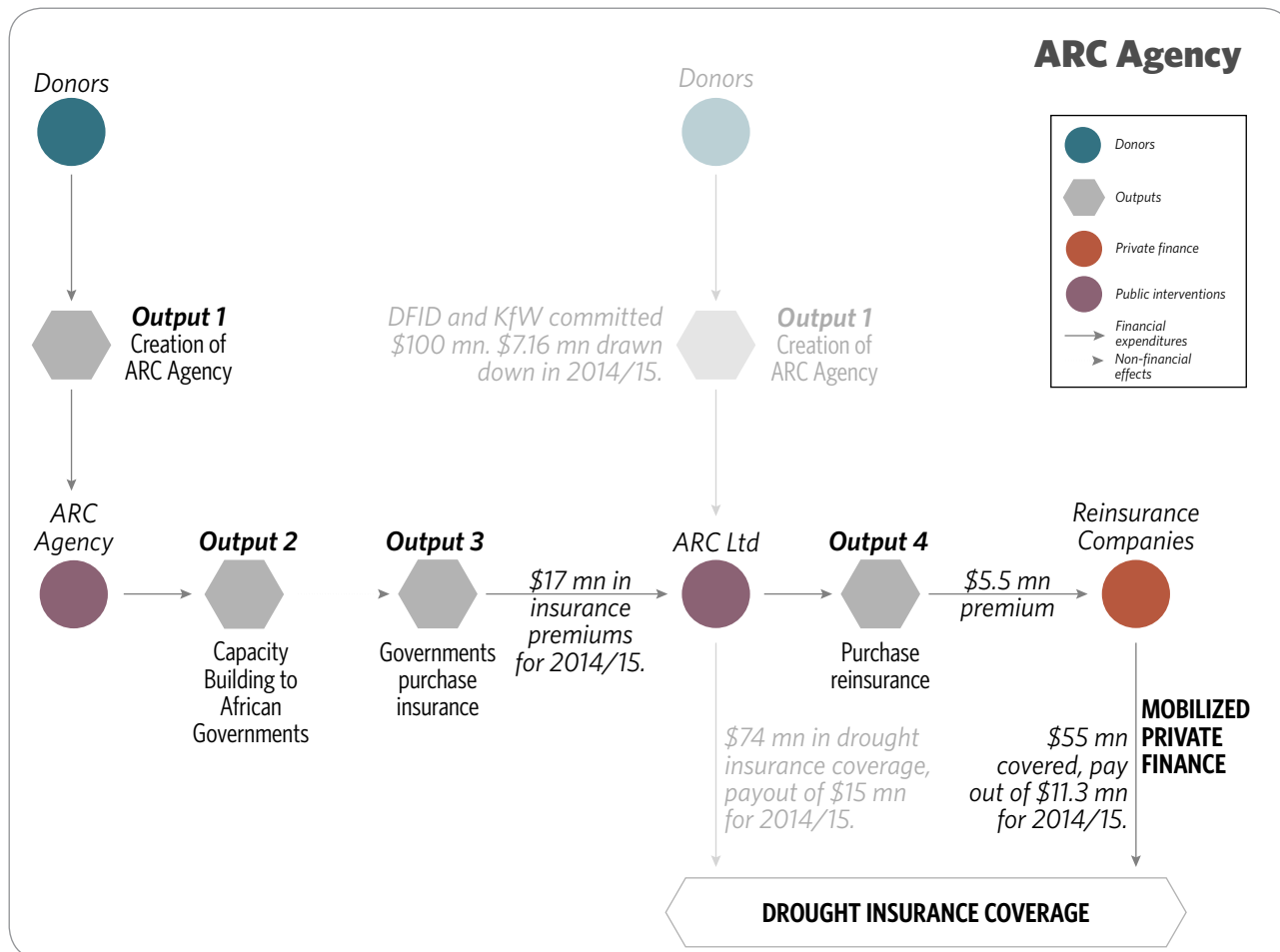


Figure 14: ARC Agency's financial value chain



should be noted that this value could underestimate potential private sector involvement and private finance mobilization given that the payout value does not necessarily reflect the opportunity cost of keeping capital available for coverage in case a large number of claims occur in the short period of time, nor does it reflect the cost of risk. Additionally, using a single annual payout value may be misleading as a measure of the real amount of private finance that is likely to be mobilized over time, as there is large annual volatility. Moreover, the approach using actual payments would estimate mobilized private climate finance as zero if no payout claim were made.

To take these factors into consideration, another option for estimating the value of mobilized private finance is to use the *total coverage* by the reinsurance companies (in this case USD 55 million) as this is contractually the maximum amount that reinsurers are prepared to pay. Alternatively, one could use the *premium cost* (USD 5.5 million paid to the reinsurers), which closely reflects what the reinsurers expect to provide in payouts, but averaged over the long term (plus some margin for profit and to account for the cost of

capital). This takes the volatility out of the annual payout values. Future work could consider using one of these alternative values when estimating the amount of mobilized private finance. On-going work within the international community to measure amounts mobilized by guarantees (OECD DAC, 2015b) as well as initial attempts to report on climate-related export credits and the private finance they mobilize (Trinomics, 2015 forthcoming) could inform this work.

### Estimating ARC's mobilized private adaptation finance

The following section applies the four methodological approaches outlined in Chapter 3 to the ARC case in order to see how much private finance the initiative has mobilized.

Given the complexities of this case study, it is important to identify the various steps involved in ARC's financial value chain to demonstrate where the private finance mobilization may be occurring. The value chains relating to ARC Agency and ARC Ltd are examined separately.

- For ARC Agency, bilateral public finance helped



establish the Agency (Agency = Output 1). The Agency then helped build capacity within African governments and oversaw development and implementation of their contingency plans to enable them to purchase insurance from ARC Ltd (capacity building = Output 2). The purchasing of insurance from ARC Ltd (Output 3) leads to ARC Ltd's purchase of reinsurance (Output 4), which ultimately leads to the private finance payout.

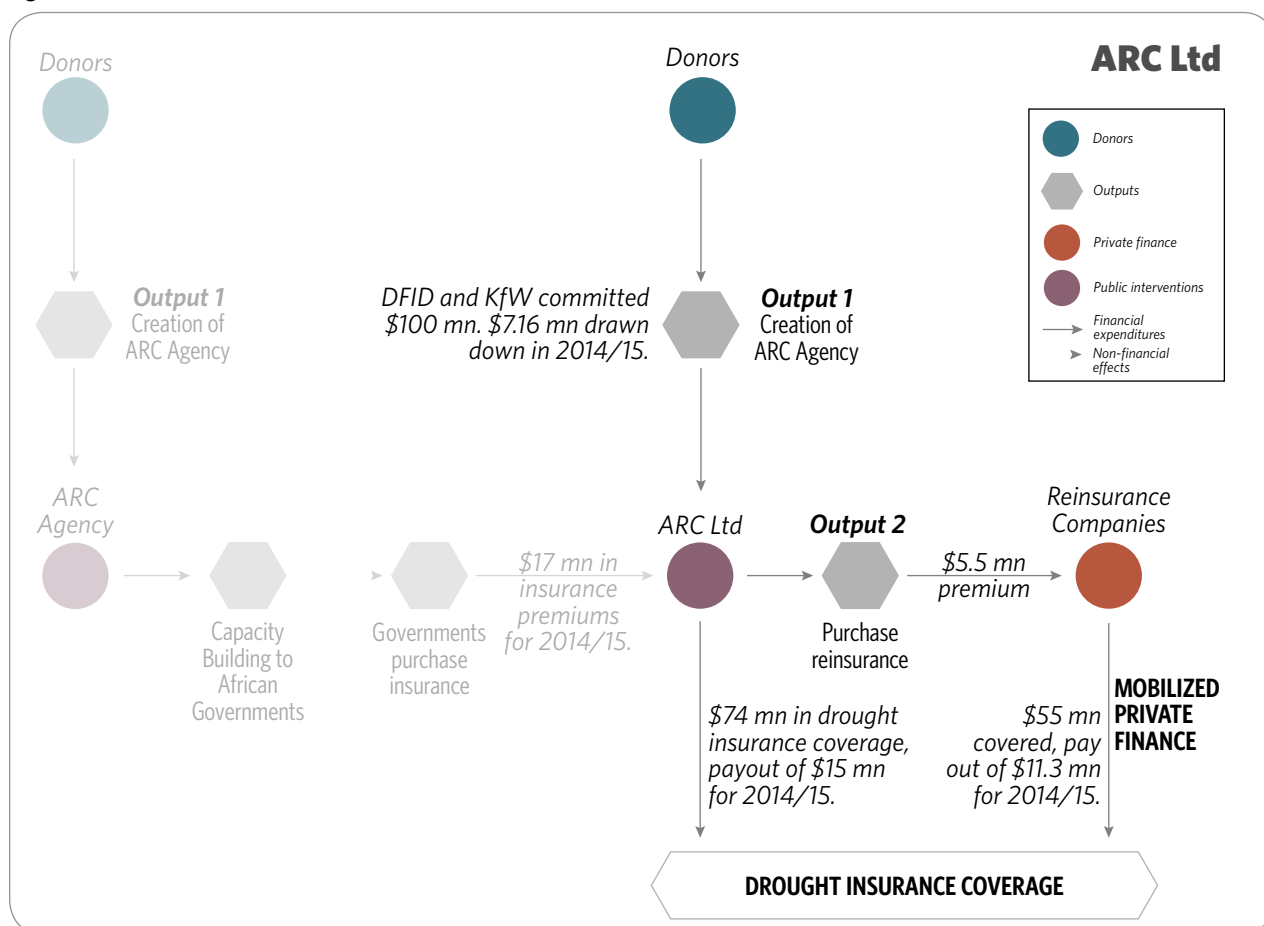
- Because there are four intermediary outputs and the intervention started four steps upstream from the private finance payout, the funding provided in support of ARC Agency is outside the scope of all methodological approaches considered in the present report, due to the complexity, uncertainty and resource-intensity of assessing mobilization via that many steps. If boundaries were extended to include this more upstream intervention, the calculation would be quite challenging. This is because the causal link assessment for the intervention related to ARC Agency and attribution of new donors to that intervention would need to be factored in to the assessment, while the amount of private finance associated

with this case remains unchanged. This would mean assigning smaller mobilization values to the donors who are directly support ARC Ltd.

