From public to private climate change adaptation finance

Adapting finance or financing adaptation?

Van publieke naar private financiering voor aanpassing aan klimaatverandering: aanpassing van financiering, of financiering voor aanpassing?

(met een samenvatting in het Nederlands)

Proefschrift

ter verkrijging van de graad van doctor aan de Universiteit Utrecht op gezag van de rector magnificus, prof.dr. G.J. van der Zwaan, ingevolge het besluit van het college voor promoties in het openbaar te verdedigen op vrijdag 22 december 2017 des ochtends te 10:30

door

Willem Pieter Pauw
geboren op 15 april 1984
te Putten

Promotoren: Prof. dr. F.H.B. Biermann

Prof. dr.ir. P. Vellinga

Dedicated to

Willem en Hermie, Willemijn en Woutine.

Preface

In 1990, the Intergovernmental Panel on Climate Change (IPCC) published its first integrated assessment on climate change. It stated that emissions resulting from human activities are substantially increasing the atmospheric concentration of greenhouse gases, which will result in 'additional warming of the earth's surface' (Houghton, Jenkins, & Ephraums, 1990; XI). The presentation and wide acceptance of the findings of the report were a reason for my PhD supervisor Pier Vellinga, who played a crucial role in putting climate change on the Dutch as well as the international political agenda, to write that 'the marathon to limit climate change has started'. He and Rob Swart foresaw a 40 year marathon race to tackle climate change (Vellinga & Swart, 1991). After more than 25 years down a road that has proven rough, the problem of climate change has only gravened. Although the annual global emissions might be peaking, the greenhouse gas concentration in the atmosphere rises year after year, and so does the average global temperature.

This thesis addresses a small element of a climate change research agenda that has expanded so rapidly that it suffers from reductionism. When I told colleagues I would want to do research on private adaptation finance in the context of the UNFCCC, some smiled and replied: 'there is no such thing, what do you want to do research on?' or 'aren't there more pressing issues in the climate finance debate?' Contrary to such judgements, I believed private adaptation finance could become a new research challenge of high societal relevance, both at national and international scales. Nobody knew how it worked or what the potential could be. There was a need for creative and exploratory research.

During initial discussions with Pier Vellinga and Frank Biermann about writing a doctoral thesis on the subject of private adaptation finance, they immediately signalled their willingness to supervise this work. Since the official start in December 2013, they have shown enormous commitment and proved continuous support; first at the VU University, and later at the Utrecht University where I also spent two great weeks as a guest researcher. Without the advice, support, thorough reading, knowledge and experience of Frank and Pier this dissertation would not have been there, and I will always remain truly grateful

for this. I learned so much from Frank and Pier and could not have imagined better supervisors.

In 2014 I spent two very inspiring months at the main office of Stockholm Environment Institute (SEI). In very concrete terms, the cooperation with Richard Klein led to a paper that forms the basis for Chapter 6. Yet SEI's inspiring environment was of even greater significance. I wholeheartedly thank my SEI colleagues, including Harro van Asselt, Magnus Benzie, Adis Dzebo, Marion Davis, Elena Dawkins, Oliver Johnson, Marie Jürisoo, Sivan Kartha, Åsa Persson, Claudia Strambo, Gregor Vulturius, and Nina Weitz for the great time at SEI and all the discussions, dinners, and meetings thereafter.

Most of my time I spent at the German Development Institute (DIE). DIE's dynamism, its warm working environment, its direct relevance for and links to policymakers, new topics that come and go as the world changes – these are just some of the institutes great characteristics. This vitality and spirit has a clear disadvantage too: it means a lot of work for and dedication to other projects. The biggest struggle during this PhD was to find time to work on it. I thank Ines Dombrowsky in particular for helping me find time and for always supporting me as a caring department head. I like to thank my colleagues, some of whom are no longer at DIE, for the fun, the support and the inspiration: Shikha Bhasin, Clara Brandi, Sander Chan, Aurelia Figueroa, Alejandro Guarin, Jonas Hein, Raoul Herrmann, Okka-Lou Mathis, Jonathan Mockshell, Nannette Lindenberg, Marcus Kaplan, Niels Keijzer, Svea Koch, Dirk Messner, Babette Never, Anna Pegels, Carmen Richerzhagen, Jean Carlo Rodríguez de Francisco, Isabel van de Sand, Armin von Schiller, Imme Scholz, and many more.

I had the privilege to test and present this PhD research dozens of times, both on its academic rigour during scientific conferences, PhD colloquia and brown bag lunches at universities and think tanks; and on its political and societal relevance and implications during a variety of other policy-related workshops and meetings with negotiators, policy makers, and colleagues from development banks, development agencies and think tanks (e.g. UNFCCC side events; OECD CCXG Global Forums; as well as meetings with the EU Expert Group on Adaptation, and the Dutch, German and Swedish UNFCCC delegations, just to name a few). Fruitful discussions on my dissertation also took place outside of the typical conference rooms, including in taxis; trains; boats and

airplanes; in cafés and in elevators; and during a marathon drive around Lake Victoria with my friends Adis Dzebo and Aaron Atteridge.

All of the above provided me with the privilege to test ideas and discuss my PhD research with a number of people in particular. I am very grateful for your continued support and your bright ideas:

Harro van Asselt
Aaron Atteridge
Skylar Bee
Barbara Bendandi
Magnus Benzie
Carola Betzold
Shikha Bhasin
Clara Brandi
Guus Borger
Sander Chan
Ines Dombrowsky
Peter Driessen
Laura Druce
Adis Dzebo
Jane Ellis
Katrin Enting
Alejandro Guarin
Gottfried van Gemmingen
Christine Grüning
Nina Hall
Sandra van der Hel
Takayoshi Kato
Niels Keijzer
Richard Klein
Kennedy Mbeva
Dirk Messner
Ulf Moslener
Anne Olhoff
Philipp Pattberg
Anna Pegels
Jonathan Pickering
Daniel Puig
Timmons Roberts
Imme Scholz
Jakob Skovgaard
Swenja Surminski
Pieter Terpstra
Chiara Trabacchi
Oscar Widerberg
Fariborz Zelli

I would now like to refer to the individual chapters, some of which benefitted greatly from co-authors, others from critical reading from colleagues and friends. Chapter 2 greatly benefits from very interesting, profound and often lengthy discussions with Frank Biermann and Pier Vellinga, Guus Borger, Timmons Roberts, Sander Chan, Adis Dzebo and many others. The drafting of this chapter was a long and difficult, yet very interesting process. I want to thank Pier and Frank for pushing me, time after time, to read more and dig deeper, to get out of the UN climate negotiations bubble, out of my comfort zone, and structure my thoughts.

Chapter 3 builds on two reports: UNEP (2016) and Druce, Moslener, Gruening, Pauw, and Connell (2016). The first is the Adaptation Finance Gap Report, for which I co-authored a chapter on private adaptation finance together with Aaron Atteridge and Pieter Terpstra. I thank them for the long-distance yet smooth cooperation. I also would like to thank the UNEP team of Anne Olhoff, Daniel Puig, Skylar Bee and Barney Dickson for the great workshop in

Copenhagen in August 2015 with most of the report's authors, as well as their endless support in improving the report's chapter. The second report is the UNEP FI Report 'Demystifying adaptation finance for the private sector' written by Laura Druce, Christine Grüning, Ulf Moslener, Richenda Connell and myself. The writing of this report was not always easy, but we grew as a team in the process and I am proud of the result. For both reports I also wish to thank reviewers and sounding board members.

Chapter 4 is published as Pauw and Pegels (2013) in *Climate and Development*. I would like to thank Anna Pegels for stepping in with all her research experience at a crucial phase in the drafting process. I would also like to thank DIE's former student assistants Hanna Schmole and Ines Waigand for contributing to the analysis of the NAPAs. Finally, I would like to thank the two anonymous reviewers of the original paper for *Climate and Development* for their useful comments and suggestions which helped to improve the paper.

Chapter 5 is published in *Climate Policy* (see Pauw, 2014). I am indebted to all those who generously gave their time to be interviewed and engaged in this research, both in Zambia and afterwards during various UNFCCC conferences and workshops. I would also like to thank Shikha Bhasin, Frank Biermann, Clara Brandi, Alejandro Guarin and Pier Vellinga for proof-reading and commenting earlier versions of this paper, and to give thanks to three anonymous reviewers of the original paper in *Climate Policy* for their invaluable comments and suggestions for improvement.

Chapter 6 is based on Pauw, Klein, Vellinga, and Biermann (2015) in *Climatic Change*. Much of the original paper was written during my stay at SEI, for which I have shown my sincere gratitude above. I would also like to thank Frank Biermann and Pier Vellinga, who both played a key role in finalising the original paper for submission. Furthermore, I am indebted to DIE's former student assistant Erik Bertram for doing parts of the data collection and initial analysis. Finally, I would like to thank the three anonymous reviewers of the original paper for *Climatic Change* for their useful comments and suggestions for improvement. To a lesser extent, Chapter 6 is also based on Chan and Pauw (2014) and Bendandi and Pauw (2016). I would like to thank Sander for the excellent cooperation, and Barbara for the cooperation on an experimental

book chapter in which we test this dissertation's ten climate finance criteria on remittances (see Excursus 6.4).

Chapter 7 was published as Pauw (2017) in a special issue on climate finance in *International Environmental Agreements*. I am indebted to the experts from development banks and agencies who generously gave their time to be interviewed before, during and after the UN climate conference in Lima in 2014. I would also like to thank Jakob Skovgaard and Lund University for inviting me to the interesting and fun 'Lund climate finance workshop' to present and discuss this paper. I furthermore want to thank Carola Betzold, Frank Biermann, Katrin Enting, Prosanto Pal, Jonathan Pickering, Jakob Skovgaard, Pier Vellinga and three anonymous reviewers for their excellent comments and suggestions for improvements on drafts of the original paper.

The finalisation of this dissertation would not have gone so smoothly if it wasn't for the fantastic copy-editing work by Anika Lindener, especially during the very long last week before Christmas. It was great to work with you.

This research would have been impossible without the funding from the German Federal Ministry for Economic Cooperation and Development (BMZ) for the projects 'Climate Change and development in sub-Sahara Africa and Latin America'; 'Climate change and development – natural resources management in the context of adaptation and mitigation'; and 'Klimalog: Research for a climate-smart and just transformation'. I received additional funding to work on this topic through the OECD project 'Scaling up and replicating effective climate finance interventions' and the UNEP FI project 'demystifying private adaptation finance'.

I would also like to thank my family and friends for their endless encouragement. My parents Willem and Hermie and my sisters Willemijn and Woutine have always been extremely important to me, including for this dissertation.

Last but not least, this dissertation would never have been there without the lasting support of Katrin Enting. Sometimes she commented on the content and structure of this work as an expert, but more importantly, she was always there for me, willing to listen, to think along, to plan, to comfort and take away frustration, and to encourage me. I thank my wife with all my heart!

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V. Abbreviations

ABS	Access and benefit-sharing
ADB	Asian Development Bank
AfD	Agence Française de Développement
AGF	High Level Advisory Group on Climate Change Finance
BR	Biennial Reporting
CAF	Cancun Adaptation Framework
CBD	Convention on Biological Diversity
CBI	Climate Bonds Initiative
CDM	Clean Development Mechanism
CIF	Climate Investment Funds
CO_2	Carbon dioxide
COP	Conference of the Parties
CPI	Climate Policy Initiative
CSR	Corporate Social Responsibility
DAC	Development Assistance Committee
DEG	Deutsche Investitions- und Entwicklungsgesellschaft
EIB	European Investment Bank
EU	European Union
FDI	Foreign Direct Investment
GCF	Green Climate Fund
GDP	Gross Domestic Product
GIZ	Gesellschaft für Internationale Zusammenarbeit
GTZ	Gesellschaft für Technische Zusammenarbeit
ICI	International Cooperative Initiatives
IFC	International Finance Corporation
IDB	Inter-American Development Bank
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau
LDCs	Least Developed Countries
LDCF	Least Developed Country Fund
LTF	Work programme on Long-Term Finance

MSE	Micro- and Small Enterprises
MSF	information on strategies and approaches for mobilizing scaled-up finance
NAPA	National Adaptation Programmes of Action
NCICD	The National Capital Integrated Coastal Development program
NGO	Non-Governmental Organisation
NWP	Nairobi work programme on impacts, vulnerability and adaptation to climate change
ODA	Official Development Assistance
ODS	Ozone Depleting Substances
OECD	Organisation for Economic Co-operation and Development
PPCR	Pilot Program for Climate Resilience
PPP	Public-private Partnership
PSI	Private Sector Initiative
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SCCF	Special Climate Change Fund
SDGs	Sustainable Development Goals
SGF	Small Grants Fund
SIDS	Small Island Development States
SME	Small and medium-sized enterprises
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
UNEP FI	United Nations Environment Programme Finance Initiative
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organisation
USAID	United States Agency for International Development
WWF	World Wide Fund for Nature
ZNFU	Zambia National Farmers Union

1 Introduction

This doctoral dissertation studies private financing for the implementation of international agreements. The underlying research was triggered by a reference to private finance in the 2009 Copenhagen Accord of the UN climate negotiations. In this accord, the private sector was mentioned as a source of finance for the mitigation of greenhouse gas emissions and adaptation to the adverse effects of climate change. Without this reference to private finance, developed countries would not have accepted the Copenhagen Accord.

The reference to private finance became a game changer both for the UN climate negotiations and for other international negotiations. After Copenhagen, private financing surfaced in diverse international agreements including 'Agenda 2030' –which led to the Sustainable Development Goals in 2015–, the United Nations Conference on Sustainable Development (2012), and the Paris Agreement of the United Nations Framework Convention on Climate Change (2015) (see Section 2.3). As Chapter 2 submits, private financing can be considered a next step in the privatisation of global governance which has been materialising since the 1990s in particular.

It is important to see the reference to private finance in a historical context. International agreements in the fields of development, environment and climate have always been characterised by a strong division between the Global North and the Global South. Since the 1970s, such agreements typically included clauses that describe how developed countries financially support developing countries with implementation. A well-known example is the 1970 agreement by the United Nations General Assembly that 'economically advanced countries' will progressively increase their official development assistance towards 0.7 percent of their gross national products (UN General Assembly, 1970, §43). Other examples include the 1972 Stockholm Declaration on the Human Environment and the 1989 Montreal Protocol on Substances that Deplete the Ozone Layer (see Section 2.1). The tradition to support developing countries with the implementation of international agreements through public finance from developed countries is now broken. Yet the potential of private finance to address the fields of environment, climate change and development remain unclear. The main research question of this doctoral dissertation is therefore:

Under what conditions can private finance effectively support adaptation to climate change in developing countries?

This dissertation concentrates on private adaptation finance in developing countries for three reasons. First, adaptation is of crucial importance for developing countries to address one of the biggest challenges of our time: climate change. Both mitigation of greenhouse gas emissions and adaptation to the effects of climate change are crucial to avert and minimise losses and damages of climate change to society, economy and ecology. Yet adaptation is often considered to be more important domestically in developing countries because of their high vulnerability and their comparatively low greenhouse gas emissions (Ciplet, Roberts, & Khan, 2015; Mbeva & Pauw, 2016). Second, climate finance already occupies the lion's share of public funding for the implementation of international environmental agreements (Pickering, Betzold, & Skovgaard, 2017) and overlaps to a large extent with development aid (OECD, 2014b). Climate finance is financial support for mitigation and adaptation projects and programs in developing countries, and is channeled by national, regional and international public entities as well as private entities (see Section 1.3). Climate finance is thus very important for providers (developed countries) and recipients (developing countries). Finally, this dissertation focuses on adaptation rather than mitigation, because the knowledge gap on private finance for adapatation is much larger than for mitigation. While the scientific and political debate on private mitigation finance is longer-standing and advanced, the potential of private adaptation finance in developing countries is openly questioned (Atteridge, 2011; Carty, 2013; Fry, 2013; Pereira, 2013; Pereira, Orenstein, & Chan, 2013; Withey, Borgerson, Herbertson, McGray, & Dixon, 2009). In this doctoral dissertation, I submit that the potential and effectiveness of private adaptation finance in developing countries depend on allocation, effectiveness and accountability (see Section 1.3.3). Private adaptation finance has decisive societal implications. The challenge of adaptation is so immense, that *if* the private sector can finance adaptation, this must be capitalised on in every sector and all over the world. However, if private adaptation finance proves fictitious, the current expectation of the UN climate negotiations – that substantial private finance contributions will complement public finance – cannot be fulfilled. In this case, tens of billions of promised adaptation finance will never reach its destination. As a consequence, tens of

millions of vulnerable and poor people will be more affected from climate change impacts.

The notion of private adaptation finance is hardly ten years old, and there is little practical experience with it. Neither research nor policymaking has reached a stage where discussions focus on improving or up-scale current practices. Instead, there is a need for exploring and clarifying private adaptation finance in the context of the core of the international climate finance architecture: the UN climate negotiations. As mentioned above, private adaptation finance became an important political issue at the 15th Conference of the Parties (COP) in Copenhagen in 2009. The conference was supposed to bring forward a successor of the 1997 Kyoto Protocol. Instead, it produced the 'Copenhagen Accord' – a non-binding political declaration that only received support of 114 out of 194 Parties (UNFCCC, 2010). The conference is therefore often considered a failure (cf. Ciplet et al., 2015; Dimitrov, 2010; Dubash, 2009; Falkner, Stephan, & Vogler, 2010; Michaelowa & Michaelowa, 2012; Peet, Robbins, & Watts, 2011).

However, the Copenhagen Accord was a watershed for the issue of climate finance. Traditionally, climate finance has been one of the most contentious issues in the UN climate negotiations (Bodansky, 2001). Such contention centres around the question of responsibility (or even liability) of countries with high (historical) emissions and the high (or even uncontrollable) costs this could imply (see Section 1.3.1 below). The conference in Copenhagen initiated two fundamental novelties on climate finance. First, developed countries pledged to mobilise US$ 100 billion annually by 2020 to support developing countries in their mitigation and adaptation activities. Ever since, the scaling up of climate finance towards the US$ 100 billion and the tracking and accounting of financial flows have been primary political and operational priorities for the UN climate negotiations (Bodnar, Brown, & Nakhooda, 2015; Iro, 2014). Second, for the first time, the private sector was mentioned as a source of climate finance. The predominant focus in adaptation research had always been on governments, communities and the service sector as key actors in adaptation (Averchenkova, Crick, Kocornik-Mina, Leck, & Surminski, 2015; Osberghaus, Dannenberg, Mennel, & Sturm, 2010). From the conference in Copenhagen onwards, private finance became a major political issue at both international and national levels, and it became subject for both policy-oriented and more fundamental research (including this doctoral dissertation).

'Private sector' is a broad concept. The content and location of the private and the public has changed throughout history and still varies between countries. According to the Oxford English Dictionary, the private sector is 'the part of the national economy not under direct state control' (Oxford English Dictionary, 2006). Within the discipline of international relations, the public has mostly been equal to the state and the private has been equal to the non-state (Pattberg & Stripple, 2008). This doctoral dissertation further distinguishes between the for-profit private sector and the not-for-profit private sector, including communities of faith, civil society, cities and philanthrophy. Unless otherwise indicated, this dissertation refers to the for-profit private sector when it describes private adaptation and private adaptation finance. In adaptation, such for-profit private actors range from smallholder farmers to multinational companies in, for example, tourism, mining or finance (see Noble et al., 2014). In theory, all these actors can invest in and contribute to adaptation, albeit in different ways. Smallholder farmers can adapt their farming practices; multinational companies can produce new technologies and have financial leverage. If adaptation is done properly, it can build resilience and enable humanity to cope with climate change. If adaptation is 'done poorly, however, it can lead to resource concentration, land grabbing, (…), marginalization of smaller groups, uncontrolled corporate power, and aggravated social poverty' (Sovacool, Linnér, & Goodsite, 2015; 618). It is therefore important to understand the potential and the effectiveness of private adaptation finance in developing countries.

This chapter provides a broad introduction to this doctoral dissertation. Section 1.1 introduces climate change and illustrates that the hampering of mitigation makes adaptation necessary. The section also introduces the UN climate negotiations and the way in which they address adaptation. Costs estimates of adaptation are introduced in Section 1.2. Section 1.3 focuses on climate finance: it introduces different justifications of why the Global North should mobilise climate finance; contextualises the pledge by developed countries to mobilise private climate finance; and elaborates on the differences between public and private climate finance in terms of allocation, effectiveness and accountability. Subsequently, Section 1.4 provides the problem description and the research questions. Section 1.5 explains the research approach and methodology. Section

1.6 describes the general scope and limitations. Finally, Section 1.7 provides a short outline of the dissertation.

1.1 Climate change and adaptation

Climate change has been subject of international scientific and political debates for around thirty years now. The first assessment of the Intergovernmental Panel on Climate Change (IPCC) in 1990 already warned against climate change and its potential effects (Houghton et al., 1990). A first ministerial conference on climate change in 1989 in Noordwijk (the Netherlands) already concluded that countries' joint efforts should limit or reduce emissions and increase greenhouse gases sinks, in order to safeguard the planet and to maintain its ecological balance (Vellinga & Swart, 1991). Three years later, in 1992, the United Nations Framework Convention on Climate Change (UNFCCC, referred to in this doctoral dissertation as 'the Convention') sets the objective to avoid dangerous anthropogenic interference with the climate system (United Nations, 1992).[1] In 2010, the UN climate negotiations translated this long-term objective into a goal to keep the average global temperature increase below 2°C above pre-industrial levels (UNFCCC, 2011). A few years later, the IPCC indicates in their Fifth Assessment Report in 2014 that anthropogenic greenhouse gas emissions are higher than ever before. The IPCC also states that the human influence on the climate system is clear: warming of the climate system is unequivocal (see Figure 1-1), and in recent decades climate change already impacted natural and human systems on all continents and across the oceans. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level rise has accelerated (IPCC, 2014b). In 2015, the UN climate negotiations reach the 'Paris Agreement', which was sharpens the target to limit the global temperature increase (UNFCCC, 2015b).[2] However, measurements prove that the global-average near-surface temperature of the Earth has increased by 1.0°C since the 19th century (see Figure 1-1) (KNMI, 2016;

[1] See Oppenheimer and Petsonk (2005) for an elaboration of this objective.

[2] Article 2.1 of the Paris Agreement aims to 1) hold '*the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change'* (UNFCCC, 2015); 2) increase the *'ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development (...)'* and 3) make finance flows *'consistent with a pathway towards low greenhouse gas emissions and climate-resilient development'.*

Ring, Lindner, Cross, & Schlesinger, 2012) and current mitigation efforts and plans remain insufficient to limit global warming to 2°C (Climate Action Tracker, 2015; UNEP, 2015).[3]

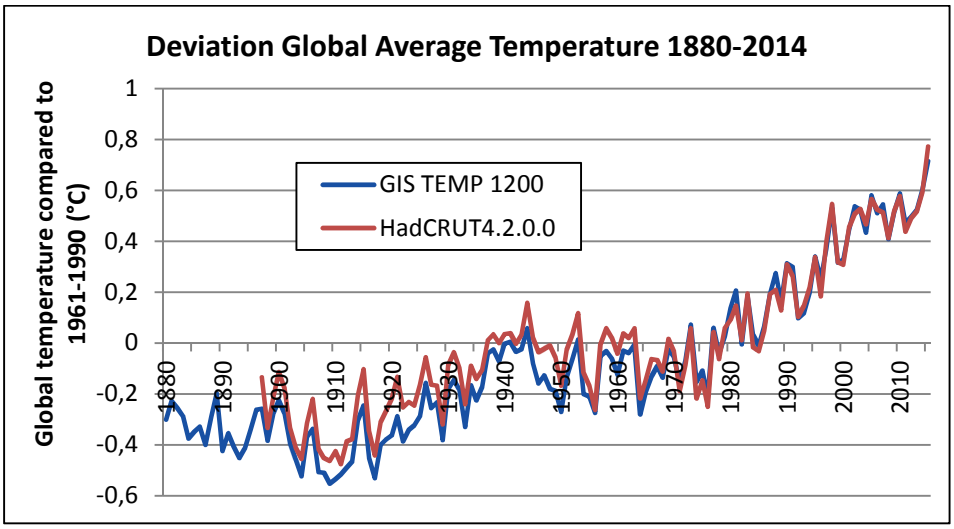

Figure 1-1: Annual global temperature as compared to the average temperature from 1961 to 1990 (in °C) for two climate models (HadCRUT4.2.0.0 and GIS TEMP 1200). Data from NASA and the Hadley Centre (source: KNMI, 2016).

Under rising temperatures, adaptation is getting more important. This doctoral dissertation follows the IPCC definition of adaptation: 'initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects' (IPCC, 2014b). For Least Developed Countries (LDCs), the adaptation debate is arguably more important than the question of emission targets (Barr, Fankhauser, & Hamilton, 2010). People in LDCs are five times more likely to die from climate-related disasters than the global average, yet their emissions are less than one percent of the global total (Ciplet, Roberts, Ousman, et al., 2013). Indeed, they prioritise adaptation (and international adaptation finance) in their recent climate action plans (or Intended Nationally Determined Contributions (INDCs)) that formed the cornerstone for the Paris Agreement (Mbeva & Pauw, 2016; Pauw et al., 2016).

[3] The globally averaged temperature in 2016 was about 1.1°C higher than the pre-industrial period. The year 2016 surpassed 2015 as the hottest year on record (World Meteorological Organization, 2017).

Adaptation was already included in the 1992 Convention. For example, Article 4.1.e states that all Parties shall 'Cooperate in preparing for adaptation to the impacts of climate change', mentioning integrated plans for coastal zone management, water resources and agriculture as well as protection and rehabilitation of areas affected by drought, desertification and floods. Furthermore, on finance, Article 4.4 states that '[t]he developed country Parties and other developed Parties included in Annex II shall also assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects' (United Nations, 1992).[4] Adaptation only came to the fore during negotiations in the 21st century (Khan, 2015). For example, at the UN climate negotiations in Marrakesh in 2001, the Adaptation Fund and the Least Developed Countries Fund were established to finance adaptation projects in developing countries. At the UN climate negotiations in 2006, the Nairobi work programme on impacts, vulnerability and adaptation to climate change was established; and in the 2007 Bali Action Plan of the recognition of adaptation was placed on equal footing with mitigation (UNFCCC, 2002, 2007c, 2008c). The 2010 Cancun Adaptation Framework (CAF) is a milestone in the sense that it further developed planning and implementation of adaptation (through National Adaptation Plans, as well as a work programme on loss and damage); elaborated on the provision of finance; created institutional mechanisms such as the Adaptation Committee; incorporated principles such as 'country-driven', 'gender-sensitive' and 'participatory'; and aimed for more stakeholder engagement (Khan, 2015). Finally, both adaptation and finance appear among the main aims of the Paris Agreement, next to the long-term temperature target (UNFCCC, 2015b; Art. 2.1).[2]**Fehler! Textmarke nicht definiert.**

1.2 Costs of adaptation

The increasing importance of both adaptation and climate finance under the UN climate negotiations created the need for insights in the global costs of adaptation. Several cost estimates of adaptation were compiled (see e.g. Oxfam, 2007; Parry et al., 2009; Stern, 2006; UNFCCC, 2008a; World Bank, 2006, 2010).

[4] These 'Annex II' Parties are Australia, Austria, Belgium, Canada, Denmark, the European Union, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom of Great Britain and Northern Ireland, and the United States of America.

These studies analyse different countries for different time spans and global change scenarios, and are therefore not fully comparable. For instance, the World Bank (2010) refers to developing countries only using a 2°C warming scenario (from 2010 to 2050), and estimates adaptation costs at US$ 70 billion to US$ 100 billion per year. Oxfam (2007) estimated the adaptation costs in developed countries to be at least US$ 50 billion per year by scaling up known adaptation projects in Least Developed Countries and by adding 'hidden costs'. Parry et al. (2009) indicate that earlier studies underestimate the costs of adaptation, partly because sectors such as mining and manufacturing, tourism and ecosystems are not regarded. According to them, adding the latter could increase annual costs by US$ 65 billion to US$ 300 billion. Although studies on adaptation costs provide a number and are therefore often referred to by scientists and policymakers alike, they are also criticised heavily. For example, Agrawala and Fankhauser (2008) note that the early studies were not substantive, borrow heavily from each other, and that they are not peer reviewed. The latest and arguably most comprehensive global costs estimate comes from the Adaptation Finance Gap Report of the United Nations Environment Programme (UNEP).[5] The report does not only look at impact-assessments and technical adaptation, but also factors in opportunity and transaction costs associated with policy implementation. It scales up cost estimates of sectors and countries, and indicates that global adaptation costs could rise to US$ 140 billion to US$ 300 billion annually by 2030, and continue to rise thereafter (UNEP, 2016).

Generally, adaptation costs rise under lower global mitigation ambitions. The objective of adaptation also strongly influences outcomes of costs estimates. An objective to maintain welfare (requiring adaptation up to the level at which countries have the same level of welfare as they would have without climate change) leads to higher adaptation costs than the objective to reach an economic optimum (which balances costs, benefits and residual impacts). Another challenge is that adaptation costs estimates should only indicate the marginal costs on top of general development baseline. In practice, however, many studies on adaptation cost also address existing adaptation deficits (costs occurring because a country is inadequately adapted to current weather-related

[5] The cost estimates can be found in Chapter 2 of this report. I was a lead author for Chapter 4 of the Adaptation Finance Gap Report, on which Chapter 3 of this doctoral dissertation also draws.

risks), and most of adaptation measures have other development-related benefits, rather than being purely additional adaptation options (Watkiss, Baarsch, & Kingsmill, 2016).

1.3 Climate finance

Due to the increasing importance of adaptation and the awareness about its costs, developed countries' provision of climate finance to developing countries became increasingly important at the UN climate negotiations. This section first provides two justifications and two additional reasons for climate finance provision by developed countries. It then introduces the concept of mobilising climate finance, as well as the fundamental differences between public and private financing.

1.3.1 Justifications for international climate finance

Issues of justice and ethics have received a fair amount of attention in the field of mitigation. Substantially less attention was directed to the questions who should bear the costs of adaptation, and in which manner (Ciplet, Roberts, & Khan, 2013; Ciplet et al., 2015). Developing countries perceive adaptation finance as a vehicle to enhance fairness in the UN climate negotiation (Pickering, Jotzo, & Wood, 2015; Rübbelke, 2011). Using fairness as a starting point,[6] two main justifications for the provision of climate finance by developed countries can be identified in literature and at the UN climate negotiations.

A first justification is solidarity. A non-consequentialist approach of fairness focuses on justice in guiding principles or intentions, rather than in outcomes (see Dellink et al., 2009). Based on the precautionary principle, proof of harm (the consequence of an act) is not needed before action is taken to avoid it. Here, the aim of adaptation finance would be a redistribution of wealth, with richer countries financing adaptation out of solidarity, irrespective of whether there is evidence that they have directly or indirectly caused harm (Dellink et al.,

[6] Fairness and equity are often used interchangeably in international political discourse, in particular for subjects such as climate finance, where developed and developing countries have diverging interests (Mbeva & Pauw, 2016). The terms have similar philosophical connotations. The Oxford English Dictionary defines equity as 'the quality of being fair and impartial', and fairness as 'treating people equally without favouritism or discrimination'. This dissertation generally uses the term fairness. See (Rajamani, 2006, 150ff) for a concise philosophical clarification of equity in the context of the notion of common but differentiated responsibilities in the UN climate negotiations (Pauw, Bauer, Richerzhagen, Brandi, & Schmole, 2014).

2009). Richer countries would take the responsibility to provide adaptation finance based on their capacity, but liability is limited. This approach naturally links to debates around development finance (see e.g. Sections 2.1.1 and 2.1.7).

The second justification is liability. Barrett (2007) points out a difference between Official Development Assistance (ODA) and adaptation: 'The rich countries did not make the poor countries poor, but they are largely responsible for the accumulation of greenhouse gases in the atmosphere'. Liability is based on the ethical principle of consequentialism (i.e. justice based on outcomes of behaviour and decisions): polluters have a responsibility to act, as expressed through widely accepted policy principles such as the no-harm principle and the polluter pays principle (see Dellink et al., 2009; Pauw et al., 2014). Based on this justification, it could be argued that industrialised countries with high (historical) emissions have a moral obligation to protect countries with low historical emissions (Rübbelke, 2011). Indeed many developing countries see adaptation finance not as 'donations' but as costs imposed on them by developed countries, and as debt incurred by developed countries (Müller, 2009; 4).

Additionally, developed countries have two more reasons to finance adaptation in developing countries. First, the climate can be seen as a public good. Given the shared atmosphere, the global public good aspects of mitigation are evident, and it might be more cost-effective for a developed country to finance emission reduction in a developing country than domestically. Adaptation also has public good aspects. For example, sea defences are typically provided by the state (Fankhauser & Soare, 2013). However, as long as adaptation measures mainly yield excludable benefits, it is a national, a local or even a private interest to produce efficient adaptation, rather than the interest of a developed country (Burns & Forrister, 2012; Rübbelke, 2011). Khan (2015) however argues that adaptation could evolve into a regional or global public good, for instance when climate change triggers mass migration or when slow-onset events like sea level rise threaten many countries at the same time.

Second, 'financial compensation' by developed countries is a strategic tool to enhance pro-active participation in the UN climate negotiations (Pauw et al., 2014). Ciplet et al. (2015; 78) go as far as stating that 'restributive material and institutional concessions' have been 'instrumental in the negotiation of consent [of wealthy and low-income states] to contemporary climate change treaties'.

Financial support could also make developing countries more willing to contribute to mitigation, even if their own historical responsibility for emissions is comparably low (Rübbelke, 2011).

The abovementioned justifications in particular play an important role in countries' positions on the responsibility of developed countries to provide climate finance. According to both justifications, the responsibilities of developed countries decline over time: the share of global emissions of countries like China and India increase (and thereby their responsibility too), and their poverty levels decline (meaning their capacities increase).

It is important to note that these justifications are subject of continuous scientific and political debate, and that neither justification is broadly accepted at the UN climate negotiations. Developed countries never explicitly recognised *liability* for adaptation – meaning their provision of climate finance continues to be voluntary (Khan, 2015). While a more fundamental debate on climate finance responsibilities is ongoing among scholars (see e.g. Ciplet, Roberts, & Khan, 2013; Dellink et al., 2009; Grasso, 2010; Pickering et al., 2015), the pragmatic approach of developing countries has always been that climate finance should at least be 'new and additional' to Official Development Assistance (see Section 6.2).

1.3.2 Mobilising climate finance

At the UN climate summit in Copenhagen in 2009, developed countries committed to significantly increase financial resources to assist developing countries with climate change mitigation and adaptation. They pledged to mobilise US$ 30 billion 'fast start finance' for the period from 2010 to 2012,[7] and US$ 100 billion per year from 2020 onwards (UNFCCC, 2010). Finance should come from 'a wide variety of sources, public and private, bilateral and multilateral, including alternative sources of finance'. Although much more is needed for the global adaptation and mitigation challenges, this goal remains the primary political benchmark for assessing progress on climate finance (Bodnar et al., 2015). The inclusion of private climate finance was a requisite

[7] So called 'fast start finance'. Different opinions exist on whether its target was met (see e.g. Fransen, Nakhooda, Harmeling, Kuramochi, & Kalbekken, 2013; Oxfam America, 2012).

from industrialised countries to sign the Copenhagen Accord and the Cancun Agreements (Romani & Stern, 2011).

In response to the abovementioned pledge, former UN Secretary General Ban Ki-moon established the High Level Advisory Group on Climate Change Finance (AGF). It concluded that it is 'challenging but feasible' to mobilise US$ 100 billion per year – but that it would require more than public funds alone (AGF, 2010). Whilst public climate finance lacks a broadly accepted definition (Brunner & Enting, 2014; UNFCCC, 2014b), defining private adaptation finance is conceptionally even more difficult considering the wide variety of sectors, type of private actors, modes of cooperation and finance flows that can be identified. The inclusion of private finance in the Copenhagen Accord not only stimulated the debate on the private sector's role in adaptation finance, but also on their role in adaptation in developing countries in general.

There are at least two reasons to believe that private finance could have a high potential to support mitigation and adaptation, and they warrant further studies. First, private sector investments constitute 86% of all investment and financial flows globally (UNFCCC, 2009), and private investments in developing countries have increased dramatically since the 1990s (see Figure 3-3). Global capital markets represent US$ 178 trillion in financial assets: it is not a matter of capital generation, but rather of redirecting 'existing and planned capital flows from traditional high-carbon to low-emission, climate-resilient investments' (Glemarec & Connelly, 2011; 2). Second, 90% of the people in developing countries depend on the private sector for their income (SER, 2011). If both the investment potential and people's income depend on the private domain, why shouldn't the finance depend on the private sector?

1.3.3 Allocation, effectiveness and accountability of private finance

The public and the private sector have different narratives on and interests in adaptation. Public sector actors, such as governments and cities, have long considered adaptation to be a public but secondary response to climate change (Khan, 2015). Initially, adaptation was supposed to address incremental impacts of climate change. The narrative later focused on reducing the general vulnerability of economy, society and ecosystems towards climate change (Burton, Huq, Lim, Pilifosova, & Schipper, 2002). As opposed to this, the private sector's narrative on adaptation needs to be seen in the context of its function

to generate revenue: all private investments have to have reasonable, relatively quick and predictable returns at acceptable risks (Atteridge, 2011; Christiansen, Ray, Smith, & Haites, 2012). For the private sector, adaptation is often regarded as a side benefit rather than the main aim of an investment. At least three characteristics of adaptation give it an unattractive risk-return profile. The first is incomplete or asymmetric information. Private actors often do not know what to expect from climate change or from adaptation technologies. Even if one actor perceives a demand for adaptation, it might not obtain credit if a financial institution makes decisions on different information. Second, adaptation often requires up-front and capital-intensive investments, but amortisation periods are generally long and uncertain. Capital markets are not adjusted to this. Finally, adaptation interventions offer limited autonomous earning power for the private sector because of their positive externalities: the benefits of many measures accrue to a wider community rather than to the investor (Atteridge, 2011; Druce et al., 2016; Tompkins & Eakin, 2012; see also Chapter 6 on the private sector interests in adaptation).

The abovementioned characteristics have an uneven applicability across private actors. For instance, a retailer with high operational flexibility (adjusting their production or supply sources) has very different incentives to invest in adaptation than a mining or oil extraction company that is locked into its assets (Agrawala et al., 2011). Even within one sector, different actors have different levels of flexibility. Hess, Pauw, and Papyrakis (2015) demonstrate that the adaptive capacity and the interest to finance adaptation within the tourism sector are different for hotels and attraction sites than for local tour operators or multinational tourism corporations. Even at the level of individual multinational companies the drivers for adaptation can vary between the home-country headquarter and its subsidiaries, for example because of different legal and regulatory environments, social and cultural values and norms, as well as stakeholder and customer pressure (Levy & Kolk, 2002).

In addition to such general characteristics of private climate financing, there are particular characteristics that raise questions of *allocation, effectiveness*, and *accountability* of private adaptation financing.

In the UNFCCC's Copenhagen Accord and the Cancun Agreements it was agreed that climate finance should be balanced between mitigation and adaptation, and that it should prioritize the most vulnerable developing countries (see Table

6-1). However, such *allocation* is difficult to impose on private finance, for at least two reasons. First, foreign aid responds to political incentives, such as democratisation or poverty levels (see also Section 2.1). Private finance is more sensitive to economic conditions in the receiving countries (including policy management, trade liberalization and protection of property rights) (Alesina & Dollar, 2000). As Withey et al. (2009; 4) state, almost cynically: 'businesses may not typically focus much attention on assuring that the poorest populations around them can adapt to climate change'. Second, private finance is less likely to be invested in adaptation than in mitigation. For example, investments in renewable energy are increasing due to declining unit costs (Buchner, Trabacchi, Mazza, Abramskiehn, & Wang, 2015) and investments in energy efficiency can have negative incremental costs on the longer term. In addition, (international) mechanisms such as the Clean Development Mechanism (CDM) have created a market for emission reduction. Prices of energy and CO_2 are sometimes uncertain, but the cost-effectiveness of mitigation is independent of how the climate changes (Pauw, Speranza, van de Sand, Kaplan, & Schraven, 2011). Adaptation investments are made under different conditions. Adaptation credit systems do not exist (See Persson, 2011); and calculations of the costs and benefits of adaptation are based on uncertain projections of *inter alia* climate change, economic growth, and population growth. Paradoxically, if expected climate extremes do not occur, an adaptive measure (e.g. the construction of a dike) might be considered too expensive ex-post (Pauw et al., 2011). A balanced allocation of finance between adaptation and mitigation as agreed under the UNFCCC's Copenhagen Accord and the Cancun Agreements (see Table 6-1) is unlikely when it comes to private finance.

In terms of *accountability*, the public sector needs to maximise 'impact' per invested dollar to demonstrate tax payers that financial flows, such as development aid and climate finance, are spent wisely (Christiansen et al., 2012). The OECD DAC measures the financial flows from its members to developing countries since the 1960s (see Footnote, Section 2.1.1 and 7.3.4)**Fehler! Verweisquelle konnte nicht gefunden werden.**, and makes results publicly available. In the context of the UN climate negotiations, countries also report on provided climate finance in their Biennial Reports (see Section 7.2). Private investments, however, focus on the risk-return profile of an investment. Portals such as the UNFCCC's Private Sector Initiative (see Chapter 6) or the

Green Bonds Initiative (see Section 0) register voluntary private adaptation initiatives, but there are no mandatory accountability requirements by countries or shareholders that force private actors to report on adaptation.

General private climate-related finance flows are being tracked by organisations such as Climate Policy Initiative (Buchner, Falconer, Hervé-Mignucci, Trabacchi, & Brinkman, 2011; Buchner et al., 2015) and the OECD-hosted and co-ordinated 'Research Collaborative'. This collaborative brings together governments, research institutions and international finance institutions for improved identification, measurement and reporting of private climate finance flows in the context of the US$ 100 billion target. However, private actors that invest in adaptation do not organise or finance such tracking activities, and data on private adaptation finance remains scarce (see Section 3.2). It is even more difficult to track private investments in adaptation (or prevention of maladaptation) which are indirectly mobilised by regulations and laws (for example through coastal zone policies, or water efficiency standards). Currently, such investments are not tracked in a comprehensive way (Dzebo & Pauw, 2015).

Finally, the *effectiveness* of private adaptation finance under the Convention has two dimensions. First, an effective institutional design at international and national levels in order to delegate or transfer public sector responsibilities to the private sector effectively. Second, such an institutional design needs to lead to desired adaptation outcomes (see Bäckstrand, 2006). Indeed the latter are difficult to measure, both for public and for private adaptation, given the lack of a broadly accepted definition of adaptation and its relation to development (Druce et al., 2016; Dzebo & Pauw, 2016; see e.g. Project Catalyst, 2010). The lack of such a definition allows for multiple and co-existing conceptualisations of adaptation, which puts the quality of adaptation practice under pressure. For example, it enables the repetition of former development practices, now re-legitimised and relabelled as adaptation (Ireland, 2012) and it encourages actors with or without sound experience in or knowledge of adaptation to manage adaptation programs (Mustelin et al., 2013). This is very different for mitigation, where governments can formulate policies on emission standards, carbon taxes or cap-and-trade systems and use the cost per ton of abated CO_2 emissions as a proxy to measure the cost-effectiveness of such policies (see Nakhooda, Carvalho, & Taschini, 2012). Because the effectiveness of adaptation is difficult

to measure on the ground, it is also difficult to understand the effectiveness of the institutional design and its policies. In the particular context of climate finance, Pickering et al. (2015) describe such effectiveness in terms of 'adequacy' – or attaining the US$ 100 billion target. Adequacy is not separable from fairness (see Section 1.3.1), since adequate financing contributes to a fair distribution between developed and developing countries of the overall costs to address climate change. Even climate finance flows are hard to measure, as Chapter 3 will explain.

Despite the difficulties mentioned above, the role of the private sector is becoming increasingly imperative in climate finance, as can be concluded from discussions around, *inter alia*, the Private Sector Facility of the newly established Green Climate Fund (GCF), UNFCCC's Standing Committee on Finance and the World Bank's Climate Investment Funds. Yet literature is still conceptualising private sector adaptation and adaptation finance (IFC, 2012). Little research has been conducted on different actors' experiences of the imperative of private sector engagement in adaptation and adaptation finance and what it signifies in terms of effectiveness, allocation and accountability issues.

1.4 Problem definition and research questions

In the context of the broader movement towards private financing to implement international agreements (see Chapter 2), this dissertation examines the particular case of private adaptation finance. In the context of the demand for more finance to cover increasing adaptation costs (see Section 1.1), the different justifications for North-South flows of financial resources (Section 1.3), and the push by developed countries for private adaptation finance – which raises questions of allocation, effectiveness and accountability (Sections 1.3.2 and 1.3.3), this PhD research explores and examines private sector adaptation and adaptation finance in developing countries. The central research question is as follows:

Box 1-1: Central research question.

> *Under what conditions can private finance effectively support adaptation to climate change in developing countries?*

Two steps need to be taken before the answering of the central question can start. First, it is important to understand *why* the private sector was listed as a source of finance in the UN climate negotiations. Chapter 2 places private adaptation finance in a historical context by analysing 22 international agreements on development, environment and climate change on the privatisation of global governance. These agreements were all signed after World War II and are politically addressed through a division between the Global North and the Global South. Chapter 2 contextualises these agreements through academic and grey literature and by explaining them through theories on liberal environmentalism, ecological modernisation and commodification.

Second, Chapter 3 provides a state-of-the-art overview of private adaptation finance in developing countries. This technical chapter introducing finance instruments, current flows of private finance towards developing countries as well as the current knowledge of barriers towards private financing and public interventions to overcome such barriers. Chapter 3 illustrates that private adaptation finance is still being conceptualised, and norms are still being developed. 'Norms' are shared conceptions of appropriate behaviour or action that, in the context of global environmental governance, define, regulate and legitimate actors' identities, interests and behaviour (Bernstein, 2002; 2). 'Institutionalised norms' define appropriate and inappropriate courses of action as well as legitimate and delegitimate institutional forms (Bernstein, 2011).

In order to better understand the conceptualisation and development of norms around the nascent issue of private adaptation finance, seven research questions on accountability, effectiveness and allocation (as introduced in Section 1.3.3) support the central research question (see Box 1-2).

Private investments in adaptation start with private actors interests in adaptation. Therefore, research question 1 studies the private sector's motivation to invest in adaptation (research question 1). Based on the literature, these motivations are explained in Chapter 4 in particular, and refined based on a case study on Zambia's agricultural sector (Chapter 5) and business cases of the private sector itself (Chapter 6). An understanding of the broader motivations will help to study which kinds of private actors might invest and finance adaptation (research question 2). This question might appear simple and plain, but the contrary is the case. The decision to designate the private sector

as a source of adaptation finance was taken by countries under the Convention, not by the private sector itself. Private actors are identified in Chapter 6 in particular, and additional examples of private sector investments in adaptation are provided in ten excursuses throughout the dissertation (see the List of Excursuses on page XIV). Given that the decision to designate the private sector as a source of adaptation finance was taken by countries under the Convention, it is important to analyse whether the private actors identified under Question 1 and 2 can be held accountable. Research question 3 addresses this issue is in particular in Chapters 5 to 7, albeit in dissimilar ways and with different level of detail.

Box 1-2: Research questions.

Accountability:

1. *Why would the private sector invest in adaptation?*
2. *Who (which private actors) would invest and finance adaptation?*
3. *Can the private sector be held accountable for financing adaptation?*

***Effectiveness**:*

4. *How effective is the institutional design at international and national levels in mobilising private adaptation finance?*
5. *Does the mobilised private adaptation finance lead to the desired adaptation outcomes in developing countries?*

***Allocation**:*

6. *Who benefits and who loses from private investments in adaptation?*
7. *Does private adaptation finance lead to socially just outcomes?*

Long-term support for the decision of the UN climate regime to mobilise private adaptation finance will depend on the effectiveness of this decision. The second set of research questions therefore addresses whether the institutional design mobilises private adaptation finance (research question 4) that leads to desired adaptation outcomes in developing countries (research question 5). Both international and national levels are examined, because the increasing global

institutionalisation of climate politics does not occur and is inconceivable without continued policymaking at national and sub-national levels (Frank Biermann & Pattberg, 2012). Research question 5 is addressed in Chapters 4 and 7 in particular. Chapter 4 analyses National Adaptation Programmes of Action of 47 Least Developed Countries and Chapter 7 describes the strategies, policies and instruments utilised by developed countries and development banks and agencies to engage the private sector in adaptation and adaptation finance. Chapters 5 to 7 address both research question 4 and 5. Chapter 5 identifies Zambia's adaptation policies and discusses the current and potential role of the private sector in Zambia's agricultural sector. Chapter 6 distils ten key criteria for adaptation finance of the Copenhagen Accord and the Cancun Agreements of the UNFCCC, and analyses whether 101 business cases meet those ten criteria.

A transmutation from public towards private adaptation financing has consequences that go beyond the adapation outcomes as such. In general terms, public financing in international governance is partly motivated by fairness – regardless of whether fairness is based on solidarity, liability or in order to protect public goods (see Section 1.3). The private sector's interest in revenues rather than fairness fundamentally alters finance allocation. The institutionalisation of private financing inherently induces winners and losers. Of particular interest are developing countries, whose negotiators in the UN climate negotiations have been insisting on receiving more adaptation finance.

Therefore, research question 5 analyses who benefits and who loses from private investments in adaptation, and research question 6 analyses whether private adaptation leads to socially just outcomes. To answer these two questions, various examples of private adaptation and private adaptation finance are analysed. For example, Chapter 3 provides a general overview of private finance flows and the extent to which the Least Developed Countries are addressed; and Chapter 4 analyses the ways in which these countries expect the private sector to contribute to adaptation through a large-N study of National Adaptation Programmes of Action (NAPAs). Zambia's agricultural sector serves as a case study to understand developing country interests on the private sector's role in adaptation (Chapter 5); and Chapter 6 includes an analysis of the indirect beneficiaries of 101 private adaptation projects all over the world and

in a large variety of sectors, including in those that emerge as priority sectors of Least Developed Countries in Chapter 4.

To conclude: all three sets of research questions are addressed in Chapters 4 to 7, albeit with different methods and in varying levels of detail. Furthermore, every individual chapter focuses on a specific actor group in the climate finance architecture. The term 'architecture' does not presume there is one architect or regulation from one (dominant) regime only, but rather conveys a neutral meaning and facilitates an analysis of policy domains with multiple regimes (Frank Biermann, Pattberg, van Asselt, & Zelli, 2009). By focusing on one actor group per chapter, such groups' interests in private adaptation finance become more explicit. Chapters 4 and 5 thus focus on recipients of climate finance; Chapter 6 on the private sector; and Chapter 7 on the public providers of climate finance (see Table 1-1 for more details). Together, these three groups need to define and institutionalise norms on private adaptation finance: under the UNFCCC, at national level, and at the level of implementation.

Chapter	Actor groups	Motivation
4	Developing countries	Climate finance recipients
5	Developing countries	Climate finance recipients
6	Private sector	Supposed to be a source of adaptation finance
	UNFCCC	At the core of the climate finance architecture
7	Developed countries	Pledged to mobilise climate finance
	Development banks	Implementing developed countries' adaptation projects
	Development agencies	Implementing developed countries' adaptation projects

Table 1-1: Each chapter focuses on a specific actor group.

Due to the continuous developing of concepts and norms and in order to accommodate the views of the actors groups in Table 1-1, this dissertation focuses on political and institutional interests in private adaptation finance, rather than on the (limited) experiences with or effectiveness of individual projects on the ground. Nonetheless, ten excursuses with practical examples are provided to illustrate the constitution of private adaptation finance in the field.

1.5 Research approach and methodology

Scientific research is an 'ideal'. Even 'the most careful' qualitative and quantitative research engages to approximate this ideal (King, Keohane, & Verba, 1994; 7). Research applies theoretical standards of interference imperfectly, and is based on inherently imperfect research designs and empirical data (King et al., 1994). Nevertheless, research is relevant to the scientific community if it advances the collective dialogue between theory and empirical data, by 'formulating, testing and improving theory, by generating and improving data, and by describing and explaining observations' (Gschwend & Schimmelfennig, 2007; 3).

One of the main challenges in this doctoral dissertation is that private adaptation finance is such a novel concept, that theory about its origin and evolvement, its effectiveness and its future potential still need to be developed. Consequently, the abovementioned 'collective dialogue between theory and data' in this case does not start with a theory, but 'at the other end' with observations that need to be explained and theorised about, and supplemented with further observations to lead to, at some point, a theory (Gschwend & Schimmelfennig, 2007; 2). At the same time, Chapter 2 in particular build on theories on liberal environmentalism, ecological modernisation and commodification; all three of which have been extensively used to explain international environmental policy (see Bernstein, 2002, 2012; Frank Biermann et al., 2012; Brouwer, Tesfaye, & Pauw, 2011; De-Shalit, 1995; Fisher & Freudenburg, 2001; Hajer, 1995; Harris & Symons, 2013; Liverman, 2004; McAfee, 1999; Mol & Spaargaren, 2000).

In doing so, this dissertation adopts an interdisciplinary, problem-driven research approach. It builds on a variety of academic domains, including political science, environmental sciences, development economics, adaptation and international finance. A large body of literature from these and other domains was examined. Academic literature was supplemented by grey literature from think tanks, civil society, consultancies and others. Although grey literature often lacks academic rigour, it is generally able to react faster to rapid developments in the field of climate finance. Furthermore, in line with the approach of this dissertation, it allowed me to better understand the interests of different kinds of actors (see Table 1-1).

A mixed method research design was adopted, the most important of which are participant observation (in 48 meetings, workshops and conferences) semi-structured interviews (with 52 interviewees), and document analysis of 201 negotiation outcome documents, policy documents and business cases) (see Table 1-2). The research methodology for this doctoral thesis is to a large extent empirically driven, as will also be explained in the following subsections.

	Chapter						
	2	**3**	**4**	**5**	**6**	**7**	**Total**
Participant observation*			48				**48**
Negotiation outcome documents**	22**				2		**24**
Policy documents			47	6		24	**77**
Business cases					101		**101**
Interviews and interviewees (in brackets)				30 (37)	2 (2)	13 (13)	**45 (52)**

* Reflects the number of international meetings, workshops conferences visited (see VII).

** The number of international agreements that were analysed. Additional intermediary negotiation outcomes are not included in this number.

Table 1-2: Empirical data used for this doctoral dissertation.

1.5.1 Participant observation

Participant observation was used as an overarching method. It has its roots in anthropological studies (Iacono, Brown, & Holtham, 2009), has a relatively long history in development studies(Chambers, 1994), and is now becoming an accepted method in social science research (Clark, Holland, Katz, & Peace, 2009; Iacono et al., 2009).

The use of participant observation has developed in part to 'satisfy predominantly post-positivist desires to question and challenge the principles and practices of research' (Clark et al., 2009; 345-346).[8] The rationale for conducting qualitative analysis based on participant observation is that, considering the human capacity to talk, the object of understanding a

[8] *Positivism* posits that reality is external and objective; that the observer is independent of what is being observed; and that objectivity is both possible and desirable (Iacono et al., 2009).

phenomenon from the point of view of the actors is largely lost when textual data are quantified (Evered & Louis, 1981; Iacono et al., 2009).

Participant observation involves participating in a situation while at the same time recording what is being observed (Iacono et al., 2009). Hypotheses do not necessarily need to be formed and tested (see Evered & Louis, 1981). It is an iterative method of enquiry which favours a more flexible process of knowledge formation (Clark et al., 2009). For this PhD research, 48 conferences, meetings and workshops with climate finance or adaptation as central issues were observed and participated in (see VII). The UNFCCC secretariat organised the majority of these events whilst others were coordinated by other institutions such as the OECD or Climate Policy Initiative (CPI). Some of the benefits of participant observation are (Clark et al., 2009; 348):

- the direct observations of behaviour of individuals and groups ensures, 'to a degree', that social realities can be simultaneously observed, documented and analysed;
- a better understanding of the context within which activities and events occur;
- 'first-hand experience of behaviours and events' that 'enable inductive enquiry rather than reliance on prior conceptualisations';
- a possible understanding what people might not be willing or unable to discuss through other method such as interviews and surveys.

In this research, participant observation not only enabled me to identify and meet relevant actors in the climate negotiations from developed countries, developing countries, research, civil society and the private sector (see Chapters 5 to 7); it also allowed me to observe the context in which they negotiate, advocate and discuss climate finance and adaptation issues. Participant observation was a crucial research method for this dissertation because it allowed me to identify actor positions and constellations as well as the diplomatic and political complexities in which actors operate and defend their statements and positions. This benefitted, for instance, the process to identify and define the ten adaptation finance criteria (see Table 6-1) and the analysis of the policy documents for Chapter 5 and 7.

Another benefit of the research outcome is that knowledge acquired through 'inquiry from the inside' through participant observation is 'inherently more

valid, useful and relevant' to the organisational actors (Evered & Louis, 1981; 387). Clark et al. (2009) also argue that a participatory approach offers those traditionally described as the subjects of research a say in determining what is being studied. Indeed, participant observation inspired me to do the research described in Chapter 6 and 7. Furthermore, the various invitations to present individual PhD chapters (see VII) as well as the invitations from, for instance, the OECD (see Kato et al., 2014) and UNEP (Atteridge et al., 2016) to contribute to their work seem to validate this argument.

The major critique on participant observation concern its objectivity: the researcher's participation might compromise the observations' objectivity concerning the subject of research. The analysis and reporting of findings must therefore be managed carefully, for example by triangulating through other sources of information or alternating/using additional research methods (Evered & Louis, 1981; Iacono et al., 2009). In the case of the PhD research, participant observation has never been utilized as a primary source of information, but rather to identify research needs, confirm research outcomes, and to understand the complex (international) contexts on which the research applies. Furthermore, in contrast to participant observation exercises by Iacono et al. (2009) and Evered and Louis (1981), my role in the UN climate negotiations has always been clearly demarcated as that of a researcher. I never participated in events as a member of a government delegation, as a lobbyist, or with commercial interests.

Other challenges for participant observation include securing access to the site (my accreditation through the German Development Institute categorised me as an 'observer', which emphasised independence but also impeded accessibility to certain negotiation sessions); finding a role that is acceptable to the social group or organisation (I was one of the many researchers, and visible as a member of the Research and Independent Non-governmental Organisations (RINGOs) to the UNFCCC); and accurately assessing the effect that the presence of the investigator has on the informants (Iacono et al., 2009). The latter is complicated: on the one hand my presentations and publications provided me the credibility and legitimacy to be in contact with informants as an expert; on the other hand, the same two outputs are likely to have influenced my informants' positions.

1.5.2 Document analysis

In total, 23 international agreements and additional negotiation outcome were analysed (see Table 2-1), as well as 77 policy documents (see Appendix 2 and Appendix 5) and 101 business cases (see Appendix 4).

Document analysis includes a broad variety of techniques. As such, It is not well explicated as a distinctive research method in either text-books on methodologies or actual research contributions (Karppinen & Moe, 2012). In this dissertation, documents are predominantly analysed as sources of information that describe policies, and the facts that underlie them. For example, the information in the six policy documents that were analysed for Chapter 5 helped to formulate the interview template, find potential interviewees, and complemented and triangulated information from interviews.

However, documents can also be a topic of study themselves when they are analysed on value-laden assumptions behind policy-making (Karppinen & Moe, 2012). Chapters 4 and 6 analyse documents this way. For example, Chapter 6 does not analyse whether the 101 business cases of the Private Sector Initiative really address adaptation (or e.g. water saving in general), but rather tries to examine the private-sector perspectives and interests in adaptation.

Because of the variety of the databases and documents that were analysed, different document analysis techniques were applied. For example, the comparability of the 'Nationally Adaptation Programmes of Action' (NAPAs) in Chapter 4 allows for keywords extraction and keyword co-occurrence analyses. These are important techniques, for instance for document clustering and text mining (Matsuo & Ishizuka, 2004). In addition, particular sections of NAPAs were analysed quantitatively and qualitatively on, for example, private sector representation among the authors or descriptions on the private sector under the 'potential barriers' sections. Similarly, Chapter 2 and the analysis of Biennial Reports in Chapter 7 also focus on particular parts of documents.

Just like Chapter 4, Chapter 6 and the analysis of the 'Information on Strategies and Approaches for Mobilizing Scaled-up Finance' (MSF documents) in Chapter 7 compare full documents. However, these documents vary so strongly in contents, scopes and lengths that they disqualify for keyword analysis. Instead, data collection was based on qualitative analysis, with limited application of

descriptive statistics (e.g. on the number of business case descriptions that include information on climate change impacts).

1.5.3 Interviews

In total, 45 interviews were conducted with 52 interviewees. Limited interview samples among key stakeholders were preferred over the creation of larger sets of empirical data in the research design of this doctoral dissertation. A clear disadvantage is that limited interview samples hamper quantitative research approaches. However, the exploratory stage of knowledge development on private adaptation finance was not considered compatible with impending generality, incomparability and inferiority of interviewing a larger set of less-experienced people in addition to the key stakeholders (cf. Gschwend & Schimmelfennig, 2007). The qualitative research design also allowed for iteration: preliminary data analysis coincided with data collection based on which interview questions could be improved or elaborated upon (see DiCicco-Bloom & Crabtree, 2006).

Interview served different functions: in Chapter 5 it was the main method of inquiry and served an iterative process of knowledge creation. In Chapter 6, two interviews were conducted to verify whether the understanding of climate finance criteria and the Private Sector Initiative were correct. In Chapter 7, interviews were bifunctional: both triangulation of the document analysis' results and the comparison of interests of developed countries and development banks and agencies.

Purposeful sampling of interviewees was an iterative process that happened through three contact avenues. First, participant observation (see Section 1.5.1) helped to access key interviewees. Second, interviewees were identified by scanning author lists of policies and other documents. Third, snowballing was used to enrich sampling clusters. Snowballing is a sampling procedure where informants whom the researcher meets are those who supply the referrals. Snowballing both uses and activates existing social networks to gain access to a broader pool of interviewees (Noy, 2008).