- For ARC Ltd, donor finance was used to establish the capital base for the insurance pool (ARC Ltd insurance pool = Output 1). This leads to ARC Ltd's purchase of reinsurance (Output 2), which ultimately leads to the private finance payout. Because there are two intermediary outputs and the intervention started two steps upstream from the private finance payout, the role of donors in supporting ARC Ltd is within the scope of methodological Approach 4, as applied below.

The following section applies the four methodological approaches outlined in Chapter 3 to the ARC case in order to see how much private finance participation the initiative is likely to attract, and how much of that can be considered as mobilized by international public finance interventions. The decision points that vary across the four methodological approaches (type of public intervention, boundaries, causality, and attribution) are detailed below. For the full list of methodological decision points uniformly applied across all four methodological approaches, see Annex 4.

Figure 15: ARC Ltd's financial value chain



**Approach 1: Direct** – not applied, as there is no private co-finance directly associated with the public interventions. Therefore, using Approach 1, no private adaptation finance is identified and estimated as mobilized.

**Approach 2: Direct and intermediated direct** – not applied, as there is no direct or intermediated-direct private co-finance associated with the public interventions. Therefore, using Approach 2, no private adaptation finance is identified and estimated as mobilized.

**Approach 3: Direct, intermediated-direct and indirect** – not applied, as there is no direct or intermediated-direct private co-finance, nor any interventions “via one enabling output” associated with the public interventions. Therefore, using Approach 3, no private adaptation finance is identified and estimated as mobilized.

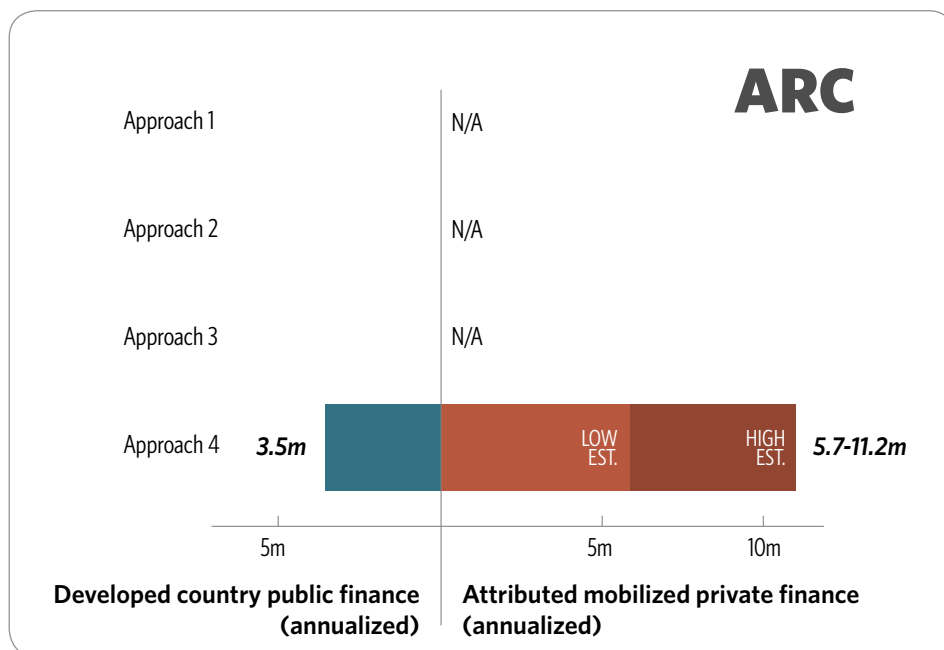
**Approach 4: Direct, intermediated direct, indirect and indirect expanded**

DECISION POINTS	DESCRIPTION
<b>TYPE OF PUBLIC INTERVENTION</b>	<ul style="list-style-type: none"> <li>• USD 100 million committed, with USD 3.5 million as the annualized amount for the first policy year (equal amounts paid in from DFID and KfW) for ARC Ltd’s capital pool, which led to 11.3 million in payouts from the private reinsurance market in the first policy year</li> <li>• (Financial contributions to ARC Agency are too far upstream and are therefore not included in this assessment – see steps below)</li> </ul>
<b>BOUNDARIES</b>	<p>Include:</p> <ul style="list-style-type: none"> <li>• Any co-finance at source (none for ARC)</li> <li>• Any co-finance via funds or credit lines one step upstream of the end investment (none for ARC)</li> <li>• Any finance provided one step upstream in the investment value chain, but outside co-finance via funds and credit lines (none for ARC)</li> <li>• Any finance provided two steps upstream (for ARC, this is the donor financed capital pool for ARC Ltd which is two steps upstream of the provision of private finance:                             <ul style="list-style-type: none"> <li>» 2 steps upstream: public donor finance to establish ARC Ltd</li> <li>» 1 step upstream: ARC Ltd purchases private reinsurance</li> <li>» Final private finance mobilization: purchase of private reinsurance enables private finance payout</li> </ul> </li> </ul> <p>Do not include:</p> <ul style="list-style-type: none"> <li>• Financial support for technical assistance provided through ARC Agency. This financial support is four steps upstream of the private finance payout and therefore outside the scope of this assessment:                             <ul style="list-style-type: none"> <li>» 4 steps upstream: Public donor finance establishes ARC Agency</li> <li>» 3 steps upstream: ARC Agency provides TA to African governments</li> <li>» 2 steps upstream: as a result of TA, governments purchase insurance from ARC Ltd</li> <li>» 1 step upstream: ARC Ltd purchases private reinsurance</li> <li>» Final private finance mobilization: purchase of private reinsurance enables private finance payout</li> </ul> </li> </ul>
<b>CAUSALITY</b>	<p>Based on interview with public investor (DFID), donor support “fully enabled” ARC Ltd to be established. DFID’s and KfW’s support made it possible to develop ARC much more efficiently and quickly. Moreover, the premium cost would have been higher without the donor support. According to ARC Ltd, donor support from DFID and KfW “mainly enabled” their establishment. While ARC Ltd agrees with the reasons mentioned above, ARC Ltd notes that it could have been established more slowly over time through the building up of a capital pool based on countries’ premiums alone, but this was unlikely to happen any time in the near future.</p> <p>Both DFID and ARC Ltd agree that ARC Ltd in turn “fully enabled” the private re-insurance coverage of natural disaster risks for African countries and the subsequent private finance payouts, given that the major reinsurance companies had been trying to work in African markets, yet had never been able to establish sovereign risk reinsurance deals as they were never able to build relationships with sovereign clients.</p> <p>Therefore, based on these interviews we determine that there is 50%-99% causality between public finance intervention (support from DFID and KfW) and private finance mobilization (private reinsurance coverage).</p>

» **Result: Using Approach 4, the financial contributions from DFID and KfW to the capital pool of ARC Ltd (USD 100 million over 20 years equivalent to an annualized amount of USD 3.5 million) mobilized between USD 5.7-11.2 million in private finance from the international private reinsurance market in ARC Ltd's first policy year (2014/15). As equal contributors, this means USD 2.85-5.6 million is attributed to DFID and 2.85-5.6 million is attributed to KfW.**

Figure 16 below shows the range of estimated private finance mobilized associated with ARC across the four different methodological approaches.

Figure 16: ARC Private Finance Mobilized



## Chapter 5: Evaluation of methodological approaches

### Key messages:

- There appears to be an inverse relationship in the methodological approaches developed between their **accuracy and the incentives they provide on the one side, and their practicality of implementation and standardization potential (including minimizing risks of double counting) on the other side.**
- Methodological approaches that only include direct and intermediated mobilized finance are the most practical and easiest to standardize but fail to account for the important role played by finance for project demonstration, capacity building and budgetary support activities.
- Methods considering indirect mobilization score better on accuracy and incentivizing public finance for capacity building and budgetary support, but data limitations and the cost of carrying out a proper evaluation limit their practicality and standardization potential across projects and public finance providers.
- A coherent application of one methodological approach among the public actors supporting the same activity is needed to minimize risks of double counting. This is especially the case where both upstream (indirect mobilization) and downstream (direct mobilization) public finance interventions can claim to have participated in mobilizing the same private finance.
- **Alternative methodological approaches other than those explored in this report could be considered (e.g. surveys, econometrics), but may be difficult and/or impractical to implement due to various barriers, such a lack of resources and data unavailability.**

In order to understand the strengths and weaknesses of the different methodological approaches, this chapter evaluates each methodological approach against four criteria below. These were developed under the OECD-hosted Research Collaborative on Tracking Private Climate Finance, first introduced by Srivastava and Venugopal (2014), and later incorporated into the evaluation of the different options under the four-stage framework (Jachnik, Caruso and Srivastava, 2015):

- **Accuracy:** Reflects a realistic and complete depiction of which interventions enabled private finance to be mobilized;
- **Incentives:** Encourages the use of public interventions to deliver climate benefits; promotes means to scale up finance for climate action;
- **Potential for standardization:** Is applicable to various types of reporting entities; allows for aggregation and comparison; avoids double counting across reporting entities; and
- **Practicality:** Is feasible with the data and expertise available; is time- and cost-efficient to report.

## Section 5.1: Summary evaluation

Table 7 below summarizes the different methodological approaches and how they perform against the identified set of criteria. As further detailed in the below subsections, there are both strengths and limitations across all approaches, and identifying a preferred approach depends on how one weighs the different principles against which the approaches are evaluated. It should

be noted that none of the approaches take into account the impact of exogenous factors, such as broader market and country conditions that shape the enabling environment for investment to occur and thus also play a role in incentivizing or disincentivizing private finance. This is an important area for future work.

Table 7: Summary evaluation of methodological approaches

APPROACH	ACCURACY	INCENTIVES	POTENTIAL FOR STANDARDIZATION	PRACTICALITY OF IMPLEMENTATION
APPROACH 1: "DIRECT"	<b>Moderate.</b> May overestimate direct mobilization by disregarding the role played by certain public	<b>Moderate-weak.</b> Encourages the use of public finance interventions that are likely to directly mobilize private co-finance at the project level; does not incentivize the use of public finance interventions that have indirect mobilization effects.	<b>Moderate-Strong</b> In principle easy to standardize across institutions. If approach not standardized, some risk of double counting across entities that are co-financing the same project.	<b>Strong.</b> Feasible with available data for most public finance instruments.
APPROACH 2: "DIRECT AND INTERMEDIATED-DIRECT"	finance interventions (for e.g. capacity building) in indirectly mobilizing private finance.	<b>Moderate-weak.</b> Encourages the use of public finance that are likely to mobilize private finance directly or in an intermediated manner; does not incentivize the use of public finance interventions that have indirect mobilization effects.	<b>Moderate.</b> Relatively easy to standardize but needed across a wider range of public finance interventions and institutions (e.g. funds) than Approach 1. As such, the risk of double counting across public interventions is slightly higher.	<b>Moderate-strong.</b> Feasible but requires data availability beyond the immediate point of commitment of public finance.
APPROACH 3: "DIRECT, INTERMEDIATED-DIRECT AND INDIRECT"	<b>Strong.</b> Takes into account both the direct and indirect mobilization effect of public finance interventions.	<b>Moderate.</b> Can incentivize all public finance intervention types, except those mobilizing private finance with more than 1 intermediary step.	<b>Weak.</b> Given causality assessment is qualitative, the approach could be standardized but results not necessarily consistent from one public actor/project to another. As a result, there is an increased risk of double counting.	<b>Weak.</b> Time-consuming (and therefore costly) to assess partial causality, thus less feasible and practical to implement than Approaches 1 and 2.
APPROACH 4: "DIRECT, INTERMEDIATED DIRECT, INDIRECT AND INDIRECT EXPANDED"		<b>Moderate-strong.</b> Can incentivize all public finance intervention types, except those mobilizing private finance with more than 2 intermediary steps.		

## Section 5.2: Evaluation of "Approach 1 — Direct"

The use of blanket causality and sole focus on direct private co-finance makes Approach 1 by far the most practical to implement and easy to standardize approach across different institutions. As such, it is the approach most likely to make it possible to minimize risks of double counting. However, this approach will not capture the role of key financial interventions that can play a critical role in indirectly mobilizing private finance including intermediated finance via funds or credit lines, or public finance in support of policy development/deployment. If widely adopted, such an approach would not incentivize the use of intermediated and public interventions with an indirect but significant

mobilization effect. This approach also does not capture private finance that might be mobilized indirectly in the absence of public co-finance at the project level.

Our case studies illustrate the limitations of this approach, as neither case provides an example of direct public intervention. If we assumed Approach 1, we would be concluding that neither NU-TEC nor ARC mobilize any private finance, which is an inaccurate conclusion. We can see that this approach, albeit simple and easy to employ, is not sufficient in estimating the mobilization impact of and incentivizing public interventions beyond those attracting direct private co-financing.

### Section 5.3: Evaluation of “Approach 2 — Direct and intermediated-direct”

Given the similarities between Approach 1 and 2, the evaluation is also similar. Approach 2 is also relatively easy to standardize and implement, although the wider range of public finance interventions and actors involved (e.g. funds of funds) does slightly increase the risk of potential double counting. As it allows for the inclusion of both direct co-finance and intermediated co-finance, this approach is slightly more accurate than Approach 1 as it factors in larger range of interventions. However, like Approach 1, Approach 2 will not capture the indirect effect of public finance interventions and could therefore disincentivize the use of such interventions if widely adopted (e.g. for NU-TEC only the USD 36 million of AgDevCo financing is involved, and not the USD 25 million provided in technical assistance). Like Approach 1, it has the potential to

overestimate the direct mobilization effect of public co-finance at the project level, while underestimating private finance mobilized from indirect interventions. This in turn can result in disincentivizing the provision of public finance in less established markets.

In our examples, we can again see the limitations of this approach. If this approach were used to assess NU-TEC, we would not capture the mobilization effect of the technical assistance portion of the project – a vital component to the overall realization of the project. We would therefore be underestimating the amount of private finance mobilized from indirect interventions. For ARC, which does not have any intermediated-direct financing, we would come to the same inaccurate conclusion as with Approach 1.

### Section 5.4: Evaluation of “Approach 3 — Direct, intermediated-direct and indirect”

Under Approach 3, the partial causality assessment allows for the consideration of additional factors that may have also helped mobilize the investment and therefore the assessment is likely to be a more accurate reflection of reality. This is evident from assessing the NU-TEC case using this approach, which enables to include both the financing provided by AgDevCo and the technical assistance provided by Palladium. It is important to note, however, given that causality is assessed based on opinions of interviewees, that accuracy depends on interviewees’ unbiased responses.

The in-depth case study approach and interviews required makes this approach difficult to implement across an entire portfolio and, as the interventions need to be assessed on a case-by-case basis, standardization is close to impossible. As a result, there are risks of double counting where both upstream (indirect mobilization) and downstream (direct mobilization) public finance interventions will claim to have participated in mobilizing the same private finance.

Furthermore, with the increase in the range and number

of assessable variables, it could be significantly more difficult to evaluate causal relationships because of a less direct relationship and more interference from exogenous variables. For example, while it is easier to see how the AgDevCo finance in the NU-TEC case helped bring about an increase in private-sector support for climate-resilient technologies given the more direct role that this finance played in derisking the investment, the ways in which technical assistance from Palladium played a role are less clear. This approach could, however, incentivize coordination of public actors towards optimizing the combined use of public finance for different purposes (investments, capacity building and budgetary support) that are most relevant in a given situation.

In the ARC case, we still have no interventions to assess, even at this level of detail. Without incorporating more layers of the overall intervention picture, we risk underestimating (or, in this particular case, completely ignoring) amounts of private investment mobilized by a given program.



## Section 5.5: Evaluation of “Approach 4 — Direct, intermediated-direct and indirect expanded”

The assessment of Approach 4 is similar to Approach 3. While the approach is time and resource intensive and very difficult to standardize across projects and programs in different countries and sectors, it is likely to be more accurate than Approach 1 and 2 as the partial causality assessment allows for consideration of other factors that may have mobilized private finance. It is also likely to be more accurate than Approach 3 as it allows more upstream interventions to be factored in. Again, it is important to note that accuracy depends on the impartiality of interviewers.

For some adaptation finance interventions such as insurance, mobilized private climate finance can only be tracked through this more accurate, but more resource intensive, approach. As illustrated in the case study on ARC, none of Approaches 1, 2 or 3 capture mobilized private climate finance for the insurance scheme. This may have significant implications for tracking private climate finance for adaptation given that insurance is increasingly more important for supporting adaptation and often involves private sector actors (e.g. reinsurers).

Assessing for upstream interventions allows us to consider the initial capital support provided by DFID and KfW Development Bank as mobilizers of private

finance. On the other hand, this additional level of detail has no effect on the NU-TEC case, which does not have any additional upstream interventions to consider. It is also not enough to incorporate the involvement of donors’ support for the establishment of ARC Agency, which is too many steps upstream to be included in this assessment.

Similar to Approach 3, in cases where private finance is mobilized both directly and indirectly by interventions with competing claims of full causality, an adjustment to partial causality needs to be applied in Approach 4 in order to avoid double counting. As with Approach 3, the difficulty to implement and standardize the approach across actors leads to an increased risk of double counting where both upstream (indirect mobilization) and downstream (direct mobilization) public finance interventions will claim to have participated in mobilizing the same private finance.

More generally, a coherent use of approaches to estimate mobilization among public actors supporting the same activity is crucial to minimizing risks of double counting where both upstream (indirect mobilization) and downstream (direct mobilization) public finance interventions can claim to have participated in mobilizing the same private finance.

## Section 5.6: Further approaches to evaluate mobilization impact

There are several other methodological approaches that could be tested when seeking to measure the mobilization of private finance for adaptation. Some could be similar to the approach we detailed above, qualitative in nature and are driven by interviews, surveys, and fieldwork. The use of surveys at the project level can for instance supplement data that is not otherwise tracked in order to generate more data points on which to conduct a causality assessment. However, surveys can be time and resource intensive, results can be sensitive to the type of stakeholder surveyed and only applicable to the specific project under examination.

The use of econometric techniques could be tested to assess causality and impact as they allow for the estimation of partial correlations and causality between the occurrence of private finance and public interventions while isolating other factors and variables. For example, Haščič et al. (2015) draws from gravity trade model literature to assess the role of public

finance and policy interventions in mobilizing private finance for renewable energy, based on a unique dataset of investment flows and controlling for a number of country and market conditions.<sup>14</sup> Econometric approaches have the potential to provide value in terms of empirical evidence to estimate the mobilization impact of public interventions, and avoid the resource intensive project-level inquiries that may be impractical when assessing a portfolio of interventions. However, econometric techniques face their own set of challenges. Project level nuance and contextual factors are to a great extent lost, and data availability and quality remains a significant barrier to employ these approaches to adaptation and adaptation-relevant sectors. Given the highly context-specific nature of adaptation investments and the lack of aggregate data on adaptation investments, the qualitative approaches outlined in this paper (using interviews and case studies to determine causality) remain a more practical option in the shorter term.

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14 Like their namesake, gravity models are functions that use elements of mass and distance to describe interactions between two entities and are often used in predicting international trade flows, international investment, and international technology transfer. They provide an ample structure for an econometric analysis.

## Chapter 6: Conclusions

This paper aims to inform international discussions on methods for estimating adaptation-related private finance mobilized by public finance interventions, which are at an early stage but quickly evolving. The paper clarifies key concepts relevant to tracking private adaptation finance, highlights data constraints, explores existing methodological approaches used by international finance institutions, and develops, tests, and evaluates four exploratory methodological approaches to estimate mobilized private adaptation finance. The testing and evaluation of the four exploratory approaches improve understanding of the impact of public finance interventions and the associated amount of mobilized private adaptation finance change depending on the methodology employed. While these approaches are described and tested for adaptation finance, they also have the potential to be used to assess private finance mobilized for mitigation action, or possibly even more broadly to evaluate the mobilization of private finance through any type of public finance intervention (health, education, development, etc.).