All interviews were semi-structured and mostly conducted face-to-face. The interviewees were guaranteed anonymity in order for them to speak more freely. All interviews were transcribed manually and analysed qualitatively.

The mixed-method research design of participant observation, document analysis and interviews provided a broad basis of empirical data.

1.6 Scope and limitations

Like any work of research, this doctoral dissertation and its methods are not without limitations. The four most important ones are summarised here.

The field of private adaptation finance suddenly and rapidly arose around the abovementioned Copenhagen Accord in 2009. Although this makes research in the field dynamic and of high societal relevance (and therefore ideal for a think tank like the German Development Institute where I wrote most of this dissertation); it also implicates that research had to be creative and explorative.

A first research limitation is therefore the restricted data availability: the research can hardly build on work of others; theories on private adaptation and private adaptation financing are still developing; and empirical data is either not available or imperfect for the research purpose. For example, a few NAPAs analysed in Chapter 4 were formulated as early as 2004 and 2005, when private adaptation finance was not yet on the political agenda. This is addressed by focusing on the role of the private sector in adaptation more generally, and by adding a case study (Chapter 5) to provide more profound empirical data. The business cases of the Private Sector Initiative in Chapter 6 have a similar limitation. They report on adaptation, rather than adaptation financing in the context of the US$ 100 billion commitment. However, it is the only large N database available on private adaptation; the UNFCCC discussions on adaptation finance are indirectly influenced by activities under the Nairobi work programme (Persson et al. 2009); and financing is an unofficial but integral part of adaptation under the Nairobi work programme. It is encouraging to see, including for researchers, that the Paris Lima Action Agenda was established under the UNFCCC in 2014 to collect private as well as public-private initiatives in mitigation and adaptation. Similarly, because many development banks, development agencies and climate funds are increasingly starting to cooperate with private actors, I expect that future research can work with improved data.

Related to this first limitation is the challenge to distinguish between private adaptation interventions and private adaptation finance. The debate on the latter triggered a debate on the former. Adaptation interventions frequently

require financial investments, but that does not necessarily imply that private finance is involved in the way it is discussed in the UNFCCC negotiations. Based on Byiers and Rosengren (2012), Chapters 4 and 5 isolate adaptation finance as capital contributions into shareholder ownership, creditor claims that need to be repaid, insurance and philanthropy. Building on Atteridge and Dzebo (2015), Chapter 3 differentiates between expenditure and finance. Both approaches suffice for the respective purposes of analysis, but at the level of UNFCCC negotiations no formal distinction is made. This distinction is not just addressed in individual chapters; it also returns in the conclusions of this dissertation. Section 7.4 argues that the overall aim of private sector engagement in adaptation could be adaptation output, rather than contributing to the US$ 100 target.

A third limitation for research in this dynamic field, is that negotiations are ongoing and can take unexpected courses. For example, some of the ten adaptation finance criteria from Chapter 6 (see Table 6-1) have a long tradition in UNFCCC decision and were under negotiation again at the 2015 climate summit in Paris. The second version of the draft text of the Paris Agreement on December 10 put most of the criteria in brackets: 'Developed country Parties shall provide [new,] [additional,] [adequate,] [predictable,] [accessible,] [sustained] and [scaled-up] financial resources to assist developing country Parties' (UNFCCC, 2015c). However, in the Paris Agreement, adopted two days later, most of these criteria disappeared. Some negotiating countries wanted to reduce the number of terms over which definitions there was no consensus (Source: pers. comm. with a staff member of the climate finance unit of the UNFCCC secretariat on 11.03.2016). While this dynamism frustrates research at times, it also highlights its timeliness and high societal relevance.

A final limitation of this study lies within its scope. Although it identifies and examines private adaptation finance as an example of broader calls for private financing in international negotiations in the fields of environment, climate change and development, it does not examine the relevance of the conclusions for other fields. It is likely that the conclusions apply at least partially for fields like environment and development if similar conditions exist (e.g. where the north-south divide is prominent; where solidarity and/or liability are imminent; where allocation, effectiveness and accountability are important but difficult to analyse). Although adaptation projects touch upon issues such as trade,

infrastructure, biodiversity conservation or public health, this dissertation was not able to study the relevance of its conclusions for such fields explicitly.

1.7 Outline

This chapter has introduced why adaptation finance is needed, and it explained that the UN climate negotiations designated the private sector as a source of climate finance.

Chapter 2 puts private adaptation finance in a historical context by analysing 22 international agreements on development, environment and climate change. These agreements are contextualised through (academic) literature and by including theories on liberal environmentalism, ecological modernisation and commodification. It explains that private adaptation finance is just one example of private finance in the ongoing privatisation of global governance.

Chapter 3 provides a state-of-the-art overview of private adaptation finance in developing countries. This is a technical chapter; introducing financing instruments, current flows of private finance towards developing countries as well as the current knowledge of barriers towards private financing and public interventions to overcome such barriers. Chapter 3 introduces private adaptation finance as a nascent issue, both for policymaking and for research.

Against this backdrop, the research questions of this PhD (see Box 1-1 and Box 1-2) are primarily addressed in the second part of this dissertation (Chapters 4 to 7). All of these chapters analyse the interests of dominant actor groups in the climate finance architecture. Chapter 4 focuses on Least Developed Countries (LDCs). It provides a large-N study on the adaptation plans as formulated in the context of the UN climate negotiations. Chapter 5 zooms in on the LDC of Zambia. It provides a case study on the agricultural sector and analyses the role of the private sector in adaptation and financing adaptation. Chapter 6 analyses private sector interests on adaptation and identifies how these meet the UNFCCC ambitions to mobilise private adaptation finance. Chapter 7 investigates the interests of developed countries as well as development banks and agencies. Finally, chapter 8 draws overall conclusions on accountability, effectiveness and allocation of private adaptation finance, specifies areas for future research and closes with final reflections.

2 International cooperation on development, environment and climate: from public to private financing

This chapter puts private adaptation financing in a historical context. For that purpose, it examines post-World War II international agreements on development, environment and climate change on how their implementation is financed.

Simultaneously, this chapter analyses the justification of and principles behind international support for the implementation of these agreements. Such financing is traditionally politically addressed through a strong global North-South divide. By examining 22 major international agreements in development, environment and climate this chapter demonstrates that such support, and the motivations to provide it, have changed substantially (see Table 2-1). Three broad phases can be defined: 1) public assistance by traditional donor countries (roughly until the 1990s); 2) public responsibilities with private partnerships (from the 1990s until the present); and 3) expectations of private (co)financing of development and climate change action. I identify the 2009 UNFCCC Copenhagen Accord (see Chapter 1 and Section 2.3.1) as the start of Phase 3.

Intergovernmental regimes around international agreements are 'rarely constructed on a blank slate' (Depledge & Yamin, 2009; 435) and indeed the three phases can be witnessed in international regimes on development, environment and climate alike. Sometimes these phases overlap, and they develop neither in linear nor identical ways. Sections 2.2, 2.3 and 2.4 examine the three phases based on literature, and explain them based on theories on liberal environmentalism, ecological modernisation and commodification. The analysed agreements are ordered chronologically based on their initial date of agreement. Occasionally this might cause confusion, in particular when negotiations on the agreement continue in the following years.

Section 2.4 provides potential explanations for the change from public to private financing in international agreements in the context of changing economic world order and the increasing dominance of market-driven logic of neo-liberalism in international regimes. It also describes ambiguity around private adaptation finance as a consequence.

Phase I (1948 - 1990s)	Phase II (1990s - present)	Phase III (2009 onwards)
1948: Marshall Plan		
1970: ODA target UN General Assembly		
1971: Ramsar Convention		
1972: Stockholm Declaration		
1987: Montreal Protocol		
1992: United Nations Conference on Environment and Development		
1992: Convention on Biological Diversity (CBD)		
1992: United Nations Framework Convention on Climate Change (UNFCCC)		
	2000: Millennium Declaration	
	2002, 2005, 2008: High-Level Forums on Aid Effectiveness	
	2002: World Summit on Sustainable Development	
		2009, 2010, 2015: UNFCCC Copenhagen Accord, Cancun Agreements, Paris Agreement
		2010: CBD Nagoya Protocol
		2011: 4th High-Level Forum on Aid Effectiveness
		2012: United Nations Conference on Sustainable Development
	2014: Leader's Climate Summit	
		2015: 3rd Financing for Development Conference
		2015: UN Sustainable Development Summit

Table 2-1. International agreements on development, environment and climate analysed in Chapter 2. The agreements are subdivided according to the three phases explained in this chapter. The single events or outcomes listed here represent longer processes and negotiations, as described in the main body of text.

In summary, this chapter illustrates 1) that from a historical perspective, it was to be expected that the private sector would feature as a source of adaptation finance under the UNFCCC; and 2) that the ambiguity around the concept of private adaptation finance necessitates more detailed investigation on the opportunities and limitations of private adaptation finance in developing countries. This necessity will be addressed in all following chapters of this doctoral dissertation.

2.1 Phase 1: Public assistance

This chapter examines financing of the implementation of post-World War II international agreements. To do this, however, a brief description of the situation before World War II is imperative. Until the 19th century, states prevented international commercial flows of technology, resources and capital beyond countries' borders as they were considered as advantages for those states possessing them. Liberalism opened borders throughout the 19th century, first and foremost in the United Kingdom and the United States (Lumsdaine, 1993; Polanyi, 1957). The industrial revolution facilitated liberalism as it allowed both for the production of large surpluses and cheaper and faster (long-distance) transport. Ultimately, however, the industrial revolution also caused a wave of more protectionist economic nationalism in the late 19th century (Polanyi, 1957; Vandevelde, 1997). As World War II drew to a close, the victorious allies resolved to create a neo-liberal economic order (Vandevelde, 1997). Neoliberalism revives the 19th century liberalism,[9] initially under the assumption that markets should rule internally and states intervene externally (Peet et al., 2011). This neoliberal international economic order allowed for free or near-free provision of technology and finance to weaker states through foreign aid, which is 'extremely anomalous' and a 'recent departure from all past practices' (Lumsdaine, 1993, p. 33). Before World War II, foreign public aid was virtually non-existent, with exceptions being provided by colonial administrations.

[9] In its economic manifestation, liberalism is the recognition of the right of free economic activity and economic exchange based on private property (Fukuyama, 1992; 44). The terms 'capitalism' and 'free market economics' can be used interchangeably and are acceptable alternative terms for economic liberalism (Fukuyama, 1992). This dissertation uses these terms interchangeably, and stays close to the terms used in the cited literature.

The decisive characteristic of Phase I is provision of foreign public aid[10] to implement international agreements. The finance volumes were politically contested and often scarce (see e.g. Sections 2.1.3 to 2.1.5). Foreign public aid was initially meant to assist economic development of poor countries. In the 1970s, social objectives such as income distribution, employment and basic needs satisfaction became more important (Gore, 2000). Yet throughout Phase I, development cooperation regarded the state as the prime mover of economic development (see Schulpen & Gibbon, 2002; Schulpen, Gibbon, & Pedersen, 2001). Global environmental governance also took a more prominent role from the 1970s onwards, particularly after the Stockholm Declaration on the Human Environment (see Section 2.1.2). In Phase 1, international agreements focused on limiting specific sorts of pollutants (SO_2, NO_2); preserving endangered wetlands (see Section 2.1.3); banning ozone depletion gasses (see Section 2.1.4); and protecting key animal species (Peet et al., 2011). Such forms of global governance can be considered as attempts to regulate the side-effects of existing forms of capitalist development (Paterson, 2008), which will be further discussed under Phase II (in Section 2.2). Over the course of Phase I, a number of principles for international cooperation to address environmental issues were developed that still exist today. These include the no-harm principle (see Section 2.1.2); the polluter-pays principle; the precautionary principle and the notion of Common But Differentiated Responsibilities (see Sections 2.1.5 to 2.1.7).

Examples of typical international agreements under Phase I are provided in Sections 2.1.1 to 2.1.7.

2.1.1 The Marshall Plan and Official Development Assistance

Starting in 1948, the 'Marshall Plan' successfully promoted post-World War II economic recovery in Western Europe with public finance from the United States. Nowadays, such flows would strictly not be considered foreign aid under the OECD definitions and coverage, because they flow from the North to the

[10] When describing foreign public aid, this chapter focuses on ODA and climate finance for two reasons. First, other than support by the former Soviet Union or South-South cooperation, ODA has grown substantially and continuously, and is at the heart of global negotiations on improving aid and its effectiveness (see e.g. Section2.2.5). Second, this group of developed countries largely overlaps with the 'Annex II' countries that provide climate finance under the UNFCCC.

North.[11] Nonetheless, the success of the Marshall Plan did help to overcome European countries' initial reluctance to start providing aid to developing countries (Lumsdaine, 1993), and it anchored the idea that economic aid is important to assist poor countries with economic development (Maizels & Nissanke, 1984).

Excursus 2-1: Motivations for foreign public aid provision.

Official aid reports by donors tend to stress the humanitarian aspects of aid, as well as the usefulness of aid in promoting social stability in the recipient countries. Some academic literature indeed underscores donors' humanitarianism and moral principles, due to its universal scope (from economically prosperous countries to poor countries), its focus on poverty, and its empowerment of the weakest groups and states (Lumsdaine, 1993). At the same time, aid allocation has always been biased. After studying the period 1976-1978, Dowling and Hiemenz (1985) for example point out that more populous countries and lower-income countries receive relatively more aid. This bias does not *a priori* rule out humanitarianism. However, other research indicates that allocation of bilateral aid in particular has been dominated by self-interest of donors, including the managing of spheres of influence (in particular during the Cold War), political or military alliances, and promotion of export trade (Easterly, 2006; Maizels & Nissanke, 1984; Younas, 2008). Furthermore, donor countries' interest in aid allocation is renewed after global political changes such as the search for the New International Economic Order[12] and the oil crises of the 1970s (Dowling & Hiemenz, 1985), the end of the Cold War Cumming (2004); (Dunning, 2004), the 9/11 terrorist attacks in the United States (Haque & Burdescu, 2004) and the global financial crisis early in the 21st century (Mawdsley, Savage, and Kim (2014). Nonetheless, significant differences between individual donors exist: Nordic countries seem to respond more to recipient countries' income levels and functioning political institutions; France in particular supports former colonies; and the aid-giving pattern of the US is strongly

[11] The OECD DAC defines ODA as grants or loans to countries and territories on the DAC List of ODA Recipients (developing countries) and to multilateral agencies which are: a) undertaken by the official sector; b) have promotion of economic development and welfare as the main objective; c) at concessional financial terms (with loans having a grant element of at least 25%). In addition to financial flows, technical co-operation is included in aid. Grants, loans and credits for military purposes are excluded. Transfer payments to private individuals (e.g. pensions, reparations or insurance payouts) are generally not counted. Source: http://www.oecd.org/dac/dac-glossary.htm#ODA. Accessed on 21 December 2016.

[12] Developing countries put the 'New International Economic Order' forward in the 1970 through the United Nations Conference on Trade and Development (UNCTAD) to promote their interests by improving their terms of trade, increasing development assistance, developed-country tariff reductions, and other means.

> influenced by their interest in the Middle East (targeting about one-third of its assistance to Egypt and Israel) (Alesina & Dollar, 2000).

In 1960, total public and private capital flows to poor countries were about 0.83% of rich countries' GNI (up from 0.5% in 1955). The United Nations General Assembly called this level 'inadequate' and adopted a resolution that expressed the hope that international assistance and capital would reach approximately 1% as soon as possible (Clemens & Moss, 2007). In the context of rapid decolonisation of the Global South and the ideological confrontation between capitalism and communism, governments of developed and developing countries aimed to strengthen development cooperation during the 'Development Decade' of the 1960s (see Excursus 2-1 on motivations for public foreign aid provision). In 1970, The United Nations General Assembly agreed that (UN General Assembly, 1970, §43):

> 'Each economically advanced country will progressively increase its official development assistance to the developing countries and will exert its best efforts to reach a minimum net amount of 0.7 per cent of its gross national product at market prices by the middle of the Decade'.

The idea of private capital flows was abandoned because these appeared to be neither programmable nor predictable (Booth, 2013; OECD, 2010). The remaining 0.7% target is an arbitrary, but acceptable political compromise on what seemed to be a realistic and desirable public share of the 1% mentioned above – not as the appropriate level of Official Development Assistance (ODA) (Clemens & Moss, 2007; Keijzer, 2016). Contributions to reaching the 0.7% target can also be monitored because they are public.

This target has repeatedly been reiterated. However, only few members of the Organisation for Economic Co-operation and Development (OECD) actually attained this percentage on a longer term. As Figure 2-1 illustrates, developed countries spend a lower percentage of their GDP on ODA in the last 20 years than in the ten years prior and after the abovementioned 1970 agreement (Development Initiatives, 2015; Maizels & Nissanke, 1984; OECD, 2010). In absolute terms, however, ODA gradually increased and reached almost US$ 135 billion in 2013 (OECD, 2015). ODA only contains public flows: all grants

and concessional loans that are assigned to the economic and social development of denominated ODA recipients (OECD, 2010).[11]

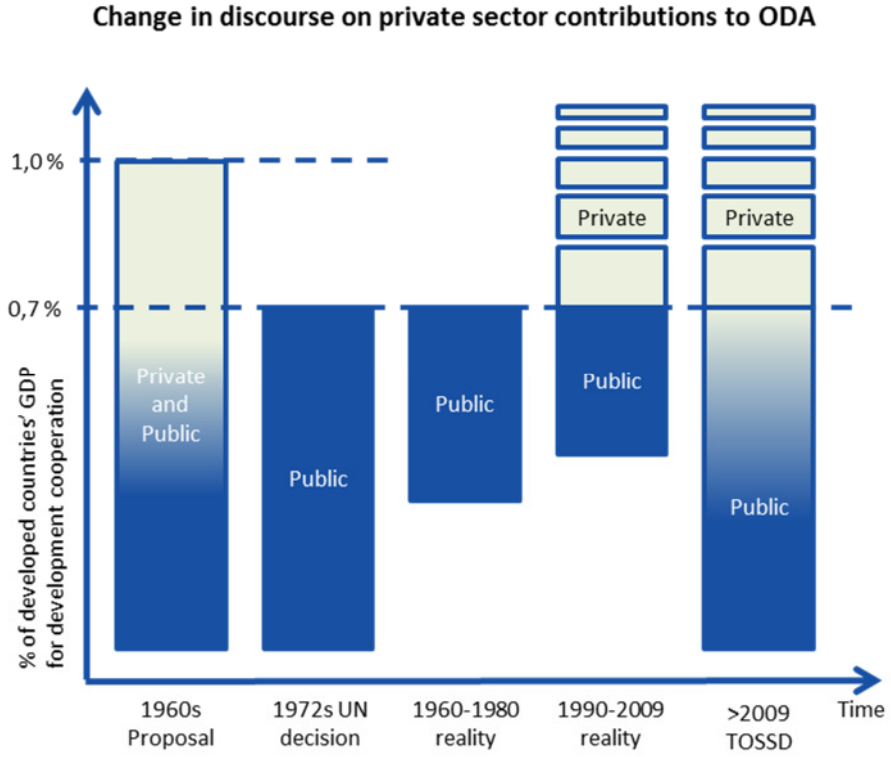

Figure 2-1. Change in discourse on private sector contributions to ODA. The estimated amounts of public ODA in Phase I and Phase II are based on Development Initiatives (2015).

2.1.2 Stockholm Declaration on the Human Environment

In the 1960s and early 1970s, development aid hardly targeted the environment. This changed after the 1972 Stockholm Declaration on the Human Environment ('Stockholm Declaration'), which emphasised linkages between environment and development. For example, it proclaims that most of the environmental problems in the developing countries are caused by underdevelopment, which can 'best be remedied by accelerated development' through transferring 'substantial quantities' of financial and technological assistance supplementary to domestic efforts in developing countries (UN, 1972, Principle 9). This need for support to developing countries is repeated in Principles 7 and 20.

Furthermore, the Stockholm Declaration acknowledges the international responsibility for environmental problems. International environmental law was long guided by sovereign equality and reciprocity between states (Stalley, 2013). However, the Stockholm Declaration introduces an international element by stating that countries have the responsibility to ensure that 'activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction' (UN, 1972, Principle 21). This became known as the no harm principle.

In short, both the responsibilities to address the development-environment nexus and the financing thereof are a public-sector task, and a task where developed countries support developing countries. This model became a prototype for the other international agreements in Phase I (see e.g. Sections 2.1.3 and 2.1.4).

2.1.3 Ramsar Convention on Wetlands of International Importance, Especially as Waterfowl Habitat

The 'substantial quantities' of finance are not further defined in the Stockholm Declaration. The fact that finance is a contentious political issue also emerges from discussions around the Convention on Wetlands of International Importance, Especially as Waterfowl Habitat (or 'Ramsar Convention'). This 1971 convention is one of the first explicit international environmental agreements,[13] and although donor countries financially supported its implementation bilaterally, a fund for its implementation was only established in 1990.

Under the economic climate in 1971 only a few countries were willing to accept a Convention to which they would have to contribute financially. The 1967 draft of the Ramsar Convention text, composed by the Netherlands, included a proposal that Parties' would contribute US$ 0,01 per capita each year, which was considered to be unacceptably high at that time. The subsequent elimination of financial provisions was only revoked at the 4th Conference of Contracting Parties in Montreux. Here, the Wetland Conservation Fund was established (later renamed 'Small Grants Fund'). Because of countries' limited

[13] The number of signatory countries to the Ramsar Convention increased from 21 in 1971 to 169 at present times. The Ramsar List of Wetlands of International Importance now includes over 2000 sites in more than 160 countries (Ramsar, 2015a).

willingness to contribute substantially, a budget line of 10,000 Swiss francs per annum[14] was agreed on, in the understanding that this amount would be augmented by regular and substantial voluntary contributions by developed countries.

Apart from a donation by the private non-profit organisation World Wide Fund for Nature (WWF), the funding of the implementation of the Ramsar Convention is typical for Phase I: it is public and comes from developed countries. Only developing countries that are contracting party to the Ramsar Convention can apply for support (Ramsar, 1990, Res. 4.3). Up to date, the fund provided over eight million Swiss francs to over 240 projects from 110 countries (Ramsar, 2015b): a small volume in comparison to the budgets of climate funds such as the multilateral Green Climate Fund or the International Climate Fund of the United Kingdom (Climate Funds Climate Funds Update, 2016).

2.1.4 Montreal Protocol on Substances that Deplete the Ozone Layer

In parallel to the development of the Ramsar Convention's Small Grants Fund, the 'Multilateral Fund' was created for the implementation of the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer ('Montreal Protocol'). The Montreal Protocol and its fund are described as 'one of the rare examples of truly effective environmental regimes that led to substantial reductions of the emission of man-made substances harmful to the environment' (F. Biermann & Simonis, 1999; 266). The Montreal Protocol is typical for Phase I because its success builds on explicit differentiation of developed and developing countries' responsibilities and the public finance provided by the former.

The Global North was by and large responsible for the global consumption of ozone depleting substances, and developing country governments initially wanted to remain outside of the regulatory system of the Montreal Protocol. This changed after negotiators from developing countries and environmentalists from the Global North successfully pressed for the establishment of the Multilateral Fund to support the implementation of the Montreal Protocol in developing countries. Industrialised countries were initially hostile to the idea of paying the full incremental costs of phasing out ozone depleting substances

[14] It is difficult to translate this value into US$. Under current exchange rates, (February 2017), 1 Swiss franc equals 1 US$.

in the South (Falkner, 1998). The Multilateral Fund is considered a 'most innovative and essential element' (DeSombre, 2000; 70) and arguably demonstrates the increased bargaining power of developing countries in the environmental realm (Frank Biermann, 1998; Sell, 1996).

The Fund is capitalised through voluntary contributions of developed countries (or 'non-Annex 5' countries) based on the United Nations scale of assessments. Contributions were supposed to be additional to other financial transfers to developing countries. The UNDP, UNEP, United Nations Industrial Development Organisation (UNIDO) and the World Bank were selected as implementing agencies. By May 2015, around 45 countries contributed US$ 3.34 billion to the Multilateral Fund (Multilateral Fund, 2015), which helped to sink the global production of ozone depleting substances in 2013 by 98% compared to 1986 (Luken & Grof, 2006; New Zealand Ministry of Environment, 2015).

The Multilateral Fund and the developed-country financing helped to deal with the political issue of equity and the economic issue of costs between industrial countries and developing countries (Falkner, 1998; Pauw et al., 2014). Despite this, even before the Multilateral Fund became operational, it was expected to have 'potentially explosive political implications', including political accountability (even where legal liability is absent) and the nature of the political precedent (even where the precedent is not legally binding) (Patlis, 1992; 219). For some time, developed countries managed to prevent the Multilateral Fund from setting a precedent. For example, during the negotiations for the Convention on Biological Diversity (CBD) and the UNFCCC in 1991, Japan and the US supported 'strengthening' of existing financial mechanisms in which they have always dominated decision making, including the Global Environment Facility (GEF), the World Bank, and the International Monetary Fund (IMF), rather than the creation of dedicated funds (Patlis, 1992; Sand, 1999). They succeeded here: the wish of developing-country governments to create an independent 'Green Fund' at the 1992 United Nations Conference on Environment and Development was dismissed (Haas, Levy, & Parson, 1992), and the GEF was designated to operate the financial mechanisms of the 1992 UNFCCC and the 1993 CBD (Sand, 1999). However, climate change financing experiences a proliferation of funds in the 21st century, both under and outside of the UNFCCC. This could be explained by new political impetus given to

adaptation (2001) and climate finance (2009) at the UN climate negotiations, as will be explained in Section 2.2.3.

2.1.5 United Nations Conference on Environment and Development

The 1992 United Nations Conference on Environment and Development (UNCED) marks the transition in international cooperation on development, environment and climate from Phase I (public assistance by traditional donor countries) to Phase II (public responsibilities with private partnerships). Therefore, the UNCED is addressed both here and Section 2.2.1. This section describes how countries' differentiated responsibilities are formalised in the UNCED.

Between the 1972 Stockholm Declaration and the UNCED, developed countries by and large managed to incorporate environmental protection into their policy-making processes. Developing countries lagged behind because of poverty and the slow pace of economic development (Haas et al., 1992). The UNCED formalised the differentiation between developed and developing countries through the principle of 'Common But Differentiated Responsibilities' (CBDR). This principle reflects a lasting political consensus that the widest possible cooperation by all countries is required to address environmental issues and that all member states have a responsibility to act accordingly. The word 'differentiated' also implies differing responsibilities depending on level of development (cf. Honkonen, 2009). The UNCED also builds on the no harm principle of the Stockholm Declaration (Principle 2; see Section 2.1.2) and spells out further underlying policy principles: the polluter pays principle (Principle 16) and the precautionary principle (Principle 15) (UN, 1992c).[15]

Whilst the 1992 conference was instrumental in spelling out the four principles above, it was less innovative in terms of international public financing. Agenda 21 describes the provision of adequate, predictable and new and additional financial resources as an objective (UN, 1992b; §33.11). However, developed country governments did not make any additional commitments beyond the

[15] The precautionary principle brings the obligation to avoid irreversible harm to others, even in the absence of scientific certainty about the potential harm. The polluter pays principle means, the polluter bears the costs of achieving acceptable environmental quality, thereby avoiding harm. See Dellink et al. (2009) for an explanation of the relation between these three principles and the policy principle of CBDR.

existing 0.7% ODA target (see Section 2.1.1), and developed-country support to address environmental issues in developing countries did not increase significantly in the years after the UNCED (Hicks, Parks, Roberts, & Tierney, 2010). This lack of real new financing commitments by developed countries left governments of developing countries disappointed (Haas et al., 1992).

2.1.6 Convention on Biological Diversity

The Convention on Biological Diversity was negotiated in the immediate context of the UNCED and entered into force in 1993. The CBD's preamble stipulates that the conservation of biodiversity is a common concern of humankind whilst also reaffirming states' sovereign rights over their own biological resources (UN (1992a); see Kellersmann (2000)). Just like the Ramsar Convention and the Montreal Protocol, the Convention on Biological Diversity bifurcates responsibilities of developed countries and developing countries. The former use and process the economic value of biodiversity, but have lost much of their own biodiversity. In the latter, more biodiversity is found; it is often under high pressure from human activities; and capacity and financial resources to protect biodiversity are often lacking (Pauw et al., 2014). As another example of Phase I, the Convention on Biological Diversity stipulates that developing countries have to protect biodiversity, but that developed countries shall finance the incremental costs to fulfil the obligations of the convention. This finance is all public (UN, 1992a, Art. 20).

2.1.7 United Nations Framework Convention on Climate Change

The UNFCCC was also negotiated in the immediate context of the UNCED, and came into effect in 1994. The UNFCCC differentiates responsibilities between developed and developing countries based on the notion of CBDR (see Section 2.1.5), but it adds 'Respective Capabilities' (-RC) (UN, 1992b).[16] This supplement reflects developed countries' political opposition to any reference to their historical emissions, as it would invoke a strong emphasis on the consequentialist polluter pays principle (see Deleuil, 2012; Dellink et al., 2009). Examples of CBDR-RC in the convention include that developed countries *should* take the lead in mitigating climate change and the adverse effects thereof (Art. 3.1) and *shall* assist developing countries that are particularly vulnerable to the

[16] See Pauw et al. (2014) for a detailed description of ways in which the responsibilities are differentiated in the CBD, UNCED, UNFCCC and other agreements.

adverse effects of climate change in meeting the costs of adaptation (Art 4.4). CBDR-RC not only mirrors earlier agreements mentioned in this chapter; it also reflected countries' emission pathways of the second half of the 20th century. Until 1982, the United States alone emitted more greenhouse gasses than all non-Annex I countries[17] together (see Figure 2-2).

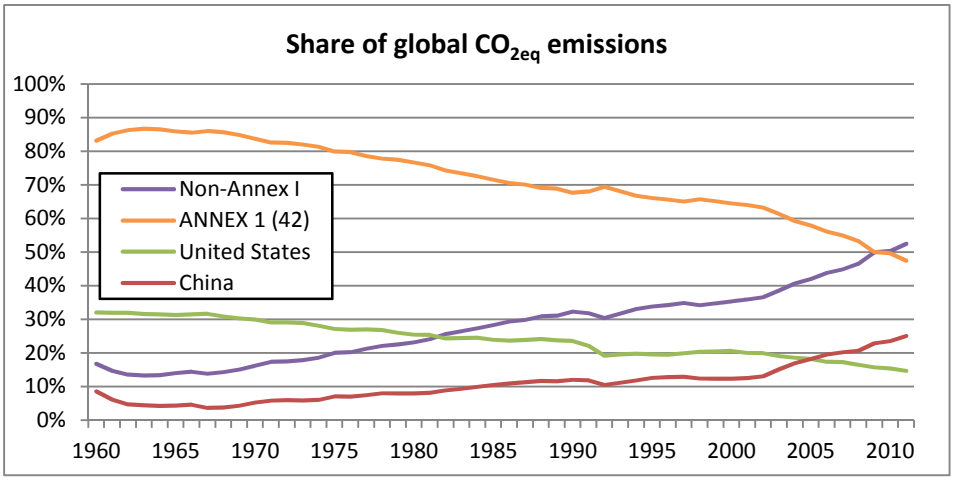

Figure 2-2. The reduction in the relative share of emissions of developed countries. The absolute amount of emissions of developed countries stabilised around 1992 and is decreasing since 2007. Based on data from the World Bank Development Indicators (accessed on 03.08.2015).

Initially, no new UNFCCC fund was established. The operation of the Financial Mechanism was entrusted to the Global Environmental Facility, although developed country parties 'may' also provide financial resources through bilateral, regional and other multilateral channels too (United Nations, 1992; Art. 11.5). In terms of its principles on responsibility; its commitments towards developing countries; and the provision of finance, the UNFCCC was, at its creation, a typical Phase I agreement.

2.2 Phase II: Public responsibilities with private partnerships

Phase II starts in the early 1990s. In this phase, global development, environment and climate governance are increasingly organised to be

[17] Annex I Parties include the industrialised countries that were members of the OECD in 1992, plus countries with economies in transition (including the Russian Federation, the Baltic States, and several Central and Eastern European States). The Non-Annex I countries are all other member states of the UNFCCC.

compatible with economic growth (as a precondition for neoliberalist capitalism) (Peet et al., 2011) or even to channel capitalism in novel directions by creating new commodities and sources of profit, for example through emission trading and carbon offset markets (see also Paterson, 2008). Governments of developed countries continue to acknowledge responsibilities vis-à-vis developing countries as set out in Phase I. Two fundamental changes occur, however, that demarcate Phase II. First, private sector participation is pursued to address development, climate and environmental issues. Second, the creation of markets through commodification of environmental goods became the norm.

The focus on the private sector and on markets follows the discourse of the late 1980s and the early 1990s. Since the 1980s, the implementation of development cooperation increasingly focused on macroeconomic aspects, following an approach known as the 'Washington Consensus'. Williamson coined the term and describes it along lines of fiscal discipline, trade liberalisation, privatisation, deregulation and the securing of property rights (Williamson, 1993, 2000). The propagation in development cooperation of economic liberalism, which can be defined as the organising principle of society engaged in creating a market system (Polanyi, 1957; 141) is called 'ahistorical' (Gore, 2000; 794). In contrast to earlier development approaches its norms are not founded on an attempt to understand rhythms, patterns and laws of development (Gore, 2000). Instead, economic liberalism is based on simple accounting frameworks and a few economic indicators such as inflation, interest rates, as well as budget and trade deficits (Soederberg, 2005). According to Gore (2000), the norms of economic liberalism are rooted in the rhetoric of globalisation and arguments on 'intrinsic ethical superiority'.

In the year in which the term 'Washington Consensus' was coined, Fukuyama (1989) in his influential essay 'The End of History' indeed argued that liberal democracy and market capitalism may signal the endpoint of humanity's socio-cultural evolution and final form of human government. Socialism with its planned economy had been the principal post-World War II ideological alternative to liberal democracy and market capitalism. This faded after the dissolution of the Soviet Union in 1991 (Saith, 2006; Vandevelde, 1997). The Washington Consensus initiated faster privatisation, deregulation, and trade liberalisation in Latin America and Eastern Europe than 'probably elsewhere at

any point in economic history', with countries in Sub-Saharan Africa following slower (Rodrik, 2006; 974). The subsequent increased levels of foreign direct investment concentrated on middle income countries, nevertheless, leaving many low-income countries marginalised in a 'poverty trap' (Sachs & McArthur, 2005; Soederberg, 2005). In the 1990s, the more extreme market liberalism (or 'market fundamentalism' – see Soros (1998)) of the 1980s was softened with the emergence of a more humane market-friendly approach to development (Gore, 2000; Soederberg, 2005). Here, the state performs specific enabling and regulatory tasks, such as providing a legal and regulatory framework, strengthened property rights, investments in infrastructure, macroeconomic stability and essential services to the poor. The (international) market (and thus the private sector) would produce and distribute goods and services in an efficient manner (Schulpen & Gibbon, 2002; Schulpen et al., 2001).

The end of the Cold War and the neo-liberal agenda also changed development cooperation. More emphasis was put on aid effectiveness (Dunning, 2004; Mawdsley et al., 2014). In theory, foreign aid became increasingly oriented towards achieving poverty reduction and promoting 'good governance' in cooperation with 'partner countries' (Mawdsley et al., 2014; Meernik, Krueger, & Poe, 1998). This reorientation is clearly visible in the High-Level Fora on Aid Effectiveness (see Section 2.2.5) and the 'Millennium Declaration' (see Section 2.2.4). At the same time neoliberal prescriptions continued, and the role of the private sector in general and of public-private partnerships in particular was increasingly emphasised.

In international environmental agreements, the role of the private sector also dramatically increases in Phase II. Agenda 21, the centrepiece of the 1992 UNCED, is a 'watershed event' for the involvement of non-state actors (Raustiala, 2001; 95). It includes explicit recognition of the potential role of industry initiatives in addressing sustainable development issues. Due to effective lobbying of the industry, these initiatives are voluntary only (Haufler, 2001). The same accounts for financing. Agenda 21 mentions voluntary private finance (mentioning philanthropy, for example, through NGOs) but ODA remains the main source of external funding for developing countries to implement Agenda 21 (UN, 1992c). According to Bernstein (2002; 4) the UNCED 'institutionalised the view that liberalization in trade and finance is consistent with, and even necessary for, international environmental protection, and that

both are compatible with the overarching goal of sustained economic growth'. This 'liberal environmentalism' is a compromise: its norms predicate international environmental protection on the promotion and maintenance of a liberal economic order (Bernstein, 2002). It begins from the premise that markets can be utilised to allocate resources and achieve environmental goals with optimal efficiency, given that appropriate regulation exists to internalise environmental externalities (Harris & Symons, 2013). Liberal environmentalism prefers and promotes market mechanisms such as tradable pollution permits or privatisation of the common through commodification over 'command-and-control' methods (such as bans, quotas and standards imposed by governments) (Bernstein, 2012).

Liberal environmentalism enabled environmental concerns to rise to a much more prominent place on the international agenda than would have been possible otherwise (Bernstein, 2002; De-Shalit, 1995). However, according to De-Shalit (1995), liberalism cannot permit the implementation, maintenance and justification of environmental policies. As Nye and Keohane (1971; 343) state: 'Insofar as they [governments] are unwilling to pay the price for the complete control, they must contend with relatively autonomous transnational forces.'

The emphasis on the private sector's role in environmental governance in Phase II can also be considered as a repair of an earlier omission by governments, and as a 'discovery' of the private sector's potential as an agent for technical innovation. The Ecological Modernisation Theory considers ecological crises as evidence of dysfunctional institutions. However, unlike more radical environmental and ecological movements as well as counterproductivity- and deindustrialisation theorists of the 1970s, it suggests that environmental problems can be solved in accordance with a capitalist organisation of society (Fisher & Freudenburg, 2001; Hajer, 1995). At the same time, it differs from strict neoliberalism in the sense that it recognises that pricing of external costs is insufficient: technological innovation and the rationalisation of production and consumption through, for example, environmental impact accounting and bookkeeping, environmental efficiency and environmental productivity are crucial (Mol & Spaargaren, 2000). Under these conditions, continued industrial development as the 'best option for escaping from the ecological crises of the developed world' (Fisher & Freudenburg, 2001; 702). The Ecological

Modernisation Theory describes environmental improvements as being economically feasible: political actors build new and different coalitions which support private entities and market dynamics to induce ecological changes (Fisher & Freudenburg, 2001; Jänicke, 2006). The involvement of industry to address ozone depletion is a good example. DeSombre (2000; 57) frames it as a mixture of 'happy coincidence', and 'well-developed regulatory incentives' that turned some of the main producers of ozone depleting substance into main innovators of the substitutes of ozone depleting substances. Both domestic regulation (DeSombre (2000) mentions the USA in particular) and international regulation (the Montreal Protocol) clearly restricted consumption of ozone depleting substances and simultaneously created a potential multi-billion dollar world market for substitutes which incentivised innovation (DeSombre, 2000).

Regardless of whether one follows the theory of liberal environmentalism or ecological modernisation – when development, environment and climate governance are made compatible with economic growth it leads to increased market environmentalism and commodification.

'Commodification' is a third theoretical underpinning of this chapter, and is by no means a new concept. Marx (1867) described it as converting use values ('Gebrauchswerte' – when the produce of labour satisfies the wants of the labourer or others) of products into exchange values ('Ware') given by the producer, seller and the buyer. Marx notes that some things ('Dinge') like virgin soil and air can have a use value, without having an exchange value, when their utility is not due to labour. Similarly, Polanyi (1957) distinguishes between 'real' and 'fictitious' commodities. He considers land, labour and money to be fictitious commodities because they are not originally produced to be sold on a market. This changed only on a large scale in the 19th century, when nature under the name of land, and man under the name of labour were made for sale through rent and wages, respectively (Polanyi, 1957; 136).

In geography, commodification and the inclusion of non-state actors in environmental governance are described as two of the main emerging themes in environmental management. There is a widespread acceptance across countries and institutions that the way to protect the environment is to (subjectively) price nature's services, assign property rights, and trade these services within a global market (Brouwer et al., 2011; Liverman, 2004).

Excursus 2-2. Payment for Ecosystem Services.

Payments for Ecosystem Services is one example of commodification. The concept of ecosystem services was originally conceived as a metaphor to reflect societal dependence on ecosystems, but since the 1990s environmental and economic science and policy have made increasing efforts to value ecosystem services in monetary terms (Brouwer et al., 2011; Gómez-Baggethun & Ruiz-Pérez, 2011). Payment for ecosystem services economically rewards resource managers for the provision of ecosystem services and is characterised by: 1) an ecological function subject to trade; 2) the establishment of a standard unit of exchange; and 3) supply, demand and intermediation flows between those who sell and buy ecosystem services (Kosoy & Corbera, 2010). In Costa Rica, for example, prices have, amongst others, been assigned to environmental services including bioprospecting (pharmaceutical companies disburse fees for the rights to collect plants and animals); carbon sequestration (private actors pay for reducing CO_2 emissions through reforestation or forest protection); ecotourism and park entrance fees (tourists disburse to enjoy wild landscapes); and fair-trade/green labelling (allowing for higher prices for 'green' products) (Liverman, 2004).

Commodification mechanisms are included in the CBD (Section 2.2.2) and the UNFCCC (Section 2.2.3). In the latter, for instance, Reducing Emissions from Deforestation and Forest Degradation (REDD+) financially rewards developing countries for (verified) efforts to reduce emissions and enhance removals of greenhouse gases through a variety of forest management options.

The commodification of nature and the marketing of ecosystem services (see Excursus 2-2) are often considered novel conservation strategies where traditional ones have failed. At the same time, the idea that economic valuation can capture a comprehensive picture of nature's societal value is heavily criticised. McAfee (1999) summarises it as 'selling nature to save it'. Costanza (2006; 749) states that most ecosystem services are public goods (non-rival and non-excludable), meaning privatisation and conventional markets 'work poorly, if at all'. Kosoy and Corbera (2010) describe three 'invisibilities' of commodification of nature. First, it involves narrowing down an ecological function to the level of one ecosystem service, hence separating the latter from the whole ecosystem. Second, it assigns a single exchange-value to this service, in order to make it tradable. Yet values of different forests or wetlands cannot be equated. Third, the process of production, exchange and consumption of ecosystem services is characterised by power asymmetries which may

contribute to reproducing rather than addressing existing inequalities in the access to natural resources and services. One significant risk of commodification therefore is that real requirements (such as nature conservation or stabilising the atmospheric greenhouse gas concentration) are subordinated to manufactured desires in their pursuit of profit. Polanyi (1957) states that the creation of markets for fictitious commodities leads to a clash of two organising principles in society: a 'double movement' of economic liberalism versus social protection. Economic liberalism prescribes the establishment of self-regulating markets through methods of laissez-faire and free trade, whereas social protection aims to conserve man, nature and productive organisation against such self-regulating markets through protective legislation, restrictive associations and other intervening methods (Polanyi, 1957; 138).

Despite all the critique on environmental liberalism and commodification in particular, the discourse of the compatibility of markets, development goals and environmental protection remains dominant (Bernstein, 2002, 2011). Many corporate leaders have embraced the notion that corporate environmentalism can promote win-win solutions that promote business and environmental interests (Esty & Winston, 2009; Falkner, 2003). The private sector is broadening its role in environmental governance: research describes phenomena such as private standard-setting initiatives for the carbon market (e.g. the Gold Standard), public-private governance networks that implement internationally agreed outcomes such as the Millennium Development Goals (MDGs) (e.g. The Renewable Energy and Energy Efficiency Partnership), public non-state networks that focus on mitigation (e.g. C40, an initiative of cities to curb their emissions) and private networks that attempt to govern the climate arena through information disclosure and public awareness (e.g. the Carbon Disclosure Project) (Chan, van Asselt, et al., 2015; Pattberg & Stripple, 2008). The following sub-sections will describe both financing aspects and the ways in which private actors are increasingly involved in international agreements in Phase II.

2.2.1 United Nations Conference on Environment and Development

The UNCED has two main outcome documents: the ‘Rio Declaration on Environment and Development’ (UN, 1992c) and ‘Agenda 21’ (UN, 1992b). The former has 22 Principles and a goal of ‘establishing a new and equitable global partnership through the creation of new levels of cooperation among States,

key sectors of societies and people', but never refers to the private sector specifically. Finance is mentioned only once: under Principle 7 developed countries acknowledge the responsibilities in the context of the 'pressures their societies place on the global environment' and of the 'technologies and financial resources they command' (UN, 1992c). Agenda 21 is a 350-page document divided into 40 chapters and 4 sections and provides more detail. Chapter 30 is about business and industry specifically and its Section 4 deals with the means of implementation (including finance).

At the UNCED, developed countries did not make any financial commitments beyond a reaffirmation of the 0.7% ODA target (see Section 2.1.5). Section 4 of Agenda 21 does however elaborate on financing means. For example, it states that 'in general' the financing for the implementation of Agenda 21 will come from countries' own public and private sectors and that 'other' (non-developed) countries may voluntarily augment developed countries' contributions (§33.13). Voluntary private contributions through non-governmental channels are included in a list of six funding sources (§33.14). The for-profit private sector is addressed in §33.15 and §33.16: the former states that 'investments' (including FDI) should be encouraged through national policies. The latter points at a need to explore innovative financing, including the use of economic and fiscal incentives and mechanisms as well as the feasibility of tradable permits.

In Chapter 30 on business and industry, however, financing is not mentioned. Rather, it emphasised how important the private sector is for economic development. Business' contribution to sustainable development, for example through increased resource efficiency and waste reduction, remains voluntary (see e.g. §30.3 and §30.2). The internalisation of negative environmental externalities could be achieved by economic instruments such as free market mechanisms (see §30.3) – with §30.8 warranting that the 'appropriate mix' of economic instruments and normative measures such as laws, legislations and standards shall be made in consultation with business and industry, including transnational corporations.

Agenda 21 is exemplary for Phase II: the private sector has a large role, but it remains voluntary, and is focused on implementing rather than financing.

2.2.2 Convention on Biological Diversity

The Convention on Biological Diversity is another typical example of Phase II for two reasons. First, it aims for private-sector participation. For example, Article 10(e) encourages cooperation between government authorities and the private sector in developing methods for sustainable use of biological resources (UNEP, 1992). Second, it developed a market-based system to regulate conservation and the use of genetic resources in developing countries by commodifying them and by capitalising on their economic (private) value (e.g. pharmaceutical products based on plant genetic material) (see Rosendal & Schei, 2012). This 'Access and Benefit Sharing' system was criticised for not meeting expectations. Biodiversity degradation continues; and almost twenty years after the CBD was agreed upon, only a few cases are reported where commercial benefits of biodiversity benefitted the developing countries (Richerzhagen, 2011, 2013). Negotiations for improvements thus continued (see Section 2.3.3).

2.2.3 United Nations Framework Convention on Climate Change

Terms such as 'private sector', 'business' and 'non-state' do not appear in the original 1992 United Nations Framework Convention on Climate Change (UNFCCC). Ever since, the private sector's role has evolved considerably. For example, non-governmental actor presence in the UN climate negotiations has increased and diversified dramatically over time, the main interested industries being energy, manufacturing, mining and services (Hanegraaff, 2015). In 2006, at the UN climate conference in Nairobi, then UN Secretary General Kofi Annan stated that: 'Changes in corporate behaviour, and in the way private investment is directed, will prove at least as significant in winning the climate battle as direct Government action'. Private action is not limited to mitigation: in 2008, the UNFCCC secretariat started an initiative targeted at private sector engagement in adaptation, under the Nairobi work programme on impacts, vulnerability and adaptation to climate change (UNFCCC (2008b), see also Chapter 6 and Appendix 4).

The market-driven logic also increasingly informs and determines the UN climate negotiations. For example, by framing commitments to reduce greenhouse gas emissions as international targets transforms the hitherto freely available sink of CO_2 – the atmosphere – into a valuable and manageable resource, effectively commodifying it (Hermwille, Obergassel, Ott, & Beuermann, 2015). This is most visible in the 1997 Kyoto Protocol. This protocol

links quantitative greenhouse gas emission reductions or limits in developed countries to three market mechanisms (International Emissions Trading; the Clean Development Mechanism; and Joint Implementation) that involve transferring price-tagged carbon emissions to help countries meet their mitigation targets. In theory, this creates incentives for investment in clean technology and more efficient emission reductions (UNFCCC, 1997; Bernstein, 2011). In the beginning, the Clean Development Mechanism of the Kyoto Protocol was so politically sensitive that 'it could not even be mentioned by name', but opposition against the market-driven logic on ideological grounds is nowadays confined to the fringes of the climate change debate (Depledge & Yamin, 2009; 441). The Clean Development Mechanism is a multi-million dollar global industry whose magnitude and application partly depend on countries' business environments (see Fankhauser & Lavric, 2003).

Commodification became more dominant since the 1997 Kyoto Protocol. In early reactions to the 2015 UNFCCC Paris Agreement, Fatheuer (2015) opines that its long-term target to achieve a balance between anthropogenic emissions and removal of greenhouse gasses by sinks, in combination with the inclusion of both tradable emissions and REDD+, basically means that forests are now included in the global CO_2 accounting. Moreno, Fuhr, and Specih Chassé (2016) opine that the uptake of carbon-uptake services from nature in the equation means that: 'Instead of changing our economic system to make it fit within the natural limits of the planet, we are redefining nature so that it fits within the economic system'. In Marx' theory (see Section 2.2.2), the 'use value' of forests is turned into an 'exchange value' despite its obvious shortcomings. For example, the exchange value is determined by (and as volatile as) the carbon price, and does not represent the (relatively stable) inherent value of forests.

Privatisation does not stop at the increasing dominance of market logic. Authority is also delegated to a range of non-state actors. For example, Pattberg and Stripple (2008; 374) consider the influence and ownership of non-state actors so important in CDM that they label it a 'hybrid authority'. Private actors have responsibilities in every step of the CDM project cycle, from project identification and design to validation, registration, and monitoring; over to verification and certification; and finally to the issuance of 'Certified Emission Reductions'. Depledge and Yamin (2009) are positive about this development,

calling it 'highly novel', 'significant' and presenting the regime's ability to make use of new (private) actors where appropriate (ibid, 443).

The private sector's role in CDM is another typical example for Phase II. The private sector itself is not responsible for the implementation of the convention (i.e. to limit or reduce greenhouse gas emissions) – it is merely participating by implementing certain activities leading to such desired outcomes.

Since 2001, climate finance became increasingly important at the UN climate negotiations. In this year, three adaptation funds are added to the Financial Mechanism of the Convention; and climate-related aid increases from an average US$ 3.1 billion per year in 2001 to 2003 to more than US$ 8 billion per year from 2010 to 2012, representing 6% of total ODA (OECD, 2014b). Yet, no climate finance target was set at the UNFCCC in Phase II, and the idea of private finance was contemplated rather than negotiated about. For example, in 2006, the Conference of the Parties (COP) mandated the UNFCCC secretariat to prepare a background paper on existing and projected investment flows and financing relevant to the development of an 'effective and appropriate' international response to climate change (UNFCCC, 2007a; 5). And the 2007 Bali Action Plan of the UNFCCC mentions 'considering' the mobilisation of public- and private-sector funding and investment in order to enhance action on mitigation and adaptation (UNFCCC, 2008c).

2.2.4 Millennium Declaration

Within the field of development, the Millennium Declaration and the Millennium Development Goals are the key example of Phase II. The declaration of 2000 outlines key objectives for the 21st century on peace and security, development and poverty eradication, securing human rights, democracy and good governance (Fukuda-Parr & Ponzio, 2002; UN General Assembly, 2000). Although no new or additional public development assistance pledges were made,[18] the eight 'Millennium Development Goals' (MDGs), which derived directly from the Millennium Declaration, became a centrepiece of foreign aid efforts in their implementation period up to 2015 (Easterly, 2009).

[18] §15 of the Millennium Declaration calls on industrialised countries to 'grant more generous development assistance, especially to countries that are genuinely making an effort to apply their resources to poverty reduction.' (UN General Assembly, 2000).

The MDGs are a compromise: in return for the rare 'political triumph over the extreme conservatism of Washington' (Saith, 2006; 1197) and in a move away from the Washington consensus, developing country governments withdrew from their early radical stances on global inequality of incomes and wealth. Although neoliberal prescriptions continued, the agenda of poverty reduction was addressed in its many dimensions. The MDGs thus address income poverty, hunger, disease, lack of adequate shelter, and exclusion, while promoting education, gender equality, and environmental sustainability and package these priorities into an comprehensible set of eight goals with measurable and time-bound objectives (Sachs, 2012).[19]

The MDGs were not universal in terms of objectives and implementation. They addressed poor countries, with rich countries adding their solidarity and assistance through finance and technology. A new mutual accountability was made explicit: donors were only willing to transfer large financial resources to developing countries when credible plans and competent institutions are in place to use these; whereas recipient country governments needed guarantees of sustained support from developed country governments in order to do this (Bourguignon & Sundberg, 2006). In terms of implementation, there were major advancements and improvements achieving some of the MDGs even before the deadline of 2015. Overall, however, the progress has been highly variable across goals, countries, and regions (Easterly, 2009; Sachs, 2012).

Cooperation with the private sector was described in two targets of goal eight to 'develop a global partnership for development'. However, it was not spelled out how to implement this goal; and private sector participation commenced later in the process and was voluntary only. The 2008 high-level event on the Millennium Development Goals and the 2010 United Nations Summit on the Millennium Development Goals both initiated a number of private sector initiatives and commitments. To the extent that the financial contributions behind these commitments is clear, they mostly derived from foundations rather than commercial investments. Although some amounts were substantial

[19] The eight goals (Eradicate Extreme Hunger and Poverty; Achieve Universal Primary Education; Promote Gender Equality and Empower Women; Reduce Child Mortality; Improve Maternal Health; Combat HIV/AIDS, Malaria and other diseases; Ensure Environmental Sustainability; Develop a Global Partnership for Development)had 18underlying targets and 48 indicators to understand performance and track achievements (cf. Sachs, 2012).

(e.g. from the Bill and Melinda Gates Foundation and the McArthur Foundation), the overall private contributions were marginal compared to the public sector contributions.

2.2.5 High-Level Fora on Aid Effectiveness

Section 2.2 already mentioned that the end of the Cold War facilitated a clearer focus on aid effectiveness. In this context, four high-level Fora on Aid Effectiveness were organised in Rome (2003), Paris (2005), Accra (2008) and Busan (2011). Countries are described as 'partners' in this context, which at least on paper is a step beyond the bifurcation between developed and developing countries.

The outcome documents of the first three fora prove an increasing focus on private sector participation and are clear examples of Phase II. The outcome document of the first forum in 2003 only mentions the private sector once, as a sub-category of civil society (OECD, 2003). The 2005 outcome document already encourages the participation of civil society and the private sector; with governments committing to create enabling environments for public and private investments (OECD, 2005). The 2008 outcome document puts the private sector at the central stage. Whilst focusing on development partnerships, it mentions the private sector as a 'development actor' in three occasions. Contrary to the outcome of the 2003 forum, civil society is now mentioned as a development actor 'whose efforts *complement* those of governments and the private sector' (OECD, 2008, p. 4; emphasis added). Private financing for development is first introduced in 2011 at the fourth forum, which is accommodated under Phase III (see Section 2.3.3).

2.2.6 World Summit on Sustainable Development

The World Summit on Sustainable Development is arguably the most explicit example of Phase II. Despite the historical 1992 UNCED and its emphasis on global sustainable development, several environmental indicators had worsened in the ten years thereafter. Apart from a short and general 'Johannesburg Declaration on Sustainable Development', the 2002 World Summit on Sustainable Development therefore introduced the 'Partnerships for Sustainable Development' as a vehicle for implementation, innovation and action on the ground through collaboration with non-state actors (Chan & Pauw, 2014).

Over 300 partnerships were formed, which often crossed local-global divides, jurisdictions, and sectors (Bäckstrand, Campe, Chan, Mert, & Schäferhoff, 2012). However, terms of participation and operation were only weakly defined in Johannesburg, leaving ample room for interpretation. The reconfiguration of authorities of the framework as a whole was therefore unclear. The Partnerships for Development are studied extensively by political scientists in particular, and their legitimacy, effectiveness and accountability are contested (cf. Frank Biermann, Chan, Mert, & Pattberg, 2007; Chan & Pauw, 2014; Pattberg, 2012; Pattberg & Stripple, 2008; van Asselt, 2014). In terms of financing, little comes from new sources; and less than 1% came from the private sector (Hale & Mauzerall, 2004). The financing and the weakly defined private-sector participation make the World Summit on Sustainable Development an explicit example of Phase II.

2.2.7 Leader's Climate Summit

In 2014, former UN Secretary-General Ban Ki-Moon invited world leaders from government, finance, business, and civil society for the Climate Summit (also referred to as the Leader's Climate Summit) to 'galvanize and catalyse climate action' through 'bold announcements and actions' to reduce emissions, strengthen climate resilience, and mobilise political will to reach a meaningful agreement at COP21 in Paris (UN, 2014).

The summit itself is different from the other examples of Phases I and II because there are no negotiated outcomes. Nevertheless, the 52 non-state 'climate actions' on mitigation and adaptation are worth mentioning. In terms of finance, the capacity of most of these remains unclear, because publicly available information is scarce (Chan, Falkner, van Asselt, & Goldberg, 2015). The Leader's Climate Summit did however initiate a focus on public-private partnerships to address climate change, including under the UN climate negotiations.[20] This new focus is taken seriously, as demonstrated by the immediate and broad efforts to develop a framework for non-state action in alignment with the UNFCCC (cf.

[20] In 2014, the Non-State Actor Zone for Climate Action (NAZCA) was launched at the UN climate negotiations. It registers commitments by companies, cities, sub-national regions and investors that address climate change. Many of these commitments are also included in the 2015 Lima-Paris Action Agenda (LPAA), which aims to accelerate cooperative public and private climate action in support of the Paris Agreement.

Chan & Pauw, 2014; Chan, van Asselt, et al., 2015; Nobuoka, Ellis, & Andersen, 2015; Widerberg & Pattberg, 2015).

2.3 Phase III: Private finance for international cooperation on development and climate

The third phase is characterised by explicit expectations by governments that the private sector also *finances* the implementation of negotiation outcomes in the fields of development, environment and climate change. This dissertation marks the 2009 Copenhagen Accord as the start of this phase. The inclusion of private financing in international agreements is neither primarily driven by the recipients (developing countries) nor by the suppliers (the private sector), but by governments of developed countries. A second characteristic of Phase III is the emphasis on responsibilities of emerging economies in global governance on environment, development and climate change (see e.g. Sections 2.3.1, 2.3.3 and 2.3.4), although the notion of Common But Differentiated Responsibilities continues to be used in international agreements. These two characteristics are intertwined, but the extent of intertwining depends on the reasons for the push for private financing. Sections 2.4 and 8.6 will reflect on such reasons in more detail.

Phase III is new in practice, and the context and theory behind its development are not well understood. In terms of context, the impacts of the global financial crisis, the financial and political problems of the Eurozone, the continuing growth of the rising powers, the reducing relevance of ODA (at least in terms of its relative amount, see Figure 3-3) and the stronger voice of recipient states, certainly contribute to an atmosphere of transition (cf. Mawdsley et al., 2014). In terms of theory, the compromise of liberal environmentalism prevails (Bernstein, 2002, 2012): international environmental protection continues to be based on the promotion and maintenance of a liberal economic order prevails. Ecological modernisation is brought in practice: through technological and industrial innovation, countries like Germany and Denmark decouple economic growth and emissions; and political actors continue to adapt (dysfunctional) international institutions (including the UNFCCC) by building new and different coalitions which support private entities and market dynamics. Similarly, and commodification of the atmosphere and forests continues.

Liberal economic norms triggered Phase III. For example, at the United Nations Conference on Sustainable Development (see Section 2.3.4) a subset of developed countries refused to discuss the norms around the green economy concept if this implied a relaxation of liberal economic norms as a potential consequence (Bernstein, 2013). Instead, green growth allowed for deepening of neo-liberalism (Kosoy et al., 2012; Zervas, 2012).

Sections 2.3.1 to 2.3.6 describe Phase III in more detail for international agreements in development, environment and climate change.

2.3.1 Copenhagen Accord and Paris Agreement

Private climate finance was first included in UN climate negotiations in the 2009 Copenhagen Accord. In Copenhagen, negotiators failed to provide a follow-up agreement to the 1997 Kyoto Protocol, but developed country governments did pledge to mobilise US$ 100 billion of climate finance annually by 2020 to support developing countries with mitigation and adaptation. Developed countries refused to sign the Copenhagen Accord if the private sector would not be included as a source of finance (Romani & Stern, 2011). The Accord itself is a non-binding political declaration that lacks consensus among parties, but the decision on private finance was formalised in the 2010 Cancun Agreements (Klein, 2010; UNFCCC, 2010, 2011).

Prior to these negotiations, developed countries already established the Climate Investment Funds (CIFs) under the World Bank in 2008, which explicitly aim to mobilise private co-financing for adaptation and mitigation projects in developing countries. Since the Copenhagen Accord, there has been a paradigm shift on climate finance within developed-country governments: from traditional, environment-oriented financing by environment ministries towards economic rationality and budget concerns, and increased involvement of finance ministries at climate negotiations (Skovgaard, 2012). As expected, private finance also became a cornerstone of the new Green Climate Fund (GCF). The GCF established a Private Sector Advisory Group in 2013 and a Private Sector Facility in 2015, to make recommendations to the GCF Board on the fund-wide private sector engagement in mitigation and adaptation.

In Phase III, climate finance is one of the most important topics at the UN climate negotiations. The 2015 Paris Agreement encourages non-developed countries

to provide climate finance voluntarily (Article 9.2); and it reiterates the importance of private finance where it states that developed countries should 'take the lead in mobilizing climate finance from a wide variety of sources, instruments and channels' (Article 9.3) (UNFCCC, 2015b). Eight years after 'Copenhagen', private finance became conventional but remain contested; and discussions on how to mobilise and track private climate finance are still ongoing (see Section 7.3.4).