**Existing methodological approaches used by international finance institutions focus on measuring mobilized finance from direct and intermediated direct public finance. As such, they do not take into account the indirect impacts of softer, “enabling” interventions, such as technical assistance.** The direct mobilization effect of public finance support (e.g. public loan for an infrastructure project) is more easily identifiable and quantifiable than indirect forms (e.g. capacity building grant). **However, excluding the consideration of indirect mobilization is likely to lead to overestimating the direct mobilization effect of public finance at the project level, while not capturing all amounts of private finance mobilized indirectly. As such not quantifying indirect mobilization may disincentivize the provision of upstream support to projects, technologies, and market developments that is critical to creating the enabling conditions for mobilizing private finance at scale.**

**There is potential to fill this methodological gap although challenges and issues remain.** All approaches presented are limited to a certain degree in terms of their precision. **More work needs to be done to more accurately assess and assign the strength of the causal relationship between different public finance interventions and the associated private finance and to isolate interventions from broader contextual factors.** Further, a coherent use of approaches to estimate

mobilization among public actors supporting the same activity is crucial to minimizing increased risks of double counting where both upstream (indirect mobilization) and downstream (direct mobilization) public finance interventions can claim to have participated in mobilizing the same private finance. Because of these limitations, and the fact that the approaches for capturing indirect forms of mobilization are time and resource intensive, other methodological approaches than those investigated here merit exploration.

To embed progress, several areas for further work need to be taken forward by the climate finance research community, policymakers and public financiers:

### Data improvements

- On-going work by bilateral and multilateral development finance institutions as well as the OECD DAC to collect and report estimates on private finance mobilized by public climate finance, including for adaptation, will greatly improve the knowledge and information base.
- Given the lack of data availability on private adaptation investments and recognizing that the term “adaptation” is rarely used in the private investment context, commercial data collectors can work to develop better proxies for identifying when an adaptation-relevant investment is occurring (for example “flood risk management”, “drought protection”, “water efficiency improvements”, “crop diversification”, etc.).

### Methodology improvements

- Building on the methodologies developed in this paper, further research could be conducted to explore other variations on these approaches. This could include, as already done in part by the OECD DAC, applying risk-based or concessionality-based attribution rules – to see how the impact of different interventions and associated volume of private finance mobilized change depending on the variations in the methodologies. Future work could also identify ways to strengthen the causality assessment in order to improve the accuracy of the assessment. For example, the use of a “causality assessment checklist” to evaluate the likely causal link between a public finance intervention and private finance flows (e.g., “Did

the public intervention help overcome a specific project hurdle?”, “Were private investors active in this region and sector already?” etc.) can help avoid mis- or over-attributing mobilization to public finance interventions.

- Beyond the methodologies developed in this paper, researchers can explore a broader set of methodological approaches to measure mobilized private adaptation finance spanning both quantitative and qualitative techniques and highlight their relative strengths and weaknesses in terms of accuracy and incentives they provide, in order to further build the international knowledge base.

Progress is being made on data, tracking and methodologies for estimating climate finance. Measuring mobilized private finance, particularly on adaptation, represents one of the most challenging methodological issues, and it will take a significant amount of work before the remaining methodological issues are adequately addressed and data are more systematically and consistently collected. This report's findings may help to improve and refine methodologies in order to improve the understanding and transparency of climate finance.

## References

- Averchenkova F C, Kocornik A, Hayley Leck M, Surminski. 2015. "Multinational corporations and climate adaptation – Are we asking the right questions? A review of current knowledge and a new research perspective". London: Grantham Research Institute on Climate Change and the Environment. Available from: <http://www.lse.ac.uk/GranthamInstitute/publication/multinational-corporations-and-climate-adaptation-are-we-asking-the-right-questions-a-review-of-current-knowledge-and-a-new-research-perspective>
- Agrawala S et al. 2011. "Private Sector Engagement in Adaptation to Climate Change: Approaches to Managing Climate Risks". Paris: OECD. DOI: <http://dx.doi.org/10.1787/5kg221jkg7-en>
- Beck T, Demirguc-Kunt A, Levine R E, Cihak M, Feyen E H B (2000), "A New Database on Financial Development and Structure". World Bank Economic Review 14, 597-605. Available from: <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/H/O,contentMDK:20696167~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html>
- Breschi S, Lissoni F. 2001. "Knowledge spillovers and local innovation systems: a critical survey". Industrial and Corporate Change, 10: 975-1005.
- Brown J, Buchner B, Sierra K, Wagner G. 2011. "Leveraging climate finance: a survey of methodologies". New York, Venice, Washington, London: EDF, CPI, Brookings, ODI.
- Buchner B, Stadelmann M, Wilkinson J, Mazza F, Rosenberg A, Abramskiehn D. 2014. "The Global Landscape of Climate Finance 2014". Venice: CPI. Available from: <http://climatepolicyinitiative.org/wp-content/uploads/2013/10/The-Global-Landscape-of-Climate-Finance-2013.pdf>.
- Caruso R, Ellis J. 2013. "Comparing Different Definitions and Methods to Estimate Mobilized Climate Finance". Draft Discussion Document. Prepared for the Climate Change Expert Group Global Forum. 19-20 March 2013. Paris: OECD.
- Caruso R, Jachnik R. 2014. "Exploring Potential Data Sources for Estimating Private Finance", *OECD Environment Working Papers*, No. 69. Paris: OECD. DOI: <http://dx.doi.org/10.1787/5jz15qzw4hs1-en>
- Climate Investment Funds (CIF). 2015. "PPCR Private Sector Set-Aside - Results from First Round". Washington: Climate Investment Funds. Available from: <http://www.climateinvestmentfunds.org/cif/node/14343>
- Cohen, Wesley, M. & Levinthal, Daniel A. 1990. *Absorptive Capacity: A New Perspective on Learning and Innovation*, ASQ, 35, 128-152. Available from: <http://web.iaincirebon.ac.id/ebook/indrya/bandura/inovasi/CohenLevinthalASQ.pdf>
- Enting K, Harnisch, J. 2014. "Vorschlag für eine Methodik zur Definition und Berichterstattung von öffentlich mobilisierter privater Klimafinanzierung". Frankfurt: KfW. (not public)
- Falconer A, Stadelmann M. 2015. "The role of technical assistance in mobilizing climate finance – Insights from GIZ programs". Venice: CPI.
- Financial Glossary. S.v. "Co-financing." Retrieved September 2 2015 from <http://financial-dictionary.thefreedictionary.com/Co-financing>
- Hašič I, Cárdenas Rodríguez M, Jachnik R, Silva J, Johnstone N. 2015. "Public Interventions and Private Finance Flows: Empirical Evidence from Renewable Energy Financing". *OECD Environment OECD Working Papers*, No. 80. OECD: Paris. DOI: <http://dx.doi.org/10.1787/5js6b1r9lfd4-en>.
- ICF (International Climate Fund). 2015. "KPI 12: Volume of private finance mobilized for climate change purposes as a result of ICF funding".
- IFC. 2015. IFC Climate Mobilization Process, Briefing presentation.
- Illman J, Halonen M, Whitley S, Canales Trujillo. 2014. "Practical Methods for Assessing Private Climate Finance Flows". DOI: <http://dx.doi.org/10.6027/TN2014-506>.
- IFC (2015, forthcoming), *IFC's Methodology for Tracking Climate Finance*
- IMF. 2009. *Balance of Payments and International Investment Position Manual*, 6th Edition. Washington: International Monetary Fund. Available from: <https://www.imf.org/external/pubs/ft/bop/2007/pdf/BPM6.pdf>
- International Finance Consulting (2015, unpublished), *Leverage of Climate Finance: Guidance and Common Practice by the Multilateral Development Banks*.