2.3.2 The Nagoya Protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization to the convention on biological diversity

Section 2.2.2 concluded that developing countries hardly benefitted from commercial Access and Benefit-Sharing. Negotiations to address this issue concluded in the 2010 Nagoya Protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization to the convention on biological diversity ('Nagoya Protocol'), which entered into force in 2014. This agreement improves the transparency of genetic resources supply chains, and is legally binding despite opposition from the pharmaceutical companies in particular (Tienhaara, Orsini, & Falkner, 2012). Nevertheless, the liberal-economic approach to biodiversity conservation only became more dominant: whereas biodiversity was the subject of concern in 1993, the Nagoya Protocol emphasises the economic aspects of biodiversity (e.g. Ten Brink, 2011). The objective of the Nagoya Protocol is 'the fair and equitable sharing of the benefits arising from the utilization of genetic resources (...), thereby contributing to the conservation of biological diversity and the sustainable use of its components' (CBD, 2011; Article 1). Both the sequence of the text and the word choice ('thereby' instead of alternatives such as 'in order to' or 'to') make clear that this protocol is about commodity management (i.e. genetic resources) rather than biodiversity conservation. In terms of finance, Article 25 states that 'developed country Parties may also provide (...) financial and other resources for the implementation of the provisions of this Protocol' (CBD, 2011). However, more explicit commitments were not made in the Nagoya Protocol. Repeated demands by developing countries where only answered by 'somewhat vague' commitments in the margins of the negotiations (Aubertin & Filoche, 2011; 62). The Nagoya Protocol is listed under Phase III because of its explicit expectations

that the private sector indirectly *finances* biodiversity conservation by commodifying genetic resources.

2.3.3 The fourth High-Level Forum on Aid Effectiveness

The outcome document of the 4th High-Level Forum on Aid Effectiveness in Busan (2011) is an archetype for Phase III because it formally included two new 'partners' in the global aid architecture. First, emerging donors (such as China, and Brazil) are included. In line with the principle of Common But Differentiated Responsibilities (see Section 2.1.5), the outcome document describes the 'voluntary basis' of South-South cooperation (OECD, 2011; §2) and ensures 'common goals and differential commitments' (§36). Second, the private sector is included as a central actor, albeit phrased and treated homogenously. The private sector has its own section (§32a-e) and it is no longer just a 'development partner': private investment and philanthropy are also mentioned as a source of finance for 'sustainable and inclusive development' (§10).

The forum in Busan meant a shift for international cooperation on development and environment. OECD (2014c; 23) states that sustainable development is no longer a matter of the 'North' aiding the 'South', but rather a 'question of balanced sharing of opportunities, responsibilities and options'. Mawdsley et al. (2014; 29) argue that the era of western-dominated aid institutions and regimes started to rupture. Yet, the new roles of emerging donors and the private sector remain uncertain. The role of emerging economies remains voluntary; and the Busan outcome document does not deliver a framework for effective and accountable private finance. Eurodad, among other civil society organisations, considered it unfair that the private sector was invited to join the forum in Busan without having to really commit to anything (cf. Ellmers, 2011). Eurodad is also worried that the Busan outcome document opens avenues for the private sector to benefit from ODA, potentially at the risk of sacrificing democratic processes to businesses' commercial interests (Ellmers, 2011). Indeed, the section 'Transparent and responsible co-operation' states that the transparency on publicly funded development activities, their financing, terms and conditions, and contribution to development results will depend on 'legitimate concerns about commercially sensitive information' (§23). Despite such critique, these typical Phase III decisions on private sector development and development financing echo in subsequent international negotiations on Financing for

Development (see Section 2.3.5) and Sustainable Development Goals (see Section 2.3.6).

2.3.4 United Nations Conference on Sustainable Development

Twenty years after the UNCED (see Sections 2.1.5 and 2.2.1), world leaders again convened in Rio de Janeiro for the United Nations Conference on Sustainable Development (or 'Rio+20'). Its outcome document 'The future we want' reiterates much of Agenda 21, and reaffirms all the principles of the 1992 Rio Declaration on Environment and Development, including the principle of Common But Differentiated Responsibilities. However, the outcome document is much more elaborate on private financing than Agenda 21 in 1992. It also focused on 'green economy' instead of 'sustainable development' (Bauer et al., 2011; Frank Biermann et al., 2012; Kosoy et al., 2012). This was criticised, for example because growth as a purely quantitative measure is less valuable for society than development, which takes into account other features such as the structures of the economy, income distribution (income equality), unemployment, infrastructure, and education (Zervas, 2012).

Just like the Copenhagen Accord, 'The future we want' emphasises the importance of mobilising private finance to address climate change. The changing aid architecture (see Section 2.3.3) is also described, stressing the complimentary South-South flows of finance and the opportunities for aid to leverage private flows (UN General Assembly, 2012). Private finance and investments are, amongst other things, expected to contribute to technical innovation (§154); sustainable development in Africa (§184); disaster risk reduction (§188); addressing climate change (§191); and reversing land degradation (§206) (UN General Assembly, 2012). This makes 'The Future we want' an emblematic and detailed example of Phase III.

2.3.5 3rd Financing for Development Conference

The 2015 Financing for Development Conference reiterated the commitment by developed countries to spend 0.7% of their GNI on ODA. Simultaneously, it was another Phase III landmark that underscored the importance of private finance. Its outcome document, the 'Addis Ababa Action Agenda', holds a nine-page section on 'domestic and international private business and finance' stating that the private sector is a driver of productivity, inclusive economic growth and job creation; and that private international capital flows along with a stable

international financial system, are vital complements to national development efforts (UN, 2015).

The Financing for Development Conferences are anomalous in this chapter because they take finance as the starting point, rather than to implement an international agreement. The first two Financing for Development Conferences (2002 and 2008) are not included in this chapter because of their limited legitimacy in the development regime: they were initiated by the IMF and the WTO, rather than by the United Nations (see Excursus 2-3).

The conference in Addis Ababa, however, has this legitimacy. A 2014 resolution by the United Nations General Assembly stressed the need for coordinated preparations for the Financing for Development Conference and the UN summit to adopt the SDGs (United Nations General Assembly, 2014; §6). Researchers expected this conference to lay the groundwork for the UN climate summit in Paris, too (Berensmann, 2015; Bracho, Hackenesch, & Weinlich, 2015; Keijzer & Klingebiel, 2015). Indeed negotiators were under substantial pressure to reach agreement on the 'Addis Ababa Action Agenda' in order not to derail negotiations on SDGs and climate change (IISD, 2015).

This context influenced the outcome: the Action Agenda marks a shift away from the outcomes of the previous Financing for Development conferences. For instance, for the first time, the highly contested principle of Common But Differentiated Responsibilities was included, thereby creating stronger linkage to negotiation language from the UNCED (see Section 2.1.5) (see Bracho et al., 2015; IISD, 2015); and issues like ecosystems and climate change have replaced the emphasis on trade liberalisation.

This change in contexts is also apparent for private finance. This is a crucial concept in all three Finance for Development conferences. However, in 2002 and 2008, it is referred to in the context of liberalising capital flows and economic growth. In contrast, the 2015 outcome document refers to private finance in the context of inclusive and sustainable growth, responsible business and investing, and gender equality (UN, 2015).

Excursus 2-3. Financing for Development Conferences: the 2002 Monterrey Consensus.

Governments worldwide adopted the 'Monterrey Consensus' in 2002 at the first International Conference on Financing for Development. It is argued that this consensus strengthened global cooperation on the MDGs by recognising the need for partnerships of rich and poor countries based on good governance and expanded trade, aid, and debt relief (Haque & Burdescu, 2004); and by urging developed countries to make efforts towards reaching the target to spend 0.7% of gross national product as ODA (Sachs & McArthur, 2005).

However, the consensus does not mention MDGs explicitly. Instead, it refers to the Millennium Declaration and 'other internationally agreed development targets' (United Nations, 2002; e.g. §35 and §40) and the 2001 Doha Conference of the WTO (United Nations, 2002; §38). ODA is only mentioned as a complementary source of finance for development; to improve the environment for private sector activities; and to pave the way for robust growth (United Nations, 2002; §35).

During the preparations for the 2002 Conference, the US representative to the UN insisted that the mandates of the World Trade Organisation (WTO), IMF and World Bank 'should be respected' and that the US would oppose any attempts by the UN to use the development financing process as a vehicle to interfere in their governance and decision-making mechanisms (Focus on the Global South, 2002). The Monterrey Consensus is criticised as an attempt to repackage the Washington Consensus, by reproducing and legitimising the growing power of transnational capital in a development context under UN consensus (Saith, 2006; Soederberg, 2005).

Nevertheless, developing country governments held on to the negotiation process (Lesage, McNair, & Vermeiren, 2010) for at least three reasons. First, many developing countries were unable to borrow sufficient funds and hoped to raise capital through foreign direct investment (Vandevelde, 1997). Second, they wanted to (re)open discussions on trade. Many complained that developed countries push for trade liberalisation, without simultaneously dismantling their own barriers to imports of labour-intensive industrial goods and agricultural products from poor countries (Haque & Burdescu, 2004). Third, developing country governments hoped that a follow-up declaration of the 2001 Doha Conference of the WTO under the auspices of the UN would generate new views and commitments on issues such as climate, financing, and social-economic crises in developing countries. The Monterrey Consensus disappointed numerous developing countries: a new agenda was pushed through, but developed countries did not make new financial commitments and were not prepared to make global governance reforms (Lesage et al., 2010).

2.3.6 UN Sustainable Development Summit

The universal Sustainable Development Goals (SDGs) mark a major innovation in international cooperation on development. The SDGs were agreed on at the 2015 Sustainable Development Summit in the UN document 'Transforming our world: the 2030 Agenda for Sustainable Development' (UN General Assembly, 2015). The SDGs are a good example for Phase III for two reasons.

First, in contrast to the MDGs, the SDGs are not strictly divided along North-South lines, but they are universal. This was decided in a context where global economic growth per capita is led by the emerging economies (see Section 2.4.2); where the global population continues to grow; and under unprecedented stress on the earth's ecosystems. Impetus by science was provided through concepts such as 'planetary boundaries' and the 'Anthropocene' (Sachs, 2012).[21]

Second, the 2030 Agenda for Sustainable Development does not focus on increasing ODA, but on 'mobilization of financial resources'. ODA is mentioned as an important catalyser for additional resource mobilisation, including from private sources (UN General Assembly, 2015; §43). This was criticised by civil society organisations. Kwakkenbos (2012; 7), for example, considers it 'encouraging' that donor governments acknowledge the importance of diverse financial flows to developing countries – but not as 'an excuse to renege on their 0.7% ODA/GNI commitments'. Nevertheless, the OECD Development Assistance Committee (DAC) is reconsidering its development financing in the context of the SDGs and private financing (see Excursus 2-4). Furthermore, the UN launched the 'Financial Innovation Platform' in 2016 together with the private sector to 'generate financing solutions' for the SDGs (UNEP, 2016).

Excursus 2-4. The OECD's Total Official Support for Sustainable Development (TOSSD).

At the 2014 high-level meeting at the OECD it was decided to 'modernize' ODA measurement and to develop a statistical measure tailored to the SDG

[21] The *Anthropocene* is a term used for the proposed recently started epoch in which human activities are the driving force in the planetary system (Frank Biermann, 2014; Zalasiewicz, Williams, Haywood, & Ellis, 2011). *Planetary boundaries* define the safe operating space for humanity, for example in terms of climate change, biodiversity and nitrogen flows (Steffen et al., 2015).

framework: the 'Total Official Support for Sustainable Development' (TOSSD). Furthermore, it was decided to prioritise countries most in need and to mobilise more private finance for development. Although not fundamentally at odds with one another, these rationales may be difficult to harmonise as poor countries' private sectors are often underdeveloped (Keijzer & Klingebiel, 2015; Kwakkenbos, 2012).

Amongst others, the TOSSD framework is supposed to support closer co-operation between 'new and old providers of development finance' (OECD, 2014c; 20), which is also typical for Phase III. The word choice points out the importance of 'finance' rather than 'assistance', and from new 'providers' rather than 'donors'. The UN is alarmed and states that different components of 'any new development financing framework should be registered separately under appropriate categories, such as climate financing, market-like instruments and ODA' (UN CDP, 2016; 1). The OECD states that the TOSSD measure will not supplant ODA accounting (OECD, 2016). This might however easily change in the future if private TOSSD would appear to outweigh public ODA. Figure 2-1 summarises the changing discourse on private sector contributions to development. It starts with the proposal in the 1960s and the decision by the United Nations General Assembly in 1970 (see Section 2.1.1); estimates true ODA amounts in Phases I and II; and TOSSD on the far right. How private finance will change the 0.7% commitment on the longer term remains unclear.

2.4 Why private climate finance?

The sections above demonstrate that the ongoing privatisation of global governance in the fields of environment, development and climate change has reached a third phase in which the private sector is expected to *finance* the implementation of international agreements. Evidently, developed countries governments pushed for this transmutation. What is not clear, is why. It goes beyond the scope of this chapter and this doctoral dissertation to answer this question. However, this section theorises about the reasons why. First by explaining why it was not logical that the UNFCCC negotiations agreed on the private sector to be a source of adaptation finance; and second by submitting three potential and likely interlinked explanations for the transmutation towards private financing.

It was not logical that the UNFCCC negotiations agreed on private sector being a source of adaptation finance for at least four reasons. First, experiences with private sector implementation of international agreements have mixed results (see Section 2.2.6 and Chan & Pauw, 2014; Chan, van Asselt, et al., 2015;

Tienhaara et al., 2012). Second, prior to the Copenhagen Accord, there was no empirical evidence of successful private adaptation finance. Private adaptation finance only started to emerge as a research field: a coherent approach to adaptation from the perspective of economics as a social science was still missing (Druce et al., 2016; Osberghaus et al., 2010). In literature, adaptation in developing countries has often been considered to have strong linkages with issues for which the public sector is traditionally held responsible, such as the environment (e.g. Fankhauser & Schmidt-Traub, 2011; Mustelin et al., 2013; Pauw, 2013) and development (Bowen, Cochrane, & Fankhauser, 2012; Denton, 2010; Eriksen & O'Brien, 2007). Third, those countries which are described as 'the most vulnerable' in the Copenhagen Accord and the Cancun Agreements (see Table 6-1) have a very low inflow of private capital (see Atteridge et al. (2016) and Section 3.2) and score low on the World Bank's Ease of Doing Business index. Fourth, from a classical liberal economic theory point of view, it can be argued that public interventions are necessary to address market failures around adaptation. These include the public good nature of many preconditions of adaptation (such as filling the knowledge gaps (Stenek, Amado, & Greenall, 2013)), the public good nature of many adaptive measures (which essentially reduces the return on investment) and the negative externalities (adaptation in one locality might have a negative impact on other localities) (Druce et al., 2016). This liberal economic view on adaptation is further challenged by considering additional political objectives such as equity (the just allocation of private adaptation finance) and security of supply of essential goods (such as water) (Osberghaus et al., 2010).

The next three subsections submit three potential and likely interlinked explanations for the transmutation towards private financing for the implementation of international agreements.

2.4.1 Neoliberalism and economisation

A first explanation for the transmutation is the broadening of the neoliberal conceptualisation of the political economy by economising adaptation and the sectors and vulnerable people adaptation needs to protect. Several experiences and signals underline the viability of this approach. For example, once the Montreal Protocol (see Section 2.1.4) was in place, it created a multibillion market for companies who produced alternative technology to CFCs. Second, from the 1992 UNCED onwards, business start to recognise economic benefits

of environmental protection. Third, ODA is losing relevance given the fact that its amount is increasingly overshadowed by private sources of finance such as remittances and FDI (see Figure 3-3). Perhaps developed country governments are convinced that neoliberalism and economisation of climate finance could not only benefit mitigation and adaptation, but also the private sector. And if so, the private sectors domiciled in developed countries could be the first in line to benefit (see also Excursus 2-4).

2.4.2 The decline of the North

A second potential explanation for the transmutation towards private financing is that developed countries' capabilities (both absolute as well as relative to increasing capability of other countries) to address global challenges with public finance is reduced, for at least three reasons.

The first is economic. The industrial revolution triggered a divergence of per capita incomes unprecedented in world history (Milanovic, 2016). In 1944, the average GDP per capita in the USA was 24.4 times higher than in China. However, stagnation of incomes in the North are growth of incomes in the South (particularly Asia) is dissolving this 'Great Divergence' (Ferguson, 2014).

The Annex I countries' share of the global economy reduced from 45% in 1991 to 37% in 2013. The share of China, now the second largest economy, increased to 7% whereas the share of the US reduced from 24% (1960) to 12% (2012) (see Figure 2-3).

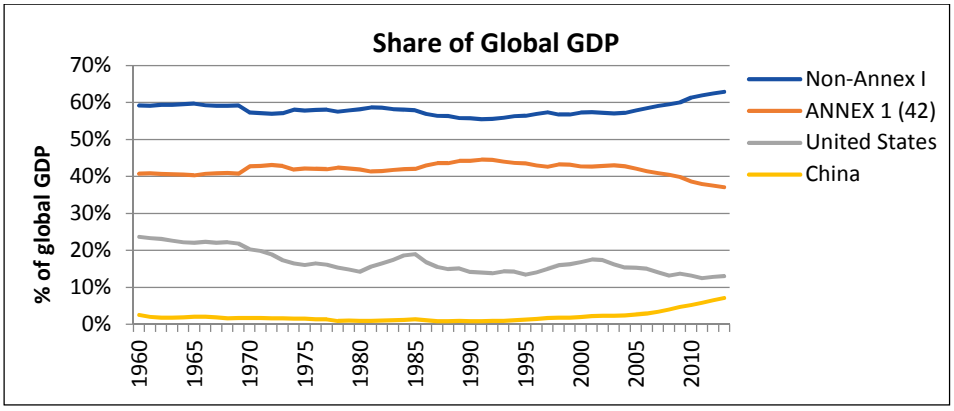

Figure 2-3. Share of the global economy (GDP). Based on data from the World Bank Development Indicators (accessed on 03.08.2015).

Since the 1970s in particular, there is economic convergence. China's annual GDP growth has been higher than GDP growth of the USA since 1977. Moreover, China receives more FDI than the USA since 2010. The emerging economies of Brazil and Hong Kong are the third and fourth largest FDI recipients (World Bank, 2015). These changing growth patterns are also reflected in manufacturing output (Huntington, 1997) and per capita incomes. In 2010, the per capita GDP in the US was only 3.8 times higher than in China (see Figure 2-4).

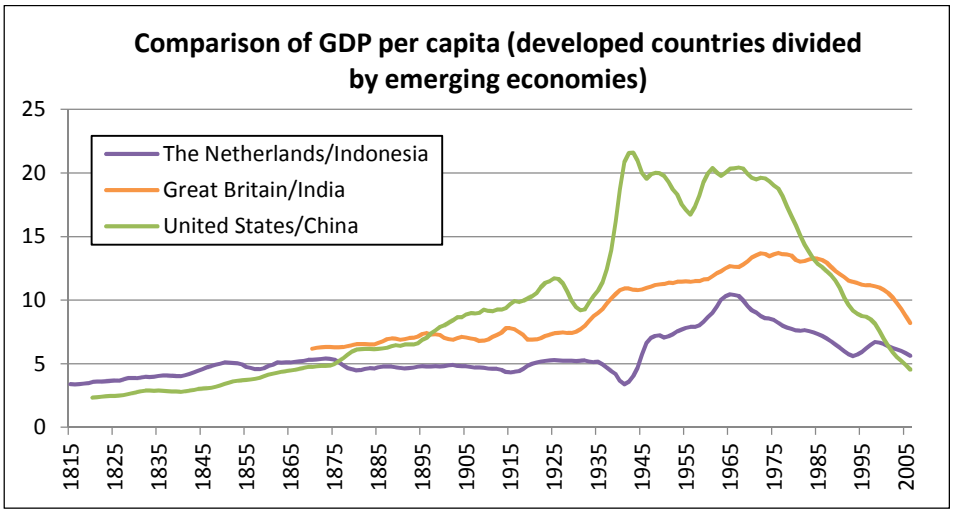

Figure 2-4. Historical per capita incomes of developed countries divided by historical per capita incomes of emerging economies. Data from The Maddison Project (2013) is provided in 5-year moving averages. Ferguson (2014) plots the US against China (see Figure 2-2 and Figure 2-3) and Great Britain against India. The Netherlands (home country of Utrecht University) and the emerging economy of Indonesia are added by the author.

Second, the developed countries' share of the world population has also been decreasing from 31% in 1960 to 18% in 2013. Since 1995, China's share of the world population is larger than the share of all Annex I countries combined. Therefore, not only the relative capacity (in GDP per capita) of developed countries is decreasing, but their total support for development, environment and climate related issues needs to be divided over more people.

Finally, the central government debt as percentage of GDP has increased rapidly in the recent financial crisis. For example, in the USA and UK it almost amounts to 100%; in Germany to 52%, and in Greece and Japan it accounts for more than

180%. These circumstances affect developed countries' ability to provide international climate finance from public budgets (World Bank, 2015).

2.4.3 Evasion of traditional donor countries

Public evasion of traditional donor countries is a third explanation for the decision to mark the private sector as a source of adaptation finance. This would mark a shift among developed country governments: from open and international world approaches towards more closed and defensive approaches. This could relate to a reduced capacity (see Section 2.4.2) and a reduced sense of responsibility.

Indeed, developed countries' share of global emissions of greenhouse gasses is decreasing. Annex I countries were responsible for almost 87% of global emissions in 1963, which reduced to 47% in 2011 (see Figure 2-2). Their total CO_2 emissions stabilised – at high levels – in 1992 around 17,800,000 kt/yr and demonstrate a trend of reduction in recent years. In contrast, emissions of Non-Annex I countries increased by 223% between 1990 and 2008 (Parikh & Baruah, 2012). The Annex I/Non-Annex I dichotomy, which the UNFCCC copied from the Montreal Protocol, hardly reflects current greenhouse gas (GHG) emission realities (Pauw et al., 2014). Per capita emissions prove a different picture. China's per capita emissions are now larger than those in the EU. Yet, India, now the fourth largest emitter globally, has per capita emissions that are only a tenth of the per capita emissions of the United States (Rastogi, 2013).

In the context of countries' changing emission pathways, developed country governments want new 'providers' to contribute climate finance too, but the regime's rigid differentiation between developed and developing countries is difficult to overcome. For instance, the Paris Agreement only encourages voluntary contributions by 'other parties' (see UNFCCC, 2015b, Art. 9.2). The introduction of a private source of finance might have been an easier option to reduce their public responsibility in international agreements to contribute to climate finance.

Such evasion by developed country governments would be particularly harmful if private finance was not able to deliver effectively, or not everywhere and in every sector. It would not only entail implications for adaptation, but complicate international cooperation as a whole (see Bernstein, 2002; 20).

2.5 Creation of ambiguity

Regardless of *why* the private sector was included as a source of adaptation finance in the climate regime, the decision itself created ambiguity concerning the mobilisation of the annual US$ 100 billion climate finance by 2020, and consequently developed country governments' adherence to their pledge. The inclusion of private finance as a source of finance generated long and tenuous discussions among policy makers and researchers about how to measure, report and review (MRV) and account for public and private contributions to climate finance (cf. Atteridge & Dzebo, 2015; Brown et al., 2015; Iro, 2014; Jachnik, Caruso, & Srivastava, 2015; and Chapter 7).

It can be argued that developed countries benefit most from this ambiguity. In general, richer and stronger countries benefit more from transnational relations (Huntington, 1997; Nye & Keohane, 1971). More in particular, developed country governments are in the position to strategically interpret the ambiguity around climate finance in the future, which allows them to translate it into policies most convenient for their purposes (see Best, 2012; Hall, 2017). Such policies could maximise mobilised private climate finance (at least on paper) in order to limit the pressure on public budgets.

Chapter 1 identified the new concept of 'private adaptation finance' as ambiguous, not bound by strict definitions of its underlying elements of adaptation, private sector, or climate finance. This chapter reduces some of that ambiguity by putting the concept of private adaptation finance in an historical context. The examination of 22 post-World War II international agreements; the contextualisation through theories on liberal environmentalism, ecological modernisation and commodification; and this chapter's differentiation between three Phases all demonstrate that the concept of private adaptation finance fits in an ongoing trend of privatisation of global governance.

This doctoral dissertation aims to reduce more of the political and conceptual ambiguity. Therefore, it focuses on private *adaptation* finance as a particular example of Phase III. In doing so, it analyses the interests of developing countries (Chapters 4 and 5), the private sector (Chapter 6) and developed countries and development institutions (Chapter 7).

3 Private finance: instruments and current insights in finance flows

This chapter provides a synopsis of the contemporary knowledge of both financial instruments to mobilise private adaptation finance in developing countries and current finance volumes.[22] Chapter 1 of this doctoral dissertation explained that crucial concepts to understand private adaptation finance – private sector, adaptation, and finance – are still being conceptualised. This makes it difficult to define the private sector's contribution to financing of adaptation-related outcomes, both conceptually and technically. This chapter is important in this doctoral dissertation because it explains the technicalities of financing and tracking of financing. It thereby provides a foundation for the analyses of Chapters 4 to 7.

Section 3.1 explains different financing instruments and Section 3.2 proceeds by summarising the current knowledge of private financial flows potentially impacting adaptation in developing countries. Section 3.3 provides an overview of the general barriers towards mobilising more private adaptation finance. Section 0 describes how financial and non-financial public interventions can mobilise more private finance; and how to track what is mobilised in the context of the target to mobilise US$ 100 billion per year by 2020 for mitigation and adaptation in developing countries (for a discussion on tracking, see also section 7.3.4). Section 3.5 concludes.

3.1 Private finance instruments

Businesses only invest when risks and expected returns are in balance. This also holds for adaptation-related investments. Therefore, it is not surprising, but very

[22] This chapter is based on two publications. First, it draws on the chapter by Atteridge et al. (2016) in the 2016 UNEP Adaptation Finance Gap Report. Although I contributed to the entire chapter, the section on enabling environments was my main responsibility. Section 3.2 on current knowledge of amounts of finance flows draws on the contributions of the chapter's co-authors. This dissertation chapter also draws on the UNEP FI report 'Demystifying adaptation finance for the private sector' by Druce et al. (2016). I contributed as a consultant to this report and was responsible for the development of the case studies on adaptation (or 'adaptation themes' and contributed to the entire report. This chapter's text on financial instruments (Section 3.1) draws heavily on the contributions of the co-authors.

important to mention that adaptation activities are by and large financed through established financing instruments such as bank loans, bonds and private equity (see Druce et al., 2016). A notable exception is philanthropy. Financial resources from philanthropy can be utilised more flexibly because returns are not expected (Persson et al., 2009). However, philanthropy is not included here because it is not strictly for-profit private adaptation finance (see Chapter 1).

Traditional private financing is either based on equity or debt. Within those two categories, private sector actors have a variety of financial instruments available. The horizontal dimension in Figure 3-1 illustrates whether the source of funding is private (individual or institutional) or raised on publicly accessible capital markets, typically through securities which can be traded among investors. These securities are bonds in the case of debt (where the lender has a creditor stake in the company) and stocks in the case of equity (where investors become shareholders of equity).

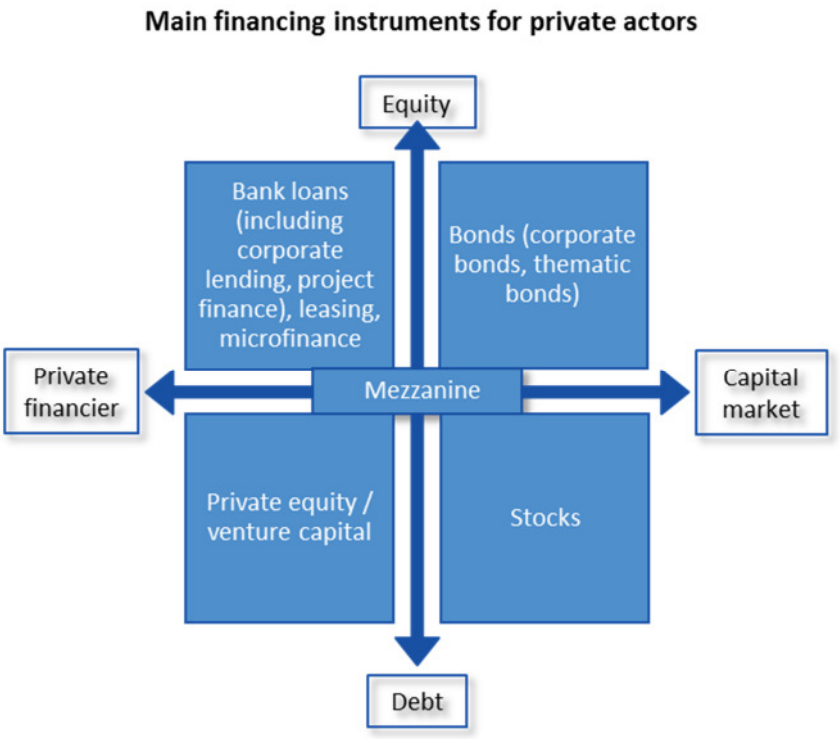

Figure 3-1. Main financing instruments for private actors (adapted from Druce et al., 2016.

To a large extent, the volume of the capital to be raised determines the choice of the appropriate financing instrument (as generalised in Figure 3-2). Using a financing instrument always involves transaction costs, including for making contracts and monitoring of implementation. These transaction costs also determine the appropriate financing instrument. Highly standardised and easy-to-handle procedures like loans from micro-finance institutions or banks carry lower transaction costs and are often used for smaller and medium scale financing volumes. Larger loans to corporates (corporate lending) require individual loan contracts and will therefore be less standardised and have higher transaction costs. Substantial capital needs of larger corporations may be served by directly offering debt (bonds) on the capital market. Large infrastructure projects are often financed through project financing. Here, the project itself is designed as a company ('special purpose vehicle') into which a so-called sponsor injects equity and heavily influences the project implementation. At the same time the project company borrows from banks. This form of financing requires the project to be profitable: the special purpose vehicle needs to be able to provide cash flows to the lenders (Druce et al., 2016).

Excursus 3-1. Public and private financing for Farmerline: a Ghana-based company which contributes to adaptation through mobile phone technology.

The Ghana-based company Farmerline provides personalised messages to farmers via mobile phones to support them to increase their productivity, for example by sharing weather information and best practices in areas such as product storage, reducing pest infestations and bringing products to market. The SME responds to a market need, including for adaptation to climate change, and developed a new business opportunity. Farmerline financed their business in the same way as many early-stage entrepreneurial ventures. Farmerline was launched in 2013, shortly after it received a grant award of US$ 9,000 from the UK-based foundation Indigo Trust (Indigo Trust, 2012). With limited access to formal financial institutions, the grant enabled the start-up to expand and focus on revenue seeking opportunities. Overall, as their subscriber base has grown to over 10,000 farmers, their revenues have increased from US$ 52,000 to an estimated US$ 200,000 by 2015 (Ashoka Changemakers, 2015). In July 2015, Farmerline received a US$ 50,000 equity investment from the seed capital firm Village Capital (Africa Capital Digest, 2015). Moreover, they are seeking further equity investments (Ashoka Changemakers, 2015). The company aspires to expand its services across Africa and aims to reach an estimated two million farmers by 2024 (The Guardian, 2014).

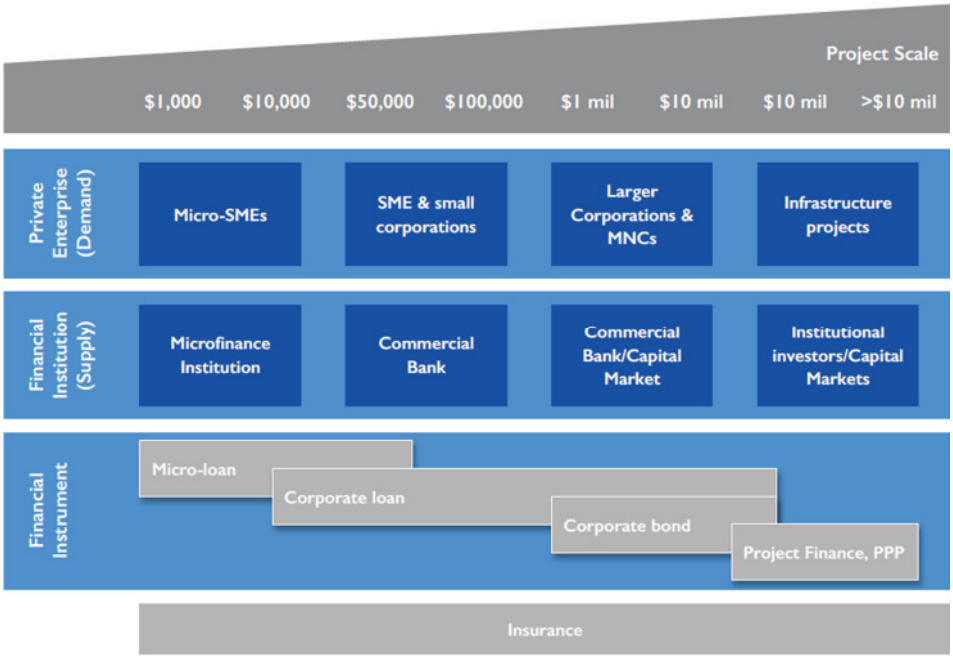

Figure 3-2. Projects of different scales generally work with different private enterprises, financial institutions and financial instruments. Insurance is the only financial instrument which works on all levels (Source: Druce et al. (2016; 6)). MNCs are multinational corporations; SMEs are small and medium enterprise; PPPs are Public-Private Partnerships.

3.2 Amounts of private adaptation finance: current knowledge

The recurring challenge for this doctoral dissertation is the limited knowledge of the amount of private financial flows for adaptation. This will be explained in detail in Chapters 4 to 7. This section provides an important foundation for these chapters.

The annual Climate Finance Landscape report of the Climate Policy Institute (CPI) notes that 'Information about private investment in adaptation remains one of the most important gaps in the climate finance landscape' (Buchner et al., 2014) and CPI refrains from trying to capture these flows in the report. The limited evidence available precludes a detailed analysis, notably regarding the extent to which the private sector might contribute to the US$ 100 billion climate finance target (Atteridge et al., 2016). Nonetheless, for some financial flows where additional general data is available, the recent overall private

finance trends can be assessed, and their likely relevance for adaptation outcomes in developing countries can be reflected upon. Foreign Direct Investment (FDI), private debt and remittances,[23] along with ODA, make up the largest components of financial inflows to developing countries (see Figure 3-3). Apart from some estimates of climate-relevant FDI flows for mitigation (see Corfee-Morlot, Guay, & Larsen, 2009; UNCTAD, 2010) and dedicated climate bonds, no quantitative estimates have been made of the adaptation-relevance of these flows. Some numbers are provided in this chapter, but it must be noted that they cannot be aggregated due to their unclear but diverse relations to adaptation.

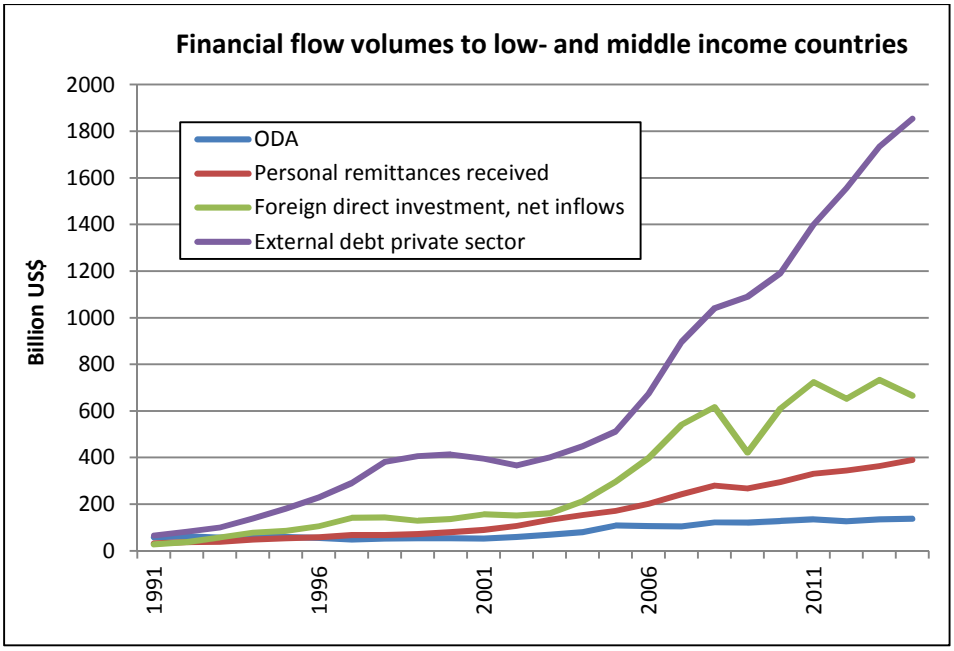

Figure 3-3. Financial flow volumes to low and middle income countries in current US$. *Official Development Assistance (ODA)* consists of official and concessional financial flows (aid) from developed countries towards developing countries (see footnote 11) (Source: OECD: http://stats.oecd.org/Index.aspx (accessed on 12 August 2016)). *Remittances* are not-for-profit private financial flows sent home by migrants and diaspora (see footnote 23). *Foreign direct investment* refers to direct investment equity flows, and is the sum of equity capital, reinvestment of earnings, and other capital. *External debt of the private sector* shows debt that has an original or extended maturity of more than one year and that is owed to non-residents

[23] Remittances are not-for-profit private financial flows sent home by migrants and diaspora (Deshingkar, 2011; Lucas & Stark, 1985; Straubhaar & Vâdean, 2006).

by resident of an economy and repayable in currency, goods, or services. (Source: World Bank Indicators database: http://wdi.worldbank.org/tables (accessed on 12 August 2016)).

For example, Atteridge (2011) demonstrates that some key sectors in terms of livelihoods and adaptation needs in developing countries, such as water and agriculture, have either been relatively unattractive to transnational private investment, or seen investment in large-scale export-oriented activities rather than in small-scale production that sustains local populations (as with agriculture in Africa). Private investment tended to favour natural resource extraction over tertiary sectors such as health or education.

Furthermore, the distribution of flows is not balanced across countries. For example, low-income and lower-middle-income countries receive less than US$ 50 of FDI per capita per year; much less than upper-middle-income countries (~US$ 150) and high-income countries (~US$ 275) (World Bank, 2015)[24]. And although the share of all remittances received by low-income nations has doubled since 1990, it remains a small proportion with 6% of the global total (Connor, Cohn, & Gonzalez-Barrera, 2013; and Excursus 6.4).

3.2.1 Climate Bonds

Public and private entities in developing countries issued US$ 223 billion in bonds in 2013 (World Bank, 2015). A share of this private investment capital raised on the bond market could be a valuable source of public or private adaptation finance. Over the last decade, interest has grown in using bonds to raise capital specifically for climate change and environmental objectives – so-called 'climate bonds' or 'green bonds'. The Climate Bonds Initiative (CBI) estimates that US$ 597.7 billion of climate-aligned bonds are outstanding globally since January 2005. Approximately US$ 12.6 billion of these has been used to invest in sectors that are directly adaptation-relevant such as water, waste management, agriculture and forestry. Green bonds are a subset of climate-aligned bonds that meet criteria established by the CBI. CBI estimates that 4.3% of the US$ 65.9 billion outstanding green bonds, or US$ 2.8 billion, are

[24] These World Bank country categories are defined based on the GNI per capita: low-income economies (< US$ 1,045); lower-middle-income (US$ 1,045-4,125); upper-middle-income economies (US$ 4,125-12,736); high-income economies (> US$ 12,736). See http://data.worldbank.org/about/country-and-lending-groups. Accessed on 21 December 2016.

linked to climate adaptation projects (CBI, 2015). Their actual contribution to adaptation is unknown.

3.2.2 Domestic private investment

As developed countries pledged to mobilise private finance as a source of the annual US$ 100 billion climate finance target, it is often assumed that this concerns the international private sector. However, the international private finance flows described above are relatively small in comparison to domestic private investments. SMEs and informal businesses provide the largest contribution to GDP in most developing countries (Dalberg, 2011): they provide jobs, income, goods, services and other forms of social capital. At the same time, SMEs are particularly affected by disasters and numerous go bankrupt after a natural disaster because they lack the cash-flow or reserves to survive (UNDP, 2013; UNISDR, 2013). Several of these enterprises are active in agriculture (World Bank, 2012), a sector that is particularly sensitive to climate change (see Chapter 5 for an analysis of adaptation by the domestic agricultural sector in Zambia). It can be assumed that a share of domestic private investment is directed towards building resilience of communities (Pauw, 2014).

3.3 Barriers towards private adaptation finance

In the context of the high estimated costs of adaptation in developing countries (see Section 1.2) and the difficulties faced when mobilising private finance, literature started describing 'barriers' to private adaptation investments. Private adaptation might not always be attractive from a commercial perspective – even if it has a net benefit from an economic or a social point of view. If a private investment carries an adaptation component, this is typically motivated through increased revenues, lower costs or lower risk due to the adaptation component. However, even commercially viable adaptation might not be implemented if a private actor is not aware of the risks or the adaptive measures and related costs and benefits. These and other barriers are identified by literature, which generally adopted versions of a broad and descriptive definition of barriers to adaptation (Moser & Ekstrom, 2010; 22027):

> *'Obstacles that can be overcome with concerted effort, creative management, change of thinking, prioritization, and related shifts in resources, land uses, institutions, etc.'*

Adaptation barriers	Trabacchi & Mazza, 2015	Islam et al., 2014	Antwi-Agyei et al., 2013	Barnett et al. 2015	Jones, 2010	Vivid Economics, 2015	PCIR, 2012	Stenek et al., 2013
Financial Barriers	funding, revenue and risk coverage gap	budget constraints; limited access to credit	lack of resources; limited credit facilitation			lack of donor co-financing; lack of long-term financing	public goods, split incentives	lack of economic incentives
Informa-tion Barriers	knowledge gap		lack of climate data; lack of awareness of climate change and climate risks		human and informa-tional barriers	lack of awareness and capacity; asymmetric information	imperfect information	lack of data and information
Institu-tional		lack of access to markets	lack of institutional capacity	path depen-dency; inertia		shortcomings in institutional and regulatory environment	Shortcomings governance and institutional arrangements	path depen-dency insti-tutional arr-angements
Political & Regulatory	policy gap	lack of enforcemen t	top-down government approach not effective locally				policy barriers, regulatory barriers	lack of policies (standards, codes) zoning, permits)
Technolo-gical		limitations in modelling accurate weather forecast						
Social & Cultural		lack of education/ skills; ethics and coercion			cognitiv e; norm-ative; institu-		behavioural barriers	

Table 3-1. Typology of barriers to private adaptation finance as provided in academic and grey literature (source: based on Druce et al. (2016; 33)).

Most literature acknowledges a broad range of barriers and focus on a few specific types, while other literature clusters and aggregates barriers in categories (see Table 3-1. Notwithstanding some overlapping, six categories of adaptation barriers can be identified: financial barriers, information barriers, institutional barriers, political & regulatory barriers, technological barriers and socio- cultural barriers (Druce et al., 2016).

3.4 Mobilising private adaptation finance

Public interventions by donors, development banks and agencies as well as developing country governments can help to lower the barriers described above and incentivise private finance of adaptation-related activities. These interventions can broadly be classified as either financial (Section 3.4.2) or non-financial (Section 3.4.1). In the context of the 'US$ 100 billion' target, it is important to track the share of private finance that is being mobilised (see Section 7.3.4).

3.4.1 Non-financial interventions

Non-financial interventions take the form of policies and regulations that influence broader financing and expenditure conditions,[25] as well as the specific kinds of investments that are incentivised. Developed-country governments have an important role here, with development organisations, bilateral agencies and development banks able to offer experience, capacity building and technical support. Stenek et al. (2013) categorise such non-financial interventions in five categories:

- **Provision of data and information.** Climate and hydrological data are often perceived as public goods. Private actors might therefore underprovide: they do not invest in generating such data themselves because they expect the government to do it (cf. Seville & Gannon, 2015). In addition to data provision, the public sector can also provide decision-support tools to understand risks and assess opportunities of climate impacts and adaptation measures; information on risks and adaptation needs of communities (for the private sector to take these into account);

[25] Atteridge and Dzebo (2015) differentiate between expenditure (made by the actor that, for example, buys an adaptation product) and financing (done by e.g. a bank or an equity investor in order to provide the earlier mentioned actor with the means to buy the adaptation product).

as well as data and information on climate-sensitivity and vulnerability of products, performances and locations;

- **Institutional arrangements** refer to ensuring appropriate coordination among public agencies and nurturing public-private partnerships that facilitate the implementation of concrete interventions with private sector participation;
- **Conducive policies** include, for example, technical standards, building codes and local zoning regulations that take into account changing climate risks;
- **Economic incentives** include subsidies on adaptation technologies and the implementation of adaptation action; taxes or levies on water or energy use, and economic instruments such as insurance or environmental trading markets (for instance for ecosystem services);
- **Communication, technology and knowledge** may include information and communication technology infrastructure and mechanisms to encourage knowledge and technology transfer and share best practices.

Which category is most important to remove barriers towards private adaptation investments depends on the local context as well as the adaptation interventions that are required. Chapters 4 to 7 will provide further and more detailed examples of non-financial as well as financial interventions to reduce barriers towards private investments in adaptation.

Another important role for the public sector is to remove policies that could cause maladaptation. For instance, too low water prices lead to over-extraction and make investments in drip-irrigation unattractive (Baglee et al., 2013). Other examples are the dike around an industrial Estate in Thailand (see Excursus 3-2) and Zambia's maize promotion programme, which aims to boost maize production but also causes high-risk monocropping (see Chapter 5).

Excursus 3-2. An example of private maladaptation: a dike around Hi-tech Industrial Estate in Thailand (based on Druce et al. (2016)).

Thailand suffered its largest ever flood in 2011. Nationwide, it caused 813 deaths and economic losses of tens of billions US Dollars.[26] Following the

[26] Although research concluded that climate change was not responsible for the 2011 Thailand floods (Komori et al., 2012; van Oldenborgh, van Urk, & Allen, 2012), it might have a role in potential future flooding, and the measures taken after the 2011 flood, including the dikes mentioned here, will have an effect on climate change vulnerability in the region.

floods, the government proposed flood prevention measures, including around US$ 11 billion of water management projects, and a nearly 320 kilometre of flood walls along a vulnerable stretch of the Chao Phraya river (Purnell).

Hi-Tech Industrial Estate in Ayutthaya was also flooded and local authorities had to invest around 100 million Baht (around US$ 3.2 million) to restore its utilities. The estate decided to build its own new 11 km long dike around the estate (Fernquest; Wiriyapong, 2011), costing 330 million Baht (around US$ 11 million). Hi-Tech Industrial Estate sought a 15 year concessional loan of 15 billion Bhat from the government (0,01% interest rate for seven years, and assistance in the form of a favourable interest rate for the remaining eight years) (Mcot). Originally, the Industry Ministry planned to finance two-thirds of the costs with funds from the insurance pool, with estate operators taking out soft loans from the Government Savings Bank for the remaining amount (Viboonchart, 2012). The Estate plans to increase the central utility fee by 1,200-1,500 Baht on top of the current 900-1,000 Baht per rai (Fernquest). The increased fee will be applied for 15 years and will be used to repay loans for building the dike.

Environmental groups were protesting that the dike would cause damage to the homes of villagers living outside of the dike in the event of future floods; and that it would have serious social and environmental impact as the dike alters the natural water flow (Fernquest). If the environmental groups are right about these consequences, the negative externalities of the dike construction cause maladaptation (Druce et al., 2016).

Ever since the Copenhagen Agreement mentioned the private sector as a source of climate finance, however, most research focused on where they contribute to adaptation, rather than on their overall (or net) impact on adaptation and vulnerability. Neither the causes, risks and consequences of private maladaptation, nor the ways in which governments might incentivise private maladaptation are currently understood well (Dzebo & Pauw, 2015).

3.4.2 Financial interventions

Public actors can also rely on *financial* interventions to shift private finance towards adaptation. For example, they can 'blend' public with private finance to lower the cost of capital (blending commercial debt with grants to provide concessional lending, see Excursus 3-3 for an example), to provide lines of credit to local finance institutions for adaptation-related investments, or to provide risk-sharing instruments such as first loss guarantees and separate treatment of political risks (UNEP, 2011). The three main approaches for financial

interventions are public lending (typically by development banks); risk guarantees and export credits; and public-private partnerships (with a financial focus). Which approach suits best depends on the type, sector and the scale of the adaptation-related investment.

Public lending. Some of the development banks and agencies can lend financial resources to private actors to or co-finance or implement adaptation projects (see also Chapter 7).[27] Currently, of all providers of international climate finance, only multilateral development banks report on the level of support provided directly to private sector recipients (MDB Joint Report, 2015). Although this only provides a partial picture of public financing of private expenditure, two interesting patterns are evident. First, while roughly 33% of the overall climate finance of multilateral development banks (MDBs) in 2014 was borrowed or received by private actors; only US$ 141 million (less than 3%) of the US$ 5 billion adaptation finance went to private recipients. Second, although approximately 30% of all MDB adaptation finance went to Least Developed Countries (LDCs) and Small Island Developing States (SIDS), only an insignificant fraction of this (US$ 3 million) went directly to private recipients. It should be noted that in general, directing public finance towards private recipients does not necessarily ensure effective or accountable adaptation outcomes. For example, based on an analysis of development finance institutions and climate funds, Pereira et al. (2013) argue that these tend to focus on large projects, often involving foreign corporations; and that reported leverage ratios used by development finance institutions are neither good indicators of the efficiency of projects in achieving their goals, nor of the quality of outcomes achieved.

Excursus 3-3. Climate Investor One.

Climate Investor One is a new facility, established by the Nederlandse Financierings-Maatschappij voor Ontwikkelingslanden N.V. (FMO) in partnership with Phoenix InfraWorks, to encourage private sector investment in renewable energy projects in developing countries. Climate Investor One combines three investment funds into one facility to finance renewable energy projects at specific stages of the project lifecycle.

First, the Development Fund provides financial, technical, environmental, social development and structuring support in the early project stage. *The*

[27] This section is about climate finance in the context of the UNFCCC. Excursus 3-2 provides an example of public lending at the domestic level.

Development Fund will be able finance up to 50% of a project development budget, to a maximum of US$ 2.5 million. This reduces the development time and makes projects more bankable.

In the second phase, Climate Investor One reduces the complexity associated with multi-party negotiations by organising equity financing for a large part of construction through the Construction Equity Fund. This fund will be able to finance up to 75% of a project's construction stage funding requirement, to a maximum of US$ 100 million in the form of shareholder financing.

In the third phase, when the project is operational, Climate Investor One mobilises long-term and low-risk debt financing through a Refinancing Fund. This allows the single purpose vehicle to optimise its funding structure and reduce its cost of capital. The Refinancing Fund will be able to finance up to 50% of a refinancing long-term debt tranche, following successful construction and commencement of operations.

Climate Investor One was selected and endorsed as one of four winning pilot initiatives by The Global Innovation Lab for Climate Finance and is lauded by the Economist for being a 'One-stop-shop' (see Chachoua, 2016). The blending of public and private finance through grants, equity and refinancing by one organisation reduces transaction costs and investment risks and stimulates private investments in renewable energy in developing countries. It could be a tool to mobilise more investment in adaptation infrastructure too (see e.g. Excursus 3-4 and Section 7.3.3).

Sources: Climate Investor One (2016) and Global Innovation Lab for Climate Finance (2016).

Risk guarantees and export credits. Public finance can help to reduce investment risks in projects through instruments such as credit guarantees; political risk insurance; hedging products such as currency and interest swaps; as well as public insurance against catastrophes or weather risks. These can increase private financing by making investing more attractive (see Excursus 3-4). For example, insurance can spread and transfer risks of coping with climate-related hazards and may provide incentives for risk reduction and preventative behaviour.

Export Credit Agencies (ECAs) can also mobilise private investment. In 2014, the OECD issued a 'Revised sector understanding on export credits for renewable energy, climate change mitigation and adaptation, and water projects' (OECD, 2014d). In an effort to make investments in adaptation more attractive, it sets favourable conditions for repayment of export credits for adaptation projects.

However, no empirical analysis of the effectiveness of export credits for adaptation purposes seems to exists (Atteridge et al., 2016). However, concerns have been raised about ECAs, relating to a lack of transparency around their operation; the fact that ECA financing in fossil fuels eclipses ECA financing in climate-friendly technologies (ECA-Watch, 2010; Maurer & Bhandari, 2000); and that they increase levels of debt distress in poor countries. For this reason there has been opposition to the idea of including export credits as 'climate finance' under the UNFCCC's US$ 100 billion per year commitment (ECA-Watch, 2010).

Excursus 3-4. Coastal development in Jakarta: the National Capital Integrated Coastal Development program (NCICD).

One of the biggest challenges for the future of Jakarta (Indonesia) is to protect its 10 million inhabitants and fast growing economy against increasing flood risks. Jakarta has a long history of coastal and riverine flooding due to its naturally flood-prone location and seasonal rainfall intensity (Caljouw, Nas, & Pratiwo, 2005; Steinberg, 2007). These risks are amplified by land subsidence of 1-15 cm/yr (Abidin et al., 2011), sea level rise of 44-74 cm by 2100 (IPCC, 2014a)and rapid economic development (Ward, Pauw, van Buuren, & Marfai, 2013).

The National Capital Integrated Coastal Development program (NCICD) provides an integrated approach to address this challenge. The construction of a completely new zone in front of the city's waterside would integrate flood protection, sanitation and water supply improvement, as well as connectivity and community development.

The Dutch government financed both a feasibility study and the development of a National Programme. The secondary actors are the consultants involved in this process, including the Dutch firms Witteveen+Bos and Grontmij (hydraulic engineering and urban development), KuiperCompagnons (design), Ecorys (economic feasibility) and Deltares (hydraulic analyses). The public-private partnership arrangement also extends to financing: several private companies expressed interest in investing (National Capital Integrated Coastal Development program, 2015). The construction of a sea wall is estimated to cost US$ 40 billion, with a 20 year construction period (Indonesia Investments, 2014). 17 artificial islands with homes and office space are planned; the exploitation of which will cover a large share of the investment costs. As the project provides a public good (protection against flooding), the project development is not envisaged to be profitable. The city administration would therefore reduce private risks by guaranteeing to buy back the islets from the construction companies and by making advance payments of US$ 13.8 billion (Indonesia Investments, 2014). Some of these costs could be recovered directly from end-users, for example through toll

roads. The city administration is also drafting the design of an international port which will be operated by city-owned property developer PT Jakarta Propertindo. The city administration is also expected to form an asset management company and additional financial support is being provided by the Dutch government.

Public Private Partnerships (PPPs) can include financial contributions from both public and private partners. The public partner often acts as enabler of private engagement by distributing investment risks. The financial value of PPPs in developing countries increased dramatically in recent years. In infrastructure, for example, private finance now provides around 15-20% of total investment (Romero, 2015). This increase was driven by a growth in infrastructure expenditure generally, as well as low interest rates in developed countries and hence the search by investors for alternative investment targets (Romero, 2015). Data on PPPs in developing countries (for example from the World Bank's Private Participation in Infrastructure database) suggest that PPPs have mainly been concentrated in energy and transport projects and in upper middle income countries. For example, between 2010 and 2015, only two PPPs were finalised in the adaptation-relevant water and sewage sector in sub-Sahara Africa (World Bank, 2016). This pattern may change over time, as many countries are still developing institutional frameworks to support PPPs (Kennedy & Corfee-Morlot, 2012). The effectiveness and the accountability of PPPs in supporting public goals like adaptation are hardly studied. Based on an analysis of PPPs for development purposes, IOB (2013) finds that resource mobilisation is the main rationale for the partnerships, and suggests that there is little evidence of them being more cost-effective or environmentally friendly than traditional public financing.

3.4.3 Tracking mobilised private climate finance

Tracking of mobilised private finance is essential to understand the extent to which developed countries meet their pledge to mobilise US$ 100 billion of climate finance annually by 2020. Tracking mobilized private finance is new to donor countries – it is not current practice for ODA (see Excursus 2-4) – and a system to track private climate finance still needs to be set up.[28] Public

[28] The OECD hosts the 'Research Collaborative on Tracking Private Climate Finance' which was established to advance this issue as an 'open network, coordinated and hosted by the OECD, of

interventions can mobilise private finance for adaptation directly (e.g. through co-financing, see Section 3.4.2) or indirectly (e.g. through non-financial interventions, see Section 3.4.1). Section 7.3.4 provides an analysis of the specific challenges faced by developed countries when tracking mobilised private investments. This section just provides a general overview.

Direct mobilisation happens 'at source' – where public finance is being provided, and mostly around the time of the provision of public finance (Brown et al., 2015). Even if public finance is initially provided one step upstream of the private investment (e.g. via a fund or in the case of a credit line), direct mobilisation is easier to track. Nevertheless, current evidence of direct mobilisation of private adaptation finance is elusive.

Indirect mobilisation of private adaptation finance is more difficult to identify and track. Although private finance investments result from public finance interventions here, causal links are weak because these interventions only supported enabling outputs that occur one or more steps upstream of the private investment (Brown et al., 2015). This often results a longer time lag between public intervention and the private finance mobilisation. Furthermore, the private sector might not (want to) disclose information about their investments in adaptation – and if they do, it is commonly framed as 'risk reduction', 'supply chain management', 'corporate social responsibility', or 'business opportunities' rather than as adaptation (Isoaho & Surminski, 2015). Finally, some private adaptation interventions do not become visible at all: the private sector might often be incentivised to adapt, and perhaps even act on it, without knowing that they are adapting. SABMiller's multimillion US Dollar investment to ensure sustainable water availability for its brewery in Ndola, for instance, was not made due to climate change, but it contributes to adaptation (see Chapter 5).

In order to create more clarity about direct and indirect mobilisation of private climate finance in the context of the US$ 100 billion target, Jachnik et al. (2015) propose a four-step methodology to assess the financial amount of mobilised private finance (see Table 3-2).

governments, research institutions and international finance institutions' (see http://www.oecd.org/env/researchcollaborative/. Accessed on 21 December 2016).

Stage 1. Define core concepts	
· Definition of climate change activities · Definition of public and private finance	· Classification of developed and developing countries · Determination of geographical origin of finance
Stage 2. Identify public interventions and instruments that can be credited for mobilising private climate finance · Types of public interventions · Specific instruments used for the interventions	
Stage 3. Value public interventions and account for total private finance involved	
· Choice and conversion of currency · Choice of point of measurement · Valuation of different public interventions	· Boundaries and estimation of private finance involved · Availability of climate-specific private finance data or proxies
Stage 4. Estimate mobilised private climate finance · Assessment of causality between public interventions and private finance · Attribution of mobilised private climate finance to public interventions and instruments	

Table 3-2. Four-stage methodology and decision points to estimate publicly mobilised private finance (source: Jachnik et al. (2015)).

A challenge not highlighted in this table is to find the right balance between practicality and accuracy. Whilst a coarse aggregation of mobilised finance is practical, it hardly reflects true levels of mobilised private climate finance. A detailed analysis at project level would result in more accurate insights, but is hindered by the limited data availability and would be very time intensive.

Finally, some elements, such as the classification of countries, the determination of the geographical origin of finance, and the conversion of currency are important to understand climate finance flows and the mobilisation thereof, but hardly say anything meaningful about the adaptation impacts of the investment.

3.5 Concluding remarks

This chapter provided an overview of the current knowledge on the instruments and volumes of private adaptation finance in developing countries. It demonstrates that private adaptation financing is conducted through existing financing instruments such as (market-based) loans, bonds and insurance. Which instruments are used is largely determined by the type and the size of

adaptation-related investments. The quantification of adaptation-relevant private finance is, however, difficult for at least three reasons:

- Independent, freely accessible data on private finance is limited and, where available, can only be aggregated at a very coarse level.
- Hitherto, it is not known which financial transactions effectively generate effective and accountable adaptation-relevant outcomes. This would require an evaluation of such flows in their specific contexts (including the sector, the location, the climate impact addressed, etc.)
- In the context of mobilising US$ 100 billion, private investments in adaptation might be mobilised directly (through financial interventions) or indirectly (through non-financial interventions). It is politically difficult to agree on a system on how to track mobilised private climate finance, and technically complicated to apply it.

The analysis provides early indications that the *international* private sector is unlikely to be a major source of adaptation finance in the most vulnerable places, with the exception of remittances,[23] because: 1) FDI flows to lower-income countries are much lower than to middle-income and higher-income countries; and 2) international private finance tends not to reach the poor and most vulnerable. The implications of this outcome will be studied further in the following chapters. Remittances are an increasingly important source of external finance in several developing countries, and could play an important role in supporting household-level adaptation. However, as Bendandi and Pauw (2016) argue, remittances should not be considered as a private source of finance, but an alternative source – if it was included as international adaptation finance under the UNFCCC at all (see Excursus 6-4).

In general terms, the barriers towards more private adaptation finance are identified in literature: financial barriers; information barriers; institutional barriers; political and regulatory barriers; technological barriers; and socio-cultural barriers. Both financial and non-financial public interventions can help to overcome these barriers. The local and national context and the adaptation intervention determine to a large extent which public intervention might be most successful in mobilising private investments in adaptation. Therefore, the next two chapters will focus on the interests of LDCs based on a large-N study

on National Adaptation Programmes of Action (NAPAs, see Chapter 4) and a case study on private adaptation in Zambia's agricultural sector (Chapter 5).

Finally, in order to understand the extent to which developed countries meet the 'US$ 100 billion target', tracking of the share of mobilised private finance is essential. Tracking is complex, even for directly mobilised private adaptation finance. And some elements of tracking exercises, such as the classification of countries, the determination of the geographical origin of finance, and the conversion of currency are important to understand climate finance flows and the mobilisation thereof, but are practically meaningless when trying to analyse the adaptation impacts of the investment.