- Jachnik R, Caruso R, Srivastava S. 2015. "Estimating Mobilized Private Climate Finance: Methodological Approaches, Options and Trade-offs". *OECD Environment Working Papers*, No. 83. Paris: OECD. DOI: <http://dx.doi.org/10.1787/5js4x001rqf8-en>.
- Joint-MDBs. 2015. "Joint report on MDB climate finance 2014". Available from: <http://documents.worldbank.org/curated/en/2015/06/24641149/2014-joint-report-multi-lateral-development-banks-climate-finance>
- Joint-MDBs. 2015. "Joint report on MDB climate finance 2014". Available from: <http://documents.worldbank.org/curated/en/2015/06/24641149/2014-joint-report-multi-lateral-development-banks-climate-finance>
- Kehler Siebert C, Dzebo A. 2013. "Private sector finance for adaptation in LDCs: Perceivable, potential, or improbable?". Stockholm: Stockholm Environment Institute. Available from: <http://www.sei-international.org/cop19/related-op-eds/2752-private-sector-finance-for-adaptation-in-lDCs-perceivable-potential-or-improbable>
- Kato T et al. 2014. "Scaling up and replicating effective climate finance interventions", *OECD/IEA Climate Change Expert Group Papers*, No. 2014/01. Paris: OECD. DOI: <http://dx.doi.org/10.1787/5js1qffvnmn-hk-en>
- Kempa K, Kreibiehl S, Moslener U. 2014. "Anrechnungsmethoden zur öffentlich mobilisierten privaten Klimafinanzierung". Frankfurt: Frankfurt School-UNEP Collaborating Centre (not public)
- MDB-IDFC. 2015. "Common Principles for Climate Change Adaptation Finance Tracking". Frankfurt: Multilateral Development Banks and the International Development Finance Club. Available at: <http://pubdocs.worldbank.org/pubdocs/publicdoc/2015/7/222771436376720470/010-gcc-mdb-idfc-adaptation-common-principles.pdf>
- Mirabile M, Benn J, Sangaré C. 2013. Guarantees for Development. *OECD Development Co-operation Working Papers*, No. 11, Paris: OECD. <http://dx.doi.org/10.1787/5k4071x5b8f8-en>
- Ockenden S, Warrander G, Eales R, Streatfield D. 2012. "A project level approach to forecasts and monitor private climate finance mobilized". Prepared for the OECD Climate Change Expert Group (CCXG) Global Forum on Leveraging and Mobilising Climate Finance. London: UK Department of Energy and Climate Change (DECC), UK Department for International Development (DFID).
- Ockenden S, Warrander G, Eales R, Streatfield D. 2012. "UK Working Paper: A project level approach to forecast and monitor private climate finance mobilized". Available from: [www.oecd.org/env/cc/2012\\_UK\\_Approach\\_paper.pdf](http://www.oecd.org/env/cc/2012_UK_Approach_paper.pdf)
- OECD. 2009. "Integrating Climate Change Adaptation into Development Co-operation: Policy Guidance". Paris: OECD. Accessed 6 October 2015. Available from: <http://www.oecd.org/dac/environment-development/integrating-climate-change-adaptation-into-development-co-operation-policy-guidance-9789264054950-en.htm>
- OECD DAC. 2015a. "Project-level data for every climate-related development finance project in 2013". Paris: OECD. Accessed 1 July 2015. Available from: <http://www.oecd.org/dac/stats/documentupload/Climate%20Finance%20Projects%202013.xls>
- OECD DAC. 2015b. "Methodologies to Measure Amounts Mobilized from the Private Sector by Official Development Finance Interventions". Available from: [www.oecd.org/dac/stats/mobilisation-effect-of-public-development-finance.htm](http://www.oecd.org/dac/stats/mobilisation-effect-of-public-development-finance.htm)
- OECD. 2015c. "Climate finance in 2013-14 and the USD 100 billion goal", a report by the Organisation for Economic Co-operation and Development (OECD) in collaboration with Climate Policy Initiative (CPI). <http://www.oecd.org/environment/cc/OECD-CPI-Climate-Finance-Report.htm>
- OECD DAC. 2013. "Converged Statistical Reporting Directives for the Creditor Reporting System (CRS) and the Annual DAC Questionnaire". Paris: OECD. Available from: <http://www.oecd.org/dac/stats/methodology.htm>.
- OECD, DAC. 2011. *Handbook on the OECD-DAC Climate markers*. Paris: OECD. Available from: [www.oecd.org/dac/stats/48785310.pdf](http://www.oecd.org/dac/stats/48785310.pdf).



- Opitz S, Morton J. 2014. "Climate Finance Delivered by Development Banks and DFIs from Industrialised Countries". Presentation at the Climate Finance Ministerial, New York, 21 September 2014 [unpublished]
- Pauw W P. 2015. "Not a panacea: private-sector engagement in adaptation and adaptation finance in developing countries". *Climate Policy*, 15:5, 583-603, DOI: 10.1080/14693062.2014.953906.
- Pauw W P, Klein R J T, Vellinga P, Biermann F. 2015. "Private finance for adaptation: do private realities meet public ambitions?" *Climatic Change*. Available from: <http://link.springer.com/article/10.1007/s10584-015-1539-3>
- Srivastava A, Venugopal S. 2014. "Evaluating Methods to Estimate Private Climate Finance Mobilized from Public Interventions". Washington: WRI. Available from: <http://www.oecd.org/env/researchcollaborative/activities.htm>
- Stadelmann M. 2014. "3 potential methodologies for estimating publicly mobilized private finance. Presentation". Elaborated for the German Ministry for the Environment and Nuclear Safety. Venice: CPI. (not public)
- Stadelmann M, Falconer A, Szambelan SJ, Brown J. 2015. "Mobilizing Private Finance – Opportunities for GIZ". Venice: CPI
- Stadelmann M, Michaelowa A. 2013. "Contribution of the private sector to Climate Change Long-Term-Finance: assessment of private climate finance mobilized by Switzerland Final report". Bern: Federal Office for the Environment (FOEN)
- Stadelmann M, Michaelowa A, Roberts J T. 2013. Difficulties in accounting for private finance in international climate policy. *Climate Policy*, 13:6.
- Stumhofer T, Detken A, Harnisch J, Lueg B. 2015. "Proposal of a methodology for tracking publicly mobilized private climate finance." Available from [https://www.kfw-entwicklungsbank.de/PDF/Download-Center/Materialien/Nr.-9\\_Proposal-of-a-methodology-for-tracking-publicly-mobilized-private-climate-finance.pdf](https://www.kfw-entwicklungsbank.de/PDF/Download-Center/Materialien/Nr.-9_Proposal-of-a-methodology-for-tracking-publicly-mobilized-private-climate-finance.pdf)
- Technical Working Group (2015), "Accounting for mobilized private climate finance: input to the OECD-CPI Report", September 2015. <http://www.bafu.admin.ch/dokumentation/medieninformation/00962/index.html?lang=en&msg-id=58589>
- UNEP. 2014. "Adaptation Gap Report. A preliminary assessment". Nairobi: United Nations Environment Programme.
- Trinomics (2015, forthcoming), "Pilot study of private climate finance mobilised by Denmark"
- Vivid Economics. 2015. "Building an Evidence Base on Private Sector Engagement in Financing Climate Change Adaptation". Report prepared for EBRD. London: Vivid Economics. Available from: <http://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/2015-05-07%20MDB%20Private%20Sector%20Adaptation%20Finance%20-%20Final%20Draft.pdf>
- Watson C, Nakhoda S, Caravani A. 2012. "The Practical Challenges of monitoring climate finance: insights from climate funds update". Paris: ODI. Available from: <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/7665.pdf>
- Whitley S, Ellis K. 2012. "Designing public sector interventions to mobilise private participation in low carbon development: 20 questions toolkit". London: ODI. Available from: <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/7660.pdf>
- World Resources Institute (WRI). 2013. "Research Collaborative on Tracking Private Climate Finance." Washington: WRI
- Würtenberger L, Wils F. 2014. "Tackling Climate Change at Scale: Mobilising private sector investments through technical assistance – GIZ's experiences and lessons learned". Eschborn: GIZ.

## Annex 1: Exploring existing official and investment-related databases

### *OECD DAC offers data on adaptation activities with “likely private sector involvement”*

As a possible way to understand where public finance may mobilize private adaptation finance, this section examines the information contained in the publicly-available OECD DAC 2013 activity-level data on bilateral and multilateral public finance, complemented with information from joint climate finance reporting by a group of MDBs. The following approach was tested for identifying possible private finance involvement using the DAC database: a systematic search for activities that include a mention of a number of key words relating to the private sector.

The key words chosen were the following: “private”, “commercial”, “mobilization”, “corporate/-tion”, “SME”, “enterprise” and/or “business” in the “activity description” field. It is important to note that this selection of keywords is by no means comprehensive and that the results presented on that basis should, therefore, be seen as indicative. Further, the identification of such keywords in activity descriptions does not make it possible to draw conclusions about possible private finance mobilization, unless conducting further in depth case-study type research beyond the information currently contained in the DAC database. It only suggests likely private sector participation, which as underlined in Chapter 1 includes private finance involvement. However, private sector participation can also take other forms.

The keyword search yields the following findings:

- Just below 7% of adaptation activities (in number) and just over 7% (in volumes) mention one or more of the private-related key words in the “short description” or “long description” fields of the DAC database.
- The key words captured (mainly “private”, “business” and “commercial”) typically refer to an intention to indirectly mobilize the private sector for adaptation through capacity building activities (e.g., strengthening the adaptive capacity of private sector actors such as smallholder farmers) rather than direct private finance mobilization.

### *Agriculture, forestry, and water are the sectors in which their seems to be the highest intent to attract private finance or participation for adaptation activities*

Bilateral and multilateral development finance committed in 2013 for adaptation in developing countries, as reported to the OECD DAC, focused mainly on agriculture, forestry, and water/ sanitation. When focusing on adaptation finance identified as likely to feature or result in private sector involvement the most relevant sectors are the cross-cutting categories of “general environmental protection” and “multi sector”. These categories are, however, likely to include activities relating to agriculture, forestry and water.

This data captured through the OECD DAC can be complemented with data from multilateral development banks. According to their joint report on climate finance for 2014, MDBs provided just over USD 5 billion adaptation-related finance, out of which 40% for infrastructure projects (17% on coastal/riverine and 23% on energy/transport infrastructure projects), 36% to the agricultural and food production sector, and 11% for water and wastewater. Only 3% of their adaptation finance went to private recipients/projects (Joint-MDBs, 2015).

A recent complementary study by Vivid Economics on the 2013-2014 MDB adaptation financing that is focused on the private sector also finds that agriculture, infrastructure and water dominate the portfolio (Vivid Economics, 2015). While this study gives a further indication of the total value of private sector adaptation activities financed by MDBs, it does not provide specific information about private finance co-financing or mobilization. Nevertheless, these different observations suggest that more in-depth attempts to estimate private climate finance mobilized by public adaptation finance should focus on agriculture, water and infrastructure investments more broadly.

### ***Challenges in identifying adaptation-specific private finance transactions using other investment-related databases***

Data providers monitoring investment-related transactions track data according to sectors (e.g., water) and sub-sectors (e.g., water supply and irrigation) within which there is no way of separating out adaptation-specific transactions (Caruso and Jachnik, 2014). This is true for commercial data providers (e.g. Bloomberg, Factset or Thomson Reuters), as well as public institutions compiling official statistics (e.g. Eurostat and OECD Foreign Direct Investment (FDI) statistics).

For instance, official FDI statistical aggregates only provide a general indication of the type of finance (equity versus debt), broad economic sectors and individual source and destination countries. These three types of aggregates cannot be combined i.e. it is not possible to present data on sectors for specific types of finance or specific countries or groups of countries (OECD, 2014), thereby preventing any granular analysis. Further, individual transactions/activities tracked commercial financial datasets do not provide the qualitative and contextual information needed to qualify an activity as adaptation-specific (Caruso and Jachnik, 2014). This precludes using such datasets for constructing bottom-up estimates of private finance flowing to adaptation activities.