4 Developing country interests: a large-N study on National Adaptation Programmes of Action [29]

Chapter 1 explained that public and private providers as well as recipients of adaptation finance have different interests in private adaptation finance, depending on their particular position and role in the climate finance debate. The overall purpose of this chapter is to provide insights into the interests of Least Developed Countries (LDCs). First, this chapter conceptualises private sector engagement in adaptation by exploring both different roles of the private sector in adaptation in developing countries and the way governments can create an enabling environment to increase private sector engagement. Second, it analyses how 47 Least Developed Countries (LDCs) express the role of the private sector in their National Adaptation Programmes of Action (NAPAs).

This chapter argues that private sector engagement in adaptation is often inevitable and potentially significant. Yet the results prove that it receives little attention in NAPAs. There are a number of potential explanations for this. It may reflect an intentional approach of LDC governments to avoid a distraction from the necessity to scale up public funding. It may also reflect a lack of awareness of the potential of the private sector. Finally, NAPAs were formulated, at least in part, to secure international public adaptation funding, and the formulation guidelines do not require a description of the private sector in adaptation.

4.1 Introduction

Least Developed Countries are particularly vulnerable to climate change, and generally least attractive for private investors as they often do not have conducive business environment. The private sector looks for countries with stable, coherent and credible long-term national policies backed up by appropriate regulation; good market governance structures; low foreign exchange and technology risks; skilled labourers, etc. (Naidoo, Vaz, & Byaba, 2012; Sierra, 2011; UNEP, 2011). Only four LDCs are in the top 100 of the World Bank's 'ease of doing business index'. In this ranking of 185 countries, the LDCs average 142 (World Bank, 2013a). The 2012-2013 Global Competitiveness Index

[29] This chapter is based on the following paper: Pauw and Pegels (2013) Private sector engagement in climate change adaptation in the Least Developed Countries: an exploration. *Climate and Development* 5 (4), p. 257-267.

of the World Economic Forum demonstrates similar results (World Economic Forum, 2012). These rankings may be imperfect in design, but they highlight that LDCs tend to be less attractive for investors in comparison to other countries.

Some key sectors for livelihoods and adaptation needs in developing countries, such as water and agriculture, have either been relatively unattractive to private investment, or have seen investment in large-scale export-oriented activities, but not in the small-scale production that sustains local populations (Atteridge, 2011).Given that the private sector failed to alleviate poverty in many of the poorest parts of the world, Atteridge (2011) wonders whether it can succeed in tackling adaptation challenges.

This chapter analyses the role that LDC governments foresee for the private sector in adaptation and adaptation financing, based on what they formulated in 47 National Adaptation Programmes of Action (NAPAs). LDCs were invited to formulate NAPAs in 2001in order to 'communicate priority activities addressing the urgent and immediate needs and concerns of the LDCs, relating to the adverse effects of climate change' (UNFCCC, 2002, Annex A to decision 28/CP.7). NAPAs generally are well-structured documents which describe the formulation process, the projected climate change impacts, and adaptation 'priority projects', including activities, actors and often budgets.

The NAPAs were formulated, at least in part, as a mechanism to secure international public funding for adaptation. This may impact their explanatory power for the purpose of this chapter, since LDC governments did not have many incentives to stress the role they foresee for the private sector in adaptation. However, for many LDCs, the NAPA formulation was the first opportunity to undertake climate change related studies and to align adaptation projects with development priorities, and the Least Developed Country Expert Group considers them a success story (LEG, 2011). The set of NAPAs provides one of the first sufficiently large databases to move beyond anecdotal evidence on the role of the private sector in adaptation in LDCs. Findings were triangulated based on secondary literature on private sector engagement in adaptation in developing countries (such as Atteridge, 2011; Christiansen et al., 2012; Intellecap, 2010; Persson et al., 2009). Chapter 4 is structured as follows. Section 4.2 conceptualises private sector engagement in adaptation. It explores both different roles of the private sector in adaptation in developing countries

and the way governments can create an enabling environment to increase private sector engagement. Section 4.3 explains the methodology of the NAPAs analysis. Section 4.4 presents the results of this analysis, providing insights into the role that LDC governments foresee for the private sector in adaptation. Section 4.5 concludes.

4.2 Conceptualising private sector engagement in adaptation

To better understand the different roles of the private sector in adaptation in developing countries, lessons can be learned from decades of experience in development cooperation. This has improved the understanding of the complexity and of the different roles of the private sector in development. (Byiers & Rosengren, 2012) distinguish between 'private sector development' and engaging the 'private sector *for* development'. Based on their work, this chapter distinguishes between 'domestic private sector adaptation' and 'international private sector *for* adaptation'.

4.2.1 Domestic private sector adaptation and private sector for adaptation

Byiers and Rosengren (2012) describe 'private sector development' as focusing on *domestic* economies in developing countries, with their governments designing and implementing policies to encourage economic transformation through investment, productivity growth, business expansion and employment. Consequently, 'domestic private sector adaptation' in this chapter relates to domestic actor engagement in adaptation. In developing countries, the income of approximately 90% of the population depends on the private sector (SER, 2011). This demonstrates the importance of the domestic private sector for the protection of people and livelihoods against climate change. Many businesses, small enterprises in particular, also lack adequate resources for adaptation (PwC, 2010). For financing their adaptation activities, farmers and small businesses in developing countries mostly depend on domestic sources (Christiansen et al., 2012). Although impacts of both climate change and adaptation have been studied extensively (IPCC, 2007, 2014a; Parry et al., 2009; World Bank, 2010), domestic private sector engagement in adaptation is not well documented from a business perspective. Among the few exceptions are Khattri, Parameshwar, and Pellech (2010), Trabacchi and Stadelmann (2013) and Begum and Pereira (2013). According to the study by Khattri et al. (2010) on Asian cities, adaptation interventions such as (affordable) housing, micro-insurance and water management are always context-specific. Therefore, small

and local businesses are important for adaptation and sometimes better able to respond to the needs of the poorest than government bodies or non-governmental organisations (NGOs). Trabacchi and Stadelmann (2013) illustrate that investments from agribusiness firms (e.g. training farmers, facilitating farmers' access to inputs) and local commercial banks (enabling access to finance) in resilience of Nepal's agricultural sector can increase farmers' production, but that implementation is limited due to many social and economic constraints and uncertainties (see Excursus 4-1). Similarly, in Malaysia, Begum and Pereira (2013) conclude that many businesses start to recognise that climate change poses risks and opportunities, but that there is often a lack of effective frameworks in place for them to understand and manage these long-term risks and opportunities.

Excursus 4-2. Project by the Pilot Programme for Climate Resilience on private adaptation in Nepal's agricultural sector (based on Trabacchi and Stadelmann (2013)).

Trabacchi and Stadelmann (2013) assessed the private adaptation project by the Pilot Program for Climate Resilience (PPCR) in Nepal, run by the International Finance Corporation (IFC). In this project, public resources are deployed to promote climate resilience in Nepal's agricultural sector by engaging and developing the capacity of agribusiness firms and local commercial banks to transfer skills and resources to farmers. Trabacchi and Stadelmann (2013) estimate that farmers could increase their production, and therefore their income by approximately 20% solely by developing more climate-resilient production processes. Agribusinesses that invest in such farmers can earn back their initial investment of up to US$ 95,000 within five years because the improved supply of agricultural products should lead to higher turnover and profits. The PCCR tries to engage local banks to provide loans to such businesses and to farmers.

However, the project faces a number of constraints. Trabacchi and Stadelmann (2013) identified risks to the project that are not directly related to adaptation. For example, there is a lack of active participation from farmers and a limited adoption of improved farming practices due to farmers' low literacy levels and competing needs. Second, a decreasing market price of crops reduces the interest in investment. Finally, local banks are hard to involve in the project, because of the low attractiveness to provide loans for climate resilience. Underdeveloped private sectors; limited awareness of the private sector's potential for climate resilience; the uncertain risk-return profile; the mismatch between possible returns on climate investments and investor's shorter time horizons are four additional risks that should be taken into account when developing adaptation projects in developing countries (Trabacchi & Stadelmann, 2013).

Byiers and Rosengren's (2012) 'private sector *for* development', on the other hand, relates more to engagement with international businesses. Persson et al. (2009) state that this international private sector engagement may be crucial for adaptation in developing countries. Byiers and Rosengren (2012) further distinguish between 1) private sector *activities* for development through encouraging productive investment, and 2) using official development assistance (ODA) to leverage private sector *finance* for development. Consequently, 'private sector *for* adaptation' in this chapter distinguishes international private sector activities and international private sector finance.

Whether international private sector *activities* will reach the least developed countries and the poorest parts of the population is an issue of debate. On a country level, there is a likelihood that only the subset of developing countries with sufficiently low investment risks will be reached (Persson et al., 2009). As for sectors and the poor, Atteridge (2011) states that sectors such as water and agriculture have either been relatively unattractive to private investment, or seen investment in large-scale export-oriented activities but not in the small-scale production that sustains local populations. Nonetheless, examples as described under the Private Sector Initiative of UNFCCC's Nairobi Work Programme, such as Nestle's Cocoa Plan and Unilever's activities, seem to indicate that the private sector can reach poorer countries and people (see Chapter 6). The former assists tens of thousands of farmers in developing countries to adapt, the latter helps to minimise water use of hand-washing laundry product users in Asia and South Africa (UNFCCC, 2015a).

The second sub-category is international private sector *financing* of adaptation. Buchner et al. (2015) estimate climate related finance at US$ 391 billion in the year 2013/2014. This sounds like a significant amount. However, it is concentrated on mitigation rather than on adaptation, and is invested in emerging economies rather than in LDCs. In one of Climate Policy Initiative's (CPI) first annual climate finance landscape studies, Buchner et al. (2012) also acknowledge weaknesses in defining and tracking adaptation finance. According to the authors, the inability of existing efforts to capture private financing of adaptation, amongst others, acts as an obstacle to the understanding of adaptation finance flows. UNEP's 2016 Adaptation Gap Report shows that this

understanding is still very limited (see also Chapter 3). In the latest climate finance landscape study, Buchner et al. (2015; 6) state that data on adaptation investments still remains 'elusive'.

The financial sector has little experience in identifying and targeting climate adaptation (Persson et al., 2009). Naidoo et al. (2012) anticipate that few areas of adaptation will generate sufficient financial returns to mobilise commercial private finance. The UNFCCC (2008a) expects private finance to cover adaptation costs partially, for instance in the sectors of agriculture, forestry, fisheries and infrastructure with privately owned physical assets – but merely in developed countries.

Although it is difficult to separate *financing* and *activities* (inherently including investment), three broad types of *financing* can be distinguished (Atteridge, 2011; Buchner et al., 2013; Christiansen et al., 2012; Khattri et al., 2010; Naidoo et al., 2012; UNEP FI, 2011).

First, adaptation can be financed through capital contributions into shareholder ownership (equity and other assets), creditor claims that need to be repaid with interest (debt, loans, bonds, etc.), and hybrid capital instruments (Buchner et al., 2012). Typical investors include banks, pension funds, private equity funds and endowments (Christiansen et al., 2012). Given the long-term effects and inherent uncertainty of climate change, and the orientation of capital markets towards short-term amortisation and risk aversion (Pegels, 2014), it is unlikely that equity and loans will finance stand-alone adaptation projects if these are not, at the same time, attractive in economic terms.

Second, insurance encourages people and societies to reduce their vulnerability; distributes risks and costs of weather-related events; and can provide relief during and after disaster (Bouwer & Aerts, 2006; CCCD, 2009). Increasing economic losses from extreme weather events can have considerable effects for the insurance sector. It also creates new business opportunities; especially in low income countries where currently 99% of households and businesses have no disaster insurance (CCCD, 2009). For example, BASIX and ICICI Lombard GIC started the first pilot project on rain-index insurance policies in India in 2003 – 11 years later there are approximately 12 million Indian farmers with weather index insurance (Kato, Ellis, Pauw, & Caruso, 2014). However, some elements

can be difficult to implement on a micro-scale (CCCD, 2009) or too expensive for many people in developing countries (Bouwer & Aerts, 2006).

Excursus 4-3. Insurance for adaptation: BASIX and ICICI Lombard GIC (based on Kato et al. (2014)).

In 2003, ICICI Lombard GIC and BASIX, with technical support from the World Bank, started a pilot project on weather index insurance with 230 small-scale farmers in India. It was the first weather index insurance initiative in India and also the first farmer-level weather-indexed insurance in the developing world (Withey et al., 2009). Subsidies by the federal government of India for premium of the insurance helped to upscale the insurance scheme and at present, approximately 12 million farmers are covered by the weather index insurance in India, with replication ongoing in countries like Malawi, Kenya, Mexico and Morocco (Kato et al., 2014).

Insurance transfers the risk from the farmers to the insurers. Traditional crop insurance products had not been commercially viable in most Indian rural settings, and have rarely helped Indian farmers overcome weather risks (Withey et al., 2009). With weather index insurance, however, insurance payments are triggered by rainfall amounts. Compensation payments are made if the rain stays below a threshold over a certain period of time. Since no field inspections are required, transaction costs are much lower, and claims can be paid promptly (Pierro & Desai, 2011). Being insured helps farmers to think of their agricultural production from a risk perspective, which might help them to take measures to reduce risks and to keep their insurance premium low (Kato et al., 2014).

Index-based weather insurance however requires significant investments during the start-up phase. Public grants could cover these costs as international reinsurance companies may be reluctant to cover them (Pierro & Desai, 2011). Once the insurance exists, it provides an innovative and commercially viable business opportunity (Kato et al., 2014).

A third type is philanthropy. The expenditure of foundations on development activities increased to US$ 4.5 billion in 2006, but mostly flows to health care (Edwards, 2009). Buchner et al. (2011) guesstimated the annual global adaptation-related philanthropy at US$ 210 million. Financial resources from philanthropy can be used more flexible than commercial investment, because no profitable returns are required (Persson et al., 2009). Governments could incentivise philanthropy for adaptation, but it would remain a modest flow and incentives might divert resources away from urgent development needs.

4.2.2 Enabling environment and the private sector motivation to adapt

The public sector can stimulate both domestic private sector adaptation and international private sector *for* adaptation by creating an 'enabling environment'. This should foster innovation, lower the costs of adaptation, and increase the rate at which available adaptation funding is put to use (Persson et al., 2009). Experiences from development cooperation demonstrate that, for instance, low levels of bureaucracy, an independent judiciary, good roads, functioning education systems, simplified business registration procedures as well as property titling all contribute to a conducive business environment – although the relative importance of each of these elements is unclear (Byiers & Rosengren, 2012; UNIDO & GTZ, 2008).

Similar premises for private sector engagement are mentioned in climate change literature (see for example Naidoo et al., 2012; Sierra, 2011; UNEP, 2011). For example, Berrang-Ford et al. (2014) write that there is evidence of national adaptation action even in small nations with low national Gross Domestic Product (GDP) or GDP per capita, but that global adaptation progress, financing and investment may be constrained by lack of governance capacity. More specific tools are tax incentives, foreign exchange liquidity facilities, loan guarantees, and subsidies (Buchner et al., 2012); technical infrastructure and information provision (UNFCCC, 2008a); and public-private partnerships through fiscal tools like risk transfers, insurance and equities (AMCEN, 2011).

Whilst creating an enabling environment, governments should think of the private sector's motivation to engage in adaptation. Two important motivations are briefly introduced here (see section 5.3 for a more extensive overview). First, many private firms will have to adapt their operations to stay in business or maintain their level of profit under changing climatic conditions. Significant investments are expected here (Christiansen et al., 2012). For example, among the 72 companies that responded to the 'Caring for Climate' survey, 83% believe that climate change impacts pose a risk to their products or services (United Nations Global Compact, UNEP, Oxfam, & WRI, 2011). An OECD study obtained similar results (Agrawala et al., 2011). The risks can be direct (e.g. heat stress, water scarcity) and indirect (e.g. impacts on regional markets, disruption of infrastructure or supply chains, regulatory or legal risks) (see Figure 5-2). Adaptation initiatives tend to be incremental and might pass unnoticed, for example when a farmer buys more costly drought resistant seeds. The visible

level of clearly identifiable adaptation activities and investments may therefore understate the actual activity level (Agrawala et al., 2011). Costs of mainstreaming adaptation will vary from country to country, from sector to sector and from business to business. Many businesses try to adapt without adequate resources, information or finance, with small and micro enterprises facing particular challenges (PwC, 2010).

The second motivation for the private sector to engage in adaptation is new business opportunities. Among the 72 companies that responded to the 'Caring for Climate' survey, 86% state that responding to climate change risks, or investing in adaptation solutions, pose a business opportunity (United Nations Global Compact et al., 2011). Adaptation offers business opportunities in two ways. On the one hand, it opens up a market for new and innovative products that are needed under changing climate conditions or for disaster risk reduction (Intellecap, 2010; Oxfam America, 2009; Persson et al., 2009). On the other hand, publicly funded adaptation projects create new business opportunities, as adaptation will often be implemented by or with the involvement of the private sector (PwC, 2010). Public adaptation finance enlarges existing markets, and creates markets for specialised businesses that understand and mainstream climate risks during project design and implementation.

This conceptualisation of private sector engagement in adaptation in developing countries and the ways in which governments can create enabling environments for this will be used further in this chapter to explore expectations of LDCs on private sector engagement in adaptation, as formulated in their NAPAs.

4.3 Methodology

Thirty-five English and 12 French NAPAs were analysed regarding the role they give to the private sector in adaptation[30]. These NAPAs can be analysed as comparable documents because they were formulated based on guiding elements, a process and a structure predefined by the Parties to the UNFCCC (see UNFCCC, 2002). The NAPAs have been criticised, for example because they focus on projects rather than strategies, and on 'climate proofing' rather than human development. The international funding for NAPA formulation has also been criticised as being too limited (UNDP, 2007). However, NAPAs are the

[30] These 47 NAPAs are listed in alphabetical order in Appendix 2.

cornerstone of adaptation activities for many LDCs(LEG, 2011). They provide a good overview of country-specific adaptation requirements and indicate projects and activities to enhance adaptive capacities (Naidoo et al., 2012). This chapter's NAPA analysis comprised five complementary tests:

- Keywords extraction and keyword co-occurrence. Forty-two keywords were first extracted from all 47 NAPAs using Acrobat Reader X. Second, a co-occurrence extraction analysis was conducted on a selection of keywords to identify co-occurrence within a distance of 30 words. Only English NAPAs were analysed for co-occurrence because French sentences have different structures.[31]
- Private sector representation in the 'NAPA team', responsible for the formulation of the NAPA.
- Role description of the private sector in a total of 502 'Priority Projects'.
- Activities to create an 'enabling environment' for private sector engagement in adaptation as part of Priority Projects.
- Analysis of the description of the private sector under 'potential barriers' to adaptation that LDCs were required to describe (UNFCCC, 2002, decision 28/CP.7). Nine NAPAs were excluded from of the analysis because they did not list barriers under a separate heading.

The procedure of the last four tests is self-explanatory; 'keywords extraction and keyword co-occurrence' require more explanation. These tools are important techniques for document retrieval, document clustering, text mining and other methods of text analysis (Matsuo & Ishizuka, 2004). They were employed only to get a first impression of the extent to which LDCs emphasise the role of the private sector in their adaptation planning, by looking at how often specific terms are used and co-occur. Results are nominal: if for example the term 'NGO' is used five times more often than 'Insurance', it only hints at priorities. In the co-occurrence analysis a χ^2 test was conducted to demonstrate the difference between observed values of co-occurrence and values that were expected based on the frequency of the occurrence of the individual keywords. Critical χ^2 values indicate strong biases in the frequency of co-occurrence of keywords, and highlight the context in which keywords are used (Matsuo & Ishizuka, 2004).

[31] The list of keywords that were analysed can be found in Appendix 3.

4.4 Results

This section provides the results on the five abovementioned complementary tests on ways in which private sector engagement in adaptation is included in the NAPAs.

4.4.1 Keyword occurrence and co-occurrence

How often keywords occur in a document indicates their importance. Forty-two different key words were analysed, all related to adaptation and private sector engagement therein. The keywords used most frequently were not private sector related, i.e. 'water' (174.3 on average, standard deviation 73.1), 'agriculture' (89.2; 33.6) and 'forest' (67.1; 56.2). The frequently occurring (>10 times on average) terms 'water', 'agriculture', 'education', 'health', 'biodiversity' and 'infrastructure' all correlate significantly with the number of pages of the NAPAs ($0.18<R^2<0.33$), which indicates the relevance of these concepts for all LDCs. Other frequent key terms (all >45 times on average) 'drought', 'flood' and 'forest' did not correlate significantly with the number of pages, indicating that they might not be relevant to all LDCs.

Keyword		Average	Median	Standard deviation	No. of NAPAs using keyword
Actor	NGO	5.85	2	10.1	42
	Company and/or business*	4.11	2	5.60	39
	Private sector	3.92	3	3.80	40
	Bank	2.91	2	4.19	35
	World Bank**	2.0	1	3.32	30
	Corporate	0,54	0	1.25	10
Instrument	Investment	5.43		8,06	44
	Insurance	1.21	0	3.41	11
	Micro credit	0.62	0	1.55	9
	Equity	0	-	-	0
	Foreign Direct Investment/FDI	0	-	-	0

Note: *'Entreprise' is the French term for both company and business. ** 69% of the times when 'bank' is used, it is done as part of 'World Bank'; the occurrence of the two terms correlates significantly (R^2=0,94).

Table 4-1. Keyword extraction of private sector related key words.

More distinct private sector related keywords, which were derived from the conceptualisation of private sector engagement in adaptation in section 4.2, were not used often in the NAPAs. Only 'NGO' and 'investment' were used more than five times on average. 'Private sector' as a keyword was used 3.9 times on average; 'company' and 'business' 2.5 and 2.2 times, respectively (see Table 4-1). Furthermore, there is a large variety in 1) presence of key words in general, e.g. 'bank' is absent in 12 NAPAs, 'insurance' in 36 NAPAs; and 2) usage, as can be concluded from standard deviations that equal or bypass averages and medians often well below averages. 'Equity', 'Foreign Direct Investment/FDI' and 'philanthropy' do not occur in any of the NAPAs.

Based on the keyword extraction analysis and in order to improve the insight in keywords usage, a co-occurrence extraction analysis was conducted. Thirteen terms were selected based on either their frequency of occurrence in the NAPAs or their relation to private sector engagement in adaptation. Table 4-2 presents the frequency of co-occurrence (upper right) and associated critical χ^2 values (lower left).[32] Highlighted in red are co-occurrence values that are lower than expected (based on the occurrence of individual key words), highlighted in green those that occur more often than expected.

'Bank' co-occurred 192 times and reached a critical value with 'private sector' (11 times, χ^2=30.86) and 'agriculture' (65 times, χ^2=30.82). The result on co-occurrence with 'agriculture' was not related to financing only; seed banks played a role here, too. Financing of banks was not related to NAPA excerpts on 'energy', 'industry' and 'investment'; the keyword 'bank' never co-occurs with any of these.

Despite their legal differences, 'company' and 'business' were summed in the analysis, as NAPAs often use either one of the terms. Overall, they co-occurred second often (133 times); mostly with tourism (47 times) and industry (33 times). Critical χ^2 values were reached with both (χ^2=290.9 and χ^2=195.3, respectively), which could indicate the importance of businesses in these sectors for adaptation. The keyword business/company hardly co-occurred with for instance 'agriculture', 'energy', and 'infrastructure', but no critical χ^2 values were reached.

[32] With dF=12 and α=0.05, the critical χ^2 value is 21.03.

	Actor				Activity	Sector-related							
	Bank	Company / business	NGO	Private sector	Investment	Agriculture	Energy	Forest	Health	Industry	Infrastructure	Tourism	Water
Bank		6	10	***11****	0	65**	0	19	6	0	18	6	47
Company / business			9	0	9	7	0	0	0	***33****	6	***47****	16
NGO				15	19	61	8	64	70	5	26	26	180
Private sector	***30,9***				9	7	3	13	4	6	12	3	37
Investment						9	6	4	10	2	***32****	17	84
Agriculture	***30,8***						76	***311****	185	31	86	62	***755****
Energy								***113****	60	23	22	24	***248****
Forest						***68,5***	***28,4***		90	27	47	21	***425****
Health										16	43	20	***454****
Industry		***195,3***									15	***56****	92
Infrastructure					***22,8***							41	***312****
Tourism		***290,9***								***135,3***			98
Water						***167,6***	***39,6***	***31,2***	***118,3***		***80,5***		

Table 4-2. Keyword co-occurrence. Critical χ^2 test values indicate strong biases in the frequency of co-occurrence of keywords. *Significant for α=0.05 (χ^2>21.03); **significant for α=0.01 (χ^2>26.22). The low-left side of Table 4-2 illustrates the associated critical.

'Private sector' as a general term co-occurred least often. It mostly co-occurred with 'water' (37 times) and 'NGO' (15 times). The latter can be explained by NAPA project descriptions listing stakeholders. This listing might also play a role in the co-occurrence with 'bank', which reaches a critical χ^2 value.

The keyword occurrence and co-occurrence analyses hint at the private sector's limited role in the NAPAs. Private sector related keywords occur relatively little, and co-occurrences did not indicate specific foci on sectors or activities. This impression will be substantiated in the following sections.

4.4.2 The role of the private sector in NAPA teams and contents

Every LDC created a 'NAPA team' to formulate the NAPA, consisting of 'a lead agency and representatives of stakeholders including government agencies and civil society' (UNFCCC, 2002, decision 28/CO.7). The NAPA formulation guidelines only mention the private sector in the final review, one step before government endorsement (ibid).

In 75% of the cases the Ministry of Environment was the lead agency for NAPA formulation. Vanuatu is the only LDC where a National Advisory Committee on Climate Change prepared the NAPA. The private sector was represented in 20 NAPA teams (43%). Nine of them (45%)explicitly wrote that the private sector has a role in the implementation of adaptation. This share was similar among the 27 LDCs with no private sector representation in the NAPA team (46%). This shows that a mere presence of private sector representatives in NAPAs teams did not lead to an increased awareness of the private sector's role in adaptation.

Altogether, 22 NAPAs explicitly specify the private sector's role in adaptation; eighteen of which also specify the sector. Fourteen of them also clarify the activities, albeit in broad terms (see Table 4-3). The sectors mentioned most often are energy (9 times), agriculture (8 times) and water (7 times). Concerning the energy sector, several African countries consider the private sector as a partner in the energy transition from wood and charcoal towards more sustainable sources of energy. This can relate to both adaptation (improved land management) and mitigation.

Mali is the only LDC that explicitly states that the private sector has to co-finance adaptation, in this case the country's energy transition. Three other countries included more general statements on private investments: Lesotho states that 'the key role of the private sector is to promote investment (...) for successful implementation of NAPA projects' (p.19); Rwanda intends to create 'a favourable environment to non-agricultural investments' (p. 70) and Tanzania wants the energy sector to invest in alternative energy sources. The private sector is also mentioned as implementing partner (7 times), for management and organisation (4 times), and research and development (2 times) (see Table 4-3).

Country	Activities as described in the NAPA	Sectors
Afghanistan	-	Energy*,
Central African Republic	Charcoal burning	Energy, forestry
Eritrea	Develop substitutes to wood as a fuel	Energy, forestry
Ethiopia	Implements an irrigation/water harvesting project	Agriculture, water
Laos	Set up coordination points for disaster management within main units of public and private sectors, including factories	Industry
Lesotho	Cooperation farmers and private sector; investment and provision of management skills	Agriculture
Mali	Co-finance energy transition from wood/charcoal to renewables and butane; reforestation	Energy, forestry
Mozambique	-	Agriculture*, early warning systems*
Nepal	Agriculture: extension, technical inputs and service delivery to help rural communities adapt Energy: accelerate rural electrification; sustainable electricity coverage; develop hydro-power; promote bio-fuel use Water: offer climate-proof water harvesting, micro-hydro and water mills technologies	Agriculture, water, disaster risk reduction*, energy, infrastructure*
Rwanda	Creation of financial and banking mechanisms favouring non-agricultural investment at local level	Energy*, finance, water*
São Tomé and Príncipe	Drinking water supply; charcoal production; construction hydropower stations	Energy, water
Sierra Leone	Production, transport and storage of rice; R&D, marketing and manufacturing energy efficiency and renewables; establish of nature reserves; HIV/AIDS prevention	Agriculture, energy, health, nature
Solomon Islands	Adding value to crops; private hospitals Insurance companies, pension funds Advising industry and business on how to adapt	Agriculture, health, insurance
Tanzania	Promote energy efficiency, cleaner production; invest in alternative sources of energy	Energy, industry
Timor Leste	-	Nature conservation*
Vanuatu	Multi-stakeholder consultative or advisory group to coordinate and monitor adaptation activities; public-private partnerships for engineering and environment management; mainstream climate risks in water resource management	Environment, forestry, tourism, water
Yemen	-	Agriculture*, water*, nature conservation*
Zambia	In existing programmes: irrigation, livestock services and marketing, extension, disease and vector control, agricultural inputs to small-scale farmers	Agriculture, water,

Table 4-3. Adaptation activities by the private sector as described in NAPAs. The information in the second column is taken directly from the NAPAs (sometimes shortened for formatting purposes) *NAPA mentions the sector, but not the private sector activities.

Yet it is unclear how the LDCs expect the private sector to implement these aims. Nepal for example aims to support the private sector in bio-fuel use promotion and Mozambique intends to promote and support the development of the private sector and job creation. However, they do not specify how the government will incentivise these activities.

4.4.3 Enabling environment and barriers to adaptation

This section illustrates to what extent LDCs included the creation of an enabling environment for private sector engagement in adaptation, particularly in their priority projects. Twenty NAPAs (43%) mention the creation of an 'enabling environment' to increase private sector adaptation. Ten of them stay on a superficial level and link the enabling environment mostly to economic growth. For example, one of the Ethiopian governments' goals is 'providing a conducive environment for a vibrant private sector'. Ten NAPAs mention sectors for which they want to create an enabling environment (see Table 4-4). Most of the statements discuss improved access to or regulation of food-related natural resources, but lack detail. Tanzania is the only country that mentions sectors (agriculture, wildlife), adaptive measures (contour farming and terracing), and ways to create an 'enabling environment' (enhance the regulatory and institutional environment).

The wording does not always clarify whether LDCs seek to create an enabling environment for 'mainstreaming' or for 'capitalisation of new opportunities' (see Section 4.2), apart from a few exceptions. The Comoros, for instance, want to *create* private enterprises (i.e. in ceramics), indicating a new (or expanded) market. Examples of mainstreaming are given by the Solomon Islands and Tanzania. The former want to make adaptation 'more viable economically' in the mining sector through tax relief; the latter wants to 'encourage' contour farming. Both stimulate mainstreaming of adaptation in ongoing business operation. Many NAPAs mention mainstreaming of adaptation into sectoral plans and policies. However, these are limited to public institutions and therefore not included in Table 4-4.

Although the NAPAs are superficial in their description on creating enabling environments, 42% of them explicitly mention the existent and non-existent laws and regulations as a 'potential barrier' to adaptation. Although this is

broader than private sector adaptation, it proves that current regulatory frameworks often fall short of dealing with climate change effectively.

Country	Statement
Comoros	Supporting the creation of private enterprises in the sector of ceramics.
Laos	Promotion of private health care networks.
Mozambique	One objective of the five year government programme for the agricultural sector is to promote and support the development of the private sector and job creation.*
Nepal	Supporting NGOs, CBOs and the private sector for promotion of bio-fuel use in communities. Support community-based adaptation initiatives and implementation of local adaptation plans.
Rwanda	Creation of a favourable environment to non-agricultural investments.
Sierra Leone	Environment, natural resources, agriculture (irrigation).
Solomon Islands	Make adaptation in the mining sector more viable economically, e.g. through tax relief
Tanzania	Encourage contour farming and terracing (agriculture); enhanced legal, regulatory, institutional environment for private sector wildlife protection (nature).
Vanuatu	Promote and encourage the growth of the private sector in fisheries development and management.*
Zambia	Irrigation Policy and Strategy, aims to promote a well-regulated and profitable irrigation sector that is attractive to both private investors and the country's partners.*

Table 4-4. Statements on creating an enabling environment for private sector engagement through laws, institutions, policies, etc. in NAPAs. *This is not strictly adaptation and is part of different policies, yet explicitly mentioned in the NAPA.

Other 'potential barriers' to implementation of adaptation related to an enabling environment are the inadequacies of 1) financial resources; 2) human resources and technical capacity; and 3) the institutional system (see Figure 4-1). The lack of private sector engagement is only mentioned by Angola, Bangladesh, Samoa and Zambia. A lack of private sector *finance* as a barrier is not even mentioned once.

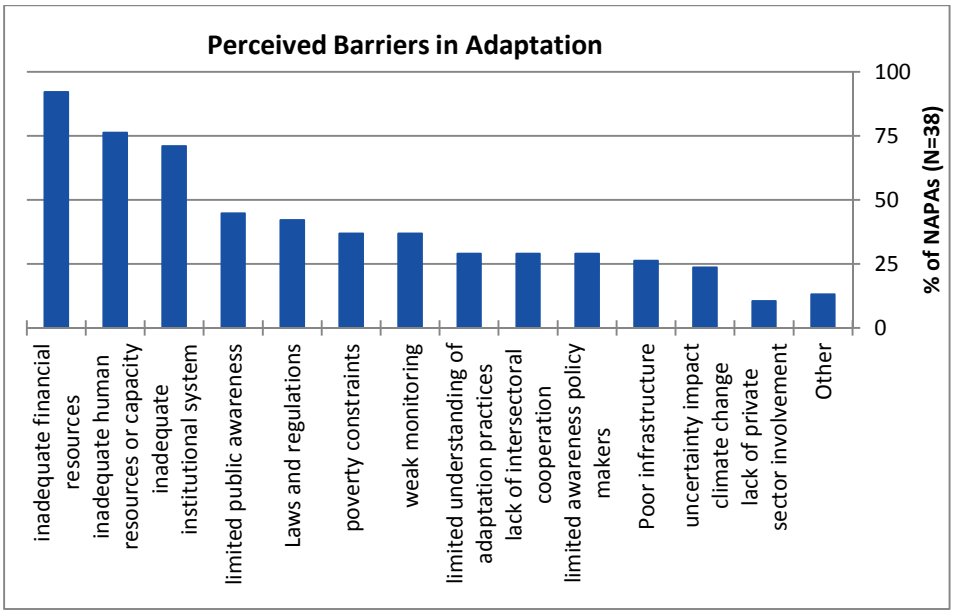

Figure 4-1. Barriers to implementation of adaptation as specified in the NAPAs (N=38). Nine NAPAs did not mention barriers under explicit headings and are therefore not included in the analysis.

4.5 Conclusion and discussion

Increasing national and international discussions on climate change adaptation reflect its relevance and urgency. So far, they are focused on the public sector, with discussion of the private sector mainly on its potential as a funding source for adaptation (Agrawala et al., 2011). Developing countries maintain that public finance should be scaled up since developed countries' historic emissions are responsible for climate change. Whilst keeping this in mind, private sector financing of adaptation has a significant potential: 86% of global investments are made by the private sector (UNFCCC, 2008a). Furthermore, the private sector itself will have to adapt its activities to climate change. However, the private sector's role in adaptation in developing countries is still unclear. Academic literature does not provide clear guidance, and parties to the UNFCCC have neither conceptualised the private sector nor the different ways in which it could engage in adaptation.

This chapter therefore contributed to the conceptual clarification by distinguishing a) private sector adaptation and b) private sector *for* adaptation.

The former refers to domestic private sector adaptation activities. This aims to protect the livelihoods of the 90% of the population in developing countries who depend on the private sector for their income. Private sector *for* adaptation refers to commercial and non-commercial financing of adaptation in developing countries by the international private sector, and to their activities that contribute to adaptation in developing countries.

These distinctions facilitated the analysis of 47 National Adaptation Programmes of Action (NAPAs) on the role of the private sector in adaptation. NAPAs are the cornerstone of many LDCs' climate change adaptation activities (LEG, 2011). The predefined guiding elements, process and structure of the NAPAs makes them a comparable set of documents and lends them to a structured analysis. Based on four finding, this chapter demonstrates that NAPAs make limited reference to the role of the private sector in adaptation in LDCs. First, the keywords extraction analysis reveals that private-sector related keywords are indeed rarely used in NAPAs. Second, the private sector was represented in only 43% of the NAPA teams. Third, only 47% of the NAPAs mention a role for the private sector in adaptation. This percentage was similar among the group of NAPAs where the private sector was represented in the NAPA team and the group where it was not, indicating that representation made little difference. And fourth, only few countries included details on how to create an enabling environment for private sector engagement in adaptation. Five countries stand out in these three tests: Lesotho, Mauritania, Nepal, Tanzania and Zambia (their NAPAs mention the keyword 'private sector' ten times on average).[33] On the other end of the scale, ten countries that score negative on the all three tests only mention 'private sector' 0.6 times on average.

The private sector is mostly mentioned as an implementing partner, for its management and organisation skills, or for research and development; particularly in the energy, agriculture and water sectors. The NAPAs hardly distinguish between the domestic and the international private sector, and most descriptions of its role remain vague. Although it is of high relevance for the creation of an enabling environment whether the private sector adapts to survive (mainstreaming) or adapts to explore new markets (capitalisation), the NAPAs do not differentiate between these two. In practice, the private sector is

[33] This is one of the reasons for the selection of Zambia for case study research in Chapter 5.

likely to be involved more often in public adaptation projects than the NAPAs describe, both to implement Priority Projects and outside the NAPA-related activities.

Although 92% of the NAPAs consider the inadequacy of financial resources a barrier to adaptation, Mali is the only LDC that explicitly mentions private co-financing of adaptation. Only three other countries explicitly refer to private investments. None of them elaborates on the type of financing or investments they expect and on whether it concerns the domestic private sector, multinationals, or both. Concepts such as FDI, equity or philanthropy are not used. Only four countries proposed insurance schemes to adapt.

The limited attention in the NAPAs on the role of the private sector in adaptation and financing sharply contrasts similar discussions and activities in the field of mitigating climate change. There are a number of reasons for this. It may reflect an intentional approach of LDC governments to avoid a distraction from the necessity to scale up public funding, as was suggested by an LDC negotiator in the context of an interview at the UN climate negotiations in Doha in 2012. It may, furthermore, reflect a lack of awareness of the potential of the private sector. Finally, the NAPA guidelines may have partly been responsible. NAPAs were formulated, at least in part, to secure international public adaptation funding, and the formulation guidelines do not require a description of the private sector in adaptation.

The private sector is no silver bullet for successful adaptation in LDCs. However, given the current public debt crises and increasing funding needs for adaptation, private sector engagement in adaptation is likely to play an increasingly important role in the coming decade. Developing countries can harvest more of the private sector's potential by investigating private actors' motivation to adapt and by thinking of how to create enabling environments that stimulate private sector engagement. The formulation of National Adaptation Plans (NAPs)could provide a good option to involve the private sector more intensively in identifying and addressing medium to long-term adaptation needs. However, this chapter proves that private sector representation in NAPA teams alone does not necessarily result in more explicit role descriptions of the private sector in adaptation.

5 Developing country interests: a case study on the agricultural sector in Zambia[34]

This chapter builds on Chapter 4 and brings more recent insights[35]of one particular Least Developed Country on private adaptation finance. Chapter 4 provided a large-N study on national policy documents, written in the context of the UNFCCC negotiations. In contrast, this chapter takes more distance from the UNFCCC negotiations and analyses Zambia's agricultural sector as a case study. Chapter 4 identified Zambia as a frontrunner in the field of private adaptation finance. Other reasons to select Zambia were its large agricultural sector, which makes it exemplary for many African countries; and the fact that the role of the private sector in Zambia's economy has dramatically changed in recent decades.

Case studies are the preferred research strategy when a phenomenon (in this case adaptation and financing thereof) cannot be divorced from its context (a vulnerable agricultural sector in a developing country), the focus is on contemporary events, and the experience of the actors is important (Benbasat, Goldstein, & Mead, 1987; Iacono et al., 2009).

The chapter also provides a more elaborate overview of the private sector's motivation to engage in adaptation, as well as ways in which the government can encourage more engagement.

5.1 Introduction

This chapter argues that private sector engagement in adaptation is inevitable and its role potentially significant, yet dependent on the definition of adaptation that is being used. Private sector engagement in adaptation is looked at from a broader perspective than financing alone, for two reasons. The first is the scale. There is a paradox between adaptation finance, as embedded in the UNFCCC negotiations, being discussed and focusing on the international financing and investing, and the local level where adaptation needs to be implemented and

[34] This chapter is based on the following paper: Pauw (2014): Not a panacea: private-sector engagement in adaptation and adaptation finance in developing countries. *Climate Policy* 15(5): 1-21.

[35] The analysed NAPAs were written between 2004 and 2011. As the introduction explains, knowledge of costs and political perspectives on (private) adaptation finance changed substantially over the course of the 21st century.

managed (Abadie, Galarraga, & Rübbelke, 2013; Ayers, 2011). Both are likely to require the private sector, but in different ways.

The second reason is the close link between adaptation and development. Adaptation is described as development 'under uncertainty' (Denton, 2010; 655) or 'in a hostile climate' (Romani & Stern, 2011; 4). It goes beyond the scope of this chapter to analyse differences and similarities between adaptation and development. But as the success of adaptation in developing countries relies strongly on broader development (e.g. Ayers, 2011; Huq & Reid, 2004; Klein & Persson, 2008), a broad perspective is required to understand private sector engagement in adaptation. The next section analyses different ways of private sector engagement in adaptation and adaptation finance. Section 5.3 considers private sector motivations for adaptation and adaptation finance; and describes how governments can create enabling environments. For consistency reasons, the section focuses on the agricultural sector. Section 5.5 explains why Zambia's agricultural sector was selected as a case study and describes the interviewing method. Section 5.6 provides the results on domestic and international private sector engagement in adaptation in Zambia, as well as ways to incentivise the private sector to engage more. Section 5.7 concludes.

5.2 Domestic and international private sector

In order to improve the understanding of the private sector's role in adaptation in developing countries, lessons can be learned from development cooperation. In Zambia, for example, it is recognised that poverty reduction and sustainable development will not be achieved through government action alone (Kivuitu, Yambayamba, & Fox, 2005). However, the role of the private sector in development is complex. Byiers and Rosengren (2012) developed an approach to better comprehend this role by distinguishing between 'private sector development' and engaging the 'private sector *for* development'. The previous chapter uses this approach as a foundation to differentiate between 'domestic private sector adaptation' and 'international private sector *for* adaptation' (see Section 4.2 and Figure 5-1). In Zambia and many other African countries, the majority of this 'domestic private sector' is in (rain-fed) agriculture; they are vulnerable to climate change, but hardly have means to invest in adaptation (Bryan, Deressa, Gbetibouo, & Ringler, 2009; Pauw, 2014). The international private sector is broader, as will be discussed in the results section.

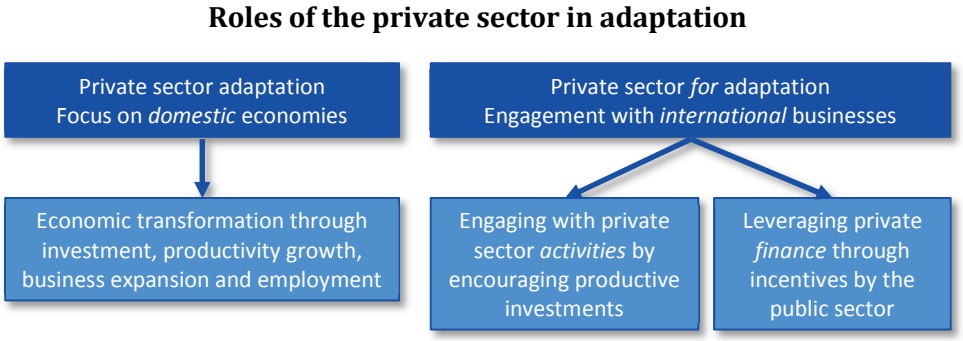

Figure 5-1. Different roles of the private sector in adaptation. Based on Byiers and Rosengren (2012) and Chapter 4.

Although this differentiation based on Byiers and Rosengren (2012) is not perfect, it is important to obtain an improved understanding of the private sector's role in adaptation in developing countries, in particular in the context of international climate finance, and it is adopted in this chapter. The next section explains the motivation of the domestic and international private sector to engage in adaptation.

5.3 Private sector motivation to engage in adaptation

Crosscutting through the three categories of the previous section, two broad categories of private sector motivation for engagement in adaptation can be identified (see Figure 5-3). The motivations are easily distinguishable, although in practice they might overlap. First, 'climate risk management' is understood as mainstreaming adaptation in business practice to protect revenues and to prevent future costs changing climatic conditions. These costs derive from direct and indirect risks. The former concerns a company's local exposure to climate impacts such as heat stress, water scarcity, and extreme weather events, causing damage to physical assets, production or health, for instance. Indirect risks are based on both local and more distant exposure as they include broader effects of climate impacts, such as disruption of infrastructure or supply chains, and impacts on communities or workforce (see Figure 5-2 and Excursus 5-1).

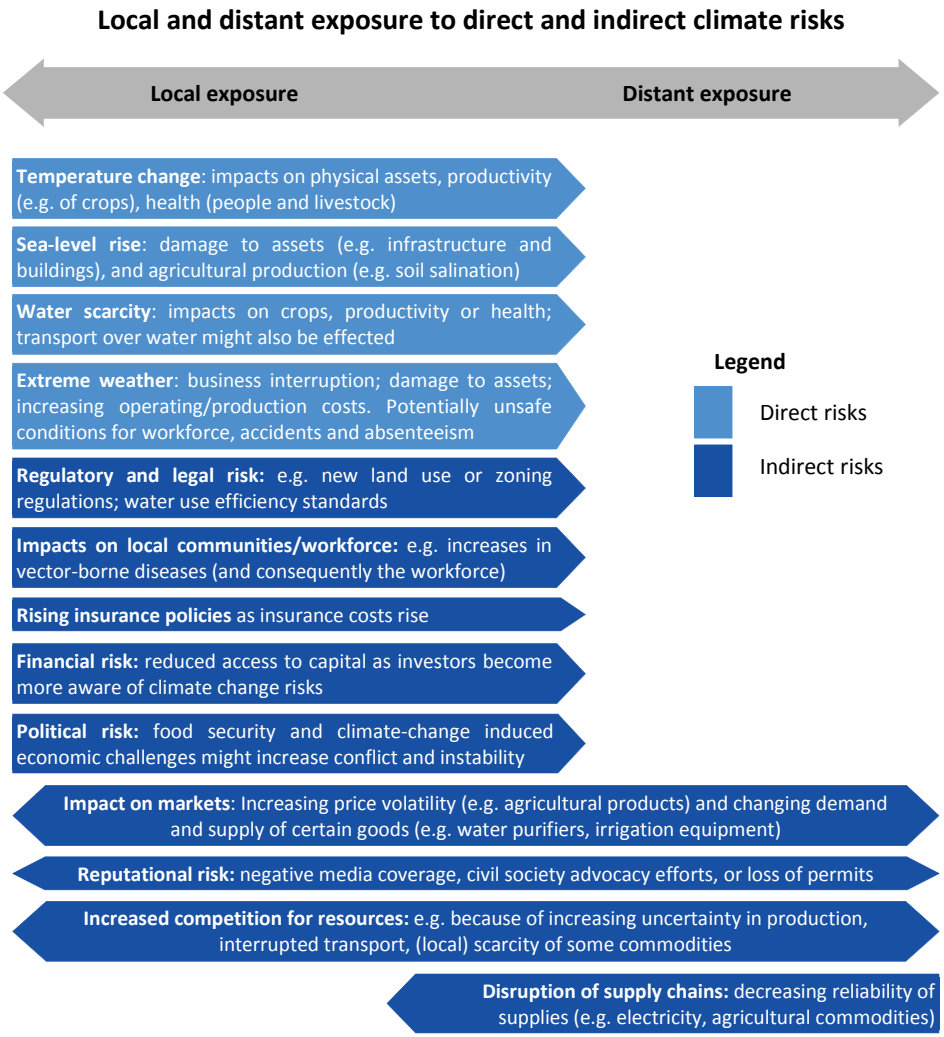

Figure 5-2. Direct and indirect climate risks for businesses. In line with the case study (see Section 5.4), this table focuses on the agricultural sector (updated from PwC (2010), based on e.g. UN Global Compact et al. (2011) and Naidoo et al. (2012)).

Significant private investments in mainstreaming of direct and indirect risks can be expected (cf. Christiansen et al., 2012). For example, among the 72 multinationals that responded to the 'Caring for Climate' survey, 83% believe that climate change impacts pose a risk to their products or services (United Nations Global Compact et al., 2011). On a national level, Begum and Pereira

(2013) for example point out that in Malaysia, 70% of the businesses perceive climate change would affect their profits.

Excursus 5-1. Exposure and risks of climate change to businesses (based on Druce et al., 2016).

A SABMiller brewery in Dar es Salaam (Tanzania) faced threats to its freshwater supply because of saltwater intrusion in 20 boreholes (Pegram, 2010). This is local exposure to a direct risk. Hypothetically, the government of Tanzania could restrict water abstraction from boreholes in coastal areas in order to reduce salt water intrusion. In this case, the brewery would be forced to react to such an *indirect risk* of climate change, and abstract less water or close the boreholes. Finally, if beer export from this brewery would be stalled as a consequence, there would also be *distant exposure* by disruption to supply chains (see Druce et al., 2016 and Figure 5-2).

However, it is unlikely that climate risk management activities will be financed as stand-alone adaptation projects (see Christiansen et al., 2012; Smit & Wandel, 2006). It will be difficult to label the additional costs of rising insurance policies, disruption of supply chains, or regulatory risk (see Figure 5-2) as adaptation; and many investments might pass unnoticed. The visible level of clearly identifiable adaptation activities and investments may thus understate the actual activity level (Agrawala et al., 2011). Businesses also often consider the academic or political concept of adaptation as a somewhat artificial concept (Berkhout, Hertin, & Gann, 2006). What counts is business continuity.

Figure 5-3. Two main motivations for the private sector to adapt and invest in adaptation.

The second motivation is new markets and business opportunities. In the 'Caring for Climate' survey (N=72), 86% of the multinationals expects business

opportunities from responding to climate change risks or investing in adaptation solutions (United Nations Global Compact et al., 2011). Two types of opportunities arise: First, demands are changing. This probably occurs in every sector, including agriculture (e.g. pest control, drip-irrigation); communication (e.g. technology and information services); and water management (e.g. water saving and purification) (Intellecap, 2010; Oxfam America, 2009; Persson et al., 2009) (see Table 5-1). Second, publicly funded adaptation projects such as climate-resilient roads and flood protection barriers require implementation by the (domestic) private sector (cf. PwC, 2010). Such adaptation projects enlarge existing markets but also require specialised companies that understand climate risks and take these into account during project design and implementation.

The public sector can incentivise both domestic private sector adaptation and international private sector's adaptation activities and adaptation finance to mainstream climate risks and to capitalise on new business opportunities. On a general level, development literature identified for instance low levels of bureaucracy, an independent judiciary, good roads, functioning education system, a simplification of business registration procedures as well as reforms of labour regulations and property titling as parts of a business enabling environment – although there is a lack of clarity about the relative importance of each of these elements (Byiers & Rosengren, 2012; UNIDO & GTZ, 2008).

Climate change literature mentions similar incentives in the context of climate (See e.g. Kato et al., 2014; Naidoo et al., 2012; Sierra, 2011; UNEP, 2011). More specific tools that are mentioned in literature include tax incentives, foreign exchange liquidity facilities, loan guarantees (Buchner et al., 2011); subsidies (UNFCCC, 2008a); establishing roadmaps for developing and disseminating key technologies and services; enhanced communication systems between public and private actors and public-private partnerships through tools such as risk mitigation instruments, insurance and equities (AMCEN, 2011; Kato et al., 2014). These take place in a domestic context, but they can also be organised or supported bilaterally or internationally. For instance, business networks and private sector platforms such as United Nations Office for Disaster Risk Reduction and the UNFCCC's 'Private Sector Initiative' offer opportunities for information exchange and building partnerships.

Sector	Business opportunity and new markets
Agriculture	• Climate resilient (e.g. drought resistant) seeds; • Pest and disease control products like technologies in seed treatment, food safety, post-harvest disease control, animal health and hygiene, human nutrition, structural pest control, and vector control; • Water-saving irrigation systems; • Expectation of growth of the biological and reduced chemical market; • Weather risk insurance, crop insurance and other insurance products.
Communication and Information	• Advanced weather forecasting systems; • Climate change information and consulting services: e.g. to provide climate change risk management strategies, adaptation options, economic, technical, and policy analysis, geographic information system for mapping and modelling.
Energy	• (Off-grid, rural) renewable energy production, using biomass, waste to energy and wind as inputs.
Housing and construction	• Resilient construction material, e.g. for storage facilities; • Resilient buildings/levees etc., to prevent losses of lives, equipment and livestock from e.g. storms and flooding.
Insurance	• Direct insurance for agriculture, e.g. weather risk insurance, crop insurance; • Indirect insurance for agriculture, e.g. flood insurance; • Catastrophe bonds, reinsurance.
Water management	• Advanced water management technologies: e.g. purification, desalination, and water filtration and reuse, pumps and filtration systems; • Water saving technologies for irrigation; • Drainage systems that cope with weather extremes.

Table 5-1. Business opportunities and new markets of adaptation related to agricultural production. Based on Oxfam America (2009), Persson et al. (2009), Intellecap (2010) and Naidoo et al. (2012).

Literature mostly focuses on multinationals, financing and mitigation rather than adaptation and the domestic private sector. More specific examples of the latter include reducing climate risks through land-use regulation for real estate (Bouwer & Aerts, 2006) or water quality standards and temperature limits (Agrawala et al., 2011). The case study in Zambia focuses on domestic private sector activities and adaptation in particular for the agricultural sector.

5.4 Case study: Zambia

Section 5.2 subdivided the role of the private sector in adaptation among the domestic and the international private sector, and explained the motivation of the private sector to engage in adaptation. Building on Section 5.2, this chapter further theorises the potential of private sector engagement in adaptation and adaptation finance and ways in which a government can incentivise more engagement. The Zambian agricultural sector was selected as the case study, for three reasons:

First, similar to various other African countries, Zambia is vulnerable to climate change as many livelihoods depend on rain-fed agriculture. Zambia's economy has grown steadily at 6.4% per year during the 2006-2010 period (CIF, 2011), and the World Bank lifted Zambia's status to 'middle-income country' in 2011. Nevertheless, 72% of the population still has a livelihood in agriculture, most of which is rain-fed (World Bank, 2013b). The Zambian government considers the development of agriculture as the engine of income expansion and livelihood improvement, and 'land use' as a priority sector to address climate change (GRZ, 2010). The annual costs of climate change on the agricultural sector are estimated at US$ 2.2 to 3.1 billion, or 41% to 72% of the estimated overall costs in Zambia (MTENR / Ministry of Transport, 2011). The contribution of agriculture, forestry and fishing to Zambia's GDP varies strongly, from 1.9% (2007) to 12% (2008), which can partly be explained by weather conditions (GRZ/Government of the Republic of Zambia, 2010). Increasing dryness has negatively affected Zambia's soil conditions and caused poor growth of crops, for example (Chaudhury, Ajayi, Hellin, & Neufeldt, 2011; MTENR / Ministry of Transport, 2011). Indeed, since the 1960s the mean annual temperature has increased by 1.3°C whereas rain has decreased by -2.3% per decade. Temperatures are projected to increase by another 1.2°C to 3.4°C by the 2060s (McSweeney, New, & Lizcano, 2008).

Second, private sector adaptation and adaptation finance are relatively new on political and academic agendas. Consequently, a frontrunner was selected as a case study. Zambia established an Interim Climate Change Secretariat and a Disaster Management and Mitigation Unit. High-level climate change focal points are appointed in every ministry. Additionally, Zambia published the study 'The Economics of Climate Change in Zambia', and formulated a National Climate Change Response Strategy and a National Adaptation Programme of

Action (NAPA). In this NAPA, Zambia gives more attention to the private sector than most other NAPAs (see Table 4-4). Zambia has also been successful in attracting multilateral climate finance, for example from the Pilot Programme for Climate Resilience (PPCR), the Global Environment Facility (GEF) and the United Nations Programme on Reducing Emissions from Deforestation and Forest Degradation (UN-REDD) (Watson, van Rooij, & Nakhooda, 2013).

Third, the role of the private sector in Zambia's economy has dramatically changed in recent decades. The private sector in Zambia ranges from large corporate, small and medium-sized enterprises (SMEs), to farmers (CIF, 2011). In 1968, four years after independence, state intervention in the economy caused large-scale nationalisation of privately owned companies. One year later, parastatal activities covered all aspects of business including mining; agriculture; tourism; brewing; housing provision and construction; transportation; electricity and water; as well as timber and wood products (Fundanga & Mwaba, 1997). In the 1980s to early 1990s, less than 20% of Zambia's economy was in private hands. Vigorous economic reforms then brought liberalisation and rapid privatisation: in 2002, 80% of production was privately owned (Fundanga & Mwaba, 1997; Kivuitu et al., 2005; NORAD, 2002). In combination with prudent macro-economic management and investments in infrastructure as well as services this has spurred economic growth in Zambia (CIF, 2011). Currently, Zambia is one of the best scoring Least Developed Countries on the Ease of Doing Business Index (World Bank, 2013b). It goes beyond the scope of this chapter to compare private sector engagement in adaptation in Zambia with more state-dominated economies – but the dramatic changes in Zambia imply that there have been debates about the private sector's role in its economy, and make the country an interesting case study (as was reaffirmed by a respondent from government). Altogether, from the inquiry in Zambia, lessons could be learned for the global debate on private sector engagement in adaptation and adaptation finance.

5.5 Methodology

Case studies normally rely on multiple sources of evidence and multiple data collection techniques (Iacono et al., 2009). Chapter 5 collects empirical data based on three techniques.

First, the groundwork of Chapter 4 as well as Sections 5.2 and 5.3 formed the theoretical foundation for interviews in Lusaka in October 2012 (N=26) and subsequent UNFCCC conferences and workshops (N=4). All interviews were transcribed and analysed qualitatively. In the research design this limited interview sample among a diversity of key stakeholders was preferred over a larger set of empirical data, as it allowed for a more in-depth analysis to better understand causalities. As can be concluded from Chapter 4, private sector engagement in adaptation in developing countries is relatively new on the political agenda in the Least Developed Countries. This chapter did not consider the subsequent exploratory stage of knowledge development compatible with impending generality, incomparability and inferiority of interviewing a larger set of less-experienced people in addition to the key stakeholders (cf. Gschwend & Schimmelfennig, 2007). Prospectively, once the field is more established a study with larger sample could bring more conclusive insights. Unlike this chapter, such as study could also shed light on the effectiveness of private sector engagement in adaptation, particularly in the wider context of markets and regulations, as well as uncertain climate change projections (cf. Berkhout et al., 2006).

Stakeholder group	Abbreviation	No. of interviews	No. of interviewees
Government	Gov	10	12
Research	Res	4	3
Private sector	PS	5	7
Development organisation	Dev	11	15

Table 5-2. Anonymised overview of interviewees.

Semi-structured face-to-face interviews of 30 minutes to 60 minutes took place with key informant stakeholders with government, research, private sector and development organisations backgrounds (see Table 5-2). The latter included domestic NGOs, financing institutions as well as bi- and multilateral development organisations. Interview questions were grouped according to 1) responsibilities for planning, financing and implementing adaptation; 2) expectations concerning climate risk mainstreaming in business operations and capitalisation on new business opportunities by the private sector; and 3) how to create enabling environments for private sector engagement in adaptation

and adaptation finance. During the interviews, no definition of 'private sector' was provided. This allowed respondents to prioritise those segments of the private sector they considered important and to provide the best examples according to their knowledge in the new field of private sector engagement in adaptation.

Second, interviews were complemented and statements triangulated by analysing six Zambian climate change planning documents. And third, Zambia's policy-prioritisation of adaptation is inherently connected to the international debate on adaptation finance. To capture these, participation observation was conducted in numerous UNFCCC conferences, meetings and discussions (see also VII). These occasions were also utilised to interview a Zambian researcher, three policymakers and a representative from civil society on adaptation of the private sector.

The research results are tabulated, but no statistical analysis is conducted because of the limited sample and the diversity of respondents.

5.6 Results

This section first describes results on domestic private sector adaptation and international private sector activities and finance for adaptation (see Section 5.2). Second, based on practical examples, this section illustrates the results of how the government can incentivise private sector adaptation. The private sector's motivation to engage in adaptation is reflected upon, but the limited sample does not allow for general conclusions in a separate section.

5.6.1 Adaptation by the domestic and international private sector

Most respondents consider the domestic private sector to have an important role in adaptation in Zambia. Respondents of all stakeholder categories consider agriculture as a key sector in Zambia's adaptation. In line with the broad definition of adaptation of development 'under uncertainty'(Denton, 2010) or 'in a hostile climate' (Romani & Stern, 2013), many respondents consider development of the agricultural sector to lead to adaptation (Dev, Gov, PS, Res). One government official stated: 'If farmers have more income, they will adapt better'. Respondents also stated that development can contribute to adaptation, even without the implementing actor to know about it (Dev, Res).

The focus of private sector engagement in adaptation has been on dealing with climate risks, rather than on exploring business opportunities (Dev). Respondents explicitly stated that adaptation offers limited opportunities for short-term profit (Dev, PS) and that the private sector has to mainstream climate risks in their operation in order to stay in business (Gov, Res, Dev). Examples include direct contributions (e.g. investing in drip irrigation and conservation farming) and indirect contributions (e.g. large scale farmers collect rainfall data) (Dev, Gov, PS, Res) (see Table 5-3). These are not practiced for adaptation purposes alone, but often have adaptation benefits.