Further, a recent study of the UNFCCC Private Sector Initiative (PSI) database where private companies or other entities can register private sector actions on adaptation observed a lack of information both about

the cost of the initiatives registered and about how they were financed. This study more generally concluded that the concept of adaptation as defined by public institutions is not common within businesses and commercial practices (Pauw et al., forthcoming). This corroborates findings from earlier research that private actors tend to consider climate risks as part of their broader risk management processes (Agrawala et al 2011) and use a range of terms (e.g. business continuity, enterprise/flood risk management) to describe their responses to climate risks (Averchenkova et al. 2015). As a result, it is unrealistic to expect the private sector to label and provide financial data on adaptation-related investments.

Given the significant limitations in using existing databases to estimate mobilized private finance for adaptation highlighted here, a practical starting point for improving data lies with the public finance providers and working to more systematically monitor private co-finance. As highlighted in Chapter 2 of this report, there are efforts underway by the OECD DAC and development finance institutions to collect and report activity-level data on private finance mobilized by official development finance interventions, including for climate change adaptation activities. Such efforts will, for the time being at least, however, only capture private co-finance directly associated with public finance. This means they will not capture private finance mobilized indirectly, which, as per the above analysis of DAC data, appears to be an area of relevance for adaptation finance.

## Annex 2: Assessing partial causality

To determine the causal link between one public finance intervention (intervention  $n$ ) and the private investment, we multiply the causal link between the public finance intervention  $n$  and output by the causal link ( $CL_{\text{public } n\text{-output}}$ ) between private finance and output ( $CL_{\text{output-private}}$ ):

$$CL_{\text{total } n} = CL_{\text{public } n\text{-output}} * CL_{\text{output-private}} \quad (1)$$

Table 4 illustrates this approach.

**Table 4: Assessing causality for indirect mobilization**

CAUSAL LINK BETWEEN OUTPUT AND PRIVATE FINANCE ( $CL_{\text{OUTPUT-PRIVATE}}$ )	CAUSAL LINK BETWEEN PUBLIC FINANCE AND OUTPUT ( $CL_{\text{PUBLIC-OUTPUT}}$ )			
	FULL CAUSAL LINK (100% CAUSALITY)	MAIN INFLUENCE (99-50% CAUSALITY)	PARTIAL INFLUENCE (49-1% CAUSALITY)	NO CAUSAL LINK (0% CAUSALITY)
<b>FULL CAUSAL LINK</b> (100% CAUSALITY)	100% causal link	99-50% causal link	49-1% causal link	No (0%) causal link
<b>MAIN INFLUENCE</b> (99-50% CAUSALITY)	99-50% causal link	99-25% causal link	49-1% causal link	No (0%) causal link
<b>PARTIAL INFLUENCE</b> (49-1% CAUSALITY)	49-1% causal link	49-1% causal link	24-1% causal link	No (0%) causal link
<b>NO INFLUENCE</b> (0% CAUSALITY)	No (0%) causal link	No (0%) causal link	No (0%) causal link	No (0%) causal link

If there is more than one enabling/intermediary output involved in one intervention value chain, (for example a donor funds the development of a policy brief (output 1) that influences the implementation of a policy (output 2) that then mobilizes private finance, we adjust the calculation to account for any number of outputs  $q$ :

$$CL_{\text{total } n} = CL_{\text{public-output 1}} * CL_{\text{output 1-output 2}} * \dots * CL_{\text{output (q-1)-output } q} * CL_{\text{output } q\text{-private}} \quad (2)$$

Similarly, if there is no output (i.e.  $q = 0$ ), then:

$$CL_{\text{total } n} = CL_{\text{public-private}} \quad (3)$$

The causality assessment approximates the extent to which one public intervention caused private finance to be mobilized. If multiple public actors contributed to the public intervention under consideration, it is necessary to combine the causality assessment with the attribution assessment to determine the amount of private finance mobilized by the different public actors. This is done by multiplying the causality determination by the attribution percentage. Given any number of donors  $D$ , the attribution assessment is simply the share of public intervention  $n$  attributed to donor  $d$ , such that:

$$A_{n,d} = \frac{V_{n,d}}{V_n} \quad (4)$$

where  $A_{n,d}$  is the attribution percentage of donor  $d$  for public intervention  $n$ ,  $V_{n,d}$  is the total face value of donor  $d$ 's public finance intervention for intervention  $n$ , and  $V_n$  is the total face value of all public finance contributions to intervention  $n$ .

Using this attribution percentage, we can then calculate the total share of private finance mobilized by donor  $d$ :

$$F_{n,d} = CL_{\text{total } n} * A_{n,d} \quad (5)$$

where  $F_{n,d}$  is the percentage share of private finance mobilized by donor  $d$  of public intervention  $n$ ,  $A_{n,d}$  is the share of public finance intervention  $n$  attributed to donor  $d$ , and  $CL_{\text{total } n}$  is the causal link associated with the public finance intervention  $n$ , as calculated above.

Multiplying this percentage share of private finance mobilized by donor  $d$  by the total observed private finance  $P$ , this gives us the total private finance mobilized by that particular donor  $d$  for public intervention  $n$ , or  $P_{n,d}$ :

$$P_{n,d} = P * F_{n,d} \quad (6)$$

The table below demonstrates how to conduct the final estimation of private finance mobilized by a given public actor, based on hypothetical examples of attribution and causality percentages.

Table 5: Share of private finance mobilized by donor d

SHARE OF PUBLIC FINANCE INTERVENTION ATTRIBUTED TO DONOR D (EXAMPLES), $A_{N,D}$	% CAUSAL LINK BETWEEN PUBLIC INTERVENTION AND PRIVATE FINANCE (EXAMPLES), $CL_{TOTAL N}$				
	100% CAUSAL LINK	1-49% CAUSAL LINK	50-99% CAUSAL LINK	1-24% CAUSAL LINK	0% CAUSAL LINK
10% ATTRIBUTED TO DONOR D	10% of private finance is mobilized by donor d	1-4% of private finance is mobilized by donor d	1-9% of private finance is mobilized by donor d	1-2% of private finance is mobilized by donor d	0% of private finance is mobilized by donor d
50% ATTRIBUTED TO DONOR D	50% of private finance is mobilized by donor d	1-24% of private finance is mobilized by donor d	25-49% of private finance is mobilized by donor d	1-12% of private finance is mobilized by donor d	0% of private finance is mobilized by donor d
100% ATTRIBUTED TO DONOR D	100% of private finance is mobilized by donor d	1-49% of private finance is mobilized by donor d	50-99% of private finance is mobilized by donor d	1-24% of private finance is mobilized by donor d	0% of private finance is mobilized by donor d

In cases where there is more than one type of public finance intervention under consideration (for example if a project receives technical assistance as well as concessional co-financing), causality needs to be assessed for each intervention. Hence, the total amount of private finance mobilized with  $N$  interventions involved is:

$$M = \sum P_{n,d} \text{ for all } 1 \leq n \leq N \text{ and } 1 \leq d \leq D \tag{7}$$

where  $M$  is the total private finance mobilized,  $N$  is the total number of interventions, and  $D$  is the total number of donors in any given intervention.

There may also be cases in which the causality assessments add up to more than 100%, e.g. in cases with two public interventions, it is determined through interviews that each intervention mainly caused the private finance (intervention 1 = 50-99%; intervention 2 = 50-99%), which leads to double counting (the upper bound sum of the two causal links is 198%). If this occurs, we normalize<sup>15</sup> any causal link where the sum of all causal links exceeds 100% so they instead total exactly 100%. If the sum of the lower bounds of all interventions' causal links does not exceed 100% (e.g., 1-49% for intervention 1 and 50-99% for intervention 2 would only have a 51% lower bound causal link, even though its upper bound sums to 148%, exceeding a possible 100%), we maintain the original calculations for the lower bound, i.e. sum the values of the lower bounds without normalizing them<sup>16,17</sup>. Thus, for number of donors  $d_n$  for each public intervention  $n$ , where the sum of all interventions' causal links exceed for any causal link over 100% for donor  $d$ :

$$CL_{normalized\ n} = \frac{CL_{total\ n}}{CL_{all}} \text{ if } CL_{all} > 100\% \tag{8}$$

We then insert this causal link into the calculation to determine the share of private finance mobilized by donor  $d$  ( $F_{n,d}$ ).

The following is an example demonstrating the above methodology in two scenarios :

1. Base case
2. Case where causal links add up to more than 100%

15 To normalize the value, we simply calculate sum up the causal link percentages under consideration and then divide each individual causal link by that sum.

16 Assuming the sum of all lower bounds of the causal link percentages is less than 100%, we keep these lower bounds without normalizing them in order to capture the true value for the lower bound of a particular intervention. We maintain a range for all interventions (instead of taking an average of the range) in order to capture all possible causality levels and avoid over- or under-estimating the amount of private finance mobilized by any particular intervention.

17 It is possible that during the normalization process, the adjusted upper bound becomes less than the original lower bound, e.g. with four interventions (1 main influence and 3 partial influences with causal links of 50-99% and 1-49%, respectively), the main influence's upper bound (99%) normalizes to 40.2%, which is below its lower bound (50%). In this case, use the lowest numerical causal link value for both upper and lower bounds.

## Base case

Let's take a base case scenario where a project retrofitting a hydropower plant in Central Asia to account for changing water flow due to climate change receives USD 200 million in finance from private investors. Before this private finance was secured, developers received a USD 20 million grant administered by a multilateral development bank and USD 30 million in finance from a project preparation facility. Each public finance intervention has its own set of donors, and each claimed to partially contribute to mobilizing the private finance.