In terms of new business opportunities (Watson et al., 2013) reveal that Zambia is quite successful in attracting international public climate finance for adaptation projects and programmes, and respondents clearly see the implementation of these projects as a new market for the domestic private sector (Gov, Res). However, respondents think it might be hard to make a business model for adaptation projects in the agricultural sector (Gov, PS, Res). Indeed, the significant delay of the PPCR project can partly be attributed to 'challenges in identifying suitable adaptation investment opportunities as well as appropriate private sector clients' (CIF, 2013). Only one clear example was identified: a seed company that continuously develops new seeds and stated to 'have been adapting all along'. More indirect contributions to farmers' adaptation are for instance extension services and marketing of products, for example to diversify livelihoods (e.g. honey or fish) (Gov), supply of equipment and drought resistant seeds (Dev, Gov) and improved transport facilities (Dev) (see Table 5-3). In this context, the private sector was described as a 'facilitator of adaptation' (Gov). The government can stimulate such activities (see e.g. Section 5.6.2 and 7.3.3).

For larger (domestic) companies, the Africa Carbon Credit Exchange launched a capacity-building project. They also take venture capital for adaptation into account, as it could enlarge contributions by the financial sector. For example, entrepreneurs could see opportunities in solar powered irrigation systems. However, given the lack of experience and the risks involved, entrepreneurs do not put their ideas into practice. Venture capital would enable one actor to provide the solar; a second actor to bring the irrigation system and a third to take care of maintenance. Venture capital can jumpstart growth and indirectly contribute to adaptation (PS).

	Mainstream climate risks		Capitalise on business opportunities	
	Direct contributions	**Indirect contributions**	**Direct contributions**	**Indirect contributions**
Domestic private sector adaptation	Drip irrigation; building small dams; conservation agriculture; use of improved seeds; diversifying livelihoods	Collect rainfall data; research; sensitising	Implement publicly financed adaptation projects; developing improved seeds	venture capital; marketing products; supply goods and equipment; transport facilities; extension services; research; sensitising
International private sector *for* adaptation: Activities	sustainable water management	CSR; sensitising	developing improved seeds	CSR; sensitising
International Private sector *for* adaptation: Financing		CSR; sensitising		Micro-finance; insurance; sensitising

Table 5-3. Examples of private sector engagement in adaptation in Zambia's agricultural sector. These are not necessarily implemented or labelled as adaptation, but respondents mentioned they contribute to it.

Respondents also considered the role of the international private sector. International private sector *activities* for adaptation are limited or not defined as such. For example, large mining companies undertake corporate social responsibility (CSR) activities. Although these are not labelled as adaptation and remain relatively small (Res), respondents mentioned the adaptation benefits of CSR in, for example, forestry (Dev) and bio-fuels (Res) through income diversification or prevention of soil erosion. Another example is SABMiller's multimillion US-Dollar investment to ensure sustainable water availability for its brewery in Ndola. This has adaptation benefits; and in the end it is also in the interest of the city council as SABMiller pays taxes and creates many jobs (Dev).

Several respondents stated that it is particularly difficult for the international private sector to undertake adaptation activities in the agricultural sector in rural areas. The private sector might not be interested, because many of the adaptation projects are *de facto* development projects with a limited return on investment and high risks (Res). Other arguments emphasise that local

entrepreneurs need to take the lead as externals perceive difficulties when starting in unknown areas (PS, Res). In addition, larger SME operate on a larger level and do not penetrate the rural areas where much of the adaptation is needed (Dev).

The government expects international private sector *financing* for adaptation among others in the energy and forestry sectors (GRZ/Government of the Republic of Zambia, 2010). At the same time, government officials stated that international adaptation finance should be public grants from developed countries rather than private loans or investments. Others stated that in practice, participation of international financial institutions in adaptation is minimal (Dev) or basically non-existent, despite it being 'crucial to move forward' (PS). Data on the size and sector of Foreign Direct Investment (FDI) inflows is available, but it does not illustrate whether FDI inflows are climate relevant or have climate change objectives (Mulenga, 2013).

Zambia's modest banking penetration was mentioned as a barrier (Dev). This might be related to Zambia's past: for a long time the Zambia Commercial National Bank had a monopoly of the banking business from the parastatal firms (see Fundanga & Mwaba, 1997). In 2002, the market for long-term lending was almost exclusively based on two parastatal banks, but international banks started operating and the microfinance sector was growing (NORAD, 2002). Indeed, respondents reported that financial institutions are growing; that they have financial means to invest (including for adaptation projects); and that they are looking for new markets and new clients (PS, Res). However, many respondents again argue that most adaptation projects are not bankable (Gov, Res).

Insurance is the second category of *financing*. Insurance is still limited in the agricultural sector, but increasing (Gov). The International Finance Corporation (IFC) plans to approach insurance companies to determine the feasibility of establishing a weather index-based insurance product (CIF, 2011). Different opinions exist on the potential of micro-credit.

The third category of financing is philanthropy. Mulenga (2013) estimates the total inflow of private philanthropic grants to 200 adaptation projects from 2009

until 2011 at approximately US$ 23 million. Moreover, in response to floods and other disasters, the private sector donates cash and equipment (Gov).

The debate on private sector engagement in adaptation is still developing in Zambia (Res), but some conclusions can be drawn. The interviews demonstrate that there is a variety of direct and indirect ways in which the private sector can mainstream climate risks in their operations. Furthermore, there are many business opportunities that could indirectly contribute to adaptation. However, seed development was identified as the only business opportunity in adaptation. Results furthermore seem to indicate that the role of the domestic private sector in adaptation is more important than the role of the international private sector. The discussion on private adaptation finance is in its infancy. The next section will elaborate on how respondents describe the way the government can create an enabling environment for more private sector engagement in adaptation.

5.6.2 Incentivising the private sector

In official documents the Zambian government repeatedly stressed the importance of an enabling policy framework for adaptation. Examples include further integration of agriculture and water management strategies; revision of building codes and safety standards in high-risk areas; energy diversification; and strengthening adaptation planning at all levels (e.g. GRZ/Government of the Republic of Zambia, 2010; MTENR / Ministry of Transport, 2011). This section analyses the respondents' view of how the government can create incentives for the domestic and international private sector to mainstream climate risks in their business operations and to capitalise on new business opportunities.

Respondents considered Zambia's national agricultural policy (2004 to 2015) important for adaptation, even though it does not refer to it. Key goals of the policy are income growth; poverty reduction; crop diversification; and improved food security; all of which could indeed contribute to adaptation (MACO/ Ministry of Agriculture and Co-operatives, 2004). In order to achieve these goals, the government invests in infrastructural development and support services, whilst supporting private sector-led development (Govereh, Shawa, Malawo, & Jayne, 2006). Examples of the latter are policies to encourage private research; liberalisation of agricultural markets by reducing trade barriers; and allowing local and foreign private firms to enter agribusiness (Pray, Gisselquist, &

Nagarajan, 2011)[36]. Respondents mentioned several other, more concrete ways that are listed under four categories: infrastructure and trade, tax rebates, information and capacity building, and stimulating investment (see also Table 5-4).

5.6.2.1 Infrastructure

The deficiency of road and electricity infrastructure was considered a barrier towards private sector activities in rural areas, constraining both development and adaptation (Dev, Gov): larger companies only operate in locations where there is infrastructure, small companies cannot grow to create economies of scale without infrastructure (Dev).

Storage facilities also facilitate adaptation (PS, Res). Farmers can lose up to 50% of their harvest due to insects and diseases (Res). Storage facilities would prevent harvest and seed losses and effectively increase food availability. The European Union recently supported Zambia National Farmers Union (ZNFU) to establish two large 'agricultural centres' where storage and marketing are joint. To minimise operation costs, these centres are managed by a consortium of seven companies, each of which offers different products (seeds, vaccines, fertilisers, etc.) and services. These centres support farmers to improve their livelihood, as farmers save time, money and energy, and are provided with improved market access.

5.6.2.2 Tax rebates

Respondents from all categories considered the existing tax rebates on seeds, fertilisers and construction material (for more resilient housing and infrastructure) useful for adaptation. Additional rebates on irrigation equipment and ICT equipment were encouraged (Dev). The tax rebates through maize promotion programmes were however criticised. They support farmers to increase their income, but the focus on maize restrains crop rotation and conservation agriculture, which counteracts government attempts to promote these (dev). Small-scale subsidies for other crops were introduced only recently. It would enhance policy consistency, if the climate change focal point in the

[36] The draft of the new national agricultural policy does refer to climate change adaptation; in fact mainstreaming climate change is one of the objectives (MAL, 2013).

Ministry of Agriculture and Livestock would be involved in these maize programmes (Gov).

Four respondents (Dev, PS) proposed to replace the current system in which farmers buy subsidised goods in Lusaka with a system of (electronic) vouchers that allow farmers to buy agricultural inputs at reduced rates at local shops. Both storage facilities (see above) and vouchers were stated to increase local business activities, reduce farmers' transaction costs, and thus indirectly contribute to adaptation.

5.6.2.3 Information and capacity building

An important approach to incentivise the private sector to engage in adaptation is to sensitise, provide information and build capacity, both for the private sector and among different ministries to stimulate integrated policymaking (Dev, Gov, PS, Res). One explicit example is the workshop organised by the former Ministry of Tourism, Environment and Natural Resources on private finance for adaptation with domestic and international banks such as Barclays and Standard Chartered Bank. The government, aware of their own budget limitations, promised incentives (including tax waivers) if these banks would deliberately invest in environment and climate. This was considered a big step. However, financial institutions were sceptical and have not demonstrated much action so far. From the ministry's point of view, it is 'a learning process' and there is ongoing exchange to explore options for private sector support for government efforts (Gov).

Improved weather forecast and weather information systems also stimulate the private sector and farmers in particular to adapt better (Dev, Gov). Tax rebates on ICT equipment could improve and broaden communication on weather-related disasters and early warning (Gov).

The important role of public and private extension officers in information provision and capacity building was highlighted by respondents from all categories. However, because of their insufficient transport facilities, public extension officers cannot cover the areas they are supposed to (PS, Res). One researcher complained that the private extension officers are only interested in high-value crops or large-scale farmers. ZNFU does however provide extension services to poor farmers in rural areas, too.

Cooperation among different ministries is crucial for consistent policymaking. The abovementioned focal points are considered important here (Gov).

	Measure	Potential adaptation benefits
Infra-structure	Improve roads, bridges, water availability and energy access	E.g. improved market accessibility and transport facilities; communication infra-structure; supply of water and electricity
	Establish storage facilities	Reduce loss of harvest, improved food security, increased income
	Build agricultural centres	Provision of seeds, fertilisers etc.; reduced transaction costs for farmers
Tax rebates	Tax rebates on seeds, fertilisers, irrigation equipment, construction material	Climate-proofing harvest; improved livelihoods, increased income
	Tax rebates on a wider variety of seeds	Ensure harvest under different weather patterns; increase resilience
	(Electronic) vouchers for discounted fertilisers and seeds	Seeds, fertilisers etc. more easily available; reduced transaction costs for farmers
Information and capacity building	Documentation, workshops	Mainstream climate risks in private sector activities and investments
	Climate change focal points	Mainstream climate risks in consistent and integrated policies
	Improve weather forecasts; tax rebates on ICT equipment	Reduce crop losses; increase harvest.
	Improve extension services	Improve farming techniques; increase food security; increase income; disaster risk reduction
	Run pilot projects	Additional private investments in adaptation
Stimulate investment	Provide small grants and soft loans for start-up projects	Depending on initiative; e.g. weather information, commodity supply, market facilities, extension services, etc.
	Create land ownership.	Improved food security, increased income
	Create farmer cooperatives	Improved food security, increased income
	Policy reform	Mainstream climate risk in plethora of investments and insurance
	PPPs, e.g. bonds	Increased private investments in adaptation

Table 5-4. Possible incentives for private sector engagement in adaptation, as mentioned by the respondents.

Finally, one respondent stated that the government could run pilot projects to demonstrate the potential of particular investments (Res). Others were more sceptical and mentioned that pilot projects can distort markets. For instance,

they postulated that more private sector activities in irrigation and dam building would exist, if there were no subsidised pilot projects for irrigation (Dev). On the other hand, an NGO representative stated that the problem is not caused by pilot projects, but that a lack of land ownership prevents farmers from investing in irrigation (see Section 0).

5.6.2.4 Stimulate investment

The government needs the private sector for adaptation as its own budget is limited (Gov). Zambian financial institutions have financial means to invest (PS, Res), but adaptation projects are mostly not bankable (Gov, Res). Respondents identified several ways for the government to incentivise the domestic and international private sector to invest more in adaptation. First, land reform could increase investments in agriculture (Dev). Farmers often stay in the village where they were born and might cultivate the same land for decades without ever owning it. Smallholders are therefore hesitant to invest, and as they have no collateral either (Dev, Gov), SMEs and the financial sector are also hesitant to invest or provide loans (Dev). One approach to address this issue is to give or sell land to farmers. Alternatively, the government is now leasing out land to farmers that join a cooperative that is able to attract investors for land development (Gov).

Another initiative focused on small-scale adaptation is grants or low-rent loans covering start-up costs of private engagement in adaptation (Res). CIF (2011) mentions the example of mobile phone platform providers which specialise on providing weather information to farmers. Respondents did not mention concrete examples.

On a larger scale, investment opportunities could also be created by issuing bonds in which the government takes the riskier parts of an investment (Res). The involvement of the private sector may be promoted through public-private partnerships (PPPs) (GRZ/Government of the Republic of Zambia, 2010; Dev). However, few PPPs have been developed so far, with the Disaster Management and Mitigation Unit as a notable exception (Dev, Gov). The enacted legislation that facilitates PPPs seems to focus on attracting FDI for larger projects, rather

than smaller 'pro-poor' PPPs between, for instance, sub-national governments and NGOs or the domestic private sector (Watson et al., 2013; Res, Dev).

Finally, national policies can encourage adaptation benefits from investments and insurance. For example, financial institutions demand the application of certain conservation agriculture principles before they finance activities (Dev). The government could also formulate stricter regulations for FDI (Dev).

The interview results demonstrate that the Zambian government has many options to incentivise private sector engagement in adaptation. This research design only allowed for a limited level of detail of individual incentives. Nevertheless, the maize promotion programme example highlights the complexity of incentivising adaptation through policies, and that there is a risk of maladaptation. More detailed analysis of such a policy would be helpful in order to optimise its long-term adaptation benefits. Incentives such as agricultural centres and extension services incentivise adaptation of the domestic private sector only, but most of the other options listed in Table 5-4 could indirectly incentivise the international private sector, too.

The incentives could both foster the private sector mainstreaming of climate risks, and create new business opportunities, but it is not always possible to draw a clear line between the two. It will be difficult to identify the 'climate finance' component of the investments potentially resulting from the incentives, in particular because most activities and investments are not stand-alone adaptation, but rather adaptation benefits of investments done for other reasons.

5.7 Conclusion and discussion

The case study in Zambia reiterates the frame from Section 5.2, where the private sector was found to adapt and contribute to adaptation in direct and indirect ways. Indeed, adaptation as such is often not an aim of the private sector, and it might sometimes contribute to adaptation without being aware of it. The concept of adaptation is more important to policy-makers than to businesses.

The amount of identifiable private sector adaptation and adaptation finance depends on the interpretation of the concept of adaptation. The narrowest interpretation would only include private stand-alone activities, investment and

financing that specifically aim at adaptation. Under this interpretation, private sector adaptation and adaptation finance is currently minimal or non-existent in Zambia.

The broadest interpretation, adaptation being development 'under uncertainty' (Denton, 2010) or 'in a hostile climate' (Romani & Stern, 2013), would not only look at what constitutes adaptation, but also what directly and indirectly contributes to adaptation, for example by increasing resilience (see Figure 5-4). In the context of Zambia's large agricultural sector and various development challenges, the adoption of this interpretation would result in significant domestic private sector adaptation, both in mainstreaming climate risks in operations (e.g. conservation farming; irrigation) and in capitalising on new opportunities (e.g. marketing of harvests and farming equipment; development of improved seeds). Through, for instance, CSR and investments in sustainable water management, activities and financing from the international private sector would also contribute.

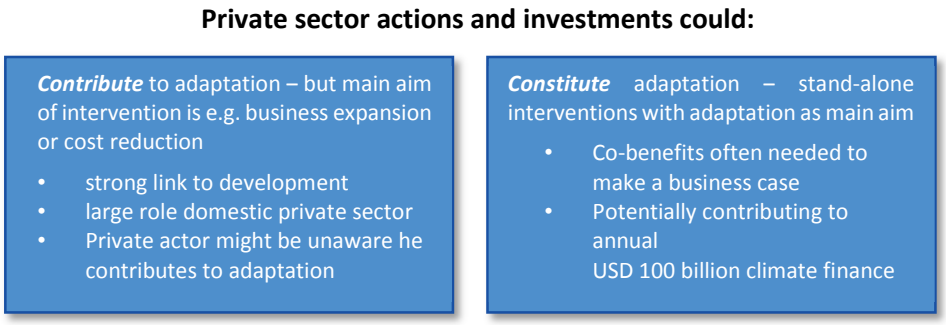

Figure 5-4. Difference between constituting adaptation and contributing to adaptation (based on Pauw (2014)).

However, there is a risk that such a broad interpretation of adaptation might advance business-as-usual (BAU) activities rather than innovation. The examples mentioned by respondents to incentivise private sector adaptation, such as improving infrastructure; investing in storage capacity and trade; and providing better weather forecasts, do reduce barriers for the private sector to do business and to contribute to adaptation. Yet according to one respondent a

broad interpretation of adaptation and such policy responses neither urge for innovative value-chain approaches or partnerships, nor for new approaches that bring together adaptation, mitigation, technology transfer and international climate finance in line with the need of developing countries.

Governments therefore have to carefully design incentives for private sector engagement in adaptation. It was outside the scope of this chapter, and private sector awareness of adaptation might first need to grow further, but in the future a more extensive study on the impact and required policy framework for private sector engagement in adaptation could really benefit adaptation processes in countries like Zambia.

A broad interpretation of adaptation helps to identify how private engagement in adaptation can be maximised at minimal costs. The frame as provided in Section 5.2 – in particular its part on motivation – is quite helpful here. For adaptation finance, however, a stricter interpretation of adaptation is probably more useful, also in the context of opposing visions on accounting of private sector financing for adaptation at UNFCCC negotiations. This interpretation could focus more on the incremental impacts of climate change, rather than on dealing with difficult current climate conditions. The latter might be more important in developing countries, but developed countries committed climate finance for the former.

This more strict interpretation of adaptation should also prevent manipulation of private sector financing of adaptation. In the past, actors in development have used adaptation language to garner funding to suit their ends, even when they feel their work is unrelated to adaptation (Ireland, 2012). During a panel discussion in advance of a board meeting of the Green Climate Fund, one investor indeed stated that business might misuse a broad definition of adaptation for greenwashing of BAU activities. It should be prevented that the private sector attracts (international) climate finance for BAU activities, and that developed country governments add falsely flagged investments in adaptation of 'their' multinationals to their national contribution of international climate finance. This is critical for trust-building between developed and developing countries, as the latter generally prefer public grants over private finance, and are therefore often sceptical about increasing private engagement. Lessons on how to determine whether an investment is BAU or mobilised through a

financial incentive could be learned from the 'additionality' debate in carbon markets (cf. Hayashi & Michaelowa, 2013)

In conclusion, it should be noted that private sector engagement in adaptation and in adaptation finance does not lead to adaptation in every sector, everywhere, and in a sufficient manner. Some sectors and locations might not be reached; in others it might lead to maladaptation, for instance when too many farmers start irrigating and deplete water resources (cf. Bowen et al., 2012). Despite the potential, private sector engagement in adaptation and adaptation finance is no panacea and can only be supplementary to, and not substitute, public financing of adaptation.

6 Private sector interests: analysing 101 private sector business cases against 10 adaptation finance criteria [37]

Section 1.3.3 explained that public and private providers and recipients of adaptation finance have different narratives on and interests in private adaptation finance. The overall purpose of this chapter is to provide insights in the interests of the private sector, and the way their interests meet the UNFCCC's expectations on adaptation finance.

6.1 Introduction

It is expected that the private sector will engage substantially in adaptation, because it is in their interest to be climate resilient and to explore new business opportunities (e.g. CDP, 2012; ICC, 2009; Mendelsohn, 2000, 2006; PwC, 2010; Schrottke, Rothenbücher, Weber, & Niewiem, 2013). Early conceptualisation of such engagement demonstrates that it would include actors in all sectors and ranging all the way from smallholders and small enterprises to multinationals (cf. Pauw, 2014). However, the actual evidence base is surprisingly poor (Fankhauser & Soare, 2013) and does not allow for an assessment at sectoral or company level (Surminski, 2013). Further conceptualisation of the role of the private sector in adaptation and its contributions to the US$ 100 billion target should go hand in hand with the analysis of empirical data. For both UNFCCC negotiations and the Green Climate Fund's (GCF) engagement with the private sector (as an initial portfolio target) it is a crucial question to what extent private investments in adaptation could contribute to adaptation finance for developing countries.

This chapter therefore analyses the 101 business case descriptions of the Private Sector Initiative (PSI) of the UNFCCC Nairobi work programme on impacts, vulnerability and adaptation to climate change (NWP)[38]. This is currently the

[37] This chapter is based on the paper Pauw, W. P., Klein, R. J. T., Biermann, F. & Vellinga, P. (2015): Private finance for adaptation: do private realities meet public ambitions? *Climatic Change* and also draws on Bendandi and Pauw (2016): Remittances for adaptation: an 'alternative source' of international climate finance? In Milan, Schraven, & Warner (Eds.), *Migration, risk management, and climate change – Evidence and policy responses*: Springer; as well as Chan and Pauw (2014): A global framework for climate action: orchestrating non-state and subnational initiatives for more effective global climate governance. DIE Discussion Paper 34/2014, Bonn.

[38] The full list of analysed case studies can be found in Appendix 4 in alphabetical order.

only large database of private sector engagement in adaptation, and is, consequently, often referred to in research (e.g. Kato et al., 2014; Pauw & Pegels, 2013; PwC, 2010; Surminski, 2013). The case studies represent private adaptation interventions all over the world and in all sectors (e.g. water, food and agriculture; transport and infrastructure; tourism). Most case studies are implemented by multinationals such as Allianz, Anglo American, GlaxoSmithKline, Nestlé and Siemens, with less representation by small to medium sized enterprises (e.g. Banka Bioloo, Ignita), research institutes (Acclimatise, Ecofys), non-profit organisations (EWV, Fonkoze) and public-sector owned companies (Network Rail, ÖBB). Although these case studies do not report on financing adaptation in the context of the US$ 100 billion goal, the connection is clear. UNFCCC discussions on adaptation finance are indirectly influenced by activities under the NWP (Persson et al, 2009); and financing is an unofficial but integral part of adaptation under the NWP and an implicit interest of the PSI. The UNFCCC highlights 'the unique expertise of the private sector, its capacity to innovate and produce new technologies for adaptation, and its financial leverage (...)' as a basis for cooperation. The PSI was launched in 2010 as an online platform for businesses to contribute to adaptation in their operations and, 'importantly, in those of the most vulnerable countries and communities around the world' (UNFCCC, 2015a).

In doing so, the PSI – and therefore this chapter – follows the definition of adaptation of the IPCC's Fourth Assessment Report: 'initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects' (UNFCCC, 2015a).

This chapter analyses the extent to which the PSI case studies meet the UNFCCC's expectations on adaptation finance. These expectations are based on political framing for global adaptation finance and are not intended to measure adaptation effectiveness. The section first distills ten criteria from the UNFCCC Copenhagen Accord and the Cancun Agreements, then defines them based on literature, and finally translates them into a private sector context as a framework for analysis of the PSI case studies. Results on the extent to which the PSI case studies meet these ten criteria are provided in Section 6.3. The results section also includes an Excursus on an analysis on whether remittance can contribute to the annual US$ 100 billion of international climate finance. It was included not because remittances are private sector finance, but because

the analysis also analyses them against the same ten adaptation finance criteria (see Bendandi & Pauw, 2016). Section 6.4 concludes and discusses ways forward.

6.2 Adaptation finance criteria

Ten criteria for adaptation finance were identified: adequate; predictable; sustainable; scaled up; new and additional; provided with improved access; balanced allocation between adaptation and mitigation; prioritised to the most vulnerable developing countries; mobilised by developed countries; and transparent (as explained in Section 6.2.1).

6.2.1 UNFCCC context

These ten criteria are based on two milestones in international negotiations on climate finance: the Copenhagen Accord and its formalisation in the Cancun Agreements (see Table 6-1). The Copenhagen Accord declared to scale up climate finance for developing countries with US$ 30 billion of fast-start finance for the period from 2010 to 2012 and with US$ 100 billion per year from 2020 onwards; declares the private sector as one of sources thereof; and initiated discussions on the (then 'Copenhagen') GCF. The Copenhagen Accord itself is a non-binding political declaration that lacks consensus among parties (Klein, 2010). The Cancun Agreements are included in this chapter because they transform much of the Copenhagen Accord's content on climate finance into a decision of the Conference of the Parties (COP).

Some of these criteria are partly based on longer-standing work agreements under the UNFCCC. Criteria such as 'new and additional', 'adequacy' and 'predictability' have been articulated repeatedly, including in Article 4.3 of the 1992 Convention text (Müller, 2008). In addition, the UNFCCC articulated more general requirements, including cost-effectiveness and efficiency of financing, and integrated approaches (see Horstmann & Abeysinghe, 2011). For climate action – only potentially including finance – the Copenhagen Accord includes the additional criteria 'country-driven approach' and 'based on national circumstances and priorities' (UNFCCC, 2010; §11).

	Copenhagen Accord (2009)	Cancun Agreements UNFCCC (2010)
1	**Adequate** (...) financial resources (...) to support the implementation of adaptation action in developing countries (§3) **Adequate** funding (...) shall be provided to developing countries (§8)	Decision: (...) and **adequate** funding shall be provided to developing country Parties (§97)
2	**Predictable** (...) financial resources (...) to support the implementation of adaptation action in developing countries (§3) **Predictable** (...) funding (...) shall be provided to developing countries (§8)	Decision: (...), **predictable** (...) funding shall be provided to developing country Parties (§97)
3	**Sustainable** financial resources (...) to support the implementation of adaptation action in developing countries (§3)	–
4	**Scaled up** (...) funding (...) shall be provided to developing countries (§8)	**scaled-up** (...) funding shall be provided to developing country Parties (§97)
5	**New and additional** (...) funding (...) shall be provided to developing countries (§8) The collective commitment by developed countries is to provide **new and additional resources** (...) approaching US$ 30 billion for the period 2010 - 2012 (...) (§8)	(...), **new and additional** (...) funding shall be provided to developing country Parties (§97) (...) developed countries to provide **new and additional** resources (...) approaching US$ 30 billion for the period 2010-2012 (§95)
6	(...) funding as well as **improved access** shall be provided to developing countries (§8)	–
7	The collective commitment by developed countries is to provide (...) resources approaching US$ 30 billion for the period 2010 - 2012 with **balanced allocation between adaptation and mitigation** (§8)	new and additional resources (...) approaching US$30 billion for the period 2010 - 2012, with a **balanced allocation between adaptation and mitigation** (§95)
8	Funding for adaptation will be **prioritized for the most vulnerable developing countries**, such as the Least Developed Countries, Small Island Developing States and Africa (§8)	(...); funding for adaptation will be **prioritized for the most vulnerable developing countries**, such as the Least Developed Countries, Small Island Developing States and Africa (§95)
9	In the context of meaningful mitigation actions and transparency on implementation, developed countries commit to a goal of **mobilizing** jointly US$ 100 billion dollars a year by 2020 to address the needs of developing countries (§8)	Developed country Parties commit, in the context of meaningful mitigation actions and transparency on implementation, to a goal of **mobilizing** jointly US$ 100 billion per year by 2020 to address the needs of developing countries (§98)
10	In the context of meaningful mitigation actions and **transparency on implementation**, developed countries commit to a goal of mobilizing jointly US$ 100 billion dollars a year by 2020 to address the needs of developing countries (§8)	Developed country Parties commit, in the context of meaningful mitigation actions and **transparency on implementation**, to a goal of mobilizing jointly US$ 100 billion per year by 2020 to address the needs of developing countries (§98)

Table 6-1. Adaptation finance criteria as distilled from the Copenhagen Accord and the Cancun Agreements. These were also used for a book chapter on whether remittances could be a source of adaptation finance (see Excursus 6-4 and Bendandi and Pauw (2016)).

Researchers and climate funds also proposed supplementary criteria, for example for feasible, effective and efficient adaptation finance (e.g. Müller, 2008; van Drunen et al., 2009). However, this chapter examines the extent to which the PSI case studies meet international adaptation finance criteria of the UNFCCC – not their effectiveness or efficiency.

6.2.2 Private Sector Initiative

Business case descriptions of the Private Sector Initiative (PSI) are only two to five pages in length, which sometimes compromises the level of detail.[39] They are based on a common template which does not reflect the adaptation finance criteria. In order to maximise data collection, it was therefore decided only to do a qualitative analysis, and to provide descriptive statistics wherever possible. The PSI database is attractive for the analysis because of its uniqueness in providing business cases on private sector adaptation; its size (N=101); and its association with UNFCCC processes. Furthermore, the business case descriptions are comparable (same template) and publicly accessible at the UNFCCC website. Although a part of the business case descriptions takes place in developed countries (i.e. not climate finance target countries), they were not excluded from the analysis *a priori,* for two reasons. First, several private actors in the PSI operate internationally, so business cases in developed countries could be replicated in developing countries. Second, the authors intended to exploit the full potential of the database, and consider it as a function of the adaptation finance criteria to exclude incompatible business case descriptions. Nevertheless, sixteen business case descriptions were excluded because they advertised an adaptation product or service, without clarifying whether it was already (partly) implemented. Occasionally, additional business case descriptions were excluded if sufficiently detailed information was lacking.

Companies often implement their business case with a partner (58%, three quarters of which with a public entity), yet participate voluntarily and submit their own business case description. Their benefits are possibilities to participate in activities mandated under the NWP; network opportunities; reputational

[39] Almost all business cases (98%) refer to websites for more information. However, additional information was not found. twelve weblinks were not working, three referred to non-English websites; and thirty referred to (company) homepages, instead of dedicated project websites. Altogether, only forty very dissimilar websites were screened as a secondary source of additional information.

advantages and increased visibility; and association with UNFCCC processes (UNFCCC, 2015a). The voluntary self-submission has three limitations. First, it might cause positively biased communication. This analysis is however not misguided by overly positive descriptions: it does not look at adaptation effectiveness, but rather at the general nature of private engagement and the extent to which this meets the adaptation finance criteria. Second, voluntary self-reporting might limit the quality of submissions, particularly their level of detail. This issue, too, would be more pressing if this analysis focused on adaptation effectiveness rather than the climate negotiations related discussion on private sector engagement in adaptation. Third, the database does not represent the entire private sector. For example, 'Water resources' (52% of all business cases) and 'Food security, agriculture, forestry, fish' (45%) are probably overrepresented, whereas tourism (7%) might be underrepresented. Furthermore, companies that 'wait and see' – those having a strategy of deferral towards climate change impacts – and those that 'share and shift' risks through insurance and collaboration (Berkhout et al., 2006; 151) are unlikely to submit a business case description. The dataset is thus skewed towards companies with clear interests in climate change: frontrunners and companies that are closest to UNFCCC processes.

6.2.3 Explaining the adaptation finance criteria

This section defines the individual criteria based on climate finance literature including AGF (2010), ActionAid (2007); Christiansen et al. (2012); van Drunen et al. (2009), Horstmann & Abeysinghe (2011), Müller (2008) and AMCEN (2011) and supported by data from Climate Finance Update (2014). The definitions were verified by a climate finance expert from the UNFCCC Secretariat.

Although it would be interesting to apply these criteria on public climate finance too, this chapter addresses private finance. For that purpose, it translates each criterion in representative and analysable aspects of private adaptation under the PSI. The criteria are based on longer-standing country-based agreements under the UNFCCC and therefore reflect public interests in financing. This is most explicit for the criteria 'new and additional' and 'predictable', but is visible in other criteria as well. The research questions for the analysis of PSI business case descriptions were therefore adjusted to reflect the private sector context.

1. Adequate. The Copenhagen Accord statement that developed countries shall provide adequate financial resources to support the implementation of adaptation action in developing countries (UNFCCC, 2010; §3, §8)was formalised under a decision in the Cancun Agreements (UNFCCC, 2011; §97). Adequate can be interpreted either in terms of amount or in terms of meeting adaptation needs. Literature generally interprets 'adequacy' in terms of the former. For example, ActionAid (2007), Müller (2008), Christiansen et al. (2012) and Flåm and Skjærseth (2009) refer to the inadequacy of adaptation funding compared to the estimated costs. Indeed, van Drunen et al. (2009; 16-17) state that under the Convention, 'adequate (…) funds were meant to help developing countries meet the agreed full incremental costs'. This chapter takes 'adequate' as sufficient financing to cover relevant adaptation costs in developing countries. To identify whether the private sector can contribute substantially to cover adaptation costs, business case descriptions were analysed on mentioning climate finance, and providing cost estimates and (total) investments.

2. Predictable. The Copenhagen Accord statement that developed countries shall provide predictable financial resources to support the implementation of adaptation action in developing countries (UNFCCC, 2010; §3, §8) was formalised under a decision in the Cancun Agreements (UNFCCC, 2011; §97). The UNFCCC does not further define predictability. Predictable funding is crucial for developing countries to formulate adaptation strategies and implement activities (AGF, 2010; AMCEN, 2011). In development literature, the Accra Agenda for Action (2008) translates predictability into donor countries providing timely information on annual expenditure as well as rolling out three- to five-year forward planning. This chapter interprets 'predictability' not as changing amounts of funding, but on whether recipients can expect future adaptation finance. This chapter thus analysed whether the PSI business cases describe their medium- to long-term planning, including indications of project duration, project extension and related costs.

3. Sustainable. The Copenhagen Accord states that developed countries 'shall provide sustainable financial resources (...) to support the implementation of adaptation action in developing countries' (§3). Although the 'sustainable criterion' was not formalised in the Cancun agreements, it is still discussed in international climate finance debates and therefore included in this chapter. For example, sustainability has been a major issue in discussions on climate finance

bridging the period between fast-start finance (2010-2012) and the annual US$ 100 billion (from 2020 onwards). Climate finance literature does not further define 'sustainable' finance. Given that climate finance should increase to US$ 100 billion per year (UNFCCC, 2011), this chapter distinguishes it from predictability by operationalising it as the amount of adaptation finance staying the same or increasing over time. The PSI business case descriptions are thus analysed on 1) mentioning stable or increasing investment volumes; or that 2) business cases generate revenues that allow for perpetual investments. In a broader sense, the chapter also analysed whether business cases describe lasting impacts of interventions.

4. Scaling up. The Copenhagen Accord states that 'Scaled up (...) funding (...) shall be provided to developing countries (UNFCCC, 2010; §8), which is formalised in a decision in the Cancun Agreements (UNFCCC, 2011; §97). How fast or by how much is however not defined. The increase from US$ 30 billion over the period from 2010 to 2012 (i.e. on average US$ 10 billion per year) to US$ 100 billion per year from 2020 onwards would be a ten-fold increase. The private sector does not think of scaling up in terms of increasing budgets, but rather in terms of increasing revenues from a proven business model, or reducing marginal costs. This chapter thus identifies possibilities and plans for scaling up and replication as described in the PSI business cases, including adaptation benefits in terms of cost reductions or market opportunities.

5. New and additional. In the Copenhagen Accord, developed countries make the collective commitment to provide new and additional resources approaching US$ 30 billion for the period from 2010 to 2012 (UNFCCC, 2010; §8). In the Cancun Agreements (UNFCCC, 2011), and also relating to the 'scaling up' criterion, the COP decides that new and additional funding shall be provided (§97), but only takes note of the idea that these 'new and additional' resources shall approach US$ 30 billion for the period from 2010 to 2012 (§95). 'New and additional' refers to official development assistance (ODA), meaning climate finance should be over and above existing traditional development funding (van Drunen et al., 2009). However, it can be discussed whether it should be 'new and additional' to existing, planned or targeted ODA expenditure at the time of the Copenhagen Agreement (see Brown, Bird, & Schalatek, 2010). This chapter analyses whether ODA was used to co-finance the PSI business cases.

6. Improved access. The Cancun Agreements do not reiterate the Copenhagen Accord's statement that: '(...) funding as well as improved access shall be provided to developing countries' (UNFCCC, 2010; §8). Nevertheless, improved access is a criterion in this analysis: it is still debated upon during UNFCCC climate negotiations and is a key concept in the design of the GCF (see also Green Climate Fund, 2014; UNFCCC, 2011). For example, developing countries' lobbying for improved access to finance has initiated the development of the 'direct access' mechanism under the Adaptation Fund (Müller, 2006); and the Green Climate Fund worked on 'enhanced direct access' (Müller, 2013). The ultimate goal of improved access is to reach the most vulnerable people. According to Ayers (2011), vulnerability to the global risk of climate change is locally experienced, which she calls the 'adaptation paradox'. Current governance of funding relationships is often accountable to contributors of climate finance rather than to the most vulnerable people that experience climate change impacts locally (ActionAid, 2007). Rather than assessing improved access to climate finance by the most vulnerable people, which is impossible in the context of the PSI, this chapter interprets 'improved access' as to whether those who would experience climate change impacts locally access the *benefits* of the business cases. The chapter thus analysed whether case studies' interventions have external benefits; and whether these benefits reach those individuals who experience local impacts of climate change.

7. Balanced allocation. In the Copenhagen Accord the developed countries make a collective commitment to provide 'resources (...) with balanced allocation between adaptation and mitigation' (UNFCCC, 2010; §8). The Cancun Agreements solely 'take[s] note' on this (UNFCCC, 2011; §95), and also state that adaptation must be addressed with the same priority as mitigation (UNFCCC, 2011; §2). It is, however, not further defined what a 'balanced' allocation means. In both the Copenhagen Accord and the Cancun Agreements, 'balancing' only refers to the period 2010 to 2012. However, the COP reiterates a balanced allocation in a request for the future board of the GCF (UNFCCC, 2012; Dec 3/CP.17), which indeed decided to 'aim for a 50:50 balance between adaptation and mitigation during the initial phase of the Fund' (Green Climate Fund, 2014; 6). According to Climate Finance Update (2014)around 16% of the public climate finance flows to adaptation so far. Whether this should increase to 50% is an open question, but in any case the finance for adaptation needs to increase

(Halimanjaya, 2014; Terpstra, 2013). The amount of private adaptation finance is very hard to track but seems minimal compared to private mitigation finance (Buchner et al., 2011). However, 'Balanced allocation' could not be part of the analysis, as the PSI only includes business cases on adaptation (with a few having some mitigation co-benefits).

8. Prioritisation. The Copenhagen Accord states that adaptation funding will be prioritised for the 'most vulnerable developing countries, such as the least developed countries (LDCs), small island developing States (SIDS) and Africa' (UNFCCC, 2010; §8). The Cancun Agreements only take note of this (UNFCCC, 2011; §95). Climate funds such as the Global Climate Change Alliance, the Pilot Project on Climate Resilience and the Adaptation Fund were all designed to make decisions on country prioritisation and allocate funds based on levels of vulnerability, but they all have their own standards for doing so (Klein & Möhner, 2011). Altogether it remains unclear what 'prioritization' means in terms of, for instance, financing or effort, so the author looked at actual flows. Of the total public adaptation finance that was approved so far, Climate Finance Update (2014) estimates that 32% flowed to Africa, 52% to LDCs, and 9% to SIDS. Given the overlap, this means 60% flows to the UNFCCC's 'most vulnerable developing countries'. This hardly reflects a country-based prioritisation, considering that these three groups together constitute 94 out of 140+ developing countries[40], and that 22% of these 94 countries have not received public climate finance so far. A prioritisation based on a per capita basis would result in very different outcomes and put more emphasis on Asia. However, this chapter analyses along UNFCCC outcomes and thus prioritises based on countries in which PSI business cases were implemented. For reasons of practicality, it installs a 60% threshold based on the analysis of Climate Finance Update.

9. Mobilising. In the Copenhagen Accord, developed countries commit to a goal of mobilising jointly US$ 100 billion per year by 2020 to address the needs of developing countries (UNFCCC, 2010; §8). The COP only 'recognizes' this goal in the Cancun Agreements (§98). A definition of 'mobilizing' was not found. This chapter interprets it broadly as pro-active public interventions of developed

[40] 'Developing countries' is not an official group under the UNFCCC. However, as a comparison: there are 154 non-Annex I parties (see http://unfccc.int/parties_and_observers/parties/non_annex_i/items/2833.php. Accessed on 21 December 2016).

countries that increase public and private financing of adaptation or mitigation in developing countries. This goes beyond domestic mobilisation of climate finance and includes institution building; enhancing climate finance readiness in developing countries; and the creation of incentives to increase private investments. To identify whether the PSI business cases' interventions are 'mobilised', this chapter analysed whether developed country institutions were involved in the planning and implementation, and whether public policies and co-financing are mentioned, both in developed and developing countries in order to allow for a broader overview.

10. Transparency. In the Copenhagen Accord, transparency is mentioned in the context of 'meaningful mitigation' and the mobilisation of US$ 100 billion per year by 2020 to address the needs of developing countries (UNFCCC, 2010; §8). The Cancun Agreement only 'recognizes' this (UNFCCC, 2011; §98). Transparency is broader in literature. For example, ActionAid (2007) suggests that transparency goes beyond purposes (i.e. mitigation), amounts (i.e. US$ 100 billion per year), and results of funding (i.e. meaningful), but also includes the governance structure and procedures at providers of financial resources. Klein (2011) points out that transparency means different things depending on whether you look at generation, governance, delivery, or use of finance. The Adaptation Fund indeed introduced transparency indicators in its overall management (Horstmann & Abeysinghe, 2011). Eventually, transparency on climate finance also means monitoring, reporting, and verification and tracking climate finance from source to final use (Buchner et al., 2011; van Drunen et al., 2009). In order to operationalise 'transparency' in a private sector context, this chapter analysed whether the business cases descriptions mention investments and discusses how they are generated, governed, delivered and used.

6.3 Results

Several business case descriptions cause doubts on whether they deliberately aim at adaptation, or 'accidentally' contribute to it. Only 53% of the business cases describe climate change impacts. Five business case descriptions do not even mention climate change, and none of the business cases defines a concept of adaptation. However, this chapter does not analyse the adaptation results or effectiveness, but rather looks at the nature of private engagement and the

extent to which this meets the ten adaptation finance criteria. In the text below, they are categorised in three groups:

- Amount of finance (criteria: adequate, predictable, sustainable, scaled-up)
- Recipients of investments (criteria: improved access, prioritisation)
- Overarching criteria (criteria: mobilisation, new and additional, transparency).

6.3.1 Amount of finance

Adequate: None of the business cases descriptions mentions 'climate finance'. Seven business case studies (8%) provided cost estimates, six of which were in developing countries, with budgets ranging from US$ 3 million (PepsiCo) to approximately US$ 516 million (Nestlé). This seems very little compared to the estimated needs of at least tens of billions of US Dollars per year in developing countries. Yet, the PSI business cases only represent a fraction of the international private sector's contributions to adaptation. Adaptation related investments can thus be expected to be significant, but the PSI business cases do not allow for a conclusion on adequacy.

Only 22 business cases specify the duration of projects, indicating a low **predictability**. These are mostly longer-term projects – on average they last 80 months (standard deviation: 64.2), with the longest already running since 1993, and the shortest having a 12-month duration. Only 10 business cases explicitly mention project extension. At least ten more projects hint at it, and extension of more business cases can be expected. For example, almost 60% of the cases are carried out with a partner. As Kato et al. (2014) demonstrate, this helps to stimulate replication and scaling up, in particular where projects were successful. This feeds in the discussion on the criterion **'sustainability'**. A variety of business cases emphasise the importance of project sustainability, including for proactive protection of public water supplies and the environment in the United Kingdom to reduce costs (Thames Water), and cyclone-proof reconstruction of schools in Madagascar (CBRE and UNICEF). Others do not mention it explicitly, but could have lasting impacts through hard adaptation interventions (e.g. construction work or irrigation equipment) or soft adaptation (e.g. training and capacity building). However, only sixteen business cases explicitly describe the sustainable continuation of the project itself.

Thirteen business cases (plan to) **scale up** their project, half of which in the UNFCCC's 'most vulnerable developing countries' (LDCs, SIDS and Africa). It must be noted that some business cases cannot be scaled up. For example, just like Thames Water (see above), Network Rail identified climate risks and adaptation responses, in this case for the railway network in the United Kingdom. Such assessments could be deepened or replicated elsewhere, but not scaled up. Scaling up would rather concern the implementation of those plans, but it is unlikely that this is financed through the same budget. The business case descriptions that plan scaling up provide little information on how to do this, but as part of an OECD report I analysed two of them in more detail (Kato et al., 2014). First, BASIX and ICICI Lombard increased the sale of index-based weather insurance contracts to small-scale farmers in India from 230 in 2003 to over 12 million individuals in 2014; and replication is ongoing in a number of countries (see Excursus 4-3). Second, Cafédirect's case study of assisting farmers to make their coffee production more climate-resilient has been replicated to a number of producer organisations in other developing countries, both by Cafédirect and the initial project partner Gesellschaft für Technische Zusammenarbeit (GTZ) (see Excursus 6-1).

Excursus 6-1. Replication of a public-private adaptation project supporting farmers in developing countries (based on (Kato et al., 2014)).

The British hot beverages company Cafédirect and the German Gesellschaft für Technische Zusammenarbeit (GTZ) formed a public-private partnership (PPP) to implement Adaptation for Smallholders to Climate Change (AdapCC) pilot initiatives in Kenya, Peru, Mexico and Nicaragua from 2004 to 2007. AdapCC supported coffee and tea farmers in developing strategies to cope with climate change risks and impacts. Interviews with farmers pointed out that they had experienced climatic changes in the preceding 20 years, such as increasing temperatures; modifications in rainfall patterns; and heavy rainfall causing landslides. A 'Risk and Opportunity Analysis' produced adaptation strategies for each pilot group, which they could implement themselves. The strategies include, among others, diversifying farmers' income and food production; increasing natural resources such efficiency; selecting more resilient crop varieties; and building capacity among farmer (Schepp, 2010).

GTZ planned and implemented the project, while Cafédirect facilitated access to their 40 small-scale coffee, cocoa and tea producer organisation in Latin America, Africa and Asia, representing more than 280.000 small-scale farmers. The pilot initiative was financed by Cafédirect (52%) and the PPP programme (48%) of the German Federal Ministry for Economic Cooperation and Development (BMZ) (Kato et al., 2014).

> GTZ replicated lessons learnt and results of AdapCC through further development partnerships in the tea and the coffee sector, including Sangana PPP (Kenya), Coffee & Climate (Brazil, Tanzania), Trifinio (Guatemala, Honduras, El Salvador, Vietnam), and ETP tea project (Kenya). Kayonza Growers Tea Factory has also replicated the projects in Uganda with the financial support from Comic Relief33 (Kato et al., 2014).

Many case studies also mention market and job-creation opportunities or opportunities to reduce future risks and costs of climate change, both of which increase potential for scaling up. Of all case studies, 46% mainstream adaptation into their operations (e.g. reducing water use or securing a supply-chain), and 35% describe new market opportunities (e.g. selling adaptation products and planning services). Activities that include both mainstreaming and capitalising on new business opportunities, such as the insurance product by BASIX and ICICI Lombard, are mentioned by 19% of the case studies.

To conclude, the private sector invests in adaptation, including in developing countries, but the amount and predictability of investments remains unclear. A share of the case studies show commitment to sustainability and scaling up. Yet plans are not described in detail. Also, it is unclear to what extent sustainable project implementation and scaling up of projects translates in sustainable and scaled up financing.

6.3.2 Recipients of investments

Prioritisation: The case studies cover the entire world, with 22 projects in Europe and 18 North America; 27 in Africa and Arab States, and 28 in Asia. However, there is no prioritisation towards the UNFCCC's 'most vulnerable developing countries': fourteen projects take place in LDCs, four in SIDS, and 17 in Africa. Given the overlap between these groups, only a third of the 85 case studies take place in the most vulnerable developing countries. This might reflect the difficult business environment and low preparedness for private sector adaptation in these countries (see Chapter 4) or a lower awareness of the PSI among companies in developing countries. Also, the NWP's objective is to assist developing countries in particular, including the LDCs and SIDS (UNFCCC, 2007b) – which is different from 'prioritising' LDCs, SIDS and Africa.

Improved access: Seventy-nine percent of the business cases (N=81) explicitly articulate external adaptation benefits, which means communities, other firms

or governments benefit from the private investment in adaptation. Some have direct positive influences on livelihoods, for example though improved water availability or increased agricultural output. Other are minor side-benefits only, such as climate-resilient rail tracks (comforting travellers – thus also ensuring customers) or new hiking paths where glaciers retreated (benefitting hikers – potentially attracting more tourists). An adaptive measure like wetland restoration can have both positive effect on livelihoods (some case studies emphasise improved natural resource management) or be a minor side-benefit only (one case describes the 'natural amenity' for local inhabitants).

Excursus 6-2. Private investments in wetland restoration with external (adaptation) benefits for communities.

In total, four business cases of the PSI aim at wetland restoration. Cafédirect and Kayonza Growers Tea Factory in Uganda use wetland protection as a tool to prevent soil erosion, floods and increase water storage. Improved resource management intends to maintain the production of Kayonza Growers Tea Factory and support local communities. In Vietnam and Thailand, the Coca-Cola Company and The World Wildlife Fund (WWF) support wetland restoration. Their efforts will help Coca-Cola to maintain its water supply, even during droughts, and will help communities to become more resilient and to be better adapted to climate change. In the United States of America, the storm water management infrastructure protecting the Houston site of polyester gel coats producer Cook Composites and Polymers Co. is ageing and not able to cope with the frequent storms and flooding in the region. Therefore, the company is planning to replace this infrastructure with a wetland ecosystem. This ecological solution should eliminate site flooding and save money. Additionally, the project will reduce the burden on the public water treatment system, and produce a 'natural amenity' that benefit the local ecosystems. Finally, Panama's Ramsar site 'Bay Wetlands' act as a natural barrier to protect Tocumen International Airport from climate change impacts. However, the site is affected by new constructions in the area. Copa Airlines now sensitises communities that also face flood risks on the importance of wetland conservation.

In all four cases, the adaptive measure – wetland restoration – has external adaptation benefits that benefits communities, albeit in different ways.

Fifty-eight percent of the business cases (N=81) benefits individuals who would experience climate impacts locally. In some cases this is evident, for example where poor farmers receive support for climate-resilient production (see

Excursus 6-1); or where flood protection is provided through dikes or wetland restoration (see Excursus 6-2). For example, COPA airlines initiated an awareness-raising campaign for the conservation of the Panama's Bay Wetlands. These wetlands act as a natural barrier against flooding for both the Tocumen International Airport and local villages. In other cases, benefits are indirect and not necessarily adaptation-related, such as access to micro-credit or increased school enrolment.

Although external benefits appear to be frequent and significant in the PSI cases, they are often not an aim in itself. Furthermore, external beneficiaries generally do not have ownership in the projects and they have limited possibilities to apply for adaptation benefits.

6.3.3 Overarching themes

Mobilising; new and additional: eight business case descriptions studies explicitly state that the government or its policies influenced project plans or outcomes. For instance, in the Indian Kashmir region with its unpredictable climate, the cooperative 'Fasiam Agro Farms' supports farmers to switch from maize to low-risk, high-value aromatic and medicinal crops, and to process and market these. The Indian government supported and co-financed Fasiam Agro Farms. Multinational mining company Anglo-American states to closely follow the government's mine closure and rehabilitation strategy whilst developing its US$ 100 million water reclamation plant (see Excursus 6-3).

Another 17 projects were implemented under public-private cooperation. Business cases in developing countries with developed-country partner institutions are particularly important in the context of international adaptation finance. However, development banks and agencies are involved in a few business cases only, and with very different roles. Kato et al. (2014) again provide insight on two business cases. GTZ provided technical support and co-financed the adaptation project with Cafédirect in a variety of developing countries; and the World Bank provided technical support to establish the weather risk-based insurance in India. When considering all business cases, the participation of public entities from developed countries is not transparent but seems limited, which indicates that the PSI investments are new and additional to ODA.

Excursus 6-3. Lack of transparency on governance, delivery and use of private financing of adaptation.

The PSI business cases hardly provide any information on the governance, delivery, or use of finance for adaptation. For example, Nestlé (CHF 460 million); PepsiCo (US$ 3 million); Unilever (US$ 230,000 per year) and Network Rail Infrastructure Limited (£ 750,000) do mention their budgets, but do not unveil details on output type and management. Anglo American appears to be more specific as it has invested almost US$ 100 million in one particular water reclamation plant to treat underground water from contaminative effects of mining operations in the Witbank coalfield. Ignitia Ghana Ltd. mentions the approximate costs for a weather forecast service (US$ 2 per farmer/year), but does not quantify its own investments.

The PSI business cases are not unique in this aspect. Generally, it is difficult to find information on governance, delivery, or use of private finance for adaptation (Atteridge et al., 2016; Druce et al., 2016; Dzebo & Pauw, 2015); see also Chapters 3, 5 and 7.

Transparency: Only seven business case descriptions (8%) provided cost estimates (see 'adequacy'). Details on generation of finance, its governance, delivery, or use are not provided (see Excursus 6-3). The weblinks to business cases provide similar information on costs of an additional five business cases only. One explanation for this lack of detail is the short PSI template: it neither requires budget information, nor allows for extensive explanations of investments. Another explanation is that firms operate in a competitive environment: not being transparent might be a strategic decision (Kato et al., 2014). This would imply that imposing UNFCCC transparency standards might reduce incentives for the private sector to engage in international adaptation finance.

In summary, presumably most private adaptation finance under the PSI is new and additional to ODA, but there is a general lack of transparency on costs and financing. Public institutions active in climate finance only partner in a limited number of business cases, but their exact role often remains unclear.

Bendandi and Pauw (2016) also use the ten adaptation finance criteria to analyse whether remittances could contribute to the annual goal of mobilising US$ 100 billion of international climate finance. Results are similar in the sense

that remittances can contribute to adaptation, but that remittances hardly meet the ten criteria (see Excursus 6-4).

Excursus 6-4. Remittances for adaptation: an 'alternative source' of international climate finance? Application of ten adaptation finance criteria (based on Bendandi & Pauw, 2015).

The ten adaptation finance criteria were used by Bendandi and Pauw (2016) to analyse whether remittances could constitute an 'alternative source' of adaptation finance in the context of the US$ 100 billion target. Remittances are financial resources sent by migrants to families and friends in the origin countries and have a huge potential. The World Bank (press release, 11 April 2014) expects recorded volumes to developing countries (which is only a share of the total) to raise up to US$ 516 billion in 2016. Other than public adaptation finance, remittances directly reach to households, including those in remote and vulnerable areas. They are often utilised for disaster relief and sometimes also for investments in long-term adaptation strategies. Households receiving remittances are more resilient to external stressors including natural disasters (Ebeke & Combes, 2013; Mohapatra, Joseph, & Ratha, 2012). Key drivers for remittances include family bonds and networks, and thus altruism, prestige, implicit co-insurance agreements and perspectives of return (Straubhaar & Vâdean, 2006). This allows remittances to address areas and adaptation issues where the private sector would not have a return on investment (cf. Deshingkar, 2011), and makes remittances an 'alternative source' of finance.

The chapter by Bendandi and Pauw (2016) used the ten adaptation finance criteria as developed by Pauw et al. (2015) and provided an interpretation that allowed to analyse the specifics of remittances:

Predictability relates to whether recipients can anticipate on future adaptation finance and plan accordingly. Although remittances are influenced by sudden factors such as economic crises in host countries (Frankel, 2011), they proved to be a more reliable source of foreign currency than other capital flows such as FDI and development aid (World Bank, 2005). Remittances often increase in case of economic crises or catastrophic weather events in migrants' countries of origin, as a strategy to 'help mitigate external vulnerabilities' and 'increase resilience' (Bettin, Lucchetti, & Zazzaro, 2012).

Sustainability. Are remittances stable enough to allow for medium to long-term adaptation planning? Migrant remittances tend to reach a peak approximately 15 to 20 years after migration (Groenewold & Fokkema, 2003), which makes them more sustainable than FDI or ODA (which normally plan for a few years only). Remittances have both short term (e.g. food consumption, health needs) and long-term objectives. The latter also includes livelihood differentiation (which is also considered an adaptive strategy), reduction of exposure to external stresses, food security and

more sustainable use of natural resources (Adams, Cuecuecha, & Page, 2008).

Improved access. Do remittances provide direct access to funding? The IPCC recognises mobility as a common adaptation strategy. Yet, international migration is too costly for the poorest. They often migrate internally, where wages are generally lower. A second aspect of access is intermediation. For example, building infrastructure through remittances is more direct and cheaper than through ODA, as foreign aid often requires the recruitment of international consultants (Acharya, 2003). The 2015 Addis Ababa Action Agenda commits to lowering the transaction costs of remittance flows, which would further improve access.

Adequacy. Could remittances contribute substantially to cover adaptation costs in developing countries? They can be a vital source of income. For example, they amount to 48% of Tajikistan's GDP, 25% of Lesotho's and Nepal's, and 24% of Moldova's (World Bank, press release, 2 October 2013). However, adequacy of remittances' is also determined by its capacity to effectively flow under circumstances such as climatic risks preparedness and relief. Remittances seem to have a stabilising effect in most developing countries vulnerable to environmental changes by providing both ex ante preparedness and ex post risk management (Combes & Ebeke, 2011; David, 2010).

Scaling up. Are remittances increasing? While developed countries can only be expected to scale up climate finance if they are confident that money will be spent wisely (AGF, 2010), remittances continue regardless. The overall annual flow of remittances to developing countries has nearly tripled since 2000 (Kebbeh, 2012) and currently grows by around 8% per year (OECD, 2014a). However, this still does not meet the necessary annual 26% increase of climate finance (from US$ 30 billion in 2010 to 2013 to US$ 100 billion by 2020), and without the necessary public incentives, it is unlikely to prioritise adaptation.

New and additional. Can remittances be recorded as new and additional to former ODA levels? They are not related to government budgets of developed countries, and therefore new and additional to ODA. The challenge lies in leveraging remittances towards adaptation actions and to account for them. Data do not exist, but it is expected that the amount directed towards adaptation is a small percentage. However, many households might contribute to adaptation without being aware of it.

Prioritisation. Do the most vulnerable developing countries receive a relatively large share of remittances? Most remittances flow to middle-income countries. Although the share of low-income countries is increasing, they only receive 6% of the total (Connor et al., 2013). Nevertheless, the economic importance of remittances is larger here than in richer countries (cf. Giuliano & Ruiz-Arranz, 2009). For example, in SIDS such as Samoa and Haiti, remittances constitute 23% and 21% of their GDP.

Mobilising. Do developed countries create enabling environments to promote adaptation through remittances? Developing countries such as Senegal and Mexico already change public policies to benefit more from remittances. However, examples of developed country incentives for adaptation-related remittances were not found in literature.

Transparency. Are remittance flows transparent from the source to the final users? The channels through which they flow are diverse, partly informal and not adequately addressed in terms of governance structures and regulations. Remittances therefore do not meet the criterion of transparency.

Balanced. Do remittances prioritise adaptation over mitigation? Remittances neither principally aim to address climate change, nor do they aim to balance between adaptation and mitigation. However, Bendandi and Pauw (2016) highlight that remittances can help to increase resilience against climate stresses and that in case of emergencies and disasters, remitters will invest in immediate relief and rehabilitation.

Conclusions

Bendandi and Pauw (2016) found that overall remittances insufficiently meet the ten adaptation finance criteria. Potentially, remittances could meet criteria such as 'adequate', 'sustainable' and 'predictability', mostly because they relate to the motivation to invest in countries of origin. Criteria such as 'improved access' and 'scaling up' can only be matched if developed and developing countries create the right incentives to reach out to the potential diaspora investors. Criteria such as 'prioritization' and 'transparent' are unlikely to be met by remittances.

Nevertheless, a share of remittances could still contribute to adaptation household and community level and meet the ten adaptation finance criteria. The official accounting of remittances as part of the annual US$ 100 billion of climate finance would require a controversial political decision. It is ethically questionable whether financial resources of poor migrants can substitute climate finance from developed countries. Among others this would contradict the polluter pays principle. Nevertheless, the chapter by Bendandi and Pauw (2016) helped to better understand potential alternative climate finance sources.

6.4 Conclusion and way forward

This chapter first distilled ten criteria for adaptation finance from the Copenhagen Accord and subsequent climate negotiations, and highlighted that these criteria only have vague and non-official definitions. It then analysed to what extent the PSI business case descriptions meet these criteria, as a proxy to whether the private sector could take over adaptation finance responsibilities

under the developed countries' pledge at the UNFCCC to mobilise US$ 100 billion of climate finance per year from 2020 onwards.

The PSI business cases on private sector adaptation confirm the idea (e.g. Fankhauser & Soare, 2013; Mendelsohn, 2006; Pauw, 2014) that the private sector actively engages in adaptation, often without public support of any kind; and that it complements public adaptation activities on the ground including in priority sectors such as water and agriculture.

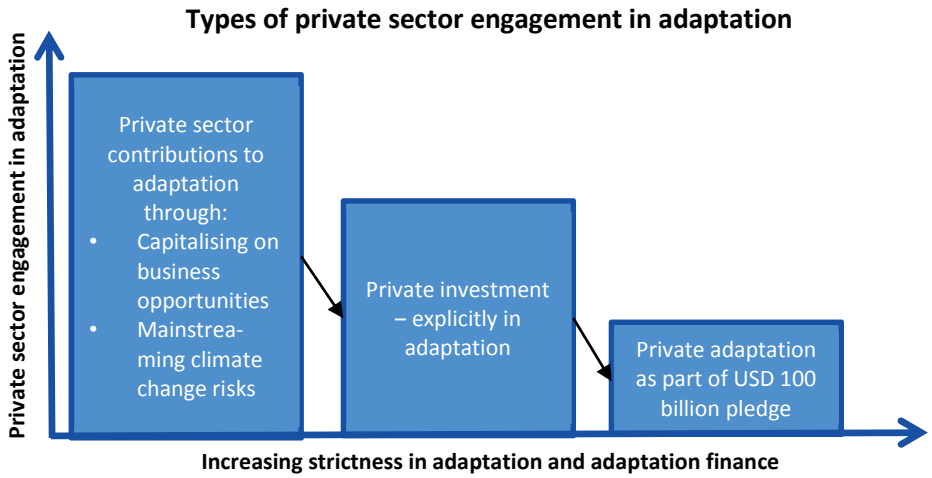

Figure 6-1. Private sector engagement in climate change adaptation plotted against increasingly strict conceptualisations of adaptation and adaptation finance.

However, the analysis of 101 PSI business cases illustrates that not all private sector contributions to adaptation also contribute to international adaptation finance (see Figure 6-1). Only a minority of the business cases takes place in the 'prioritised' most vulnerable developing countries. Private investments of the PSI business cases are 'new and additional' to ODA, but their 'adequacy' and 'predictability' remain unclear. And although some business cases commit to 'sustainability' and 'scaling up', the actual plans and their associated investments remain undisclosed. As for 'improved access': most business cases have external benefits, including for those most vulnerable in developing countries. This does not mean they have ownership or improved access to finance, but it demonstrates that the international private sector can contribute to adaptation of some of the people most vulnerable to climate change. The

business cases present little evidence of being 'mobilised' by developed countries. A better insight in the role of the private sector in adaptation finance would definitely require more 'transparency' on generation, governance, delivery and use of finance. An analysis of the exact extent to which the business cases meet the ten adaptation finance criteria would require further in-depth research, for example through interviews, site-visits and an analysis of (classified) project documentation.

Public and private sectors have different motivations to invest in adaptation (cf. Pauw, 2014). This chapter adds that the diplomatic UNFCCC conceptualisation of financing adaptation is dissonant from the private sector reality. Even the PSI business cases on adaptation – potentially positively biased, dominated by frontrunners, and 'associated' with UNFCCC processes – do not come close to meeting the ten adaptation finance criteria. Three approaches could be thought of to improve this situation and to examine whether private investments could qualify as international adaptation finance as negotiated under the UNFCCC.

First, the UNFCCC could alter existing criteria to make them more suitable for private initiatives. Subsequently, the adaptation agenda – already burdened with conceptual issues such as the 'adaptation paradox' (Ayers, 2011) and the complex relation between adaptation and development (e.g. Huq & Reid, 2004; Persson & Klein, 2009) – would be broadened even further. The PSI database presents a wide variety of sectors, type of private actors, modes of cooperation and projects that would need to be accommodated. Financing instruments would be supplementary to that. UNFCCC Parties would have to agree on a new set of all-encompassing criteria allowing for accountability, but it is unlikely that they reach consensus. Criteria have not been further defined in the past, because of the political process and the difficulties in reaching agreement (Klein & Möhner, 2011). Furthermore, developing country parties often voice their general scepticism towards private finance for adaptation. However, future research could provide an impulse here, for example through an analysis on whether public adaptation finance itself meets the ten adaptation finance criteria, or by providing a clear (e.g. resilience-based instead of adaptation-based) framework for private adaptation finance.

Second, the private sector could increase its effort to understand UNFCCC outcomes, and adaptation finance criteria in particular, in order to align their

investments and communication. This chapter proves that this does not happen naturally, despite existing private sector interest and experiences with adaptation and their presence at COPs (Hanegraaff, 2015). The public sector has dedicated adaptation funds to contribute to the US$ 100 billion target. Yet, for the private sector, adaptation is often mainstreamed in other activities (Berkhout et al., 2006; CDP, 2012; Pauw, 2014). Businesses are probably not intrinsically motivated to artificially separate adaptation just to comply with (complex) UNFCCC reporting procedures. Disclosure of commercial confidentiality is another barrier. There are forums in which the private sector committed to voluntary reporting, such as the Carbon Disclosure Project and the Equator Principles, nonetheless. As a try-out, some adaptation finance criteria or their derivatives could be added to the PSI business case template. For example, explicitly requiring information about project duration, reaching out as well as inclusiveness would provide more insight in 'predictability' and 'improved access'. One precondition is a COP mandate to lift the PSI beyond a UNFCCC Secretariat 'initiative'. This would provide the political space and capacity to significantly change the template. Earlier changes were minimal and did not lead to significant differences in content. An improved template would also raise awareness and help future analysis of private adaptation interventions in the context of the US$ 100 billion climate finance. Certainly, the greatest potential lies outside of the PSI, with thousands of companies worldwide contributing to adaptation.

Both approaches seem unrealistic. Picking the low hanging fruit is a third and more practical approach: only monitor and report private engagement in adaptation that principally planned to finance adaptation. This could for example be philanthropy or private finance that is mobilised through publicly financed adaptation projects and carried out by development banks and agencies. Mobilisation through public policies would not be part of this approach, as causes and effects remain unclear. This third option dramatically thins out private adaptation finance that contributes to the US$ 100 billion of climate finance, which means more public finance is required to reach this annual target. However, it is a practical way forward in which private investments could meet criteria such as 'predictability', 'sustainability', 'transparency', and 'mobilisation'.

7 Developed-country interests: analysis of policy documents and interviews with officials from development banks and development agencies [41]

The effective functioning of the climate finance system depends on its architecture, and on whether its actors can operate without intractable norm conflicts. Chapters 4 and 5 described the interests of Least Developed Countries (LDCs) in private adaptation finance. Chapter 6 described the private sector interests. This chapter is to provide insights in developed-country interests. Developed countries pledged to mobilise private finance and persisted on the private sector being one of the sources of the pledged US$ 100 billion of finance per annum by 2020. Based on four sets of policy documents, this chapter analyses how developed-country parties define and motivate private adaptation finance; their current experiences; the actors and instruments they involve; and tracking of private finance. Interviews with experts from development banks and development agencies add practical experience on adaptation projects with the private sector.

The chapter finds a discrepancy between developed countries' communication at the global climate negotiations and development banks and agencies' implementation of adaptation projects with private sector engagement. For example, developed countries' communications on mobilising private sector finance to the UN climate negotiations are abstract and private-sector awareness is low here. At the level of implementation, development banks and agencies do encounter private sector awareness on climate impacts and experience with increasing resilience.

This discrepancy is the result of ambiguity around the concept of private adaptation finance in the highly fragmented climate finance architecture. This ambiguity is problematic when the aim of mobilising private adaptation finance is to contribute to the US$ 100 billion commitment. However, if the aim is

[41] This chapter is based on the paper Pauw (2017): Mobilising private adaptation finance: developed-country perspectives. *International Environmental Agreements: Politics, Law and Economics (17)1: 55-71.*

adaptation in practice, both ambiguity and fragmentation might actually make the climate finance system more inclusive and innovative.

7.1 Introduction

Climate change already impacts natural and human systems on all continents and across the oceans (IPCC, 2014a). Developing countries are historically least responsible for the emissions that result in climate change, but most vulnerable to such impacts (Ayers, 2011) with global costs of adaptation being estimated at US$ 280 to US$ 500 billion by 2050 (Watkiss et al., 2016). Developed countries recognise the need for substantial financial resources to meet the costs of adaptation and mitigation, and pledged to mobilise US$ 100 billion annually by 2020 at the UN climate negotiations in 2009 (UNFCCC, 2010). At the recent UN Climate Summit in Paris, countries decided that this US$ 100 billion would be a floor for future commitments (UNFCCC, 2015b).

This chapter focuses on one of the most contested aspects of climate finance: private adaptation finance. Research on this topic so far focuses on its potential and experiences in developing countries (cf. Atteridge, 2011; Intellecap, 2010; Chapters 4 and 5), but not on the arguments of those who introduced and continue to advocate it. This chapter aims to fill this research gap by investigating the positions of developed countries, as well as development banks and agencies. In particular, it aims to identify whether these actors can reach a common understanding of private adaptation finance that minimises norm conflicts in a fragmented climate finance system.

The 'private sector' is a broad concept. This chapter refers to it as all for-profit non-state organisations and individuals in all economic sectors. In adaptation, this ranges from smallholder farmers all the way to multinationals, for instance in construction or finance. These actors can implement and/or finance adaptation. Private adaptation finance is fundamentally different from and more complex than private mitigation finance. The cost per ton of abated greenhouse gas emissions is a useful proxy to measure the effectiveness of mitigation investments. The concept of adaptation, however, remains characterised by epistemic ambiguity (Hall, 2017) and its impacts are hard to measure. It is carried out amid uncertainty about actual and projected climate change; and costs potentially remain with the investor, whereas benefits are

often largely public (Abadie et al., 2013; Atteridge & Dzebo, 2015; Project Catalyst, 2010; as well as Chapters 3 and 5).

Although climate finance does not have a broadly accepted definition (Brunner & Enting, 2014; UNFCCC, 2014a), first attempts have been made to define (mobilised) *private* climate finance (see Brown et al., 2015; Jachnik et al., 2015; Vivid Vivid Economics, 2015). The best definition of publicly mobilised private adaptation finance is probably from Brown et al. (2015, p. IV): 'private finance invested as a result of adaptation-related public interventions, which can typically take the form of finance or policies'. However, this definition does not resolve contentious issues about the type of actors (which could include institutional investors, insurers, banks, philanthropy, and other instrument) or finance instruments (which could include bank loans, bonds, insurance, etc.). Furthermore, it does not explain how it can prevent public interventions from creating inappropriate subsidies or crowding out private actors.

Developing countries are sceptical about private adaptation finance: the potential is unclear given the limited experience, and many countries fear that private finance will replace public finance (cf. Pauw, 2014; Surminski, 2013). The work programme on long-term finance of the United Nations Framework Convention on Climate Change (UNFCCC) pointed out that the current mix of public and private funds mobilised may not meet the needs for adaptation finance (UNFCCC, 2013b). It also shows that private finance is generally inclined towards mitigation, and that an emphasis on private finance could further disadvantage adaptation (for empirical evidence on this, see also Whitley & Mohanty, 2012; Whitley & Mohanty, 2013). Finally, the report calls for improved transparency on climate finance by defining mobilised private finance in the context of the US$ 100 billion commitment (UNFCCC, 2013b).

Despite the unclear definition and limited experience, developed countries push for mobilising private climate finance. For example, in 2008 they established the Pilot Programme for Climate Resilience (PPCR), which explicitly aims to mobilise private co-financing for adaptation projects in developing countries. In 2009 developed countries refused to support the Copenhagen Accord if the private sector was not included as a source of climate finance (Romani & Stern, 2011). Furthermore, in 2013, after a push by developed countries in particular, the Green Climate Fund (GCF) established a Private Sector Facility, which targets

international businesses and capital markets to catalyse clean investments and innovation.

Effective mobilisation of private investments in adaptation partly depends on the governance architecture of the 'climate finance system' at large (Pickering et al., 2017). The term architecture does not presume that there is one architect or regulation from one (dominant) regime only: it is a neutral term and allows for an analysis of policy domains with multiple regimes (Frank Biermann et al., 2009). The climate finance system is highly fragmented, which is an inherent structural characteristic of present-day international relations (Zelli & van Asselt, 2013; 3). Frank Biermann et al. (2009) describe fragmentation as a continuum ranging from a synergistic (higher) to a conflictive (lower) degree of fragmentation. Their typology of fragmentation of governance architecture highlights the importance of 'institutional integration'; 'actor constellations'; and 'norm conflicts':

- *Institutional integration*: the UNFCCC is the core of the climate finance architecture. This is where countries decide on climate finance aims, targets and proceedings. However, this core would be unable to address its main objective – to prevent dangerous climate change – and therefore dysfunctional without its wider spheres (or categories) of institutional fragmentation, including specialised UN agencies (e.g. the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP)); other multilateral as well as bilateral institutions (including the banks and agencies from which experts were interviewed for this chapter – see the method section), climate funds, climate trust funds, etc.
- *Actor constellations*: the abovementioned spheres and actors are only loosely integrated. Beyond the bifurcation between developed countries (providing finance) and developing countries (receiving finance), many actors focus on certain regions (e.g. the Asian Development Bank) or groups of countries (e.g. the Least Developed Countries Fund). Other actors have particular roles, such as funding projects (where the GCF and the many other climate funds also fund particular types of projects) or tracking climate finance (e.g. the Organisation for Economic Co-operation and Development (OECD) and Climate Policy Initiative).

- *Norm conflicts:* between the abovementioned institutions in the climate finance system are abundant. This chapter focuses on the norm conflict on private adaptation finance.

The two sets of actors in the climate finance system studied in this chapter (developed countries and development banks and agencies) are crucial in the climate finance system's architecture. Their control over the financial resources allows them to dominate much of the policy process and lead the debate. Developed countries provide public climate finance and insisted on private finance as a source of the US$ 100 billion commitment. Development banks and agencies, including those represented by the respondents (see Section 7.2) were originally established to serve development purposes and have expanded their tasks to also mobilise, manage and provide climate finance in the last decade in particular. In that sense they are inherited from the development regime (see Delina, 2017). They are predominantly owned by the developed countries and might also represent their interests in private adaptation finance. As empirical data, this chapter first analyses political statements of six developed countries based on 24 submissions to the UNFCCC. Second, the distilled information is triangulated and deepened through expert interviews with development banks and agencies. It is beyond the scope of this chapter to describe individual projects and their effectiveness. Instead, this chapter focuses on institutional interests in private adaptation finance in order to accommodate the views of the targeted sets of actors in the climate finance system.

The next section describes the research method in detail. Section 7.3 provides the results of the document analysis and the interviews in four sub-sections: 1) defining the mobilisation of private adaptation finance and motivations to do so; 2) early experiences; 3) actors, instruments and modalities used; and 4) tracking of private finance in the context of the US$ 100 billion commitment. Section 7.4 concludes.

7.2 Methodology

This chapter first analyses four sets of documents from Canada, the EU, Japan, New Zealand, Norway, and the US on their interests in private adaptation

finance: their Biennial Reports (BR) of 2014 (BR1) and 2015/2016 (BR2);[42] and their submissions on Strategies and Approaches for Mobilising Scaled-up Finance of 2013 (MSF) and 2014 (MSF2).[43]

Biennial Reports are formulated by developed countries only. They should include complete, transparent, accurate, comparable and consistent information on a variety of issues including emission reductions and the provision of financial, technology and capacity-building support to developing countries, and, 'to the extent possible', on bilaterally leveraged private climate finance.[44] Furthermore, developed countries should report on policies and measures that promote the up-scaling of private investment in mitigation and adaptation activities in developing countries (UNFCCC, 2011: §12-22). This may lead to an incomplete picture, since private finance mobilised by multilateral funds including the PPCR, the Global Environment Facility and in the future the GCF are not covered in BRs (Iro, 2014).

Therefore, this chapter also analysed MSF submissions. In the context of the challenge to mobilise US$ 100 billion per year by 2020, developed countries were invited in 2012 to provide information on their strategies and approaches towards this goal (UNFCCC, 2013a: §67). Given the lack of guidelines, submissions vary significantly in structure and length (between 3 and 81 pages).

Only Canada, Japan, New Zealand, Norway, and the US (as countries) and the EU (as a group of countries) submitted all four documents. Together they represent 21 out of all 24 'Annex II Parties': countries that committed to provide climate finance to developing countries in the 1992 UNFCCC. They represent 95% of the

[42] References to those documents in this chapter will be according to these abbreviations: BR1: First biennial reports (UNFCCC, 2014c); BR2: Second biennial reports (UNFCCC, 2016). All submissions are also listed in Appendix 5.

[43] References to those documents in this chapter will be according to these abbreviations: MSF1: Submissions from Parties to the COP (UNFCCC, 2013c); MFS2: Submission Portal (UNFCCC, 2014d). All submissions are also listed in Appendix 5.

[44] 'Leveraging' and 'mobilising' are often used interchangeably (see e.g. Brown et al. 2011; Stadelmann et al. 2011). Following Caruso and Ellis (2013), this paper uses the term 'mobilise' in the political context of the US$ 100 billion climate finance commitment; 'leveraging' is used only in reference to financial instruments. It mostly refers to private finance (see Table 7-2).

Gross Domestic Product, 96% of the emissions, and 97% of the population of the Annex II Parties (World Bank, 2015).[45]

Second, findings were triangulated and deepened through semi-structured interviews with climate finance and adaptation experts from bilateral and multilateral development banks and development agencies between November 2014 and March 2015. Here, the focus is on organisations that are predominantly or fully owned by developed countries and inherited from the development regime (i.e. not climate funds such as the GCF or the Adaptation Fund). Given their donor-drive decision-making processes, these organisations are more likely to argue in line with developed-country interests (see Gupta, 1995; Kilby, 2006; Neumayer, 2003). The interviews were essential for two reasons. First, the analysed documents are likely to be partly politically motivated. Although this helps to understand the framing of developed countries, it might be at the cost of content. Second, policies do not only live in the formal texts that define them, but also in ways in which they are applied on a daily basis in the forms of rules, local practises, procedures and guidelines. The interviews addressed both issues by adding important practical and experience-driven information. Thirteen experts were interviewed from the Asian Development Bank (ADB), Agence Française de Développement (AfD), Deutsche Investitions- und Entwicklungsgesellschaft (DEG), European Investment Bank (EIB), Inter-American Development Bank (IDB, two interviews), Global Environment Facility (GEF), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ, two interviews), International Finance Corporation (IFC) of the World Bank Group, Japan International Cooperation Agency (JICA), Kreditanstalt für Wiederaufbau (KfW), and USAID. This limited number of semi-structured interviews allowed for an in-depth, 'within-case' analysis to better understand causalities (cf. Gschwend & Schimmelfennig, 2007). Only experts from donor organisations were interviewed because this chapter investigates the positions of developed countries and development banks and agencies.

Draft interview questions were first discussed with three researchers working on adaptation and global environmental governance and were pre-tested with a climate finance expert from a development bank (not included as an

[45] The EU is an Annex II Party, but not all its Member States are. These percentages do not include those EU countries that are not Annex II Parties, such as Poland and Slovakia.

interviewee). The interviewees were carefully selected. Just like the author, most also observe and participate in climate finance workshops and conferences within and outside of the UNFCCC regime. Some interviewees were recommended by their peers or superiors. All interviewees are either actively involved in adaptation projects, or have in-depth knowledge about their organisations' projects because their position requires this. The sample of interviewees is representative: it covers a large share of a limited target group that is active in many different regions in the world. The interviewees were guaranteed anonymity in order for them to speak more freely.

7.3 Political and practical interests

This section describes motivations to mobilise private adaptation finance; recent practices; actors, instruments and modalities; and tracking of mobilised private adaptation finance in four subsections. Each sub-section provides the interests of developed countries (based on the BRs and MSFs); critical reflections by respondents from development banks and agencies; as well as implications of the results for the climate finance system based on the fragmentation typology by Frank Biermann et al. (2009).

7.3.1 Motivation for private adaptation finance

All analysed countries intend to mobilise private finance in order to reach the US$ 100 billion commitment. The EU (MSF1; 63) describes it as 'a key part' and Japan (MSF1; 1) as 'essential'. Japan (BR2) states to have mobilised US$ 3.6 billion of private finance from 2013 to 2014, but this was predominantly mitigation finance.

Most countries provide additional motivations for mobilising private finance (see Table 7-1). The EU, New Zealand and Norway consider private finance key to limit global warming to 2°C. The EU, New Zealand, Norway and the US mention the importance of the private sector for countries' transition to low-carbon and resilient economies. Some countries make it clear that public funding alone is insufficient for the challenge of climate change. The US (BR1, BR2) calls its public resources 'significant, but finite' and Norway (BR2) points out that the dominant global financial flows are private. Japan furthermore states that private finance is 'crucially important' for large investments, such as infrastructure projects (BR1, BR2).

Despite arguing for the importance of mobilised private finance, countries do not define mobilised private adaptation finance in their submissions. The interviews confirm this. Only two respondents stated that developed countries sufficiently define private adaptation finance. The first stated that the OECD's Development Assistance Committee (DAC) offers tangible criteria to measure public climate finance, which should be elaborated to include private finance in the future. The other respondent states that a vague definition can be interpreted in multiple ways, thus allowing his organisation to be opportunistic. Ambiguous policies that leave room for interpretation can indeed help international organisations to be more functional and have more power (Best, 2012). Such ambiguity, however, also contributes to a proliferation of activities labelled as adaptation and difficulties in tracking and monitoring adaptation assistance. Most respondents stated that adaptation is a vague concept; five respondents emphasised that the UNFCCC has not defined private adaptation financing. Four respondents stated that at least there should be a differentiation between private investors (providing adaptation finance) and businesses that implement adaptation; and between sector types and private actors (e.g. small enterprises and infrastructure).

	Meet US$ 100 billion commitment	Transition to low-carbon and resilient economies	Meet 2°C target	Finance large-scale projects
Canada	2	0	0	0
EU	3	3	1	0
Japan	2	0	0	2
New Zealand	1	1	2	0
Norway	1	2	1	0
US	1	2	0	0

The numbers in the table indicate the number of submissions (0-4) by a country that provides this motivation.

Table 7-1. Developed-country motivations to include the private sector as a source of climate finance as described in BR1, BR2, MSF1 and MSF2.

The respondents are sceptical about developed countries' motivations for mobilising private finance for adaptation. Several respondents interpret the emphasis on private finance as a strong signal to involve the private sector in projects. However, all respondents find the provided motivation of reaching the US$ 100 billion commitment counterproductive. This is considered a global

negotiation issue to which, according to some respondents, both the private sector and project managers at development banks are indifferent in their day-to-day activities. Several respondents furthermore state that the '2 degree target' is mitigation-related only. The 'transition', which is more dominant in later reporting, was appreciated. Two respondents point to the important role private finance could play here.

The development banks and agencies instead cooperate with the private sector to fulfil their pre-existing development mission, including sustained creation of jobs, financial sector development and economic growth. Resilience is crucial for development. As one respondent from a multilateral development bank stated: 'a country cannot be resilient if the private sector is not resilient' (Interview, 25 March 2015). Issues such as stability and the prevention of climate refugees, among others, are side benefits. Also, three respondents state that it is impossible not to cooperate with the private sector in one way or another in adaptation projects. These statements refer to businesses that implement adaptation (either autonomous or financed through public climate finance) rather than to private investors (that provide adaptation finance).

In summary: although there is no synergy between developed countries and the interviewed development banks and agencies on the definition of private adaptation finance and the motivation to mobilise it, there is no conflict either. This can be attributed to the ambiguous delegation from developed countries which provides development banks and agencies with flexibility in their adaptation projects with the private sector (cf. Hall, 2017).

7.3.2 Recent practice

The developed country documents analysed in this chapter focus on recent practices with mobilising private mitigation finance and say little about mobilised private adaption finance. Japan mobilised some private adaptation finance through trade insurance and co-financing by the Japan Bank for International Cooperation (JBIC) (BR1). Japan also states that adaptation projects tend to generate relatively little financial return to the private sector compared to mitigation projects, and that numerous adaptation projects do not deliver a financial return at all (MSF1). Canada (BR1; 244) states that 'there are a number of potential barriers to facilitating sufficient private investment'. Yet it hardly describes such barriers or how to overcome them. Canada contributes

much of its climate finance to multilateral organisations (including the IFC, IDB and ADB), thus outsourcing its mobilisation of private climate finance (see BR2).

New Zeeland (MSF1) and Norway (BR1) do report on adaptation projects in cooperation with the private sector. Yet instead of financing, the private sector was implementing projects. This mirrors the differentiation that many respondents refer to in the previous sub-section. Chapter 5 validated this by illustrating that in the agricultural sector in Zambia, the (domestic) private sector can implement adaptation, but few opportunities exist for (international) private financing of adaptation.

Finally, although all countries emphasise the importance of strategy development and capacity building for adaptation, they do not involve the private sector here. For example, the EU does not mention the private sector when it explains its strengthened support for building human and technical capacity (BR1). The US (BR1; BR2) aims to engage the private sector through capacity building and strategy development in developing countries, but examples of its assistance focus on partner governments and civil society, even though the for-profit private sector has much more investment potential than the non-profit private sector. Finally, Japan (BR1; 83) claims to have developed its fast-start finance projects in 'close consultation' but examples of this only refer to developing-country governments and international organisations.

Although respondents confirmed that there is very little experience with leveraging private adaptation finance, two-thirds reported examples of public-private cooperation on adaptation, either with private investors or with businesses that implement adaptation (actors, instruments and modalities will be discussed in the next subsection). Examples were provided in the following sectors: agriculture (five times); water management; water intensive industries; infrastructure (all twice); insurance; financial sector; and tourism (all once). Such cooperation leads to private implementation of adaptation, and inherently to private expenditure, too. Yet the respondents could usually not tell how much the private counterpart spent on adaptation. Indeed accounting of such expenditure as private adaptation finance is difficult (Atteridge & Dzebo, 2015; Brown et al., 2015).

Only one development bank official mentioned an example where private finance was leveraged – with a ratio of 1:2. The bank covered the full incremental costs of adaptation and the private investor only covered the business-as-usual investment. Discussions on the share of such investments that could count as adaptation finance have hardly started (see Section 3.4; Hall, 2017). Respondents generally see possibilities to mobilise private investments when co-benefits can be created, such as reduced water or energy use. In this context, they mention water management (two times); tourism (once); and agriculture (once). Furthermore, respondents mention service sectors (e.g. insurance, information services, risk assessments (all once)) and large-scale infrastructure projects with revenue streams such as toll roads (once).

Most respondents stated that it is crucial for private sector involvement in both financing and implementing adaptation to build capacity (six times); raise awareness and provide information (three times); provide guidance in initial phases of projects (twice); and demonstrate successful adaptation to promote up-scaling and replication (once). Some respondents stated that although the private sector might have experience with weather-related disasters such as heat waves and floods, they still need to develop greater awareness and understanding about climate change. One respondent stated that public-private partnerships can be a good vehicle here. For example, the IFC financed a US$ 200,000 study on adaptation options for a port in Colombia. Its outcomes led to a private US$ 30 million investment, financed through a commercial loan (see Excursus 7-1). Furthermore, three respondents emphasised that capacity building also helps the public sector to better understand the private sector interests in adaptation.

Excursus 7-1. Terminal Marítimo Muelles El Bosque (Colombia) invests US$ 30 billion in adaptation based on a publicly financed risk assessment (based on Druce et al. (2016)).

Terminal Marítimo Muelles El Bosque (MEB) was established in 1992 as the first privately owned maritime terminal in Colombia. In 2011, the IFC Adaptation Programme analysed the potential risks and opportunities from climate change for MEB, including financial, operational and health and safety risks (see Stenek et al., 2011).

The IFC identified increased seawater flooding of port areas as the highest risk: the cost of flooding on the causeway (under an accelerated sea level rise scenario by 2030) was estimated at US$ 2,040,000. The IFC recommended to raise the causeway by 20 cm at a cost of US$ 380,000

(with no discount rate). Overall, the net present cost of adaptive management option was below the net present cost of the 'one-off adaptation' option for discount rates above 0,2%. Other potential cost-saving opportunities were reduced dredging requirements through mangrove regeneration. Under an accelerated sea level rise, the increased draft would decrease the volume of material to be dredged, reducing dredging costs by US$ 325,000-400,000 by 2100. The IFC study also stated that climate change will more likely lead to increased maintenance costs or reduced useful life of the port rather than significant damage costs that would be covered by insurance (Stenek et al., 2011).

The study on environmental performance addressed the information asymmetry: As a direct response to this study, MEB announced plans for US$ 30 million adaptation investments in two ports, including US$ 12 million that had already been invested (Becker et al., 2013), financed through a commercial loan (Druce et al., 2016).

This section demonstrated that most cooperation with the private sector on adaptation relates to implementation (and inherently to private expenditure on adaptation) so far, rather than private adaptation financing. Although this might conflict with the first aim in Table 7-1 (reaching the US$ 100 billion commitment), it does not conflict with the second aim (mobilising private investments for a transition towards climate-resilient economies). Furthermore, the conflict on the mobilisation of US$ 100 billion of climate finance, and the perceived importance of capacity building indicate a cooperative but incomplete actor constellation. Many private actors have a limited understanding of adaptation, and an even lower awareness on (discussions about) private adaptation finance at the UN climate change negotiations (Pauw et al., 2015).

7.3.3 Actors, instruments and modalities

Most analysed countries acknowledge that they have to move forward together and with the private sector in order to reach the US$ 100 billion commitment. The countries also emphasise the importance of enabling environments. However, neither the 'partnership' nor the enabling environments are elaborated in detail.

Canada, Japan, and the US point to the importance of multilateral channels to leverage private finance. In their MSF2, the EU, Japan and the US signal the importance of the newly established Private Sector Facility of the GCF. The EU (MSF1) focuses on support for small and medium enterprises in developing

countries. Most emphasis, however, is on both domestic and developing country governments that need to create an enabling environment for the mobilisation of private adaptation finance. Stenek et al. (2013) structure enabling environments along the following five categories: 1) provision of (weather and climate) data and information; 2) institutional arrangements (e.g. partnerships); 3) conducive policies (e.g. technical standards and zoning regulations); 4) economic incentives (e.g. taxes and subsidies); and 5) communication and technology (e.g. encouraging knowledge and technology transfer). These are generally to be addressed domestically, but they can also be organised or supported internationally (see Chapter 5).

Domestically, for example, the EU (MSF1, BR1) plans to mainstream climate policy into public and private investments to reduce risks of investments, build capacity, and develop a project pipeline. In an international context, Canada (BR1) considers capacity building and the development of financeable projects an effective use of climate finance. New Zealand (MSF1) proposes to increase private adaptation finance by encouraging and supporting developing countries to develop strategies in order to provide the private sector the confidence and policy certainty to make investments. The EU (MSF1; 2) also states that 'countries with a sound climate policy framework are well positioned to attract international and domestic climate finance' and supports developing countries to build capacity to attract climate finance.

The US, Japan and Norway take a harder stance. The US emphasises developing countries' own responsibility when stating that 'strategies for mobilising finance in and to developing countries will be incomplete without developing countries doing their part to strengthen domestic enabling environments' (MSF1; 3). Japan (MSF1) explicitly mentions the limited enabling environment in developing countries (including hard and soft infrastructure) as a main barrier for scale up of private finance in climate change mitigation and adaptation. Norway goes one step further. According to Norway, effective climate action by developing countries and these countries' steps to improve enabling environments (which should be 'fuelled by national self-interest') are even a requirement for the US$ 100 billion commitment to be met (MSF1; 7). This statement puts the responsibility to mobilise finance partly in the hands of the recipients.

All respondents acknowledge the importance of a favourable enabling environment for adaptation. On a very practical level, two respondents for example stated that it would be useful to list and describe all potential adaptive measures – in particular those that lower the costs of production – and to showcase replicable and easy-to-understand projects.

However, respondents put more emphasis on the importance of the broader context when implementing adaptation projects with the private sector for three reasons. First, three respondents point out that much of the enabling environment for private climate finance actually depends on the general business environment. This goes beyond the five categories of Stenek et al. (2013), and also includes, for instance, low levels of bureaucracy or good transport and IT infrastructure.

Second, respondents emphasise that enabling environments should encompass more than adaptation alone, because both public and private actors are often unfamiliar with the concept of adaptation. Two respondents note that the specifics of private adaptation are unclear even to countries that make an effort to create an enabling environment for private climate finance. Two other respondents state that it is irrelevant for the private sector whether investments that contribute to adaptation (based on expert judgement) are actually labelled as such. In general, most respondents themselves also refer to increasing resilience and reducing vulnerability, rather than to adaptation.

Finally, respondents pointed to the difference between global climate negotiations and the level of project implementation. For example, the analysis above demonstrates that enabling environments for private investments are imperative for developed countries at the UNFCCC negotiations. Here, there is a norm conflict with many developing countries: four respondents stated that many developing countries oppose the general notion of private adaptation finance at the UNFCCC negotiations (the author also observed this repeatedly). However, on the level of implementation, such political standpoints on private adaptation finance are less relevant. Half of the interviewees were under the impression that developing countries even prefer private investments over public finance, given that the private sector can create longer-term jobs, economic development and tax revenues.

Instruments to leverage private finance that countries mention are skewed towards mitigation. The analysed submissions scarcely mention instruments to leverage private adaptation finance and generally not describe details (see Table 7-2). Canada (MSF1; 3) for instance writes that 'insurance and other market-based approaches can help address those adaptation risks that are financeable'. Japan (MSF1) mentions concessional loans and insurance mechanisms. More concretely, Japan is working on stand-by loans for disaster recovery and weather-related insurance provided by private companies. The EU (MSF1) states that it has finance instruments that target specific market failures and that are designed not to crowd out or over-subsidise the private sector. It describes the use of grants to leverage public finance (including Official Development Assistance) and private sector financing though regional blending mechanisms. Instruments for this purpose include grants, technical assistance, interest-rate subsidies, risk capital and guarantees. Although the blending facilities have mainly supported public investments so far, the EU intends to increase the use for facilitating private sector participation.

Canada (MSF1), New Zealand (MSF2) and the United States (BR1; BR2) state that public grant support should be considered where affordable market-based financing is not available, for example for adaptation in the poorest and most vulnerable countries. Yet the US (BR1; BR2) also turns the argument around by stating that such means can be made available if private finance can be leveraged more efficiently elsewhere. Canada (MSF1) furthermore states that non-grant financing, including (concessional) loans, should be the primary choice in middle-income countries or where the private sector is involved. Japan (MSF1; 3) on the other hand separates public and private responsibilities (and consequently financing) when it states that 'private companies basically seek to invest in projects which deliver a financial return without receiving public assistance', but that the private sector does expect public support through enabling environments in developing countries.

Finally, all countries use non-financing instruments such as technology transfer and capacity building. However, solely the United States (BR1) and Norway (BR1) mention this instrument in the context of leveraging private finance with examples on mitigation only.

	Canada	European Union	Japan	Norway	United States of America
Non-financial instruments		2	2	1	2
Grants	2	2	1		2
Guarantees		2	1		2
Concessional loans	2		2		
Insurance	2		2		
Loans	2		2		
Export credit	1				1
Lines of credit		1			

A '2' (in dark grey) indicates a country elaborates on an instrument at least once. A '1' (in light grey) means a country mentioned an instrument without elaborating on it. New Zealand did not describe specific instruments.

Table 7-2. Financial instruments to leverage private adaptation finance, as described in BRs and MSFs.

Respondents provided different views on financial instruments. First, they did not mention examples of export credit and guarantees. A potential explanation is that they these instruments are not within their mandates.

Second, respondents put more emphasis on loans (mentioned six times) and lines of credit (three times). Through the latter, development banks finance local private banks and other intermediaries in developing countries, which on-lend the credit to private end-borrowers that would otherwise struggle to get finance. However, two respondents from development banks state that it is not in their mandate to finance the private sector directly.

Finally, in contrast to the analysed developed countries, most respondents emphasise that technical assistance is crucial in projects, and one respondent mentions green bonds. Technical assistance, both for financial institutions and for those who implement adaptation projects, can be financed through grants. Bonds are mentioned in the context of cities with comprehensive adaptation strategies. If related adaptation measures have a return on investment, or if a city plans to finance them publicly anyway, bonds could frontload investments.

To summarise the implications for the fragmented climate finance system: developed countries and the development banks and agencies shared the norm

that enabling environments are important to mobilise private adaptation finance and private adaptation implementation. However, there were different views on the importance of enabling environments for adaptation, even between countries. Just like the minor differences in the instruments that countries and development banks and agencies refer to, this does not cause conflicts for the institutional integration, norms, or actor constellations. A more important contrast, however, seems to be that at a local level, development banks and agencies perceive that they have synergies with developing countries when it comes to adaptation projects with the private sector. In global climate change negotiations, however, there is a norm conflict between developed countries (advocating for private finance) and developing countries (disapproving of it).

7.3.4 Tracking private adaptation finance

Measurement, reporting and verification (MRV) of climate finance helps to gain a better overall understanding of its scale, distribution and use. It is technically complex and touches upon highly political and sensitive definitional questions. Currently, there is limited publicly available data on private adaptation finance mobilised by public interventions in and to developing countries (UNEP 2016), and there is no agreed definition on how to account for private adaptation finance (Brown et al., 2015; Buchner et al., 2015; Vivid Vivid Economics, 2015).

The EU (MSF1) emphasises the need to advance towards an agreed definition, as well as accounting and monitoring, of private climate flows. It mentions the complexities surrounding data availability, the multitude of actors involved, diverse channels of finance and rapidly fluctuating activities. According to the EU (MSF1; 26), a common understanding of private climate finance is necessary to ensure transparency and trust. The EU expresses support to on-going research on this matter, and, just like Japan (MSF1) and Canada (MSF1), states that this process should be gone through in close cooperation with other donors.

Canada (MSF1), Norway (MSF1) and New Zealand state that there should be a focus on outcomes; according to New Zealand (MSF1) this would ensure that the results of climate finance interventions can be tracked and reported. Norway (MSF1) states that a focus on outcomes also makes developing country partners accountable for reaching desired climate results.

New Zealand and the US also criticise tracking. For example, New Zealand (MSF1) states that burdensome reporting and application procedures can deter uptake and further mobilisation of climate finance. The US points to the range of actors involved and the vast variety of financing tools and policies needed to enable mitigation and adaptation activities. According to the US (BR1; 1), this should be recognised, 'rather than seeking overly simplified solutions focused on a particular delivery channel, sector, or financing approach'. At the same time, however, the US only describes three financial instruments in their submissions (see Table 7-2).

All respondents' organisations report their climate finance contributions using the OECD-DAC Rio Markers. Although these markers were originally introduced by the OECD DAC to indicate donor's environmental policy objectives in development cooperation (Iro, 2014), they are also used to measure climate finance. Some respondents state that their organisations also monitor and report because of internal targets on financing (for instance renewable energy or climate, twice); because they intend to demonstrate that the organisation is an important player in climate finance (twice); or because of accountability towards taxpayers (once).

However, only four respondents mentioned that their organisation reports on mobilised private adaptation finance, stating how difficult this is. The respondents provided three reasons for this. The first is internal lack of preparedness. One organisation undertook a reporting exercise before the UN Climate Summit in New York in 2014. According to the respondent, this exercise clarified that there is currently no information available concerning mobilised private adaptation finance. Future monitoring and reporting would require a new system to be built up. The second reason is limited willingness from the private sector to undertake MRV. Apart from an administrative burden, two respondents also mentioned confidentiality and competitiveness as potential issues for the private sector. As a third reason, three respondents mentioned that without a clear definition of adaptation finance, MRV will be difficult and perhaps not very useful. For example, two respondents state that their institution covers the incremental costs of adaptation. For instance, one development bank covered the costs to climate-proof a road. Strictly speaking, the private sector's share (the road itself) is not invested in adaptation. In another example, three respondents highlighted that the MDBs currently use

different methods in their common reporting system. This system (see EIB, 2014) takes vulnerability reduction as a starting point rather than adaptation, which could result in an overestimate of mobilised adaptation finance. Reporting based on different methods cannot provide final answers in terms of contributions to the US$ 100 billion commitment.

In terms of the climate finance system, the most conflictive consequences of fragmentation identified in this chapter relate to the accounting of mobilised private finance towards the US$ 100 billion commitment. Such accounting would require a cooperative (if not synergistic) actor constellation. However, respondents see limited willingness from the private sector to be part of MRV in the climate finance system. Furthermore, respondents use different reporting systems themselves. Finally, developed countries disagree on the importance and aim of tracking mobilised private finance.

7.4 Discussion and conclusion

This chapter analysed the position of developed countries as well as development banks and agencies towards private adaptation finance. It proves that there is a discrepancy between the former's position in submissions to the UN climate negotiations, and the latter's understanding and local implementation of private adaptation and adaptation finance (see Table 7-3). This chapter demonstrates that this discrepancy is a consequence of the fragmented climate finance system.

In submissions to the UNFCCC, developed countries focused on the private sector in general. They aim to mobilise private finance to reach the US$ 100 billion commitment, and for a transition to low-carbon and climate-resilient economies. At the level of implementation, these objectives proved to be too abstract. Here, respondents' organisations instead cooperated with the private sector to implementation adaptation actions, in order to increase resilience or reduce vulnerability.

Furthermore, at the level of implementation, development banks and agencies perceive that they have scope for cooperation with developing countries: they had the impression that developing countries also aim to include the private sector in adaptation projects, as it can create jobs, economic growth, and tax revenue. In the global climate change negotiations, however, norm conflict

remains between developed countries (advocating for private finance) and developing countries (often disapproving of it).

	Level	
	Developed country communication to UN climate negotiations	**Implementation according to respondents from development banks and agencies**
Main motivations for private engagement	• Mobilise US$ 100 billion p.a • Transformation to low-carbon and climate-resilient economies	• Implementation of projects • Sustained creation of jobs • Development of the financial sector • Economic growth
Private actors involved	• 'Private sector' in general • No differentiation between private sector financing and implementation	• Predominantly private implementation of adaptation (rather than finance) • Need to specify sectors • Need to specify types of private entities
Perception of position of developing countries	(Not included in submissions)	Private-sector engagement wanted, sometimes preferred over public finance as it can create jobs, tax revenue and economic growth

Table 7-3. Discrepancy on private sector engagement in adaptation finance between developed countries' submissions to the UN climate negotiations and the respondents of development banks and agencies.

Second, in line with Pauw et al. (2015), this chapter concludes that the diplomatic UNFCCC language around private adaptation finance differs from the private sector reality. Respondents stated that the private sector has a low awareness of political aspects and conceptualisations of adaptation, but that it does have practical experience in dealing with climate-related hazards such as heat waves and flooding. As the private sector seeks to address such hazards, the respondents do see potential for private investments in resilience in a variety of sectors, including in developing countries. According to the respondents, technical assistance could increase the private sector's understanding of climate change and stimulate private investment in adaptation. This need for technical assistance, in combination with the limited mobilisation of private adaptation finance so far, demonstrates that the private sector is not integrated in the climate finance system. One limitation of this study is that private-sector actors were not interviewed themselves. This was

not necessary for the aim of this chapter, but it would be necessary for a more comprehensive analysis of the private sector's limited integration in the climate finance system.

The abovementioned discrepancy illustrates how fragmented the climate finance system is. It also demonstrates the epistemic ambiguity around concepts such as 'private adaptation finance', 'enabling environment' and 'mobilising' (see also Hall, 2017). As long as such concepts remain ambiguous, actors' key norms can differ without conflict. This could facilitate the inclusion of a broad set of actors and policy approaches. It may also enhance innovation at the level of a public agency and increase innovation in the entire system (Frank Biermann et al., 2009).

However, if the aim of mobilising private finance is to reach the US$ 100 billion commitment, the climate finance system requires a more static and integrated architecture. It would need clear definitions on concepts (including mobilised private adaptation finance); accounting rules (what counts?) as well as attribution rules (who mobilised?). This will cause norm conflicts between important actors, given the technical difficulties in quantifying the mobilisation effect of public interventions (see Brown et al., 2015; Jachnik et al., 2015) and political struggles in agreeing on how to account for private finance as part of the US$ 100 billion commitment in the UNFCCC regime. Furthermore, it would require a cooperative (if not synergistic) actor constellation, but respondents perceived a low willingness from the private sector to be part of the climate finance system.

Alternatively, the aim could be output: maximising the mobilisation of effective private investments (rather than finance) in resilience and reducing vulnerability, regardless of whether these could constitute climate finance or not. In addition to the historical focus on support for private investment at the project level (e.g. through grants, concessional lending and equity investments that can be accounted for), such 'aiming for output' could also address the increased awareness of the need for interventions at market level (cf. Whitley, 2014a). An analysis of the idea that the private sector can make a substantial contribution to adaptation finance can still be performed at a later stage once additional practical experience exists.

Adaptation finance is not an end in itself, but only a means towards adaptation. Rather than being fixated on reaching the US$ 100 billion commitment, the climate finance system should aim for adaptation output. This might also enhance innovation and include more actors in the system.

8 Conclusions

Private financing is the latest mark of the privatisation of global governance. International agreements in the fields of environment, climate change and development have always been characterised by a strong division between developed and developing countries, where the former traditionally supports the latter financially. Chapter 2 demonstrated that this tradition is disrupted: in 'Phase III', which started with the 2009 Copenhagen Accord of the UN climate negotiations, negotiation outcomes increasingly envisage private finance to support the implementation of international agreements. It might be a new example of institutions of a society that are being subordinated to the logic of the market economy (e.g. Polanyi, 1957) – yet, the potential and effectiveness of the transmutation from public to private finance remains intangible.

This doctoral dissertation examined private adaptation finance as a particularly important example of implementation of international agreements through private financing, for three reasons. First, adaptation is of crucial importance for developing countries to address one of the biggest challenges of our time: climate change. Second, climate finance is very important for both providers (developed countries) and recipients (developing countries), because it currently occupies the lion's share of public funding for the implementation of international environmental agreements (Pickering et al., 2017) and overlaps to a large extent with development aid (OECD, 2014b). And third, scientific and political debates on private adaptation finance have only emerged in recent years and openly question the potential of private finance to address adaptation in developing countries is (Atteridge, 2011; Carty, 2013; Fry, 2013; Pereira, 2013; Pereira et al., 2013; Withey et al., 2009). Experience is negligible; and as Chapter 1 explains, the underlying concepts of 'adaptation', 'private sector' and 'climate finance' are so ambiguous that a clear understanding of the potential and effectiveness of private adaptation finance is inhibited.

Chapter 2 reduced some ambiguity by putting the concept of private adaptation finance in an historical context. Its examination of 22 post-World War II international agreements demonstrated that the move towards private financing in the climate change negotiations does not stand on itself, but that it is also institutionalised in, among others, the outcome of the United Nations Conference on Sustainable Development (see Section 2.3.6) and the Sustainable

Development Goals (see Section 2.3.4). Chapter 2 contextualised the ongoing privatisation of global environmental governance through theories on liberal environmentalism, ecological modernisation and commodification. These three concepts will also be used to provide a deeper theoretical basis for conclusions in Sections 8.1 to 8.6. Political and conceptual ambiguity is further reduced in Chapters 3 to 7. Chapter 3 provides a state-of-the-art overview of private adaptation finance in developing countries. Chapters 4 to 7 analysed the interests of the actor groups that dominate the conceptualisation and institutionalisation of private adaptation finance: developing countries (as recipients, in Chapters 4 and 5), the private sector (Chapter 6) and developed countries, development bank and -agencies (as providers, in Chapter 7).

In this chapter, I will return to the central research question posed in Chapter 1 (see Box 1-1): *Under what conditions can private finance effectively support adaptation to climate change in developing countries?* In addressing this question, the following three sections will first address the three sets of research questions on *accountability*; *effectiveness* and *allocation* (see Box 1-2). Section 8.4 and 8.5 provide theoretical reflections as well as suggestions for future research on private adaptation finance. Finally, Section 8.6 reflects on private finance in general (not only adaptation). Based on three potential motivations for the transmutation towards private financing for the implementation of international agreements, it discusses the potential implications for developing countries.

8.1 Accountability of private adaptation finance is low

In order to understand whether the private sector can be held accountable for financing adaptation (Research question 3), it is important to first understand the private sector's motivations to invest in adaptation (Research question 1) and the kinds of actors that might finance adaptation (Research question 2).

In very general terms, Section 1.3 anticipated that the private sector will not finance adaptation according to the accountability standards for public adaptation finance. Three reasons are identified. First, motivations for financing vary. It is likely that public climate finance is partly driven by geopolitical rationales (just like development finance, see Excursus 2-1). But it is also driven by solidarity and responsibility towards vulnerable communities in developing countries. Private investments, however, are driven by reasonable, relatively

quick and predictable returns, at acceptable risks (Atteridge, 2011; Christiansen et al., 2012). Second, businesses are often not familiar to the academic or political concept of adaptation (Berkhout et al., 2006; Dzebo & Pauw, 2016; Pauw & Dzebo, 2016). When the private sector adapts, it is usually not its main objective, or done unconsciously. And third, policy makers' understanding of private adaptation and private adaptation finance is low, given that these are new on policy and research agendas, which makes public-private cooperation difficult.

Nevertheless, in addressing research questions 1 and 2, this doctoral dissertation collected evidence of private sector activities and finance for adaptation which helps to answer question 3. A theory on private sector motivations to adapt was created based on Chapter 4, a case study (Chapter 5) and business cases by the private sector itself (Chapter 6). This theory identifies two broad categories of private sector motivation for engagement in adaptation (see Figure 5-3):

- **Climate risk management** mainstreams adaptation in business practice to protect revenues and to prevent future costs from both direct and indirect risks caused by changing climatic conditions. This represents a rationalisation of production and consumption patterns as discussed in ecological modernisation theory. In line with Christiansen et al. (2012) and Smit and Wandel (2006) this dissertation demonstrates that private actors make significant investments to address climate risks, but generally not in the form of stand-alone adaptation projects. For example, 65% of the business cases in Chapter 6 aim to mainstream climate risks into their operations, for example by reducing water use or securing a supply-chain. Conservation farming and irrigation are further examples provided in Chapter 5. In particular those interventions that address indirect risks of climate change or distant exposure (see Figure 5-1) are hard to label as adaptation. A considerable share of such contributions to adaptation might pass unnoticed. What is under the radar of the climate finance regime cannot be held accountable.
- **New markets and business opportunities.** First, climate change alters market demands in every sector, including agriculture, communication and water management (Khattri et al., 2010; Oxfam America, 2009; Persson & Klein, 2009) (see Table 5-1). Second, more public finance for

adaptation generates more projects: both for those private actors that already implement 'traditional' projects such as dike strengthening and road improvement, as well as for specialised companies that understand climate risks and take these into account during project design and implementation. Of all business cases analysed in Chapter 6, 54% describes new market opportunities, including the selling of adaptation products and planning services. The changing market demands are caused by a rationalisation of production and consumption patterns as discussed in ecological modernisation theory. The changing market demands are created by a new market to trade adaptation/adaptation benefits as a commodity (see Section 8.3).

One important finding of this dissertation is the large gap between the plethora of private adaptation activities and limited (known) private adaptation finance. Under both the above-mentioned motivations, a variety of examples of private adaptation *activities* were identified, but hardly any of private *finance*. For example, the National Adaptation Programmes of Action (NAPAs) analysed in Chapter 4 mentioned the private sector mostly as an implementing partner, for its management and organisational skills, or for research and development – not in the context of finance. Chapters 5 and 6 identify examples of private interventions that contribute to adaptation – yet the financing aspects mostly remain undisclosed. In Chapter 7, two thirds of the interviewees reported examples of public-private cooperation on adaptation. Three interviewees state that it is impossible not to cooperate with the private sector in one way or another in their adaptation projects. Yet, only one respondent was able to quantify the investment by the private partner.

In the case of private adaptation finance, the limited information automatically implies accountability is low. Voluntary registration and tracking of private climate investments is still scarce (see Section 1.3.3) and formal methodologies to track private finance do not exist (see Atteridge & Dzebo, 2015; Brown et al., 2015). The business cases of Chapter 6 describe adaptation activities all over the world and in every sector (see Appendix 4Appendix 4), but they are not verified by the UNFCCC, let alone that the private actors are held accountable for implementing the business cases or their adaptation effectiveness. In that sense they are stereotypical for liberal environmentalism: through the portal of the Private Sector Initiative the business cases enabled private adaptation to rise to

a more prominent place on the international agenda, but the results of the business cases remains unknown and the private actors are not held accountable (Bernstein, 2002; De-Shalit, 1995). The business cases also do not allow for a third party to hold them accountable: in terms of finance in particular, the transparency concerning generation, governance, delivery and use of resources is very limited (see Excursus 6-3). Therefore, the short answer on research question 3 is 'no': the private sector is currently not held accountable for adaptation finance or adaptation expenditure. Accountability could be improved, although it is unlikely to ever cover all private sector activities that contribute to adaptation. As I will explain in the more forward-looking Section 8.4, a future accountability framework could cover private adaptation financing better, but its development and implementation would face technical and political difficulties.

At the same time, it should not be ruled out that some private actors implemented their business case in Chapter 6 to comply with (national) regulations on, for example, water quality or nature compensation. In cases where private adaptation overlaps with stated policy goals and regulations, the private actor is indirectly held accountable for adaptation outcomes. Even in these cases, however, the private sector is still not accountable for adaptation *finance* in the context of the UN climate regime. Although this might be problematic for this regime, I submit in Section 8.4 that it is not problematic for adaptation in developing countries.

8.2 Effectiveness of private adaptation finance remains unknown

In order to understand the effectiveness of private adaptation finance, this section addresses research question 4 (on the effectiveness of the institutional design and international and national levels) and research question 5 (on whether the institutional design leads to adaptation outcomes). Effectiveness is by no means a given under liberalism: 'while it allows and encourages discussion of environmental issues, it cannot permit its outcome, namely the implementation, maintenance and justification of environmental policies (De-Shalit, 1995; 83).In hybrid authorities, where authority is delegated to non-nation state actors (see Pattberg & Stripple, 2008), governments must 'contend with relatively autonomous transnational forces' (Nye & Keohane, 1971; 343).

Eight years after the Copenhagen Accord there is still only little experience with mobilising private adaptation finance. Based on Chapters 3 to 5 and 7, three principal impediments can be distinguished in the institutional design. First: the political motivation to mobilise private finance remains unclear. In the particular context of climate finance, Pickering et al. (2015) describe effectiveness in terms of 'adequacy' – or meeting the target to mobilise US$ 100 billion of climate finance annually by 2020. However, developed countries also have other motivations for mobilising private finance (see Chapter 7): a transition towards low-carbon and resilient economies; meeting the 2°C target; and financing large scale projects. Indeed the US$ 100 billion is repeatedly stated the be a 'means to an end, not an end in itself' during Global Forums of the OECD Climate Change Expert Group I participated in (see VII). All interviewees in Chapter 7 consider the reaching of the US$ 100 billion target an unsuitable motivation. Instead, they cooperate with the private sector to fulfil their pre-existing development mission (including sustained creation of jobs and development of the financial sector) in a climate-resilient manner. In fact, the interviewees usually do not know how much private investment their project mobilises. Consequently, the projects score defectively on contributing to the US$ 100 billion (research question 4) – even if the projects result in effective adaptation (research question 5).

The second impediment, is that delegation is ambiguous. Who is meant by 'private sector' is not defined. Ambiguous delegation from developed countries provides development banks and agencies with flexibility in their adaptation projects with the private sector (see Section 7.3.1 and Hall (2017)). Similarly, delegation from the UNFCCC is also ambiguous. The ten criteria for adaptation finance from the Copenhagen Accord and subsequent climate negotiations (see Chapter 6) only have vague and nonofficial definitions. In Chapter 5, the ambiguity allows for a variety of, sometimes contrasting, positions among finance recipients. Zambian government documents expect international private financing for adaptation, for example, in the energy and forestry sectors (GRZ, 2010). Yet interviewed government officials declared that international adaptation finance should consist of public grants from developed countries rather than private loans or investments. Another example: respondents stated that international financial institutions are almost absent in adaptation, but they did mention adaptation activities by the international private sector in sectors including mining, food and beverage and insurance – which might have been

financed by international finance institutions. In general, ambiguity allows actors' key norms to differ without conflict. This could facilitate the inclusion of a broad set of actors and policy approaches and enhance innovation (Biermann et al. 2009). However, the lack of clarity makes mobilisation of private finance challenging in the context of the US$ 100 billion target.

The third impediment is the disconnect between public and private sectors in the climate finance architecture – at least in adaptation. Chapter 4 illustrates that a lack of finance obstructs adaptation in 92% of the NAPAs. Nevertheless, these NAPAs hardly explore the private sector's role in adaptation. Chapter 5 lists private sector activities contributing to adaptation in Zambia's agricultural sector. However, the discussion on private adaptation finance is in its infancy. For example, the climate-relevance of foreign direct investment inflows is unknown (Mulenga, 2013). The disconnect is most apparent in Chapter 6. It demonstrates that the diplomatic UNFCCC conceptualisation of adaptation financing is dissonant from the private sector reality. Even the business cases of the PSI – potentially positively biased, dominated by frontrunners, and 'associated' with UNFCCC processes – do not come close to meeting the ten adaptation finance criteria. In Chapter 7, interviewees also expressed the private sector's low awareness of political aspects and conceptualisations of adaptation – although they did pinpoint the private sector's practical experience in dealing with climate-related hazards such as heat waves and flooding. The implication of the disconnect between public and private sectors in the climate finance architecture is that most private contributions to adaptation cannot be accounted towards the US$ 100 billion target, which in turn confines the understanding of the effectiveness of private adaptation finance.

The institutional design (research question 4) could be made more effective in mobilising private finance by defining it in the context of the US$ 100 billion target. This does, however, not necessarily lead to desired adaptation outcomes (research question 5). Given the lack of is a broadly accepted definition of adaptation and its relation to development, multiple conceptualisations of adaptation co-exist which puts the quality of adaptation practice under pressure (see Ireland, 2012; Mustelin et al., 2013). For instance, in Chapter 5, interviewees mentioned a variety of private activities and investments that potentially contribute to adaptation in the agricultural sector, but their effectiveness in terms of adaptation is unknown. Among the 85 business cases

in Chapter 6, only 53% describes the climate change impacts they are adapting to; and none of the business cases defines what they mean with adaptation. This puts the general belief in 'enabling environments' that governments can create for private investments in adaptation (see Chapters 3; 4; 5 and 7) under pressure. Building on the growing body of literature on private adaptation finance, Dzebo and Pauw (2016) and Pauw and Dzebo (2016) ask: enabling environments can stimulate private investments that contribute to adaptation, but how to comprehend their effectiveness?

The answer to question 5 is that there is currently little evidence that mobilised private adaptation finance leads to desired adaptation outcomes in developing countries. This in itself is additional evidence to answer research question 4: the institutional design currently proves to be ineffective in mobilising substantial amounts of private adaptation finance that can be accounted for under the US$ 100 billion target of the UN climate regime.

8.3 The market cannot allocate adaptation finance in line with UNFCCC intentions

To understand the consequences of the transmutation from public- towards private financing for the implementation of international agreements, the allocation of private climate finance is studied by asking who benefits and who loses from such finance (research question 6) and whether private adaptation finance leads to socially just outcomes (research question 7).

The UNFCCC set two proxies for just allocation: climate finance should be *balanced* between mitigation and adaptation, and it should *prioritise* the most vulnerable developing countries (see Table 6-1). Such allocation is difficult to impose on private finance, and the legitimacy of this imposition is questionable. The UNFCCC does not have the legitimacy to decide that the private sector will finance adaptation. Individual countries can impose it through laws and regulations, but not through a decision at an international level. Instead of allocation based on 'balancing' and 'prioritising', this dissertation illustrated that the private sector makes adaptation decisions based on a revenue narrative. This can overlap with public adaptation needs (see Chapter 5), or in any case

have benefits[46] beyond the private investor (see Chapter 6). Can the private sector's revenue narrative be concordant with meeting the allocation criteria of 'balancing' and 'prioritising'?

First, 'balancing' is discussed. Chapter 1 anticipated that a balanced allocation of private finance is unlikely. The neoliberal market system as such is more suitable for mitigation than for adaptation. Commodification of the atmosphere put a price on CO_2 emissions and opened up markets for mitigation. The Clean Development Mechanism (CDM) is an international market created specifically for reducing emissions; and on national and state levels carbon emission trading markets are developing rapidly around the world (Du et al., 2015). Furthermore, mitigation offers clear opportunities for money gains (e.g. a booming industry in electric vehicles and renewable energy) and a system of demand and supply exists in important mitigation sectors like energy. For example, when prices of renewable energy decrease, investments go up (Buchner et al., 2015). Furthermore, national governments apply a variety of other market-oriented policy instruments to stimulate mitigation, such as feed-in-tariffs and renewable energy auctions. In contrast, adaptation does not meet some of the basic qualifications of the neoliberal market system. First, adaptation credit systems do not exist and it is difficult to put a (tradable) price on adaptation (Persson, 2011). Second, there is incomplete and asymmetric information on both the risks of climate change and the costs and benefits of adaptation (Druce et al., 2016). And finally, many private adaptation investments have positive externalities. This can be considered positively (e.g. 79% of the business cases in Chapter 6 articulate external adaptation benefits), but it can also hold back private investments, resulting in increased public vulnerability (Tompkins & Eakin, 2012).

This dissertation nevertheless demonstrates that the private sector 'allocates' investments in adaptation in every sector and all over the world. It is however important to differentiate between what *contributes* to adaptation and what *constitutes* adaptation (see Chapter 5). *Contributing* to adaptation is broad and concerns all development 'under uncertainty' (Denton, 2010; 655) or 'in a hostile climate' (Romani & Stern, 2011; 4) which directly or indirectly

[46] What can be considered as benefits by the wider community are often 'positive externalities' for the private investor which reduce the return on investment (see Section 1.3.3, Chapter 3 and Druce et al. (2016)).

contributes to adaptation, by increasing resilience or reducing vulnerability. Both Chapters 5 and 6 provide ample examples of private-sector 'contributions' to adaptation in developing countries. Chapter 5 describes significant domestic private-sector activities, both in mainstreaming climate risks in operations (e.g. conservation farming; irrigation) and in capitalising on new opportunities (e.g. marketing of harvests and farming equipment; development of improved seeds). The international private sector contributes too, for instance through corporate social responsibility and investments in sustainable water management. Similarly, dozens of business cases in Chapter 6 contribute to adaptation, such as Ericsson's business case to provide extreme weather forecasts to fishermen on Lake Victoria (see Appendix 4). Private interventions that *constitute* adaptation are much more difficult to find, at least in developing countries. 'Constituting' refers to private stand-alone activities, investment, and financing that specifically target adaptation. For example, in one business case in Chapter 6, small-scale farmers in developing countries are supported by hot beverage company Cafédirect (the buyer of their product) and development agency GTZ to increase the climate resilience of their production (see Excursus 6-1). In terms of allocation, weaker 'contributions' by the domestic private sector are dominant. Based on literature, Section 8.2 already submitted that there is little experience with mobilising private adaptation finance. Empirical evidence from Chapter 4 to 7 support this. Therefore, this dissertation concludes that the allocation is not balanced between adaptation and mitigation.