The separate contributions by the donors are listed below:

### USD 20 million grant administered by MDB

USA contributed USD 15 million

UK contributed USD 2 million

France contributed USD 2 million

Private investors contributed USD 1 million

### USD 30 million in finance provided by the project preparation facility

Japan contributed 15 million

Norway contributed 15 million

To determine the amount of private finance mobilized by each intervention and each donor, the following steps are taken:

1. To begin, we determine *causality*. Because each grant administrator claimed partial causality, we assume that each intervention had between 1-49% influence on the private finance mobilization. Given intermediary outputs  $q = 0$  for both interventions  $n$ ,  $CL_n = CL_{\text{public-private}}$ , or:

$$CL_{\text{total MDB}} = 50 - 99\%$$

$$CL_{\text{total PPF}} = 1 - 49\%$$

2. We then calculate the *attribution percentage* of each donor  $d$  for each public intervention  $n$  ( $A_{n,d}$ ). Because we only consider public interventions, we do not include the USD 1 million in private contributions to the MDB administered grant:

$$A_{\text{MDB,USA}} = \frac{V_{\text{MDB,USA}}}{V_{\text{MDB}}} = \frac{\text{USD 15 million}}{\text{USD 19 million}} = 78.9\%$$

$$A_{\text{MDB,UK}} = \frac{V_{\text{MDB,UK}}}{V_{\text{MDB}}} = \frac{\text{USD 3 million}}{\text{USD 19 million}} = 15.8\%$$

$$A_{\text{MDB,France}} = \frac{V_{\text{MDB,France}}}{V_{\text{MDB}}} = \frac{\text{USD 1 million}}{\text{USD 19 million}} = 5.3\%$$

$$A_{\text{PPF,Japan}} = \frac{V_{\text{PPF,Japan}}}{V_{\text{PPF}}} = \frac{\text{USD 15 million}}{\text{USD 30 million}} = 50\%$$

$$A_{\text{PPF,Norway}} = \frac{V_{\text{PPF,Norway}}}{V_{\text{PPF}}} = \frac{\text{USD 15 million}}{\text{USD 30 million}} = 50\%$$

3. Taking attribution and causality together, we calculate the *percentage share of private finance mobilized by each donor*. Each donor had a percentage share  $F_{n,d}$  of private finance mobilized by donor  $d$  of each public intervention  $n$ , calculated as follows:

$$F_{\text{MDB,USA}} = CL_{\text{total MDB}} * A_{\text{MDB,USA}} = (1 - 49\%) * 78.9\% = 0.79 - 38.7\%$$

$$F_{\text{MDB,UK}} = CL_{\text{total MDB}} * A_{\text{MDB,UK}} = (1 - 49\%) * 15.8\% = 0.16 - 7.7\%$$

$$F_{\text{MDB,France}} = CL_{\text{total MDB}} * A_{\text{MDB,France}} = (1 - 49\%) * 5.3\% = 0.5 - 24.5\%$$

$$F_{\text{PPF,Japan}} = CL_{\text{total PPF}} * A_{\text{PPF,Japan}} = (1 - 49\%) * 50\% = 0.5 - 24.5\%$$

$$F_{\text{PPF,Norway}} = CL_{\text{total PPF}} * A_{\text{PPF,Norway}} = (1 - 49\%) * 50\% = 0.5 - 24.5\%$$



4. Multiplying these *percentage share by the total amount of private finance involved*  $P$  (USD 200 million), we can then assign a distinct amount of mobilized private finance  $P_{n,d}$  to each donor:

$$\begin{aligned} P_{\text{MDB,USA}} &= P * F_{\text{MDB,USA}} = \text{USD } 200 * (0.79 - 38.7\%) = \text{USD } 1.6 - 77.4 \text{ million} \\ P_{\text{MDB,UK}} &= P * F_{\text{MDB,UK}} = \text{USD } 200 * (0.16 - 7.7\%) = \text{USD } 0.3 - 15.4 \text{ million} \\ P_{\text{MDB,France}} &= P * F_{\text{MDB,France}} = \text{USD } 200 * (0.05 - 2.6\%) = \text{USD } 0.1 - 5.2 \text{ million} \\ P_{\text{PPF,Japan}} &= P * F_{\text{PPF,Japan}} = \text{USD } 200 * (0.5 - 24.5\%) = \text{USD } 1 - 49 \text{ million} \\ P_{\text{PPF,Norway}} &= P * F_{\text{PPF,Norway}} = \text{USD } 200 * (0.5 - 24.5\%) = \text{USD } 1 - 49 \text{ million} \end{aligned}$$

Summing these up such that  $\sum P_{n,d}$  = total mobilized finance  $M$ , we conclude that public interventions in total mobilized anywhere between USD 4 million and 196 million of the USD 200 million of private finance that was observed.

### Case where causal links add up to more than 100%

Let's now assume the MDB is claiming that it didn't just partially cause the mobilized finance for the project, but was the *main* reason for its success. The developers agree, so we upgrade its causal link to "main influence". Furthermore, new interviews conducted reveal that the project was "partially enabled" by a national tax credit, which was lobbied for by a regional trade bloc with interest in increased sustainable energy exports. The bloc invested USD 6 million to help this agenda push forward, and, through a causality assessment, we determine that the bloc "mainly enabled" the new tax policy's success.

To determine the amount of private finance mobilized in this new scenario, we take the following steps :

1. Because we concluded that the MDB administered grant had a "main influence" on the private finance, we assume that the *causal link* of the MDB administered grant is now 50-99%, while the project preparation facility, which still only "partially influenced" the private finance, maintains 1-49% causality. Again, given intermediary outputs  $q = 0$  for both interventions  $n$ ,  $CL_n = CL_{\text{public-private}}$  or:

$$\begin{aligned} CL_{\text{total MDB}} &= 50 - 99\% \\ CL_{\text{total PPF}} &= 1 - 49\% \end{aligned}$$

The new tax credit also has 1-49% causality, and itself was 50-99% caused by the trade bloc. Because this intervention has an intermediary output, we multiply the two causal link steps together (as established above):

$$CL_{\text{total BLOC}} = CL_{\text{BLOC-tax}} * CL_{\text{tax-public}} = (50 - 99\%) * (1 - 49\%) = 0.5 - 49\%$$

Thus, the total causal link ranges for the three interventions are:

$$\begin{aligned} &50 - 99\% \text{ for the MDB administered grant} \\ &1 - 49\% \text{ for the project preparation facility} \\ &0.5 - 49\% \text{ for the regional trade bloc} \end{aligned}$$

In this case, we can still sum up the lower bound of the causal link ranges without an issue, but the summing up the upper range will add up to more than 100% (99% + 49% + 49% = 197%). This would imply that public interventions mobilized *more* than the total amount of private finance associated with the project, which is not possible. To address this, we normalize the upper bound so that is equals 100%. We keep the lower bound of the range as is, given that the sum of all public interventions' lower bounds is 51.5%, i.e. less than 100%.

The normalization calculation for the upper bounds of the causal link ranges is, given  $CL_{all}$  is the sum of all the upper bounds of the individual total causal links:

$$CL_{normalized\ upper\ MDB} = \frac{CL_{total\ upper\ MDB}}{CL_{all}} = \frac{99\%}{(99\% + 49\% + 49\%)} = 50.3\%$$

$$CL_{normalized\ upper\ PPF} = \frac{CL_{total\ upper\ PPF}}{CL_{all}} = \frac{49\%}{(99\% + 49\% + 49\%)} = 24.9\%$$

$$CL_{normalized\ upper\ BLOC} = \frac{CL_{total\ upper\ BLOC}}{CL_{all}} = \frac{49\%}{(99\% + 49\% + 49\%)} = 24.9\%$$

This gives us normalized causal link percentage ranges of:

$$CL_{normalized\ MDB} = CL_{lower\ MDB} - CL_{normalized\ upper\ MDB} = 50 - 50.3\%$$

$$CL_{normalized\ PPF} = CL_{lower\ PPF} - CL_{normalized\ upper\ PPF} = 1 - 24.9\%$$

$$CL_{normalized\ BLOC} = CL_{lower\ BLOC} - CL_{normalized\ upper\ BLOC} = 0.5 - 24.9\%$$

Thus, we see that ultimately the combined causal link of all three interventions on the private finance will be 51.5-100%<sup>18</sup>.

2. The *attribution* remains the same for the MDB-administered grant and the project preparation facility. The regional trade bloc was the only contributor to the tax policy, so it claims 100% attribution for that particular intervention, i.e.:

$$A_{BLOC} = \frac{V_{BLOC}}{V_{BLOC}} = \frac{\text{USD 6 million}}{\text{USD 6 million}} = 100\%$$

3. To determine the *percentage share of private finance mobilized by each donor*, using the causal links and attributions above, the adjusted donor share  $F_{n,d}$  calculations are then as follows<sup>19</sup>:

$$F_{adjusted\ MDB,USA} = CL_{normalized\ MDB} * A_{MDB,USA} = (50 - 50.3\%) * 78.9\% = 39.5 - 39.7\%$$

$$F_{adjusted\ MDB,UK} = CL_{normalized\ MDB} * A_{MDB,UK} = (50 - 50.3\%) * 15.8\% = 7.9 - 8\%$$

$$F_{adjusted\ MDB,France} = CL_{normalized\ MDB} * A_{MDB,France} = (50 - 50.3\%) * 5.3\% = 2.7\%$$

$$F_{adjusted\ PPF,Japan} = CL_{normalized\ PPF} * A_{PPF,Japan} = (1 - 24.9\%) * 50\% = 0.5 - 12.5\%$$

$$F_{adjusted\ PPF,Norway} = CL_{normalized\ PPF} * A_{PPF,Norway} = (1 - 24.9\%) * 50\% = 0.5 - 12.5\%$$

$$F_{adjusted\ BLOC} = CL_{normalized\ BLOC} * A_{BLOC} = (0.5 - 24.9\%) * 100\% = 0.5 - 24.9\%$$

4. From here, we can derive that that each donor mobilized the following amounts of finance:

$$P_{MDB,USA} = P * F_{adjusted\ MDB,USA} = \text{USD 200 million} * (39.5 - 39.7\%) = \text{USD 79 - 79.4 million}$$

$$P_{MDB,UK} = P * F_{adjusted\ MDB,UK} = \text{USD 200 million} * (7.9 - 8\%) = \text{USD 15.8 - 16 million}$$

$$P_{MDB,France} = P * F_{adjusted\ MDB,France} = \text{USD 200 million} * (2.7\% - 2.7\%) = \text{USD 5.4 million}$$

$$P_{PPF,Japan} = P * F_{adjusted\ PPF,Japan} = \text{USD 200 million} * (0.5 - 12.5\%) = \text{USD 1 - 25 million}$$

$$P_{PPF,Norway} = P * F_{adjusted\ PPF,Norway} = \text{USD 200 million} * (0.5 - 12.5\%) = \text{USD 1 - 25 million}$$

$$P_{BLOC} = P * F_{adjusted\ BLOC} = \text{USD 200 million} * (0.5 - 24.9\%) = \text{USD 1 - 49.8 million}$$

Summing these range up, we can conclude that public interventions mobilized between USD 103.2 million and 200 million of the private finance involved.