Private adaptation finance does not prioritise the most vulnerable developing countries either. Chapter 3 reveals that the most vulnerable developing countries have a very low overall inflow of private capital. Chapter 4 shows that Least Developed Countries pay very little attention to private sector engagement in adaptation in their National Adaptation Programme of Action. I argued that this might have political or procedural reasons. However, Chapter 5 analysed Zambia's agricultural sector, a sector that most LDCs prioritise in their NAPA, and concludes that international private finance contributes little to adaptation so far. Only a third of the business cases in Chapter 6 prioritise the most vulnerable developing countries, even though this group consists of 94 countries.

A liberal economic view on adaptation is further compromised – and challenged – by considering additional political objectives such as fairness (see Section

1.3.1: balancing and prioritisation only form part of this) and security of supply of essential goods such as water (Osberghaus et al., 2010). Markets do not make resources available to those who need them, but to those who can buy them (see also Bernstein, 2012). Indeed this dissertation shows that private adaptation investments are not allocated and prioritised in line with UNFCCC priorities. It therefore agrees with Fankhauser and Soare (2013) that it remains a key role of the public actors to assist people that are not able to adapt themselves.

8.4 Conditions for private finance to effectively address adaptation in developing countries

The transmutation towards private adaptation finance fits under the organising principle of economic liberalism. For private financing to function optimally, adaptation (or adaptation benefits) should become a commodity which can be price-tagged and traded on a market. The concept of private climate finance comes from the Global North – developed countries insisted on it. Indeed, economic liberalism as such originates from and is most advanced here (Fukuyama, 1992; Huntington, 1997; Polanyi, 1957). Successful private financing would reduce public finance responsibilities, which benefits the Global North. Yet is it a modern example of 'subordinating' society to the logic of the market internationally, just like land and labour became subordinated to the market under economic liberalism (see Polanyi, 1957; e.g. 74-75; 187)? Or is it a necessity, given the challenge of climate change and the fact that global private finance flows eclipse inadequate public resources? As the central research question asks: *under what conditions can private finance effectively support adaptation to climate change in developing countries?*

The most important condition is that the institutional design of the climate finance regime becomes more static (e.g. detailed general principles which regulate decision making, policies, definitions and accounting) and integrated (e.g. a clear governance architecture, lead by one core institution comprised by and recognized by all countries) – if its aim is to mobilise private finance to reach the US$100 billion target. to provides three reasons.

First, Section 8.1 concluded that the private sector is currently not held accountable for adaptation finance or adaptation expenditure. Accountability is unlikely to ever cover all private sector *activities* that contribute to adaptation,

but finance would need to be accounted better in the context of the US$ 100 billion target. Second, Section 8.2 concluded that the institutional design is currently not effective in mobilising substantial amounts of private adaptation finance that can be accounted for under the UN climate regime; and currently there is no evidence that mobilised private adaptation finance leads to the desired adaptation outcomes in developing countries. Third, Section 8.3 concluded that current allocation of private finance is not balanced between adaptation and mitigation; and does not prioritise the most vulnerable developing countries. The liberal economic view on adaptation is further challenged by considering additional political objectives such as fairness and security of supply of essential goods such as water. These three conclusions demonstrate that the current fragmented climate finance regime is not effective in mobilising private adaptation finance in the context of the USD 100 billion target.

A more static and integrated institutional design would be more effective. However, it would contrast the liberal environmentalism theory approaches of corporate self-regulation and voluntary initiatives which dominated international negotiations since the 1992 United Nations Conference on Environment and Development (see Phase II in Chapter 2). In practical terms, the climate finance regime would have to make two fundamental changes. First, it would require clear definitions on concepts such as private sector, adaptation, and climate finance; and rules to accounting and attribute mobilised private climate finance (which country mobilised how much private finance?). This will cause ideological norm conflicts on political levels between developed countries (advocating private adaptation finance) and developing countries (disapproving it). On a more technical level it will also cause norm conflicts given the difficulties in quantifying the mobilisation effect of public interventions (Brown et al., 2015; Jachnik et al., 2015), even among the advocates of private adaptation finance (see Chapter 7).

Second, the creation of a static and integrated institutional design requires a cooperative (if not synergistic) actor constellation (see Chapter 7). This requires the abovementioned norm conflicts between developed and developing countries to be straightened, which is unlikely. More importantly, the constellation with the private sector needs to be cooperative. However, businesses operate in a competitive environment: not being transparent might

be a strategic decision (Kato et al., 2014). Imposing UNFCCC transparency and accountability standards on private adaptation finance might therefore be counterproductive and reduce incentives for private-sector engagement. It also needs to overwind the disconnect between the private sector and the climate finance regime which currently confines the understanding of the effectiveness of private adaptation finance (see Section 7.4), for example through awareness raising and the creation of enabling environments (see Section 8.4.2) .

8.4.1 Activities instead of finance

It is unlikely that the UNFCCC, with its 196 member parties, can negotiate towards the abovementioned needs for common definitions and a static and integrated institutional design on mobilising private adaptation finance. The most straightforward option would be to monitor and report only private finance which is principally planned to finance adaptation, such as philanthropy or private finance that is directly and explicitly mobilised through publicly financed adaptation projects (see Chapter 7). However, this would dramatically thin out the amount of private investments that can be qualified as adaptation finance contributions to the US$ 100 billion. If developed countries insisted on private financing in the UN climate regime because they aim to significantly reduce their public financing responsibilities, this option will hardly be acceptable to them.

Alternatively, instead of the US$ 100 billion target, the aim of private sector engagement in adaptation could be adaptation output: maximising the mobilisation of effective private investments (rather than finance) in resilience and reducing vulnerability, regardless of whether these could constitute climate finance or not. This is in line with the idea that adaptation finance is not an end in itself, but only a means towards adaptation. Both ambiguity and fragmentation of the climate finance regime are not problematic when the aim is adaptation output – they might actually make the climate finance regime more inclusive (in terms of actors) and innovative (in terms of policy approaches) (see Biermann et al., 2009). There is also less pressure to turn adaptation (or adaptation benefits) into a tradable commodity, because there is no necessity to track and account for it on national and international levels.

Opposition of developing countries might also decrease when focusing on output (see Chapters 5 and 7). Developed countries would oppose this alternative focus initially, but as experience with private adaptation output

augments over time, it paves the way for accounting of private adaptation finance in the medium-term future.

8.4.2 Awareness and enabling environments

In order to move adaptation financing and adaptation activities forward, the private sector has to be aware of its potential role in adaptation. Currently, this awareness is low. It is crucial that the public sector creates both awareness and an enabling environment for private adaptation. Enabling environments can only be developed and optimised in national and sectoral contexts. In general terms, however, enabling environments need to overcome barriers that prevent the private sector from investing in adaptation, which can be financial; information-related; institutional; policy and regulation-related; technological; as well as social and cultural (see Table 3-1 and Druce et al. (2016)). As Chapter 3 illustrates, governments can take both financial and non-financial interventions to stimulate adaptation and reduce maladaptation.

Financial interventions can shift private finance towards adaptation. For example, they can provide grants or concessional loans, lines of credit, or risk-sharing instruments (Atteridge et al., 2016; UNEP, 2011). I believe non-financial interventions are more important than financial interventions, in particular when focusing on adaptation activities rather than finance. Non-financial interventions can help to move away from the historical focus on support for private investment at the project level to broader interventions at the market level (see Whitley, 2014b). Non-financial interventions take the form of policies and regulations that influence both broader and specific financing and expenditure conditions. Stenek et al. (2013) subdivide such interventions in five categories (see Section 3.4.1). For elucidation, practical examples from Chapter 5 are provided for each category in brackets:

1. Provision of data and information (e.g. improved weather forecasts; documentation and workshops on adaptation);
2. Institutional arrangements (e.g. climate change focal points in ministries; improved extension services);
3. Conducive policies (e.g. stimulate land ownership; create farmer cooperatives);
4. Economic incentives (e.g. tax rebates on seeds, fertilisers, irrigation equipment, construction material, ICT equipment);

5. Communication, technology and knowledge infrastructure (running pilot projects; electronic vouchers for discounted fertilizers and seeds).

In addition, Chapter 5 identified the importance of infrastructure for adaptation. Infrastructure can help to improve resilience or reduce vulnerability, even if roads, bridges, storage facilities and agricultural centres are not developed for adaptation per se.

Apart from developing country governments, developed country governments can also stimulate private adaptation through non-financial interventions. Their development agencies and development banks offer experience, capacity building and technical support. Chapters 5 and 7 in particular highlighted that technical assistance could increase the private sector's awareness and understanding of climate change; stimulate private investment in adaptation; and help to integrate the private sector in the climate finance architecture. An additional benefit is that capacity building also helps the public sector to better understand the private sector interests in adaptation.

8.5 Future research on private adaptation

Based on this doctoral dissertation, several options for future research on private sector adaptation can be recommended. My personal conviction is that the focus should be on private adaptation activities instead of private financing of adaptation. However, the political reality is that the climate finance architecture at the UN climate regime will continue to focus on private adaptation financing.

A first research need is therefore about better understanding innovative financial instruments, as well as financial chains. Innovative financial instruments move beyond the traditional instruments such as loans and insurance (see Section 3.1), for example by developing new types of insurance (such as weather index insurance, see Druce et al., 2016) or by combining financial instruments. Excursus 3-3 describes such 'blending' of finance by FMO, and initiatives such as 'The Global Innovation Lab for Climate Finance' are developing combinations too[47]. A more theoretical research question on the

[47] The Global Innovation Lab for Climate Finance identifies, designs, and pilots innovative financial instruments that reduce private investors' risks and improve their financial returns, and 'build new

financial chain is: who pays for adaptation? For example: a seed company applies for a loan to develop a climate-resilient seed variety. A development bank provides a line of credit to allow the commercial bank to on-lend against more attractive terms. Farmers buy the 'adapted' seeds. In this case, a successful cooperation between private and public actors results in adaptation. Yet the question arises: who financed the 'adapted' seeds? The development bank, the commercial bank, the seed company or, in the end, the farmers? In practical terms, this would be important for the climate finance regime, as it would undermine trust of developing countries in the US$ 100 billion target. In theoretical terms, the question touches upon ethical considerations on the (international) political economy. A more normative and justice-oriented research question would therefore be: who *should* pay for adaptation? If it were the farmers that finance adaptation, and if these were the poor subsistence farmers in developing countries that were supposed to be supported through international climate finance, one could indeed conclude that this institution of society was subordinated to the requirements of a malfunctioning market economy (see Polanyi, 1957). After all, the costs of adaptation would be imposed upon the world's poorest, which did not contribute to climate change through emissions. Atteridge and Dzebo (2015) conducted some initial research on finance chains. A more detailed and thorough analysis on both financing chains and underlying ethical considerations (in particular in terms of private actors) is still lacking.

A second research need, is on the full role of the private sector in adaptation. In global environmental governance, Tienhaara et al. (2012) describe corporations both as creators of environmental problems and as critical to the success of environmental protection. Ever since the Copenhagen Accord, research – including this dissertation – has focused on finding and analysing positive examples of private adaptation finance. Future research should also identify and explain the negative impacts of the private sector on vulnerability and resilience. The ecological modernisation theory might be useful here. Other than neoliberal theorists, who focus on pricing externalities (and in effect commodifying adaptation/adaptation benefits), ecological modernisation is more nuanced

markets, attract new investors, and help to unlock billions of dollars in new climate-friendly investment in developing countries' (see The Global Innovation Lab for Climate Finance (2017).

towards economic liberalism and focuses on rationalising production and consumption. The question is whether 'redirecting and transforming of free market capitalism' (Mol & Spaargaren, 2000; 23) as prescribed by ecological modernisation for the field of environment would also work for adaptation. Early and explorative research by Dzebo and Pauw (2016) in Rwanda and Pauw and Dzebo (2016) in Kenya reveals that private actors' negative impacts on vulnerability and resilience are new on both research and policy agendas. Yet a systematic analysis using ecological modernisation theory does not exist.

Third, the two research needs above can be addressed by focusing on specific sectors or value chains of commodities as dependent variables. Climate risks and the climate finance regime could function as an independent variable. Businesses' incentives to invest in adaptation under uncertainty are very different for a retailer with high operational flexibility, and mining companies that are locked into their assets, for instance (Agrawala et al., 2011). Even within one sector, actors have different levels of flexibility (see Hess et al., 2015). Similar to addressing the abovementioned research need on the full role of the private sector in adaptation, this research would focus on rationalising production and consumption patterns, through an ecological modernisation theory lens. Such research could locate adaptation potential and adaptation decision-making in value chains, and put the potential climate change costs and risks for the private sector into a new and transnational perspective. Benzie, Wallgren, and Davis (2013) and Benzie (2015) made some promising initial contributions here. A researcher could focus on specific (e.g. agricultural) commodities here (I do not foresee possibilities to look at adaptation/adaptation benefits as a commodity) and try to answer the following question: can value chains stimulate accountable private-private adaptation investments?

8.6 Private finance: a new instrument to implement international agreements?

In this last section of the doctoral dissertation I will discuss private finance for the implementation of international agreements in the fields of environment, climate and development more generally. After the second World War, the implementation of such agreements in developing countries was generally supported with public finance from developed countries. Since the Copenhagen Accord of the UN climate negotiations in 2009, however, private finance is now

designated as a new instrument to implement international agreements as diverse as the Convention on Biological Diversity (see Section 2.3.2), the United Nations Conference on Sustainable Development (Section 2.3.4) and the Sustainable Development Goals of Agenda 2030 (Section 2.3.6).

This transmutation from public to private finance could have many different reasons, which might only become clear in retrospect (cf. Milanovic, 2016; Polanyi, 1957). This section shortly addresses three potential causes: the strong belief in neoliberalism and economisation; the rise of emerging economies and the decline of the North in the world's political economy; and a public evasion by traditional donor countries. For all three causes the potential implications for the recipient developing countries are indicated.

First, if neoliberalism and economisation are the main causes for the transmutation from public to private finance, the underlying assumption must be that market mechanisms and privatisation of global governance can support the implementation of international agreements. Although this does not mean the state is 'withered away', there is a 'reconfiguration of its relation to society through economisation' (Madra & Adaman, 2014; 706). In international agreements on development, environment and climate change, Chapter 2 demarcates this reconfiguration with the start of Phase II. Bernstein (2002; 2012) describes the reconfiguration as the compromise of liberal environmentalism: international environmental protection based on the promotion and maintenance of a liberal economic order. However, Bernstein (2012; 110) demonstrates how liberal environmentalism institutionalised further over the last two decades despite a poor record of environmental achievements. Developing countries fight against further expansion of Western neoliberalism and economisation in international agreements (see e.g. Section 2.2.4 and 2.3.4 and Excursus 2-3). The question is, how much further the neoliberal agenda and economisation can be pushed in international agreements, and what the consequences will be for the environment, the climate and for developing countries. In the political economy, Polanyi (1957) argues that a substantial governmental role is indispensable to manage 'fictitious commodities', of which biodiversity and adaptation/adaptation benefits are examples. This doctoral dissertation demonstrates that private adaptation finance is a bridge too far for the increasingly dominant privatisation of global governance. Neoliberalism and economisation might not function for

other subjects of international agreements either, including sustainable development. For instance, Ostrom (1996) explains how public-private coproduction of goods and services works better in infrastructure than in education. Malfunctioning neoliberalism and economisation in implementing international agreements would impact developing countries most negatively, as these are supposed to benefit from international financial support for the domestic implementation of the agreements.

Second, if a changing world order is the main reason, the notion of private financing hints at an impending responsibility vacuum, rather than at further economisation. The decline or fading out of the Global North (see Ferguson, 2014; Huntington, 1997) effectively reduces its capacity to take responsibility for the implementation of international agreements. A push for private financing might cover (up) this responsibility gap, both in negotiations and in practice, in parallel to more support from emerging economies. However, unlike Northern support, South-South cooperation is voluntary and not formally aligned with internationally agreed rules and institutions (see Section 2.4). This dissertation shows that the push for private adaptation finance has not lead to effective adaptation in developing countries. In other international agreements, the push for private finance might also lead to inadequate accountability of financing, an ineffective institutional design, and unclear allocation of financing. The question is, whether emerging economies could fill the impending responsibility vacuum. If it evolves, the recipients (developing countries) would – again – be the main victims of this second cause.

Finally, public evasion of traditional donor countries provides a third explanation. This would mark a shift from developed countries' open and international world approach towards a more closed and defensive approach. On a general level, less public financing could either be caused by a lower willingness or a lower capacity of developed countries, or a mixture of these two. Bernstein (2002) warns that under public evasion, international cooperation on solutions to international environmental problems is likely to remain difficult. I think his point is particularly important when the public evasion is caused by a lack of capacity to pay (see Section 2.4.3). Most certainly, western governments would try to camouflage this not only by mobilising private finance, but also by double counting provided public finance (e.g. a project on decentralised energy provision in rural Africa would be counted

under mitigation finance, as ODA, and as part of any special purpose initiative by the G7, the African Union or another coalition on e.g. energy or rural development in Africa) and by financing domestic costs (e.g. military expenditure, refugee uptake, wetland restoration) with financial resources that are pledged to implement international agreements. Again, the recipients (developing countries) would lose most from public evasion.

Poorer developing countries will be the main victims of the transmutation towards private financing for the implementation of international agreements. It is unlikely that this transmutation will be made undone. Most flexibility – and therefore most hope for developing countries – is to be expected in the case where the transmutation is caused by public evasion as a result of a lower willingness (rather than capacity) to pay. In response to large scale natural disasters such as the 2004 tsunami in Asia or the 2011 earthquake in Haiti, the willingness of both governments and developed country citizens translates into billions of US dollars relief within weeks (Ramachandran & Walz, 2015; Thomas & Fritz, 2006). Relief can partly be explained by donor interests, but also by cosmopolitanism, humanitarianism, and awareness (Strömberg, 2007; Wei & Marinova, 2015). This shows that public evasion can be reversed.

VI. References

Abadie, L. M., Galarraga, I., & Rübbelke, D. (2013). An analysis of the causes of the mitigation bias in international climate finance. *Mitigation and Adaptation Strategies for Global Change, 18*(7), 943-955.

Abidin, H. Z., Andreas, H., Gumilar, I., Fukuda, Y., Pohon, Y. E., & Deguchi, T. (2011). Land subsidence of Jakarta (Indonesia) and its relation with urban development. *Natural Hazards, 59*(3), 1753–1771.

Accra Agenda for Action. (2008). *Accra Agenda for Action*. Retrieved from https://www.oecd.org/dac/effectiveness/45827311.pdf

Acharya, S. R. (2003). *Official development assistance (ODA) in transport sector: challenges and opportunities.* Paper presented at the Proceedings of the Eastern Asia Society for Transportation Studies.

ActionAid. (2007). *Equitable adaptation finance: the case for an enhanced funding mechanism under the UN Framework Convention on Climate Change*. Retrieved from ActionAid International, Johannesburg

Adams, J. R. H., Cuecuecha, A., & Page, J. (2008). The impact of remittances on poverty and inequality in Ghana. *World Bank Policy, Research Working Paper Series No 4732*.

Africa Capital Digest. (2015). Village Capital backs Farmerline and Atikus with $ 50,000. Retrieved from http://africacapitaldigest.com/village-capital-backs-farmerline-and-atikus-with-50000/

AGF. (2010). *Report of the Secretary-General's High-level Advisory Group on Climate Change Financing*. Retrieved from New York: https://www.un-ngls.org/index.php/consultations/climate-finance/405-4156

Agrawala, S., Carraro, M., Kingsmill, N., Lanzi, E., Mullan, M., & Prudent-Richard, G. (2011). *Private Sector Engagement in Adaptation to Climate Change: Approaches to Managing Climate Risks*. OECD Environment Working Papers. OECD Publishing. Paris.

Agrawala, S., & Fankhauser, S. (2008). *Economic Aspects of Adaptation to Climate Change: Costs, Benefits and Policy Instruments*. Paris: Organisation for Economic Cooperation and Development (OECD).

Alesina, A., & Dollar, D. (2000). Who gives foreign aid to whom and why? *Journal of economic growth, 5*(1), 33-63.

AMCEN. (2011). *Addressing climate change challenges in Africa; a practical guide towards sustainable development*. Retrieved from AMCEN secretariat, Nairobi:

Ashoka Changemakers. (2015). Farmerline Ltd: Improving the Livelihoods of Smallholder Farmers through ICT. Retrieved from https://www.changemakers.com/discussions/entries/farmerline-ltd

Atteridge, A. (2011). *Will private finance support climate change adaptation in developing countries?* Historical patterns as a window on future private-sector climate finance. Working Paper. Stockholm Environment Institute.

Atteridge, A., & Dzebo, A. (2015). When does private finance count as climate finance? Accounting for private contributions towards international pledges. Retrieved

from https://www.weadapt.org/sites/weadapt.org/files/sei-db-2015-private-climate-finance-accountability_1.pdf

Atteridge, A., Pauw, W. P., Terpstra, P., Bedini, F., Bossi, L., & Costella, C. (2016). Private sector finance for adaptation. In D. Puig, A. Olhoff, S. Bee, B. Dickson, & K. Alverson (Eds.), *Adaptation Finance Gap Report*. Nairobi: United Nations Environment Programme.

Aubertin, C., & Filoche, G. (2011). The Nagoya Protocol on the use of genetic resources: one embodiment of an endless discussion. *Sustentabilidade em Debate, 2*(1), 51-64.

Averchenkova, A., Crick, F., Kocornik-Mina, A., Leck, H., & Surminski, S. (2015). *Multinational corporations and climate adaptation – Are we asking the right questions? A review of current knowledge and a new research perspective*. Retrieved from http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2015/03/Working-Paper-183-Averchenkova-et-al.pdf

Ayers, J. (2011). Resolving the adaptation paradox: Exploring the potential for deliberative adaptation policy-making in Bangladesh. *Global Environmental Politics, 11*(1), 62-88.

Bäckstrand, K. (2006). Multi-stakeholder partnerships for sustainable development: rethinking legitimacy, accountability and effectiveness. *European Environment, 16*(5), 290-306.

Bäckstrand, K., Campe, S., Chan, S., Mert, A., & Schäferhoff, M. (2012). Transnational public-private partnerships. *Global environmental governance reconsidered*, 123-148.

Baglee, A., Connell, R., Haworth, A., Rabb, B., Bugler, W., Uluğ, G., . . . Moller Laugesen, F. (2013). *Pilot Climate Change Adaptation Market Study: Turkey*. Retrieved from http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/cb_home/publications/publication_adaptationmarketstudy_turkey

Barr, R., Fankhauser, S., & Hamilton, K. (2010). Adaptation investments: a resource allocation framework. *Mitigation and Adaptation Strategies for Global Change, 15*(8), 843-858.

Barrett, S. (2007). Equity, The Stern Review, and What We Should Do About Climate Change. *Climate Policy.* Retrieved from http://www.climatepolicy.org/?p=13

Bauer, S., Beisheim, M., Guimaraes, R. P., Kameri-Mbote, P., Lei, X., Linn, J., . . . Wang, Y. (2011). Now is the Time! Why "Rio+20" must succeed. In G. D. I. D. I. f. E. (DIE) (Ed.). Bonn: German Development Institute/Deutsches Institut für Entwicklungspolitik (DIE).

Becker, A. H., Acciaro, M., Asariotis, R., Cabrera, E., Cretegny, L., Crist, P., . . . Naruse, S. (2013). A note on climate change adaptation for seaports: a challenge for global ports, a challenge for global society. *Climatic Change, 120*(4), 683-695.

Begum, R. A., & Pereira, J. J. (2013). The awareness, perception and motivational analysis of climate change and business perspectives in Malaysia. *Mitigation and Adaptation Strategies for Global Change*, Published online 29 August 2013.

Benbasat, I., Goldstein, D. K., & Mead, M. (1987). The case research strategy in studies of information systems. *MIS quarterly*, 369-386.

Bendandi, B., & Pauw, W. P. (2016). Remittances for Adaptation: an 'Alternative Source' of International Climate Finance? In A. Milan, B. Schraven, K. Warner, & N. Cascone (Eds.), *Migration, Risk Management and Climate Change – Evidence and Policy Responses* (pp. 195-211): Springer.

Benzie, M. (2015). *Reducing vulnerability to food price shocks in a changing climate*. Retrieved from https://www.sei-international.org/mediamanager/documents/Publications/Climate/SEI-DB-2015-Food-security-indirect-climate-impacts.pdf

Benzie, M., Wallgren, O., & Davis, M. (2013). *Adaptation without borders? How understanding indirect impacts could change countries' approach to climate risks*. Retrieved from https://www.sei-international.org/mediamanager/documents/Publications/Climate/SEI-DB-2013-Adaptation-Without-Borders.pdf

Berensmann, K. (2015). The conference on Development Finance in Addis Ababa: leading the way on future international cooperation? Retrieved from http://www.diplomatisches-magazin.de/business-06-2015-en/A3/?PHPSESSID=hq7t0ii5n19t42op0k0qghfb43

Berkhout, F., Hertin, J., & Gann, D. M. (2006). Learning to adapt: organisational adaptation to climate change impacts. *Climatic change, 78*(1), 135-156.

Bernstein, S. (2002). Liberal environmentalism and global environmental governance. *Global Environmental Politics, 2*(3), 1-16.

Bernstein, S. (2011). Legitimacy in intergovernmental and non-state global governance. *Review of International Political Economy, 18*(1), 17-51.

Bernstein, S. (2012). *The compromise of liberal environmentalism*: Columbia University Press.

Bernstein, S. (2013). Rio+ 20: sustainable development in a time of multilateral decline. *Global Environmental Politics, 13*(4), 12-21.

Berrang-Ford, L., Ford, J. D., Lesnikowski, A., Poutiainen, C., Barrera, M., & Heymann, S. J. (2014). What drives national adaptation? A global assessment. *Climatic Change, 124*(1-2), 441-450.

Best, J. (2012). Bureaucratic ambiguity. *Economy and Society, 41*(1), 84-106.

Bettin, G., Lucchetti, R., & Zazzaro, A. (2012). Financial development and remittances: Micro-econometric evidence. *Economics Letters, 115*(2), 184-186.

Biermann, F. (1998). Weltumweltpolitik zwischen Nord und Süd. Die neue Verhandlungsmacht der Entwicklungsländer. *Nomos Verlagsgesellschaft, Baden-Baden*.

Biermann, F. (2014). The Anthropocene: A governance perspective. *The Anthropocene Review, 1*(1), 57-61.

Biermann, F., Abbott, K., Andresen, S., Bäckstrand, K., Bernstein, S., Betsill, M. M., . . . Folke, C. (2012). Navigating the Anthropocene: improving earth system governance. *Science, 335*(6074), 1306-1307.

Biermann, F., Chan, M.-s., Mert, A., & Pattberg, P. (2007). 11. Multi-stakeholder partnerships for sustainable development: does the promise hold? *Partnerships, governance and sustainable development: Reflections on theory and practice*, 239.

Biermann, F., & Pattberg, P. (2012). *Global environmental governance reconsidered*: MIT Press.

Biermann, F., Pattberg, P., van Asselt, H., & Zelli, F. (2009). The fragmentation of global governance architectures: A framework for analysis. *Global Environmental Politics, 9*(4), 14-40.

Biermann, F., & Simonis, U. E. (1999). The Multilateral Ozone Fund: A case study on institutional learning. *International Journal of Social Economics, 26*(1/2/3), 239-273.

Bodansky, D. (2001). The history of the global climate change regime. *International relations and global climate change*, 23-40.

Bodnar, P., Brown, J., & Nakhooda, S. (2015). *What counts: tools to help define and understand progress towards the $100 billion climate finance commitment* Working Paper. World Resources Institute, Climate Policy Initiative and Overseas Development Institute.

Booth, L. (2013). The 0.7% aid target. *Information note to UK Members of Parliament. London: House of Commons Library*.

Bourguignon, F., & Sundberg, M. (2006). Constraints to achieving the MDGs with scaled-up aid. *New York: United Nations*.

Bouwer, L. M., & Aerts, J. C. J. H. (2006). Financing climate change adaptation. *Disasters, 30*(1), 49-63.

Bowen, A., Cochrane, S., & Fankhauser, S. (2012). Climate change, adaptation and economic growth. *Climatic Change, 113*(2), 95-106.

Bracho, G., Hackenesch, C., & Weinlich, S. (2015). Addis Ababa: Trying to square the circle, or – how to share responsibilities in an unequal world (Vol. 2015). Bonn: German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE).

Brouwer, R., Tesfaye, A., & Pauw, W. P. (2011). Meta-analysis of institutional-economic factors explaining the environmental performance of payments for watershed services. *Environmental Conservation, 38*(04), 380-392.

Brown, J., Bird, N., & Schalatek, L. (2010). Climate finance additionality: emerging definitions and their implications. *Climate Finance policy brief, 2*, 1-11.

Brown, J., Stadelmann, M., Wang, D., Boni, L., Climate Policy Initiative, Jachnik, R., & Kato, T. (2015). *Estimating mobilized private finance for adaptation: exploring data and methods*. CPI and OECD.

Brunner, S., & Enting, K. (2014). Climate finance: A transaction cost perspective on the structure of state-to-state transfers. *Global Environmental Change, 27*, 138-143.

Bryan, E., Deressa, T. T., Gbetibouo, G. A., & Ringler, C. (2009). Adaptation to climate change in Ethiopia and South Africa: options and constraints. *Environmental Science & Policy, 12*(4), 413-426.

Buchner, B., Falconer, A., Hervé-Mignucci, M., Trabacchi, C., & Brinkman, M. (2011). *The landscape of climate finance*. Retrieved from https://climatepolicyinitiative.org/wp-content/uploads/2011/10/The-Landscape-of-Climate-Finance-120120.pdf

Buchner, B., Hervé-Mignucci, C., Trabacchi, C., Wilkinson, M., Stadelmann, M., Boyd, F., . . . Micale, A. (2013). *The Global Landscape of Climate Finance*. Retrieved from https://climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2013/

Buchner, B., Hervé-Mignucci, M., Trabacchi, C., & Falconer, A. (2012). *The Landscape of Climate Finance 2012*. Retrieved from Venice, Italy:

Buchner, B., Stadelmann, M., Wilkinson, J., Mazza, F., Rosenberg, A., & Abramskiehn, D. (2014). *The Global Landscape of Climate Finance 2014*. Retrieved from http://climatepolicyinitiative.org/wp-content/uploads/2014/11/The-Global-Landscape-of-Climate-Finance-2014.pdf

Buchner, B., Trabacchi, C., Mazza, F., Abramskiehn, D., & Wang, D. (2015). *Global Landscape of Climate Finance 2015*. Retrieved from http://climatepolicyinitiative.org/wp-content/uploads/2015/11/Global-Landscape-of-Climate-Finance-2015.pdf

Burns, S., & Forrister, D. (2012). *Private investment, market mechanisms and climate change adaptation: options for closing the adaptation financing gap*. Retrieved from DNV KEMA, Arnhem:

Burton, I., Huq, S., Lim, B., Pilifosova, O., & Schipper, E. L. (2002). From impacts assessment to adaptation priorities: the shaping of adaptation policy. *Climate policy, 2*(2-3), 145-159.

Byiers, B., & Rosengren, A. (2012). *Common or conflicting interests? Reflections on the Private Sector (for) Development Agenda*. ECDPM Discussion Paper. European Center for Development Policy Management. Maastricht.

Caljouw, M., Nas, P. J. M., & Pratiwo. (2005). Flooding in Jakarta : Towards a blue city with improved water management *Bijdragen tot de Taal-, Land- en Volkenkunde (BKI), 161*(4), 454-484.

Carty, T. (2013). *Adaptation and the $100 billion commitment*. Retrieved from Oxfam International, Oxford: https://www.oxfam.org/sites/www.oxfam.org/files/ib-adaptation-public-finance-climate-adaptation-181113-en_0.pdf

Caruso, R., & Ellis, J. (2013). Comparing definitions and methods to estimate mobilised climate finance.

CBD. (2011). Nagoya protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization to the convention on biological diversity. Retrieved from https://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf

CBI. (2015). *Bonds and climate change – the State of the Market in 2015*. Climate Bonds Initiative. Retrieved from http://www.climatebonds.net/files/files/CBI-HSBC%20report%207July%20JG01.pdf

CCCD. (2009). *Closing the gaps. Disaster risk reduction and adaptation to climate change in developing countries*. Retrieved from Commission on Climate Change and Development, Stockholm:

CDP. (2012). *Insights into climate change adaptation by UK companies*. Retrieved from Carbon Disclosure Project, London: https://www.2degreesnetwork.com/groups/2degrees-

community/resources/insights-into-climate-change-adaptation-by-uk-companies/attachments/5422/

Chachoua, E. (2016). *POWER UP: Delivering Renewable Energy in Africa*. Retrieved from https://www.eiuperspectives.economist.com/sites/default/files/Power%20Up.pdf

Chambers, R. (1994). Participatory rural appraisal (PRA): analysis of experience. *World development, 22*(9), 1253-1268.

Chan, S., Falkner, R., van Asselt, H., & Goldberg, M. (2015). *Strengthening non-state climate action: a progress assessment of commitments launched at the 2014 UN Climate Summit*. Retrieved from London School of Economics and Grantham Research Institute on Climate Change and the Environment, London: http://www.lse.ac.uk/GranthamInstitute/publication/strengthening-non-state-climate-action-a-progress-assessment-of-commitments-launched-at-the-2014-un-climate-summit/

Chan, S., & Pauw, W. P. (2014). *A global framework for climate action: orchestrating non-state and subnational initiatives for more effective global climate governance*. DIE Discussion Paper. German Development Institute.

Chan, S., van Asselt, H., Hale, T., Abbott, K. W., Beisheim, M., Hoffmann, M., . . . Widerberg, O. (2015). Reinvigorating international climate policy: A comprehensive framework for effective nonstate action. *Global Policy, 6*(4), 466-473.

Chaudhury, M., Ajayi, O. C., Hellin, J., & Neufeldt, H. (2011). *Climate change adaptation and social protection in agroforestry systems: enhancing adaptive capacity and minimizing risk of drought in Zambia and Honduras*. ICRAF Working Paper. World Agroforestry Centre. Nairobi.

Christiansen, L., Ray, A. D., Smith, J. B., & Haites, E. (2012). *Accessing international funding for climate change adaptation*. Roskilde, DK: UNEP Risø Centre on Energy, Climate and Sustainable Development. Department of Management Engineering.

CIF. (2011). *Strategic Program for Climate Resilience Zambia*. Prepared for the Pilot Programme for Climate Resilience (PPCR). Climate Investment Funds.

CIF. (2013). *Pilot Programme for Climate Resilience semi-annual operational report*.

Ciplet, D., Roberts, J. T., & Khan, M. (2013). The politics of international climate adaptation funding: Justice and divisions in the greenhouse. *Global Environmental Politics, 13*(1), 49-68.

Ciplet, D., Roberts, J. T., & Khan, M. R. (2015). *Power in a Warming World. The New Global Politics of Climate Change and the Remaking of Environmental Inequality* MIT Press.

Ciplet, D., Roberts, T., Ousman, P., Abeysinghe, A., Durand, A., Kopin, D., . . . Purdom, S. (2013). *A burden to share? Addressing unequal climate impacts in the Least Developed Countries*. Retrieved from London, United Kingdom: http://pubs.iied.org/pdfs/17181IIED.pdf

Clark, A., Holland, C., Katz, J., & Peace, S. (2009). Learning to see: lessons from a participatory observation research project in public spaces. *International Journal of Social Research Methodology, 12*(4), 345-360.

Clemens, M. A., & Moss, T. J. (2007). The ghost of 0.7 per cent: origins and relevance of the international aid target. *International Journal of Development Issues, 6*(1), 3-25.

Climate Action Tracker. (2015). *Paris Agreement: near-term actions do not match long term purpose – but stage is set to ramp up climate action*. Climate Action Tracker Statement, 12 December 2015.

Climate Finance Update. (2014). The data. http://www.climatefundsupdate.org/data

Climate Funds Update. (2016). The data: status of climate funds. http://www.climatefundsupdate.org/data

Climate Investor One. (2016). Retrieved from http://www.climatefundmanagers.com/

Combes, J.-L., & Ebeke, C. (2011). *Do remittances dampen the effect of natural disasters on output growth volatility in developing countries?* Document de travail du CERDI.

Connor, P., Cohn, D., & Gonzalez-Barrera, A. (2013). *Changing patterns of global migration and remittances*. Pew Research Center report. Retrieved from www.pewsocialtrends.org/files/2013/12/global-migration-final_12-2013.pdf

Corfee-Morlot, J., Guay, B., & Larsen, K. (2009). *Financing climate change mitigation: Towards a framework for measurement, reporting and verification*. Organisation for Economic Co-operation and Development. Paris.

Costanza, R. (2006). Nature: ecosystems without commodifying them. *Nature, 443*(7113), 749-749.

Cumming, G. D. (2004). UK African policy in the post-cold war era: from realpolitik to moralpolitik? *Commonwealth & Comparative Politics, 42*(1), 106-128.

Dalberg. (2011). Report on Support to SMEs in Developing Countries Through Financial Intermediaries.

David, A. C. (2010). *How do international financial flows to developing countries respond to natural disasters?* IMF Working Papers. International Monetary Fund.

De-Shalit, A. (1995). Is liberalism environment-friendly? *Social Theory and Practice, 21*(2), 287-314.

Deleuil, T. (2012). The common but differentiated responsibilities principle: Changes in continuity after the Durban conference of the parties. *Review of European Community & International Environmental Law, 21*(3), 271-281.

Delina, L. (2017). Multilateral development banking in a fragmented climate system: shifting priorities in energy finance at the Asian Development Bank. *International Environmental Agreements: Politics, Law and Economics, 17*(1), 73-88.

Dellink, R., den Elzen, M., Aiking, H., Bergsma, E., Berkhout, F., Dekker, T., & Gupta, J. (2009). Sharing the burden of financing adaptation to climate change. *Global Environmental Change, 19*(4), 411-421.

Denton, F. (2010). Financing adaptation in Least Developed Countries in West Africa: is finance the 'real deal'? *Climate Policy, 10*(6), 655-671.

Depledge, J., & Yamin, F. (2009). *The global climate-change regime: a defence*: na.

Deshingkar, P. (2011). Are there examples of remittances being used to build local resilience to environmental change, especially through investment in soil and water conservation or broader agriculture. *UK Foresight, SR13*.

DeSombre, E. R. (2000). Experience of the Montreal Protocol: Particularly Remarkable, and Remarkably Particular, The. *UCLA J. Envtl. L. & Pol'y, 19*, 49.

Development Initiatives. (2015). Global aid trends – ODA: what you need to know. Retrieved from http://devinit.org/#!/post/global-aid-trends-need-know

DiCicco-Bloom, B., & Crabtree, B. F. (2006). The qualitative research interview. *medical education, 40*(4), 314-321.

Dimitrov, R. S. (2010). Inside UN climate change negotiations: The Copenhagen conference. *Review of policy research, 27*(6), 795-821.

Dowling, J. M., & Hiemenz, U. (1985). Biases in the allocation of foreign aid: some new evidence. *World Development, 13*(4), 535-541.

Druce, L., Moslener, U., Gruening, C., Pauw, W. P., & Connell, R. (2016). *Demystifying Adaptation Finance for the Private Sector*. Retrieved from Geneva: http://www.unepfi.org/wordpress/wp-content/uploads/2016/11/DEMYSITIFYING-ADAPTATION-FINANCE-FOR-THE-PRIVATE-SECTOR-AW-FULL-REPORT.pdf

Du, H., Li, B., Brown, M. A., Mao, G., Rameezdeen, R., & Chen, H. (2015). Expanding and shifting trends in carbon market research: a quantitative bibliometric study *Journal of Cleaner Production, 103*, 104-111.

Dubash, N. K. (2009). Copenhagen: Climate of mistrust. *Economic and Political Weekly*, 8-11.

Dunning, T. (2004). Conditioning the effects of aid: Cold War politics, donor credibility, and democracy in Africa. *International Organization, 58*(2), 409-423.

Dzebo, A., & Pauw, W. P. (2015). *Private finance for adaptation in LDCs? Spelling out the options*. SEI Discussion Brief. Stockholm.

Dzebo, A., & Pauw, W. P. (2016). *Mobilizing private finance: Unlocking the potential of Rwanda's businesses to drive climate change adaptation*. Retrieved from Stockholm: https://www.sei-international.org/mediamanager/documents/Publications/SEI-PB-2016-Rwanda-private-climate-finance.pdf

Easterly, W. (2006). *The white man's burden: why the West's efforts to aid the rest have done so much ill and so little good*: Penguin.

Easterly, W. (2009). How the millennium development goals are unfair to Africa. *World Development, 37*(1), 26-35.

Ebeke, C., & Combes, J.-L. (2013). Do remittances dampen the effect of natural disasters on output growth volatility in developing countries? *Applied Economics, 45*(16), 2241-2254.

ECA-Watch. (2010). *Export Credit Agencies and Climate Change – a briefing for Cancun. FERN, Gloucestershire (U.K.) and Brussels (Belgium)*. Briefing note. FERN. Gloucestershire (U.K.) and Brussels (Belgium).

Edwards, M. (2009). Why 'philanthrocapitalism' is not the answer: private initiatives and international development. In M. Kremer, van Lieshout, P. and Went, R. (Ed.), *Doing good or doing better. Development policies in a globalizing world* (pp. 237-249): Amsterdam University Press.

EIB. (2014). *Joint Report on MDB climate finance 2014*. Retrieved from http://www.eib.org/projects/documents/joint-report-on-mdb-climate-finance-2013.htm

Ellmers, B. (2011). Busan Partnership for Effective Development Cooperation: some progress, no clear commitments, no thanks to EU. Retrieved from http://www.eurodad.org/Entries/view/4737/2011/12/07/Busan-Partnership-for-Effective-Development-Cooperation-some-progress-no-clear-commitments-no-thanks-to-EU

Eriksen, S. H., & O'Brien, K. (2007). Vulnerability, poverty and the need for sustainable adaptation measures. *Climate policy, 7*(4), 337-352.

Esty, D., & Winston, A. (2009). *Green to gold: How smart companies use environmental strategy to innovate, create value, and build competitive advantage*: John Wiley & Sons.

Evered, R., & Louis, M. R. (1981). Alternative perspectives in the organizational sciences: "inquiry from the inside" and "inquiry from the outside". *Academy of management review, 6*(3), 385-395.

Falkner, R. (1998). The Multilateral Ozone Fund of the Montreal Protocol: Institutions for global environmental change. *Global Environmental Change, 8*(2), 171-175.

Falkner, R. (2003). Private environmental governance and international relations: exploring the links. *Global Environmental Politics, 3*(2), 72-87.

Falkner, R., Stephan, H., & Vogler, J. (2010). International climate policy after Copenhagen: Towards a 'building blocks' approach. *Global Policy, 1*(3), 252-262.

Fankhauser, S., & Lavric, L. (2003). The investment climate for climate investment: joint implementation in transition countries. *Climate Policy, 3*(4), 417-434.

Fankhauser, S., & Schmidt-Traub, G. (2011). From adaptation to climate-resilient development: the costs of climate-proofing the Millennium Development Goals in Africa. *Climate and Development, 3*(2), 94-113.

Fankhauser, S., & Soare, R. (2013). An economic approach to adaptation: illustrations from Europe. *Climatic Change, 118*(2), 367-379.

Fatheuer, T. (2015). Das Pariser Klimaabkommen: alle Übel aus der Büchse der Pandora ziehen sich die Kleider der Klimaneutralität an. Retrieved from https://www.fdcl.org/2015/12/alle-uebel-aus-der-buechse-der-pandora-ziehen-sich-die-kleider-der-klimaneutralitaet-an/

Ferguson, N. (2014). *The great degeneration: How institutions decay and economies die*: Penguin.

Fernquest, J. (6 March 2012). Feud pits eco-activists against industrial parks. *Bangkok Post*. Retrieved from http://www.bangkokpost.com/business/economics/283040/feud-pits-eco-activists-against-industrial-parks

Fernquest, J. (2 December 2011). Floods: factories reopening. *Bangkok Post*. Retrieved from http://www.bangkokpost.com/learning/learning-news/268958/floods-factories-reopening

Fisher, D. R., & Freudenburg, W. R. (2001). Ecological modernization and its critics: Assessing the past and looking toward the future. *Society & natural resources, 14*(8), 701-709.

Flåm, K. H., & Skjærseth, J. B. (2009). Does adequate financing exist for adaptation in developing countries? *Climate Policy, 9*(1), 109-114.

Focus on the Global South. (2002). The road to Monterrey passes through Washington. *Focus on the Global South, 75*.

Frankel, J. (2011). Are bilateral remittances countercyclical? *Open Economies Review, 22*(1), 1-16.

Fransen, T., Nakhooda, S., Harmeling, S., Kuramochi, T., & Kalbekken, S. (2013). 5 Insights from developed countries' fast-start finance contributions (pp. WRI Blog Post. http://www.wri.org/blog/2013/2006/2015-insights-developed-countries-fast-start-finance-contributions).

Fry, T. (2013). *The private sector and climate change adaptation: International Finance Corporation investments under the Pilot Program for Climate Resilience*. Retrieved from http://www.brettonwoodsproject.org/wp-content/uploads/2013/12/PPCR_PS_briefing_web.pdf

Fukuda-Parr, S., & Ponzio, R. (2002). Governance: Past, Present, Future setting the governance agenda for the Millennium Declaration. *New York: United Nations Development Program*.

Fukuyama, F. (1989). The end of history? *The national interest*(16), 3-18.

Fukuyama, F. (1992). *The End of History and the Last Man* New York: Avon Books.

Fund, M. (2015). Multilateral Fund for the Implementation of the Montreal Protocol. Retrieved from http://www.multilateralfund.org/default.

Fundanga, C. M., & Mwaba, A. (1997). *Privatization of public enterprises in Zambia: An evaluation of the policies, procedures and experiences*: African Development Bank.

Giuliano, P., & Ruiz-Arranz, M. (2009). Remittances, financial development, and growth. *Journal of Development Economics, 90*(1), 144-152.

Glemarec, Y., & Connelly, C. (2011). *Catalysing climate finance: a guidebook on policy and financing options to support green, low-emission and climate-resilient development*: United Nations Development Programme.

Global Innovation Lab for Climate Finance. (2016). Retrieved from Climate Investor One website: http://climatefinancelab.org/idea/fmo-climate-development-finance-facility/

Gómez-Baggethun, E., & Ruiz-Pérez, M. (2011). Economic valuation and the commodification of ecosystem services. *Progress in Physical Geography, 35*(5), 613-628.

Gore, C. (2000). The rise and fall of the Washington Consensus as a paradigm for developing countries. *World development, 28*(5), 789-804.

Govereh, J., Shawa, J. J., Malawo, E., & Jayne, T. S. (2006). *Raising the productivity of public investments in Zambia's agricultural sector*. Food security research project Working Paper. Lusaka.

Grasso, M. (2010). An ethical approach to climate adaptation finance. *Global Environmental Change, 20*(1), 74-81.

Green Climate Fund. (2014). Initial modalities for the operation of the fund's mitigation and adaptation windows and its private sector facility. *GCF/B.07/08*.

Groenewold, G., & Fokkema, T. (2003). Economic causes and effects of international migration receipt of remittances and their effect on emigration intentions in Egypt, Morocco and Turkey. *EUROPEAN POPULATION: CHALLENGES AND OPPORTUNITIES.[vp]. 2003.*

GRZ/Government of the Republic of Zambia. (2010). *National climate change response strategy*. Retrieved from http://adaptation-undp.org/sites/default/files/downloads/zambia-climate_change_response_strategy.pdf

Gschwend, T., & Schimmelfennig, F. (2007). Introduction: Designing research in political science – A dialogue between theory and data. In T. Gschwend & F. Schimmelfennig (Eds.), *Research Design in Political Science: how to practice what they preach*. Pargrave Macmilan, New York.

Gupta, J. (1995). The global environment facility in its North-South context. *Environmental Politics, 4*(1), 19-43.

Haas, P. M., Levy, M. A., & Parson, E. A. (1992). How Should We Judge UNCED's Success? *Environment: Science and Policy for Sustainable Development, 34*(8), 6-33.

Hajer, M. A. (1995). *The politics of environmental discourse: ecological modernization and the policy process*: Clarendon Press Oxford.

Hale, T. N., & Mauzerall, D. L. (2004). Thinking globally and acting locally: Can the Johannesburg partnerships coordinate action on sustainable development? *The Journal of Environment & Development, 13*(3), 220-239.

Halimanjaya, A. (2014). Climate mitigation finance across developing countries: what are the major determinants? *Climate Policy, (ahead-of-print)*, 1-30.

Hall, N. (2017). What is adaptation to climate change? Epistemic ambiguity in the climate finance system. *International Environmental Agreements: Politics, Law and Economics, 17*(1), 37-53.

Hanegraaff, M. (2015). Transnational advocacy over time: business and NGO mobilization at UN climate summits. *Global Environmental Politics, 15*(1), 82-104.

Haque, I., & Burdescu, R. (2004). Monterrey consensus on financing for development: response sought from international economic law. *BC Int'l & Comp. L. Rev., 27*, 219.

Harris, P. G., & Symons, J. (2013). Norm conflict in climate governance: greenhouse gas accounting and the problem of consumption. *Global Environmental Politics, 13*(1), 9-29.

Haufler, V. (2001). *A public role for the private sector: Industry self-regulation in a global economy*. Washington D.C.: Carnegie Endowment for International Peace.

Hayashi, D., & Michaelowa, A. (2013). Standardization of baseline and additionality determination under the CDM. *Climate Policy, 13*(2), 191-209.

Hermwille, L., Obergassel, W., Ott, H. E., & Beuermann, C. (2015). UNFCCC before and after Paris – what's necessary for an effective climate regime? *Climate Policy*, 1-21.

Hess, J. S., Pauw, W. P., & Papyrakis, E. (2015). *Can the tourism industry contribute to international adaptation finance?* . DIE Briefing Paper 2/2015

Hicks, R. L., Parks, B. C., Roberts, J. T., & Tierney, M. J. (2010). *Greening Aid? Understanding the Environmental Impact of Development Assistance*. New York: Oxford University Press.

Honkonen, T. (2009). *The common but differentiated responsibility principle in multilateral environmental agreements: regulatory and policy aspects* (Vol. 5): Kluwer Law International.

Horstmann, B., & Abeysinghe, A. C. (2011). The Adaptation Fund of the Kyoto Protocol: A model for financing adaptation to climate change? *Climate Law, 2*(3), 415-437.

Houghton, J. T., Jenkins, G. J., & Ephraums, J. (1990). Climate change: the IPCC scientific assessment. *American Scientist;(United States), 80*(6).

Huntington, S. P. (1997). *The clash of civilizations and the remaking of world order*: Penguin Books India.

Huq, S., & Reid, H. (2004). Mainstreaming adaptation in development. *IDS bulletin, 35*(3), 15-21.

Iacono, J., Brown, A., & Holtham, C. (2009). Research methods – A case example of participant observation. *Electronic Journal of Business Research Methods, 7*(1), 39-46.

ICC. (2009). *ICC views on adaptation to climate change*. Discussion paper. International Chamber of Commerce. Paris.

IFC. (2012). *Private investment in inclusive green growth and climate-related activities: Key messages from the literature and bibliography*. Retrieved from Washington:

IISD. (2015). *FfD3*. Retrieved from http://www.iisd.ca/ffd/ffd3/

Indigo Trust. (2012). Grant awarded to Farmerline. Retrieved from http://indigotrust.org.uk/2012/12/06/grant-awarded-to-farmerline/

Indonesia Investments. (2014). Jakarta's Giant Sea Wall & National Capital Integrated Coastal Development. Retrieved from http://www.indonesia-investments.com/business/business-columns/jakartas-giant-sea-wall-national-capital-integrated-coastal-development/item1834

Intellecap. (2010). Opportunities for private sector engagement in urban climate change resilience building.

IOB. (2013). *Public-Private Partnerships in developing countries – A systematic literature review*. IOB Study No. IOB. The Netherlands.

IPCC. (2007). *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Retrieved from Cambridge, United Kingdom and New York, USA: http://www.ipcc.ch/publications_and_data/ar4/wg2/en/contents.html

IPCC. (2014a). *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Retrieved from Cambridge, United Kingdom and New York, NY, USA: http://www.ipcc.ch/report/ar5/wg2/

IPCC. (2014b). *Climate Change 2014: Synthesis Report*. Retrieved from Geneva, Switzerland: https://www.ipcc.ch/report/ar5/syr/

Ireland, P. (2012). Climate change adaptation: Business-as-usual aid and development or an emerging discourse for change? *International Journal of Development Issues, 11*(2), 92-110.

Iro, A. (2014). *Measuring, Reporting and Verifying Climate Finance: International state of play and future perspectives.* Retrieved from Eschborn & Bonn: https://www.giz.de/expertise/downloads/giz2014-en-climate-finance-mrv.pdf

Isoaho, K., & Surminski, S. (2015). Does it matter what you call it? Reflections on how companies voluntarily disclose their adaptation activities.

Jachnik, R., Caruso, R., & Srivastava, A. (2015). *Estimating Mobilised Private Climate Finance: Methodological Approaches, Options and Trade-offs*. OECD Environment Working Papers, No. OECD Publishing. Paris.

Jänicke, M. (2006). Ecological Modernisation: New Perspectives. In M. Jänicke & K. Jacob (Eds.), *Environmental Governance in Global Perspective. New Approaches to Ecological Modernisation* (pp. 9-29). Berlin.

Karppinen, K., & Moe, H. (2012). What We Talk about When We Talk about Document Analysis In N. Just & M. Puppis (Eds.), *Trends in Communication Policy Research: New Theories, Methods and Subjects* (pp. 177-193). Bristol: Intellect Ltd.

Kato, T., Ellis, J., Pauw, W. P., & Caruso, R. (2014). *Scaling up and replicating effective climate finance interventions*. Climate Change Expert Group Paper OECD and IEA. Paris.

Kebbeh, O. (2012). Declining ODA, Resilient Remittances *World Bank's Blog*

Keijzer, N. (2016). Open Data on a Closed Shop? Assessing the potential of transparency initiatives with a focus on efforts to strengthen capacity development support. *Development Policy Review, 34*(1), 83-100.

Keijzer, N., & Klingebiel, S. (2015). *Financing Global Development: What Role for Official Development Assistance?* Retrieved from Bonn: https://www.die-gdi.de/en/briefing-paper/article/financing-global-development-what-role-for-official-development-assistance/

Kellersmann, B. (2000). *Die gemeinsame, aber differenzierte Verantwortlichkeit von Industriestaaten und Entwicklungsländern für den Schutz der globalen Umwelt* (Vol. 143): Springer.

Kennedy, C., & Corfee-Morlot, J. (2012). *Mobilising Investment in Low Carbon, Climate Resilient Infrastructure*. OECD Environment Working Papers No. . OECD Publishing. Retrieved from http://dx.doi.org/10.1787/5k8zm3gxxmnq-en

Khan, M. R. (2015). *Toward a Binding Climate Change Adaptation Regime: A Proposed Framework*: Routledge.

Khattri, A., Parameshwar, D., & Pellech, S. (2010). *Opportunities for private sector engagement in urban climate change resilience building*. Retrieved from Hyderabad, India: http://www.intellecap.com/publications/opportunities-private-sector-engagement-urban-climate-change-resilience-building

Kilby, C. (2006). Donor influence in multilateral development banks: The case of the Asian Development Bank. *The Review of International Organizations, 1*(2), 173-195.

King, G., Keohane, R. O., & Verba, S. (1994). *Designing social inquiry: Scientific inference in qualitative research*: Princeton university press.

Kivuitu, M., Yambayamba, K., & Fox, T. (2005). How can corporate social responsibility deliver in Africa? Insights from Kenya and Zambia. *Perspectives on Corporate Responsibility for Environment and Development, 3*(1).

Klein, R. J. T. (2010). Linking adaptation and development finance: A policy dilemma not addressed in Copenhagen. *Climate and Development, 2*(3), 203-206.

Klein, R. J. T. (2011). Show me the money: ensuring equity, transparency and accountability in adaptation finance. In Transparency International (Ed.), *Global corruption report: climate change* (pp. 220–233). Earthscan, London.

Klein, R. J. T., & Möhner, A. (2011). The political dimension of vulnerability: implications for the Green Climate Fund. *IDS Bulletin, 42*(3), 15-22.

Klein, R. J. T., & Persson, Å. (2008). *Financing Adaptation to Climate Change: Issues and Priorities*. ECP Report. European Climate Platform. Brussels.

KNMI. (2016). *KNMI Climate Change Atlas*. Retrieved from https://climexp.knmi.nl/plot_atlas_form.py?id=someone@somewhere

Komori, D., Nakamura, S., Kiguchi, M., Nishijima, A., Yamazaki, D., Suzuki, S., . . . Oki, T. (2012). Characteristics of the 2011 Chao Phraya River flood in central Thailand. *Hydrological Research Letters, 6*(0), 41-46.

Kosoy, N., Brown, P. G., Bosselmann, K., Duraiappah, A., Mackey, B., Martinez-Alier, J., . . . Thomson, R. (2012). Pillars for a flourishing Earth: planetary boundaries, economic growth delusion and green economy. *Current Opinion in Environmental Sustainability, 4*(1), 74-79.

Kosoy, N., & Corbera, E. (2010). Payments for ecosystem services as commodity fetishism. *Ecological economics, 69*(6), 1228-1236.

Kwakkenbos, J. (2012). *Private profit for public good? Can investing in private companies deliver for the poor?* Retrieved from Brussels, Belgium: http://eurodad.org/files/pdf/1543000-private-profit-for-public-good-can-investing-in-private-companies-deliver-for-the-poor-.pdf

LEG. (2011). *Best practices and lessons learned in addressing adaptation in the least developed countries through the national adaptation programme of action process*. Retrieved from Bonn: http://unfccc.int/resource/docs/publications/ldc_publication_bbll_2011.pdf

Lesage, D., McNair, D., & Vermeiren, M. (2010). From Monterrey to Doha: Taxation and financing for development. *Development Policy Review, 28*(2), 155-172.

Levy, D. L., & Kolk, A. (2002). Strategic responses to global climate change: Conflicting pressures on multinationals in the oil industry. *Business and Politics, 4*(3), 275-300.

Liverman, D. (2004). Who governs, at what scale and at what price? Geography, environmental governance, and the commodification of nature. *Annals of the Association of American Geographers, 94*(4), 734-738.

Lucas, R. E. B., & Stark, O. (1985). Motivations to Remit: Evidence from Botswana. *Journal of Political Economy, 93*(5), 901-918.

Luken, R., & Grof, T. (2006). The Montreal Protocol's multilateral fund and sustainable development. *Ecological Economics, 56*(2), 241-255.

Lumsdaine, D. H. (1993). *Moral vision in international politics: the foreign aid regime, 1949-1989*: Princeton University Press.

MACO/ Ministry of Agriculture and Co-operatives. (2004). *National Agricultural Policy (2004-2015)*. Lusaka.

Madra, Y. M., & Adaman, F. (2014). Neoliberal Reason and Its Forms: De-Politicisation Through Economisation. *Antipode, 46*(3), 691-716.

Maizels, A., & Nissanke, M. K. (1984). Motivations for aid to developing countries. *World Development, 12*(9), 879-900.

Marx, K. (1867). Das Kapital, Bd. 1. *MEW, Bd, 23*, 405.

Matsuo, Y., & Ishizuka, M. (2004). Keyword extraction from a single document using word co-occurrence statistical information. *International Journal on Artificial Intelligence Tools, 13*(01), 157-169.

Maurer, C., & Bhandari, R. (2000). *The Climate of Export Credit Agencies*: World Resources Institute.

Mawdsley, E., Savage, L., & Kim, S. M. (2014). A 'post-aid world'? Paradigm shift in foreign aid and development cooperation at the 2011 Busan High Level Forum. *The Geographical Journal, 180*(1), 27-38.

Mbeva, K., & Pauw, W. P. (2016). *Self-differentiation of countries' responsibilities: Addressing climate change through Intended Nationally Determined Contributions.* Discussion Paper

McAfee, K. (1999). Selling nature to save it? Biodiversity and green developmentalism. *Environment and planning D: society and space, 17*(2), 133-154.

Mcot. (2 December 2011). Hi-Tech Industrial Estate kickstarts operations. *Pattaya Mail*. Retrieved from http://www.pattayamail.com/business/hi-tech-industrial-estate-kickstarts-operations-8338

McSweeney, C., New, M., & Lizcano, G. (2008). Zambia, UNDP Climate Change Country Profiles.

MDB Joint Report. (2015). *2014 Joint Report on Multilateral Development Banks' Climate Finance*. Retrieved from http://www.ebrd.com/news/2015/joint-report-on-mdb-climate-finance-shows-record-results.html

Meernik, J., Krueger, E. L., & Poe, S. C. (1998). Testing models of US foreign policy: Foreign aid during and after the Cold War. *The journal of Politics, 60*(01), 63-85.

Mendelsohn, R. (2000). Efficient adaptation to climate change. *Climatic Change, 45*(3-4), 583-600.

Mendelsohn, R. (2006). The role of markets and governments in helping society adapt to a changing climate. *Climatic Change, 78*(1), 203-215.

Michaelowa, K., & Michaelowa, A. (2012). Negotiating climate change. *Climate Policy, 12*(5), 527-533.

Milanovic, B. (2016). *Global Inequality. A New Approach for the Age of Globalization*. Cambridge, Massachusetts.

Mohapatra, S., Joseph, G., & Ratha, D. (2012). Remittances and natural disasters: ex-post response and contribution to ex-ante preparedness. *Environment, Development and Sustainability, 14*(3), 365-387.

Mol, A. P. J., & Spaargaren, G. (2000). Ecological modernisation theory in debate: A review. *Environmental Politics, 9*(1), 17-49.