18 The total is slightly above 100% (100.1%), but this is due to rounding.

19 Again, total is above 100% due to rounding.

## Annex 3: NU-TEC case study's decision points (uniformly applied across all methodological approaches)

STAGES	SHORT DESCRIPTION OF METHODOLOGICAL DECISION POINTS
1. DEFINE CORE CONCEPTS	<p><b>Climate change activities:</b> Investments in the agricultural sector that intend to reduce the vulnerability of agricultural production to the impacts of climate change and climate-related risks, by increasing adaptive capacity and resilience.</p> <p><b>Adaptation-specific project components:</b> DFID has labelled the full cost of this project as "adaptation".</p> <p><b>Public and private finance:</b></p> <ul style="list-style-type: none"> <li>• Public finance is provided by DFID.</li> <li>• While not yet committed, private investments are likely to be made by the agribusinesses operating in Northern Uganda and via private capital (most likely equity) to be co-invested alongside AgDevCo's investments in agribusinesses.</li> </ul> <p><b>Country:</b> Uganda (ODA recipient)</p> <p><b>Geographical origin of private finance:</b> The origin is not yet known as the private finance is not yet committed.</p>
2. IDENTIFY PUBLIC INTERVENTIONS AND INSTRUMENTS	<p><b>Type of public intervention:</b> VARIES BY METHODOLOGICAL APPROACH (see the next section)</p> <p><b>Specific public finance instruments:</b> DFID provides capital to its partners who go on to provide the following:</p> <ul style="list-style-type: none"> <li>• Component 1: technical assistance provided by Palladium</li> <li>• Component 2: 70% equity or debt (provided via AgDevCo's capital fund), 30% technical assistance</li> <li>• Component 3: TBD; likely to be short to medium-term loan or credit line.</li> </ul>
3. VALUE PUBLIC INTERVENTIONS AND ACCOUNT FOR TOTAL PRIVATE FINANCE INVOLVED	<p><b>Currency and conversion:</b></p> <ul style="list-style-type: none"> <li>• Volumes of finance are reported in USD, using OECD official exchange rates</li> </ul> <p><b>Point of measurement:</b></p> <ul style="list-style-type: none"> <li>• For public finance contributions, we use finance at point of commitment</li> <li>• For private finance, given no commitment or disbursement data is yet available, we use estimates based on DFID's NU-TEC business case.</li> </ul> <p><b>Value of public interventions:</b></p> <ul style="list-style-type: none"> <li>• We account for the volume at face value</li> </ul>
	<p><b>Boundaries:</b> VARIES BY METHODOLOGICAL APPROACH (see the next section)</p> <p><b>Data availability:</b></p> <ul style="list-style-type: none"> <li>• All data is provided by DFID (references listed below). Financial figures and forward looking estimates of private investments are included in DFID's NU-TEC business case, and were confirmed through interviews.</li> <li>• References for ARC: <ul style="list-style-type: none"> <li>» Interview with Richard Sandall, DFID, July 23, 2015</li> <li>» Interview with Richard Sandall, DFID, August 19, 2015</li> <li>» Interview with Andrew Koleros, Palladium, September 1, 2015</li> <li>» Interview with Rebecca Sankar, AgDevCo, September 1, 2015</li> <li>» NU-TEC business case and summary 204012 Available from: <a href="http://devtracker.DFID.gov.uk/projects/GB-1-204012/documents/">http://devtracker.DFID.gov.uk/projects/GB-1-204012/documents/</a></li> <li>» NU-TEC Logical Framework 204012. Available from: <a href="http://devtracker.DFID.gov.uk/projects/GB-1-204012/documents/">http://devtracker.DFID.gov.uk/projects/GB-1-204012/documents/</a></li> </ul> </li> </ul>
4. ESTIMATE PRIVATE FINANCE MOBILIZATION	<p><b>Causality:</b> VARIES BY METHODOLOGICAL APPROACH (see the next section)</p> <p><b>Attribution:</b></p> <ul style="list-style-type: none"> <li>• DFID is the only funder of NU-TEC, so all results are attributed to DFID.</li> </ul>

## Annex 4: ARC case study's decision points (uniformly applied across all methodological approaches)

STAGES	SHORT DESCRIPTION OF METHODOLOGICAL DECISION POINTS
1. DEFINE CORE CONCEPTS	<p><b>Climate change activities:</b> ARC provides an adaptation activity measure that implements drought insurance to governments, allowing the governments to address the impact of drought on vulnerable populations, based on pre-approved contingency plans.</p> <p><b>Adaptation-specific project components:</b> DFID has labelled the full cost of this project as "adaptation".</p> <p><b>Public and private finance:</b></p> <ul style="list-style-type: none"> <li>• Public finance for ARC Agency:           <ul style="list-style-type: none"> <li>» Design phase of ARC Agency was funded by five public donors - DFID, Swiss Agency for Development and Cooperation (SDC), Saudi Innovation Fund, Swedish International Development Agency (Sida) and International Fund for Agricultural Development (IFAD) - and one private donor, the Rockefeller Foundation.</li> <li>» Post-design phase is funded by four public donors (DFID, SDC, Sida and USAID) and one private donor (Rockefeller Fdn).</li> </ul> </li> <li>• Public finance for ARC Ltd is provided by DFID and KfW (on behalf of BMZ) in the form of risk capital</li> <li>• Private finance is provided through pay outs from the private reinsurance market.</li> </ul> <p><b>Country classification:</b> All African countries involved are ODA recipients</p> <p><b>Geographical origin of private finance:</b></p> <ul style="list-style-type: none"> <li>• Domestic: There is no private finance provided domestically</li> <li>• International: 18 Reinsurance companies for the first policy year</li> </ul>
2. IDENTIFY PUBLIC INTERVENTIONS AND INSTRUMENTS	<p><b>Type of public intervention:</b> VARIES BY METHODOLOGICAL APPROACH (see the next section)</p> <p><b>Specific instruments:</b></p> <ul style="list-style-type: none"> <li>• Donors provided grants to establish ARC Agency. ARC Agency then uses this support to provide technical assistance to African countries</li> <li>• DFID and KfW provided Development Capital (0% interest, returnable after 20 years) to ARC Ltd.</li> <li>• Countries pay a premium that includes the cost of insurance and a contribution to capital.</li> <li>• ARC Ltd provides insurance cover to African governments and purchases reinsurance on international markets.</li> </ul>

*Table continues on next page...*

STAGES	SHORT DESCRIPTION OF METHODOLOGICAL DECISION POINTS
3. VALUE PUBLIC INTERVENTIONS AND ACCOUNT FOR TOTAL PRIVATE FINANCE INVOLVED	<p><b>Currency and conversion:</b></p> <ul style="list-style-type: none"> <li>• Volumes of finance are reported in USD;</li> </ul> <p><b>Point of measurement:</b></p> <ul style="list-style-type: none"> <li>• For public finance contributions, we use finance at point of drawdown /disbursement - USD 7.16 million (USD 3.58 million each from DFID and KfW) in the first policy year</li> <li>• For private finance, we use finance at point of disbursement (payout)</li> </ul> <p><b>Value of public interventions:</b></p> <ul style="list-style-type: none"> <li>• We account for the volume at face value</li> </ul> <p><b>Boundaries:</b> VARIES BY METHODOLOGICAL APPROACH (see the next session)</p> <p><b>Data availability:</b></p> <ul style="list-style-type: none"> <li>• Data are obtained from documents and funding reports prepared by ARC, as well as interviews with DFID, ARC Ltd, and ARC Agency.</li> <li>• References for ARC include: <ul style="list-style-type: none"> <li>» ARC Press release: Monday 6 July 2015, "G7 endorses the African Risk Capacity as model for climate insurance"</li> <li>» Messaging/Talking points: Humanitarian operations funded by 2014/2015 Insurance Pay-Outs, July 1, 2015</li> <li>» Messaging/Talking points: African Risk Capacity Initiatives, July 1, 2015</li> <li>» Interview with Nicky Jenns, DFID, July 24, 2015</li> <li>» Interview with Nicky Jenns, DFID, July 28, 2015</li> <li>» Interview with Simon Young, ARC Ltd, September 17, 2015-09-17</li> <li>» Interview with Fatima Kassam, ARC Agency, September 18, 2015</li> <li>» DFID. 2013. "Helping Developing Countries Deal with Humanitarian Emergencies". London: Department for International Development. Available from: <a href="https://www.gov.uk/government/policies/helping-developing-countries-deal-with-humanitarian-emergencies/supporting-pages/helping-countries-protect-themselves-against-future-disasters">https://www.gov.uk/government/policies/helping-developing-countries-deal-with-humanitarian-emergencies/supporting-pages/helping-countries-protect-themselves-against-future-disasters</a> [accessed 15 July 2014].</li> </ul> </li> </ul>
4. ESTIMATE PRIVATE FINANCE MOBILIZATION	<p><b>Causality:</b> VARIES BY METHODOLOGICAL APPROACH (see the next section)</p> <p><b>Attribution:</b></p> <ul style="list-style-type: none"> <li>• For the funding going through ARC Ltd, DFID and KfW share attribution evenly (50% for each donor, as they paid in equal amounts)</li> </ul>