Moreno, C., Fuhr, L., & Specih Chassé, D. (2016). Beyond Paris: avoiding the trap of carbon metrics. Open democracy. Retrieved from https://www.opendemocracy.net/transformation/camila-moreno-lili-fuhr-daniel-speich-chass/beyond-paris-avoiding-trap-of-carbon-metr

Moser, S. C., & Ekstrom, J. A. (2010). A framework to diagnose barriers to climate change adaptation. *Proceedings of the National Academy of Sciences, 107*(51), 22026-22031.

MTENR / Ministry of Transport, E. a. N. R. (2011). *The economics of climate change in Zambia*. Lusaka.

Mulenga, C. (2013). *Tracking of Public and Private Climate Finance Inflows to Zambia.* Paper presented at the Discussion paper prepared for the Climate Change Expert Group (CCXG) Global Forum 19-20 March 2013, Zambia Institute of Environmental Management, Lusaka.

Müller, B. (2006). *Trust and the future of adaptation funding*. Oxford Institute for Energy Studies EV38. Retrieved from www.oxfordenergy.org/pdfs/EV38.pdf

Müller, B. (2008). *International adaptation finance: the need for an innovative and strategic approach*. Retrieved from Oxford: https://www.oxfordenergy.org/publications/international-adaptation-funding-the-need-for-an-innovative-and-strategic-approach-2/

Müller, B. (2009). *International adaptation finance: the need for an innovative and strategic approach.* Paper presented at the IOP Conference Series: Earth and Environmental Science.

Müller, B. (2013). *Enhanced (direct) access through '(national) funding entities' – etymology and examples. Information note on the Green Climate Fund Business Model Framework*. Retrieved from Oxford: http://www.oxfordclimatepolicy.org/publications/documents/EnhancedDirectAccess-04-2013.pdf

Mustelin, J., Kuruppu, N., Kramer, A. M., Daron, J., de Bruin, K., & Noriega, A. G. (2013). Climate adaptation research for the next generation. *Climate and Development, 5*(3), 189-193.

Naidoo, T., Vaz, K., & Byaba, L. (2012). *Background Paper on adaptation. An introduction to adaptation in view of developing a private financing approach for adaptation related projects using the CTI PFAN model*. CTI PFAN. Retrieved from www.cti-pfan.net/upload/event/file/CTIPFANAdaptationPaper_Final_270212.pdf

Nakhooda, S., Carvalho, M., & Taschini, L. (2012). *Mitigation finance*. ODI Paper.

National Capital Integrated Coastal Development program. (2015). Changing threats into opportunities: Overview. Retrieved from http://en.ncicd.com/ncicd/

Neumayer, E. (2003). The determinants of aid allocation by regional multilateral development banks and United Nations agencies. *International Studies Quarterly, 47*(1), 101-122.

New Zealand Ministry of Environment. (2015). Global emissions of ozone-depleting substances. Retrieved from http://www.stats.govt.nz/browse_for_stats/environment/environmental-reporting-series/environmental-indicators/Home/Atmosphere-and-climate/global-emissions-ozone-depleting-substances.aspx

Noble, I. R., Huq, S., Anokhin, Y. A., Carmin, J., Goudou, D., Lansigan, F. P., . . . Villamizar, A. (2014). Adaptation needs and options. *Climate Change*, 833-868.

Nobuoka, Y., Ellis, J., & Andersen, S. P. (2015). Encouraging Increased Climate Action by Non-Party Stakeholders.

NORAD. (2002). *Study on private sector development in Zambia*. Norwegian Agency for Development Cooperation. Oslo.

Noy, C. (2008). Sampling Knowledge: The Hermeneutics of Snowball Sampling in Qualitative Research. *International Journal of Social Research Methodology, 11*(4), 327-344. doi:10.1080/13645570701401305

Nye, J. S., & Keohane, R. O. (1971). Transnational relations and world politics: An introduction. *International Organization, 25*(03), 329-349.

OECD. (2003). Harmonising Donor Practices for Effective Aid Delivery: Good Practice Papers : A Dac Reference Document (Dac Guidelines and Reference Series). Retrieved from https://www.oecd.org/dac/effectiveness/20896122.pdf

OECD. (2005). The Paris Declaration on Aid Effectiveness. Retrieved from http://apps.who.int/medicinedocs/documents/s18744en/s18744en.pdf

OECD. (2008). Accra Agenda for Action. Retrieved from

OECD. (2010). History of the 0.7% ODA target. Retrieved from http://www.oecd.org/dac/stats/45539274.pdf

OECD. (2011). *Busan partnership for effective development cooperation*. Retrieved from http://www.oecd.org/dac/effectiveness/49650173.pdf

OECD. (2014a). Aid to developing countries rebounds in 2013 to reach an all-time high. In OECD (Ed.). OECD website.

OECD. (2014b). *Climate-related aid*. Retrieved from Paris: http://www.oecd.org/dac/environment-development/Climate-related%20aid%20Flyer%20-%20March%202014%20v3%20final.pdf

OECD. (2014c). Development Co-operation Report 2014: Mobilising Resources for Sustainable Development. Retrieved from. http://dx.doi.org/10.1787/dcr-2014-en

OECD. (2014d). *Revised Sector Understanding on Export Credits For Renewable Energy, Climate Change Mitigation and Adaptation, and Water Projects*. OECD TAD/PG(2014)4. Paris.

OECD. (2015). Statistics on resource flows to developing countries. Retrieved from http://www.oecd.org/dac/stats/statisticsonresourceflowstodevelopingcountries.htm

OECD. (2016). *TOSSD Compendium for public consultation*. Retrieved from Paris: http://www.oecd.org/dac/financing-sustainable-development/tossd-public-consultation.htm

Oppenheimer, M., & Petsonk, A. (2005). Article 2 of the UNFCCC: historical origins, recent interpretations. *Climatic Change, 73*(3), 195-226.

Osberghaus, D., Dannenberg, A., Mennel, T., & Sturm, B. (2010). The role of the government in adaptation to climate change. *Environment and planning C: government and policy, 28*(5), 834-850.

Ostrom, E. (1996). Crossing the great divide: coproduction, synergy, and development. *World Development, 24*(6), 1073-1087.

Oxfam. (2007). *Adapting to climate change. What's needed in poor countries, and who should pay*. Briefing Paper. Oxfam. Washington.

Oxfam America. (2009). *The New Adaptation Marketplace: Climate change and opportunities for green economic growth*. Oxfam America. Boston and Washington.

Oxfam America. (2012). The climate finance cliff: An evaluation of fast start finance and lessons for the future. *Oxfam Media Brief*.

Oxford English Dictionary. (2006). Oxford University Press *New York*.

Parikh, J., & Baruah, L. (2012). A New Framework for the UNFCCC. *Economic & Political Weekly, 47*(45), 67.

Parry, M., Arnell, N., Berry, P., Dodman, D., Fankhauser, S., Hope, C., . . . Wheeler, T. (2009). *Assessing the costs of adaptation to climate change. a review of the UNFCCC and other recent estimates*. Retrieved from London: http://pubs.iied.org/pdfs/11501IIED.pdf

Paterson, M. (2008). Global governance for sustainable capitalism? *Governing Sustainability. Cambridge University Press, London*.

Patlis, J. M. (1992). Multilateral Fund of the Montreal Protocol: A Prototype for Financial Mechanisms in Protecting the Global Environment, The. *Cornell Int'l LJ, 25*, 181.

Pattberg, P. (2012). *Public-private partnerships for sustainable development: Emergence, influence and legitimacy*: Edward Elgar Publishing.

Pattberg, P., & Stripple, J. (2008). Beyond the public and private divide: remapping transnational climate governance in the 21st century. *International Environmental Agreements: Politics, Law and Economics, 8*(4), 367-388.

Pauw, W. P. (2013). The role of perception in subsistence farmer adaptation in Africa: Enriching the climate finance debate. *International Journal of Climate Change Strategies and Management, 5*(3), 267-284.

Pauw, W. P. (2014). Not a panacea: private-sector engagement in adaptation and adaptation finance in developing countries. *Climate Policy, 15*(5), 1-21.

Pauw, W. P. (2017). Mobilising private adaptation finance: developed-country perspectives. *International Environmental Agreements: Politics, Law and Economics, 17*(1), 55-71. doi:10.1007/s10784-016-9342-9

Pauw, W. P., Bauer, S., Richerzhagen, C., Brandi, C., & Schmole, H. (2014). *Different perspectives on differentiated responsibilities: a state-of-the-art review of the notion of common but differentiated responsibilities in international negotiations*. Discussion Paper Deutsches Institut für Entwicklungspolitik (DIE)/German Development Institute, Bonn.

Pauw, W. P., Cassanmagnano, D., Mbeva, K., Hein, J., Guarin, A., Brandi, C., . . . Muhammad, D. (2016). NDC Explorer. doi:10.23661/ndc_explorer_2016_1.0

Pauw, W. P., & Dzebo, A. (2016). *Private Finance for Climate-Change Adaptation: Challenges and Opportunities for Kenya*. Retrieved from Bonn: https://www.die-gdi.de/uploads/media/BP_22.2016.pdf

Pauw, W. P., Klein, R. J. T., Vellinga, P., & Biermann, F. (2015). Private finance for adaptation: do private realities meet public ambitions? *Climatic Change, 134*(4), 489-503. doi:10.1007/s10584-015-1539-3

Pauw, W. P., & Pegels, A. (2013). Private sector engagement in climate change adaptation in least developed countries: an exploration. *Climate and Development, 5*(4), 257-267.

Pauw, W. P., Speranza, C. I., van de Sand, I., Kaplan, M., & Schraven, B. (2011). *Climate Change Adaptation: Challenges in Institutionalization and Financing*. SEF Policy Paper. Stiftung Entwicklung und Frieden

Peet, R., Robbins, P., & Watts, M. (2011). Global nature. *Global Political Ecology*, 1-47.

Pegels, A. (2014). *Green Industrial Policy in Emerging Countries*: Routledge.

Pegram, G. (2010). Global water scarcity: risks and challenges for business. *Lloyd's, 360*.

Pereira, J. (2013). *Climate change adaptation and the role of the private sector. Creating effective tools for private sector engagement*. Retrieved from CAN Europe, Brussels, Belgium:

Pereira, J., Orenstein, K., & Chan, M. (2013). *Pro-poor climate finance: is there a role for private finance in the Green Climate Fund?* Report by Friends of the Earth U.S. and Pan African Climate Justice Alliance. Washington. Retrieved from http://www.foe.org/news/archives/2013-04-pro-poor-climate-finance-is-there-a-role-for-private

Persson, Å. (2011). Institutionalising climate adaptation finance under the UNFCCC and beyond: Could an adaptation 'market' emerge. *Stockholm: Stockholm Environment Institute*.

Persson, Å., & Klein, R. J. T. (2009). Mainstreaming adaptation to climate change into official development assistance: challenges to foreign policy integration. In P. Harris (Ed.), *Climate Change and Foreign Policy: Case Studies from East to West* (pp. 162–177). London: Routledge.

Persson, Å., Klein, R. J. T., Siebert, C., Atteridge, A., Müller, B., Hoffmaister, J., . . . Takama, T. (2009). *Adaptation finance under a Copenhagen agreed outcome*. Retrieved from Stockholm: https://www.sei-international.org/mediamanager/documents/Publications/SEI-ResearchReport-PerssonA-AdaptationFinanceUnderACopenhagenAgreedOutcome-2009.pdf

Pickering, J., Betzold, C., & Skovgaard, J. (2017). Special issue: managing fragmentation and complexity in the emerging system of international climate finance. *International Environmental Agreements: Politics, Law and Economics, 17*(1), 1-16.

Pickering, J., Jotzo, F., & Wood, P. J. (2015). Sharing the Global Climate Finance Effort Fairly with Limited Coordination. *Global Environmental Politics*.

Pierro, R., & Desai, B. (2011). *The potential role of disaster insurance for disaster risk reduction and climate change adaptation*. Christian Aid (CA) and Climate and Disaster Governance (CDG) Retrieved from http://www.preventionweb.net/english/professional/publications/v.php?id=18210

Polanyi, K. (1957). *The Great Transformation: (the Political and Economic Origin of Our Time)*: Beacon Press.

Pray, C., Gisselquist, D., & Nagarajan, L. (2011). *Private investment in agricultural research and technology transfer in Africa*, IFPRI, Washington D.C. and FARA, Accra.

Project Catalyst. (2010). *Making Fast Start Finance Work*. Briefing Paper Climate Works Foundation

European Climate Foundation. Retrieved from https://europeanclimate.org/documents/Project_Catalyst_Fast_Start_Finance-Full%20Report.pdf

Purnell, N. (9 February 2012). As Rainy Season Approaches, Thailand Focuses on Floods. *Wall Street Journal*. Retrieved from http://blogs.wsj.com/indonesiarealtime/2012/02/09/as-rainy-season-approaches-thailand-focuses-on-floods/

PwC. (2010). *Business leadership on climate change adaptation: Encouraging engagement and action*. Retrieved from London, UK:

Rajamani, L. (2006). *Differential treatment in international environmental law* (Vol. 175): Oxford University Press Oxford.

Ramachandran, V., & Walz, J. (2015). Haiti: Where has all the money gone? *Journal of Haitian Studies, 21*(1), 26-65.

Ramsar. (1990). Resolution 4.3: A Wetland Conservation Fund. Retrieved from http://archive.ramsar.org/cda/en/ramsar-documents-resol-resolution-4-3-a/main/ramsar/1-31-107%5E23371_4000_0

Ramsar. (2015a). The Ramsar sites. Retrieved from http://www.ramsar.org/sites-countries/the-ramsar-sites

Ramsar. (2015b). Small Grants Fund Retrieved from http://www.ramsar.org/activity/small-grants-fund

Rastogi, P. (2013). India's evolving climate change strategy *Climate change and the law* (pp. 605-618): Springer.

Raustiala, K. (2001). Nonstate actors in the global climate regime. *International relations and global climate change, 117*.

Richerzhagen, C. (2011). Effective governance of access and benefit-sharing under the Convention on Biological Diversity. *Biodiversity and Conservation, 20*(10), 2243-2261.

Richerzhagen, C. (2013). *Protecting biological diversity: the effectiveness of access and benefit-sharing regimes* (Vol. 24): Routledge.

Ring, M. J., Lindner, D., Cross, E. F., & Schlesinger, M. E. (2012). Causes of the global warming observed since the 19th century. *Atmospheric and Climate Sciences, 2*(04), 401.

Rodrik, D. (2006). Goodbye Washington consensus, hello Washington confusion? A review of the World Bank's economic growth in the 1990s: learning from a decade of reform. *Journal of Economic literature, 44*(4), 973-987.

Romani, M., & Stern, N. (2011). *Delivering climate finance: principles and practice for funding the Fund*. Policy paper Grantham Institute. London, UK.

Romani, M., & Stern, N. (2013). Sources of finance for climate action: principles and options for implementation mechanisms in this decade. In Haites (Ed.), *International climate finance* (pp. 117-134). Routledge, New York, NY, USA.

Romero, M. J. (2015). What lies Beneath? A Critical Assessment of PPPs and their Impact on Sustainable Development. *Brussels: Eurodad*.

Rosendal, K., & Schei, P. J. (2012). Convention on Biological Diversity : from National Conservation to Global Responsibility. In S. Andresen, E. L. Boasson, & G. Hønneland (Eds.), *International Environmental Agreements : an Introduction / ed. by* London: Routledge.

Rübbelke, D. T. G. (2011). International support of climate change policies in developing countries: Strategic, moral and fairness aspects. *Ecological Economics, 70*(8), 1470-1480.

Sachs, J. D. (2012). From millennium development goals to sustainable development goals. *The Lancet, 379*(9832), 2206-2211.

Sachs, J. D., & McArthur, J. W. (2005). The millennium project: a plan for meeting the millennium development goals. *The Lancet, 365*(9456), 347-353.

Saith, A. (2006). From universal values to Millennium Development Goals: lost in translation. *Development and Change, 37*(6), 1167-1199.

Sand, P. H. (1999). Carrots without Sticks? New Financial Mechanisms for Global Environmental Agreements. *Max Planck Yearbook of United Nations Law, 3*, 363-388.

Schepp, K. (2010). How can small-scale coffee and tea producers adapt to climate change. *AdapCC Final Report – Results & Lessons Learnt, Cafédirect and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, GTZ, Eschborn, Germany*.

Schrottke, J., Rothenbücher, J., Weber, T., & Niewiem, S. (2013). *Adapting to the inevitable*. ThinkForward: A. T. Kearney's foresight series. Retrieved from https://www.atkearney.com/documents/10192/1297375/Adapting+to+the+Inevitable.pdf/a295c989-4053-41aa-8976-13d440f0a70d

Schulpen, L., & Gibbon, P. (2002). Private sector development: policies, practices and problems. *World Development, 30*(1), 1-15.

Schulpen, L., Gibbon, P., & Pedersen, P. O. (2001). *Private Sector Development: Policies, Practices and Problems*: Centre for Development Research.

Sell, S. (1996). North-south environmental bargaining: Ozone, climate change, and biodiversity. *Global Governance, 2*(1), 97-118.

SER. (2011). *Advies Ontwikkeling door duurzaam ondernemen*. Retrieved from Den Haag: https://www.ser.nl/nl/publicaties/adviezen/2010-2019/2011/b30143.aspx

Seville, A., & Gannon, C. (2015). *2015 Corporate Adaptation Survey*. Retrieved from Berkeley (USA): http://gain.org/sites/default/files/2015%20Corporate%20Adaptation%20Survey.pdf

Sierra, K. (2011). The Green Climate Fund: Options for Mobilizing the Private Sector. A brief for the GCF Transitional Committee. *August, 26*, 2011.

Skovgaard, J. (2012). Learning about climate change: Finance ministries in international climate change politics. *Global Environmental Politics, 12*(4), 1-8.

Smit, B., & Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. *Global Environmental Change, 16*(3), 282-292.

Soederberg, S. (2005). Recasting neoliberal dominance in the global south? A critique of the Monterrey Consensus. *Alternatives: Global, Local, Political, 30*(3), 325-364.
Soros, G. (1998). The Crisis of Global Capitalism. New York: Public Affairs.
Sovacool, B. K., Linnér, B.-O., & Goodsite, M. E. (2015). The political economy of climate adaptation. *Nature Climate Change, 5*(7), 616-618.
Stalley, P. (2013). Forum: Principled Strategy: The Role of Equity Norms in China's Climate Change Diplomacy. *Global Environmental Politics, 13*(1), 1-8.
Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., . . . de Wit, C. A. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science, 347*(6223), 1259855.
Steinberg, F. (2007). Jakarta: Environmental problems and sustainability. *Habitat International, 31*(3-4), 354-365.
Stenek, V., Amado, J. C., Connell, R., Palin, O., Wright, S., Pope, B., . . . Pabón, J. D. (2011). *Climate Risk and Business Ports: Terminal Marítimo Muelles el Bosque, Cartagena, Colombia*. Retrieved from Washington DC: http://documents.worldbank.org/curated/en/659131468027590522/pdf/626410PUB00Ports0Box0361488B0PUBLIC0.pdf
Stenek, V., Amado, J. C., & Greenall, D. (2013). *Enabling Environment for Private Sector Adaptation: An Index Assessment Framework, International Finance Corporation*. International Finance Corporation. Washington, DC.
Stern, N. H. (2006). Stern Review: The economics of climate change. London: HM treasury.
Straubhaar, T., & Vâdean, F. P. (2006). International migration Outlook 2006. International Migrant remittances and their role in development (Part III). In OECD (Ed.), (pp. 13-37). Paris.
Strömberg, D. (2007). Natural disasters, economic development, and humanitarian aid. *The Journal of Economic Perspectives, 21*(3), 199-222.
Surminski, S. (2013). Private-sector adaptation to climate risk. *Nature Climate Change, 3*(11), 943-945.
Ten Brink, P. (2011). *The economics of ecosystems and biodiversity in national and international policy making*: Routledge.
Terpstra, P. (2013). Is adaptation short-changed? The imbalance in climate finance commitments. *WRI Blog*. Retrieved from http://www.wri.org/blog/adaptation-short-changed-imbalance-climate-finance-commitments
The Global Innovation Lab for Climate Finance. (2017). How it works. Retrieved from http://climatefinancelab.org/how-it-works/
The Guardian. (2014, 15 October 2014). Empowering farmers through mobile communication in West Africa. *The Guardian*. Retrieved from http://www.theguardian.com/sustainable-business/2014/oct/22/empowering-farmers-through-mobile-communication-in-west-africa
The Maddison Project. (2013). The Maddison-Project. http://www.ggdc.net/maddison/maddison-project/home.htm
Thomas, A., & Fritz, L. (2006). Disaster relief, inc. *Harvard Business Review,* p. 114.
Tienhaara, K., Orsini, A., & Falkner, R. (2012). *Global corporations*: MIT Press.

Tompkins, E. L., & Eakin, H. (2012). Managing private and public adaptation to climate change. *Global Environmental Change, 22*(1), 3-11.

Trabacchi, C., & Stadelmann, M. (2013). *Making adaptation a private sector business: Insights from the pilot program for climate resilience in Nepal*. Retrieved from Venice: https://climatepolicyinitiative.org/wp-content/uploads/2013/12/SGG-Case-Study-Pilot-Program-for-Climate-Resilience-in-Nepal.pdf

UN. (1972). Declaration of the United Nations Conference on the Human Environment. http://www.unep.org/documents.multilingual/default.asp?documentid=97&articleid=1503

UN. (1992a). Convention on Biological Diversity. Retrieved from http://www.cbd.int/doc/legal/cbd-en.pdf

UN. (1992b). Results of the World Conference on Environment and Development: Agenda 21. Retrieved from https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf

UN. (1992c). Rio Declaration on Environment and Development. Retrieved from http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm

UN. (2014). 2014 Climate change summary – Chair's summary. Retrieved from http://www.un.org/climatechange/summit/2014/09/2014-climate-change-summary-chairs-summary/

UN. (2015). *Addis Ababa Action Agenda of the Third International Conference on Financing for Development*. Retrieved from New York: http://www.un.org/esa/ffd/wp-content/uploads/2015/08/AAAA_Outcome.pdf

UN CDP. (2016). *Total official support for sustainable development*. Retrieved from New York: http://www.un.org/en/development/desa/policy/cdp/cdp_news_archive/2016_ecosoc_report_ch3.pdf

UN General Assembly. (1970). *International Development Strategy for the Second United Nations Development Decade. Resolution 2626 (XXV), 24 October 1970.* Retrieved from New York: http://www.un-documents.net/a25r2626.htm

UN General Assembly. (2000). United Nations millennium declaration. *resolution adopted, 18*.

The Future We Want. Resolution adopted by the General Assembly on 27 July 2012, (2012).

UN General Assembly. (2015). *Transforming our world: the 2030 Agenda for Sustainable Development*. Retrieved from New York: https://sustainabledevelopment.un.org/post2015/transformingourworld

UNCTAD. (2010). *World investment report 2010. Investing in a low-carbon economy*. Retrieved from Geneva: http://unctad.org/en/Docs/wir2010_en.pdf

UNDP. (2007). *Human Development Report. Fighting climate change: human solidarity in a divided world*. Retrieved from New York: http://hdr.undp.org/sites/default/files/reports/268/hdr_20072008_en_complete.pdf

UNDP. (2013). *Small Businesses: Impact of Disasters and Building Resilience*. Background Paper prepared for the 2013 Global Assessment Report on Disaster Risk Reduction. UNISDR. Geneva, Switzerland.

UNEP. (1992). *Convention on Biological Diversity.* Paper presented at the UN Conference on Environment and Development (UNCED).

UNEP. (2011). *Innovative climate finance. Examples from the UNEP bilateral Finance Institutions* United Nations Environment Programme. Climate Change Working Group UNEP Energy Branch. Paris.

UNEP. (2015). *The Emissions Gap Report 2015. A UNEP Synthesis Report*. Retrieved from Nairobi, Kenya: https://uneplive.unep.org/media/docs/theme/13/EGR_2015_301115_lores.pdf

UNEP. (2016). *Adaptation finance gap report*. Retrieved from Nairobi (Kenya): http://web.unep.org/adaptationgapreport/2016

UNEP FI. (2011). *The Green Climate Fund (GCF): The private financial sector's perspective.* Retrieved from Bonn: https://unfccc.int/files/cancun_agreements/green_climate_fund/application/pdf/unep_fi_submission_on_private_sector.pdf

UNFCCC. (2002). *Report of the COP 7, held at Marrakesh from 29 October to 10 November 2001. Addendum: Part 2: action taken by the COP*. Retrieved from

UNFCCC. (2007a). Investment and Financial Flows to Address Climate Change. *UNFCCC, Bonn, Germany*.

UNFCCC. (2007b). The Nairobi work programme on impacts, vulnerability and adaptation to climate change. Retrieved from https://unfccc.int/files/adaptation/sbsta_agenda_item_adaptation/application/pdf/nwp_brochure.pdf

UNFCCC. (2007c). *Report of the Conference of the Parties on its twelfth session, held at Nairobi from 6 to 17 November 2006*. Retrieved from Bonn (Germany): http://unfccc.int/resource/docs/2006/cop12/eng/05.pdf

UNFCCC. (2008a). *Investment and financial flows UNFCCC to address climate change: an update*. Retrieved from Bonn: http://unfccc.int/resource/docs/2008/tp/07.pdf

UNFCCC. (2008b). *The Nairobi Work Programme. The Second Phase* Retrieved from http://unfccc.int/resource/docs/publications/08_nairobi_wp_2dphase.pdf

UNFCCC. (2008c). *Report of the Conference of the Parties on its thirteenth session, held in Bali from 3 to 15 December 2007*. Retrieved from Bonn: https://unfccc.int/resource/docs/2007/cop13/eng/06.pdf

UNFCCC. (2009). *Fact sheet: financing climate change action. Investment and financial flows for a strengthened response to climate change.* Retrieved from Bonn: http://unfccc.int/press/fact_sheets/items/4982.php

UNFCCC. (2010). *Report of the Conference of the Parties on its fifteenth session, held in Copenhagen from 7 to 19 December 2009*. Retrieved from http://unfccc.int/bodies/body/6383/php/view/reports.php (08.07.2014)

UNFCCC. (2011). *Report of the Conference of the Parties on its sixteenth session, held in Cancun from 29 November to 10 December 2010*. Retrieved from http://unfccc.int/bodies/body/6383/php/view/reports.php (08.07.2014)

UNFCCC. (2012). *Report of the Conference of the Parties on its seventeenth session, held in Durban from 28 November to 11 December 2011*. Retrieved from http://unfccc.int/bodies/body/6383/php/view/reports.php (accessed on 08.07.2014).

UNFCCC. (2013a). *Report of the Conference of the Parties on its eighteenth session, held in Doha from 26 November to 8 December 2012*. Retrieved from Bonn: http://unfccc.int/resource/docs/2012/cop18/eng/08a01.pdf

UNFCCC. (2013b). *Report on the outcomes of the extended work programme on long-term finance. Note by the co-chairs.* Retrieved from Bonn: http://unfccc.int/resource/docs/2013/cop19/eng/07.pdf

UNFCCC. (2013c). Submissions from Parties to the COP. Retrieved from http://unfccc.int/documentation/submissions_from_parties/items/5916.php

UNFCCC. (2014a). *Biennial Assessment and Overview of Climate Finance Flows Report*. Retrieved from

UNFCCC. (2014b). Biennial Reports by Developed Country Parties. Retrieved from http://unfccc.int/national_reports/biennial_reports_and_iar/items/7534.php

UNFCCC. (2014c). First Biennial Reports. Retrieved from http://unfccc.int/national_reports/biennial_reports_and_iar/submitted_biennial_reports/items/9356.php

UNFCCC. (2014d). Submission Portal. Retrieved from http://www4.unfccc.int/submissions/SitePages/sessions.aspx

UNFCCC. (2015a). Adaptation Private Sector Initiative (PSI). Retrieved from http://unfccc.int/adaptation/workstreams/nairobi_work_programme/items/4623.php

UNFCCC. (2015b). *Adoption of the Paris Agreement*. Retrieved from Bonn: https://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf

UNFCCC. (2015c). Draft Paris outcome. Proposal by the president. Version 2 of 10 December 2015, 21:00. Not published: UNFCCC.

UNFCCC. (2016). Second Biennial Reports. Retrieved from http://unfccc.int/national_reports/biennial_reports_and_iar/submitted_biennial_reports/items/7550.php

UNIDO, & GTZ. (2008). Creating an enabling environment for private sector development in sub-Saharan Africa. *Vienna: UNIDO.*

UNISDR. (2013). *From Shared Risk to Shared Value – The Business Case for Disaster Risk Reduction.* Global Assessment Report on Disaster Risk Reduction. United Nations Office for Disaster Risk Reduction (UNISDR). Geneva, Switzerland. Retrieved from http://www.preventionweb.net/english/hyogo/gar/2013/en/gar-pdf/GAR2013_EN.pdf

United Nations. (1992). United Nations Framework Convention on Climate Change *FCCC/INFORMAL/84*.

United Nations. (2002). *Monterrey Consensus of the International Conference on Financing for Development.* Paper presented at the Adopted at the International Conference on Financing for Development. Monterrey, Mexico.

Resolution 68/279. Modalities for the third International Conference on Financing for Development, 68/279, United Nations (2014).

United Nations Global Compact, UNEP, Oxfam, & WRI. (2011). *Adapting for a Green Economy: Companies, Communities and Climate Change: a Caring for Climate Report*.

van Asselt, H. (2014). *The fragmentation of global climate governance: consequences and management of regime interactions*: Edward Elgar Publishing.

van Drunen, M., Bouwer, L., Dellink, R., Gupta, J., Massey, E., & Pauw, W. P. (2009). *Financing adaptation in developing countries: assessing new mechanisms*. Retrieved from Bilthoven: https://research.vu.nl/en/publications/financing-adaptation-in-developing-countries-assessing-new-mechan

van Oldenborgh, G. J., van Urk, A., & Allen, M. (2012). The absence of a role of climate change in the 2011 Thailand floods. *Bulletin of the American Meteorological Society, 93*(7), 1047-1049.

Vandevelde, K. J. (1997). Sustainable liberalism and the international investment regime. *Mich. J. Int'l L., 19*, 373-399.

Vellinga, P., & Swart, R. (1991). The greenhouse marathon: a proposal for a global strategy. *Climatic Change, 18*(1), vii-xii.

Viboonchart, N. (2012, 14 February 2012). IEAT seeks anti-flooding financing. *The Nation*. Retrieved from http://www.nationmultimedia.com/business/IEAT-seeks-anti-flooding-financing-30175799.html

Vivid Economics. (2015). *Building an Evidence Base on Private Sector Engagement in Financing Climate Change Adaptation* Report prepared for EBRD.

Ward, P. J., Pauw, W. P., van Buuren, M. W., & Marfai, M. A. (2013). Governance of flood risk management in a time of climate change: the cases of Jakarta and Rotterdam. *Environmental Politics, 22*(3), 518-536.

Watkiss, P., Baarsch, F., & Kingsmill, N. (2016). The costs of adaptation. In D. Puig, A. Olhoff, S. Bee, B. Dickson, & K. Alverson (Eds.), *Adaptation Finance Gap Report* (Vol. 2016, pp. 9-20). Nairobi: UNEP.

Watson, C., van Rooij, J., & Nakhooda, S. (2013). *Understanding climate finance readiness needs in Zambia*. Retrieved from Bonn and Eschborn: https://www.giz.de/expertise/downloads/giz2013-en-climate-finance-readiness-zambia.pdf

Wei, J., & Marinova, D. (2015). The orientation of disaster donations: differences in the global response to five major earthquakes. *Disasters*.

Whitley, S. (2014a). *Mapping climate-relevant incentives and investment at country level*. Retrieved from

Whitley, S. (2014b). *Mapping climate-relevant incentives and investment at country level: a diagnostic tool to mobilise private climate finance*. Retrieved from London: https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8890.pdf

Whitley, S., & Mohanty, R. (2012). *The United States' private climate finance support: mobilising private sector engagement in climate compatible development*. Retrieved from London: https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/7786.pdf

Whitley, S., & Mohanty, R. (2013). *Germany's private climate finance support: Mobilising private sector engagement in climate compatible development*. Retrieved from London: https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8235.pdf

Widerberg, O., & Pattberg, P. (2015). International Cooperative Initiatives in Global Climate Governance: Raising the Ambition Level or Delegitimizing the UNFCCC? *Global Policy, 6*(1), 45-56.

Williamson, J. (1993). Democracy and the "Washington consensus". *World development, 21*(8), 1329-1336.

Williamson, J. (2000). What should the World Bank think about the Washington Consensus? *The World Bank Research Observer, 15*(2), 251-264.

Wiriyapong, N. (2011). Massive utility hike to pay for new dyke. *Pattaya Today*. Retrieved from http://pattayatoday.net/news/thailand-news/hi-tech-partially-reopens-early/

Withey, L., Borgerson, K., Herbertson, K., McGray, H., & Dixon, J. (2009). *Making Climate Your Business. Private Sector Adaptation in Southeast Asia*. Retrieved from Stockholm: http://www.wri.org/sites/default/files/pdf/making_climate_your_business.pdf

World Bank. (2005). *Global Development Finance 2005*. Retrieved from Washington, DC: http://documents.worldbank.org/curated/en/512351468324879093/Summary-and-country-tables

World Bank. (2006). *Clean energy and development: towards an investment framework. DC2006-0002*. Retrieved from Washington:

World Bank. (2010). *Economics of adaptation to climate change: synthesis report*. Retrieved from Washington, D.C.: http://documents.worldbank.org/curated/en/646291468171244256/pdf/702670ESW0P10800EACCSynthesisReport.pdf

World Bank. (2012). *World Development Report 2013: Jobs*. Retrieved from Washington, DC: http://siteresources.worldbank.org/EXTNWDR2013/Resources/8258024-1320950747192/8260293-1322665883147/WDR_2013_Report.pdf

World Bank. (2013a). Doing business indicators. Retrieved from http://www.doingbusiness.org/rankings

World Bank. (2013b). World Bank Development indicators. Retrieved from http://wdi.worldbank.org/tables

World Bank. (2015). International Debt Statistics 2015. Retrieved from http://data.worldbank.org/data-catalog/international-debt-statistics

World Bank. (2016). Private Participation in Infrastructure Database. Retrieved from http://ppi.worldbank.org/data

World Bank. (press release, 2 October 2013). Developing Countries to Receive Over $410 Billion in Remittances in 2013, Says World Bank, http://www.worldbank.org/en/news/press-release/2013/10/02/developing-countries-remittances-2013-world-bank.

World Bank. (press release, 11 April 2014). Remittances to developing countries to stay robust this year, despite increased deportations of migrant workers, says WB,

http://www.worldbank.org/en/news/press-release/2014/04/11/remittances-developing-countries-deportations-migrant-workers-wb.

World Economic Forum. (2012). Global Competitiveness Index 2012-2013. Retrieved 05.02.2013 http://www.weforum.org/issues/global-competitiveness

World Meteorological Organization. (2017). WMO confirms 2016 as hottest year on record, about 1.1°C above pre-industrial era. Retrieved from https://public.wmo.int/en/media/press-release/wmo-confirms-2016-hottest-year-record-about-11%C2%B0c-above-pre-industrial-era

Younas, J. (2008). Motivation for bilateral aid allocation: Altruism or trade benefits. *European Journal of Political Economy, 24*(3), 661-674.

Zalasiewicz, J., Williams, M., Haywood, A., & Ellis, M. (2011). The Anthropocene: a new epoch of geological time? *Philosophical Transactions of the Royal Society of London A: Mathematical, Physical and Engineering Sciences, 369*(1938), 835-841.

Zelli, F., & van Asselt, H. (2013). Introduction: The institutional fragmentation of global environmental governance: Causes, consequences, and responses. *Global Environmental Politics, 13*(3), 1-13.

Zervas, E. (2012). *Green Growth Versus Sustainable Development.* Paper presented at the 3rd International Conference on Development, Energy, Environment, Economics (DEEE'12), December 2-4, Paris, France.

VII. Nederlandse samenvatting (summary in Dutch)

Dit proefschrift onderzoekt private financiering voor het omzetten van internationale overeenkomsten op het gebied van milieu, klimaat en ontwikkelingssamenwerking. Dergelijke overeenkomsten worden gekenmerkt door het onderscheid dat zij maken tussen geïndustrialiseerde landen en ontwikkelingslanden. Omdat industrielanden grotere financiële mogelijkheden hebben of internationale milieuproblemen (grotendeels) veroorzaken, ondersteunen zij ontwikkelingslanden vaak bij het omzetten van een overeenkomst. In de decennia direct na de Tweede Wereldoorlog gebeurde dit met overheidsgeld. Zo besliste de Algemene Vergadering van de Verenigde Naties in 1970 dat economisch geavanceerde landen hun ontwikkelingshulp (ODA) stapsgewijs verhogen tot 0.7 procent van hun bruto nationaal product, en werd overheidsgeld toegezegd voor de implementatie van conferentie van de Verenigde Naties over het menselijk leefmilieu (1972) en het Montreal Protocol om de ozonlaag te beschermen (1989) (zie sectie 2.1).

Zoals Hoofdstuk 2 laat zien, is er echter een transmutatie gaande van publieke naar private financiering voor de omzetting van internationale overeenkomsten. In het Akkoord van Kopenhagen (2009) van het VN Klimaatverdrag (UNFCCC) zegden geïndustrialiseerde landen toe om vanaf 2020 jaarlijks US$ 100 miljard aan klimaatfinanciering te mobiliseren om ontwikkelingslanden te ondersteunen bij het tegengaan van klimaatverandering (mitigatie) en het aanpassen daaraan (adaptatie). Als voorwaarde daarvoor eisten industrielanden dat naast de publieke- ook de private sector als financieringsbron werd genoemd. Deze transmutatie is ook zichtbaar in andere internationale verdragen, waaronder de Duurzame Ontwikkelingsdoelen (SDGs – Sustainable Development Goals) (2015) en de VN-conferentie over Duurzame Ontwikkeling (2012) (zie sectie 2.3).

Deze transmutatie vindt plaats, hoewel het nog onduidelijk is welk potentiaal private financiering heeft om problematiek rond ontwikkeling, milieu en klimaat aan te pakken. Is dat een logische keuze? De private sector verzorgt 86 procent van alle investeringen wereldwijd en 90 procent van de bevolking in ontwikkelingslanden verdient zijn inkomen in de private sector. De private sector moet echter winst maken, onder acceptabele risico's en binnen een afzienbare termijn. Gaat dit samen met de publieke en sociale doelen van

internationale overeenkomsten? Met name uit ontwikkelingslanden komt hierop veel kritiek. Dit proefschrift onderzoekt daarom de volgende onderzoeksvraag: 'Onder welke omstandigheden kan private financiering adaptatie aan klimaatverandering in ontwikkelingslanden effectief ondersteunen?'

De focus op adaptatie steunt op drie pijlers. Ten eerste is adaptatie cruciaal voor ontwikkelingslanden bij de omgang met één van de grootste uitdagingen van deze eeuw: klimaatverandering. Mensen in de minst ontwikkelde landen (LDCs – Least Developed Countries) hebben gemiddeld een vijf keer zo hoge kans om te sterven aan klimaatgerelateerde rampen dan (gemiddeld) mensen elders ter wereld, terwijl zij verantwoordelijk zijn voor minder dan 1 procent van de wereldwijde uitstoot van broeikasgassen. Ten tweede omvat klimaatfinanciering nu al het grootste deel van de totale steun van geïndustrialiseerde landen aan ontwikkelingslanden voor het omzetten van internationale overeenkomsten. Adaptatie wordt belangrijker en duurder naarmate het klimaat sterker veranderd: volgens de meest recente studie van het VN-Milieuprogramma kunnen de wereldwijde kosten van adaptatie rond 2030 oplopen tot US$ 140-300 miljard per jaar. Ten derde is er inmiddels kennis en ervaring opgedaan met private mitigatiefinanciering, maar private adaptatiefinanciering is vrijwel onbekend terrein (zie hoofstuk 3).

De inzet is hoog. Effectieve private adaptatiefinanciering kan ontwikkelingslanden helpen bij de omgang met klimaatverandering en verlaagt de druk op publieke budgetten in zowel ontwikkelings- als industrielanden. Als private adaptatiefinanciering echter een fictief concept blijkt – opgenomen in politieke internationale overeenkomsten maar onrealistisch in de uitvoering – dan zal het weinig aan de US$ 100 miljard klimaatfinanciering bijdragen. Dan wordt dit bedrag niet gemobiliseerd en blijven tientallen miljoenen mensen kwetsbaar voor klimaatverandering, met name in ontwikkelingslanden.

Allocatie, effectiviteit en verantwoording

Hoofdstukken 4 tot en met 7 beschrijven hoe ontwikkelingslanden (hoofdstuk 4 en 5), de private sector (hoofdstuk 6), industrielanden (hoofdstuk 7) en andere belangrijke actoren 'private adaptatiefinanciering' conceptualiseren en welke belangen ze hebben. Daarbij trek ik conclusies over de allocatie, de effectiviteit en verantwoording ('accountability').

Hoofdstuk 4 bestudeert de minst ontwikkelde landen (LDCs – Least Developed Countries) aan de hand van hun Nationale Adaptatie Programma's voor Actie ('NAPAs'), die zij in de context van de VN klimaatonderhandelingen hebben geschreven. De analyse laat zien dat de private sector vooralsnog geen beduidende rol speelt in adaptatieplannen van ontwikkelingslanden. Als de private sector al genoemd wordt, dan is het met name als omzetter van de adaptatiestrategie, voor management en organisatie, of voor onderzoek. Dit terwijl 92% van LDCs aangeeft dat gebrekkige financiële middelen een barrière vormen voor de omzetting van de NAPA. Dit staat in schril contrast met het belang dat gehecht wordt aan private klimaatfinanciering bij de VN klimaatonderhandelingen.

Hoofdstuk 5 is een case study over de landbouwsector in Zambia. De private sector investeert om twee verschillende redenen in adaptatie, maar zelden met adaptatie als hoofddoel. Ten eerste is 'management van klimaatrisico's' erop gericht om inkomsten te beschermen en toekomstige kosten te voorkomen. Een bedrijf kan bijvoorbeeld overstromingsrisico's verkleinen (een lokaal risico, zie Excursus 7-1) of toelevering van grondstoffen zeker stellen door te investeren in de veerkracht van toeleveranciers (een risico op afstand, zie Excursus 6-1). Een tweede motivatie zijn de nieuwe (want veranderende) markten en zakelijke kansen. De Zambiaanse private sector kan veel bijdragen aan adaptatie door bijvoorbeeld landbouwtechnische, watermanagement- en logistieke maatregelen te nemen. Ook de internationale private sector kan dan bijdragen. De effectiviteit en de verantwoording zijn echter moeilijk te bepalen, omdat investeringen niet bewust met adaptatie als doel worden gedaan. Ook dwingt het niet tot innovatie. Met explicitiete private investeringen in adaptatie is vooralsnog weinig kennis en ervaring opgedaan.

Hoofdstuk 6 onderzoekt de belangen van de private sector. Aan de hand van uitkomsten van VN klimaatonderhandelingen beschrijft het hoofdstuk tien criteria voor adaptatiefinanciering. Vervolgens is getoetst in hoeverre 101 business cases aan deze criteria voldoen. De business cases bewijzen dat de private sector wereldwijd en in alle sectoren activiteiten onderneemt die bijdragen aan adaptatie en complementair zijn aan activiteiten van de publieke sector. De activiteiten voldoen echter niet aan de tien criteria. Zo zijn de investeringen niet 'voorspelbaar', en zijn de kosten en plannen voor 'opschalen' onbekend. De realiteit van de private sector en de ambities van de VN

klimaatonderhandelingen stemmen dus niet overeen. Op deze manier draagt de private sector nauwelijks bij aan het mobiliseren van de US$ 100 miljard aan klimaatfinanciering.

Hoofdstuk 7 bestudeert de belangen van geïndustrialiseerde landen (aan de hand van rapporten) en hun ontwikkelingsbanken en –agentschappen (aan de hand van interviews). De analyse maakt een aantal discrepanties duidelijk tussen deze verschillende actoren, bijvoorbeeld wat betreft de motivatie om de private sector bij adaptatie te betrekken, de manier waarop, en welke (financiele) instrumenten daarbij gebruikt worden. Ik verklaar die discrepantie door te wijzen op de ambiguïeit rond het concept 'private adaptatiefinanciering' en op de versnippering van actoren met uiteenlopende interesses in het klimaatfinancieringsregime. Zowel de ambiguïteit als de versnippering zijn problematisch wanneer de mobilisatie van US$ 100 miljard het doel van private adaptatiefinanciering is, omdat allocatie, effectiviteit en verantwoording nauwelijks te meten en te beoordelen zijn. De ambiguïeit en de versnippering zijn echter geen probleem wanneer adaptatie het doel is.

Conclusie

De belangrijkste conditie voor effectieve private financiering van adaptatie in ontwikkelingslanden, is een statischer en meer geïntegreerd institutioneel raamwerk. Ten minste: als het doel is om jaarijks US$ 100 miljard te mobiliseren. 'Statischer' betekent bijvoorbeeld dat gemeenschappelijke en duidelijke definities nodig zijn en afspraken gemaakt moeten worden over hoe gemonitord wordt. 'Geintegreerd' betekent dat er een duidelijke governance architectuur moet zijn, die geleid wordt door één kernorganisatie waarin de betreffende landen gerepresenteerd zijn. Momenteel wordt om drie redenen niet voldaan aan deze condities.

Ten eerste wordt de private sector momenteel niet verantwoordelijk ('accountable') gehouden voor het financieren van adaptatie. Het is onwaarschijnlijk, dat alle activiteiten van de private sector die bijdragen aan adaptatie ooit gemonitord kunnen worden (zie Sectie 8.1).

Ten tweede concludeert is het huidige institutionele raamwerk niet effectief in het mobiliseren van substantiële private financiering die bijdraagt aan de US$ 100 miljard. Voor de financiering die gemobiliseerd wordt bestaat geen

eenduidig bewijs dat die daadwerkelijk de door ontwikkelingslanden gewenste adaptatie tot gevolg heeft (zie Sectie 8.2).

Ten derde is, anders dan afgesproken bij de VN klimaatonderhandelingen (zie Tabel 6-1), de huidige allocatie van private adaptatiefinanciering niet gebalanceerd tussen mitigatie en adaptatie, en worden de meest kwetsbare landen niet geprioritiseerd. Het liberaal-economische georiënteerde idee dat de private sector adaptatie kan financieren is bovendien verder gecomprimeerd door andere criteria voor allocatie van financiering, zoals de (doorgaans publieke) verzorging van drinkwatervoorzieningen, en rechtvaardigheid (betalen rijkere landen en/of vervuilers meer?).

Met andere woorden, het huidige, sterk versplinterde klimaatfinancieringsregime is niet effectief in het mobiliseren van private adaptatiefinanciering in de context van de US$ 100 miljard klimaatfinanciering. Een statischer en sterker geïntegreerd institutioneel kader zou effectiever zijn, maar het is niet realistisch dat de 196 onderhandelende partijen bij de VN klimaatonderhandelingen het daarover eens kunnen worden. Het gaat recht in tegen de liberal-economische stroming om milieuproblemen aan te pakken met zelf-regulatie van bedrijven en de vrijwillige private initiatieven die de internationale onderhandelingen op het gebied van milieu, ontwikkeling en klimaat sinds 1992 gedomineerd hebben. Er ontstaan dan ideologische conflicten over normen, met name tussen Westerse industrielanden en ontwikkelingslanden. Ook is het onwaarschijnlijk dat de private sector, altijd onderhevig aan competitie, bereid is transparant te zijn over investeringen in adaptatie en de rendementen daarvan. Hoge standaards voor transparantie en verantwoording zouden dus zelfs contraproductief kunnen zijn en private actoren weg kunnen drijven van de onderhandelingen.

Een pragmatische oplossing om toch inzicht te krijgen in de bijdrage van private adaptatiefinanciering aan de US$ 100 miljard, is om enkel te monitoren en te berichten over de private financiering die in eerste lijn gepland is voor adaptatie, zoals filantropie en direct door ontwikkelingsbanken gemobiliseerde financiering (zie hoofdstuk 7). Omdat deze een geringe bijdrage aan de US$ 100 miljard vormen, is dit voor industrielanden waarschijnlijk niet acceptabel.

Een blik vooruit

Klimaafinanciering is een middel, en geen doel op zich. Wat centraal zou moeten staan, is het mobiliseren van effectieve private bijdragen aan adaptatie in brede zin, los van de vraag of deze aan de US$ 100 miljard bijdragen. Het dusdanig verleggen van de focus heeft vier voordelen. Ten eerste vormen de ambiguïeit rond het concept 'private adaptatiefinanciering' en de versnippering van akteuren en hun belangen geen probleem. Sterker nog, ze kunnen het klimaatfinancieringsregime innovatiever en meer inclusief (meer actoren) maken. Ten tweede verdwijnt met het wegvallen van het doel om aan de 100 miljard bij te dragen, ook de noodzaak weg om het fictieve goed adaptatie verhandelbaar te maken. Ten derde verminderd wellicht de weerstand van ontwikkelingslanden tegen het idee van private adaptatiefinanciering. Tot slot biedt het mogelijkheden voor het opdoen van ervaring en groeit het bewijstzijn van de private sector over hun rol in adaptatie.

Deze dissertatie bewijst dat private adaptatiefinanciering acht jaar na het Akkoord van Kopenhagen geen onverdeeld succes is. Waarom is daartoe dan besloten? Deze dissertatie kan geen uitsluitsel bieden, maar er zijn drie mogelijk en elkaar niet uitsluitende redenen. Ten eerste: een sterk geloof in neoliberalisme en marktwerking. Deze dissertatie laat zien dat private adaptatiefinanciering een brug te ver is. Ten tweede: de groei van opkomende economieën en de achteruitgang van het Westen. Ook dit zou geen goed nieuws zijn voor ontwikkelingslanden die afhankelijk zijn van buitenlandse steun. Een derde reden kan zijn dat traditionele donorlanden hun verantwoordelijkheid ontwijken. In alle drie gevallen zijn de ontwikkelingslanden de dupe. Hen is jaarlijks US$ 100 miljard toegezegd, maar dit geld wordt niet gemobiliseerd.

Appendix 1 Conferences, meetings and workshops in which participation observation was conducted

In chronological order, this Appendix includes the conferences, workshops and meetings where participation observation was conducted. Two selection criteria were applied: 1) the event focused on climate finance and/or adaptation; and 2) multiple policymakers and/or climate change negotiators also participated in the event. An asterisk (*) indicates I also presented on one or multiple occasions during the event. Please note that each individual Conference of the Parties (COP) and Bonn Climate Change Conference (SB) of the UNFCCC consist of a wide variety of side events, workshops and negotiation sessions. Here, only events outside of the main venue are included separately in the list.

Workshop 'Mobilizing and delivering private-sector finance for climate-resilient investments in Rwanda' in Kigali (Rwanda), 13 December 2016. Organised by SEI, DIE and FONERWA.*

Training programme 'East Africa Green Climate Fund Training', organised by ACTS, the Kenyan National Treasury, the African Sustainability hub, and the National Environment Trust Fund (NETFUND), University of Nairobi and CARE International. 9 Dec. 2016.*

Workshop 'Private investments in climate change adaptation'. Organised by DIE, SEI and ACTS. ACTS, Nairobi (Kenya), 5 December 2016.*

Negotiations: 22th Conference of the Parties (COP) to the UNFCCC. Organized by the UNFCCC Secretariat. Marrakesh (Morocco), 07-19 Nov. 2015.*

Conference: Metrics of adaptation conference. Measuring Adaptation for Concrete Action. Organised by the scientific committee of COP22. Skhirat (Morocco), 27 Sept. 2016.*

Conference: Global Forum of the OECD Climate Change Expert Group. Organised by the OECD and the IEA. Paris (France), 13-14 Sept. 2016.

Workshop: Business Engagement in INDCs and the Paris Agreement. Organised by Major Economies Business Forum on Energy Security and Climate Change (BizMEF) and the Business and Industry Advisory Committee at the OECD (BIAC). Paris (France), 12.09.2016.

Workshop: Research Collaborative on tracking private climate finance. Organised by the OECD. Paris (France), 14 Mar. 2016.

Negotiations: Bonn Climate Change Conference SB 44. Organized by the UNFCCC Secretariat. Bonn (Germany), May 16–26, 2016.

Workshop: Financing Loss and Damage. Organised by the German Development Institute and Brown University. Bonn (Germany), 17 May 2016.

Conference: Global Forum of the OECD Climate Change Expert Group. Organised by the OECD and the IEA. Paris (France), 15-16 Mar. 2016.*

Workshop: Research Collaborative on tracking private climate finance. Organised by the OECD. Paris (France), 14 Mar. 2016.

Symposium: 'Pariser Abkommen – Umsetzung global und in Deutschland'. Organised by BMUB and United for Action. Berlin, 18 Dec. 15.

Negotiations: 21th Conference of the Parties (COP) to the UNFCCC. Organized by the UNFCCC Secretariat. Paris (France), 30 Nov. – 12 Dec. 2015.*

Working diner: Are we using climate finance effectively? Organised by Climate Policy Initiative (CPI), the Overseas Development Institute (ODI), and the World Resources Institute (WRI). Paris (France), 5 Dec. 2015.

Seminar: Preparing for a Paris Climate Deal 2015: Key issues for Germany and the U.S. Organised by Stiftung Wissenschaft und Politik (SWP) and World Resources Institute (WRI). Berlin (Germany), 17 Sept. 2016.

Seminar: Lunch session on climate finance. Organised by HIER Klimaatbureau, Both ENDS, Oxfam Novib and Hivos. The Hague (the Netherlands), 3 Sept. 2015.*

Conference: 'How to build support within the EU for a deal in Paris? Organised by the German, English and French embassies and Clingendael Institute**.** Amsterdam (the Netherlands), 17 Jun. 2016*

Negotiations: Bonn Climate Change Conference SB 42. Organized by the UNFCCC Secretariat. Bonn (Germany), 1-11 Jun. 2016*

Workshop: Kick-off workshop of the 'practitioners' dialogue on climate investments. Organised by Gesellschaft für Internationale Zusammenarbeit (GIZ), Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung (BMZ) and DIE. Bonn (Germany), 10 Jun. 2016.

Workshop: Catalyzing Climate Actions for Resilient Development. Organised by DIE, the Energy and Resources Institute (TERI) and 'Galvanizing the Groundswell of Climate Actions'. Bonn (Germany), 5 Jun. 2016.

Meeting: monthly meeting of the Dutch climate change negotiations delegation. The Hague (the Netherlands), 21 May 2015*

Workshop: Innovative Finance for Climate Resilience: Managing Climate Risks in Infrastructure, Water-Related and Agribusiness Sectors. Organised by Climate Policy Initiative, the Dutch Ministry of Infrastructure and Environment & the International Chamber of Commerce. Paris (France), 21 May 2015.

Conference: Climate Change Expert Group Global Forum. Organised by the OECD and the IEA. Paris (France), 17-18 Mar. 2015.*

Negotiations: Geneva Climate Change Conference ADP 2-8. Geneva (Switzerland), 9-12 Feb. 2015.

Negotiations: 20th Conference of the Parties (COP) to the UNFCCC. Organised by the UNFCCC Secretariat. Lima (Peru), 1-12 Dec. 2014.*

Workshop: Enhancing Accountability for Adaptation Finance. Organised by World Resources Institute (WRI), Oxfam and Overseas Development Institute (ODI). Lima (Peru), 8 Dec. 2014.

Conference: Climate Change Expert Group Global Forum. Organised by the OECD and the IEA. Paris (France), 16-17 Sept. 2014.*

Workshop: Research Collaborative on tracking private climate finance. Organised by the OECD. Paris (France), 15 Sept. 2014.

Conference: National Adaptation Plans Expo: catalyzing actions and support for the National Adaptation Plans process. Bonn (Germany), 8-9 Aug. 2014

Roundtable: Roundtable on CBDR in SDGs and the 2015 climate agreement. Organised by the Swedish Ministry of Environment and Naturvårdsverket. Stockholm (Sweden), 27 May 2014.

Conference: Climate Change Expert Group Global Forum. Organised by the OECD and the IEA. Paris (France), 18-19 Mar. 2014.

Negotiations: 19th Conference of the Parties (COP) to the UNFCCC. Organised by the UNFCCC secretariat. Warsaw (Poland), 16-22 Dec. 2013.

Seminar: Consultation on Development and Climate Change. Organised by the OECD and Climate Policy Initiative. Warsaw (Poland), 19 Nov. 2014

Workshop: Nordic-Belgian Workshop on operationalising equity in the 2015 agreement. Organised by the Nordic Council of Ministers and the Belgian federal public service for Public Health, Food Chain Safety and Environment. Stockholm (Sweden), 24 Oct. 2013.*

Meeting: 2013/3rd meeting of the EU Expert Group on Adaptation. Organised by the permanent representation of Lithuania in Brussels. Brussels (Belgium), 23 Oct. 2013.*

Negotiations: 5rd Green Climate Fund Board Meeting. Organized by the Interim Secretariat of the Green Climate Fund. Paris (France), 8 Oct. 2013.

Workshop: Practitioners Workshop – Implementing Climate Finance. Organised by the French Ministry of Economy, Finance and Industry. Paris (France), 6 Oct. 2013.

Conference: Third Annual Meeting of the San Giorgio Group: Expanding Green, Low-Emissions Finance. Organised by Climate Policy Initiative. Venice (Italy), 03-04 Oct. 2013.*

Roundtable: Paris Roundtable on private finance for adaptation. Organised by CAN International. Paris (France), 16 Sept. 2013.*

Negotiations: Bonn Climate Change Conference SB 38. Organised by the UNFCCC Secretariat. Bonn (Germany), 3-14 Jun. 2013.

Conference: First Forum on the Standing Committee on Finance: mobilizing finance and investments for climate action now. Organised by the UNFCCC secretariat and the Standing Committee on Finance. Barcelona (Spain), 28 May 2013.

Negotiations: 3rd GCF Board Meeting. Organized by the Interim Secretariat of the Green Climate Fund. Berlin (Germany), 14-15 Mar. 2013.

Negotiations: 18th Conference of the Parties (COP) to the UNFCCC. Organised by the UNFCCC secretariat. Doha (Qatar), 27 Nov. – 6 Dec. 2012.

Roundtable: Readiness for Climate Finance: Taking Stock. Organised by ODI and the Africa Climate Finance Hub. Doha (Qatar), 1 Dec. 2012.*

Workshop: UNFCCC Workshop on Long-Term Finance. Organised by the UNFCCC Secretariat. Bonn (Germany), 9-11 Jul. 2012.

Negotiations: Bonn Climate Change Conference SB 36. Organized by the UNFCCC secretariat. Bonn (Germany), 14-24 May 2012.

Negotiations: 17th Conference of the Parties (COP) to the UNFCCC. Organised by the UNFCCC secretariat. Durban (South Africa), 4-10 Dec. 2011.

Appendix 2 List of NAPAs analysed for Chapter 4 (N=47)

Afghanistan, 2009. National Capacity Needs Self-Assessment for Global Environmental Management (NCSA) and National Adaptation Programme of Action for Climate Change (NAPA). Afghanistan National Environmental Protection Agency (NEPA), United Nations Environment Programme (UNEP) and Global Environment Facility (GEF), Nairobi.

Angola, 2011. National Adaptation Programme of Action under the United Nations Framework Convention on Climate Change (UNFCCC). Ministry of the Environment, Luanda

Bangladesh, 2005. National Adaptation Programme of Action (NAPA). Ministry of Environment and Forest (MOEF) of the People's Republic of Bangladesh, United Nations Development Programme (UNDP) and Global Environment Facility (GEF).

Benin, 2008. Programme d'Action National d'Adaptation aux Changements Climatiques du Benin (PANA-BENIN). Ministère de l'Environnement et de la Protection de la Nature (MEPN) Benin, Programme des Nations Unies pour le Développement (PNUD) et Fonds pour l'Environnement Mondial (FEM), Cotonou.

Bhutan, 2006. Bhutan National Adaptation Programme of Action (NAPA). National Environment Commission (NEC) of the Royal Government of Bhutan, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF), Thimphu.

Burkina Faso, 2007. Programme d'Action National d'Adaptation à la Variabilité et aux Changements Climatiques (PANA du Burkina Faso). Ministère de l'Environment et du Cadre de Vie (MECV) et Secrétariat Permanent du Conseil National pour l'Environment et le Développement Durable (SP/CONEDD) Burkina Faso, Programme des Nations Unies pour le Développement (PNUD) et Fonds pour l'Environnement Mondial (FEM), Ouagadougou.

Burundi, 2007. National Adaptation Plan of Action to Climate Change (NAPA). Ministry for Land Management, Tourism and Environment of the Republic of Burundi (MINATTE), United Nations Environment Programme (UNEP) and Global Environmental Facility (GEF), Bujumbura.

Cambodia, 2006. National Adaptation Programme of Action to Climate Change (NAPA). Ministry of Environment (MoE) of the Royal Government of Camdodia (RGC), United Nations Development Programme (UNDP) and Global Environment Facility (GEF).

Cape Verde, 2007. National Adaptation Programme of Action for Climate Change (NAPA). Ministry of Environment and Agriculture and National Meteorology and Geophysics Institute of the Government of Cape Verde, United Nations Development Programme (UNDP) and Global Environment Facility (GEF).

Chad, 2010. Programme d'Action National d'Adaptation aux Changements Climatiques (PANA-Tchad). Ministère de l'Environnement, de l'Eau et des Ressources Halieutiques de La République du Tchad, Programme des Nations Unies pour le Développement (PNUD) et Fonds pour l'Environnement Mondial (FEM), N´Djamena.

Comoros, 2006. National Action Programme of Adaptation to Climate Change (NAPA). Ministry of Rural Development, Fisheries, Handicraft and Environment of the Union

of the Comoros, United Nations Development Programme (UNDP) and Global Environment Facility (GEF).

Congo, 2006. Programme d'Action National d'Adaptation au Changement Climatique (PANA) de la République Démocratique du Congo. Ministère de l'Environnement de la République Démocratique du Congo, Programme des Nations Unies pour le Développement (PNUD) et Fonds pour l'Environnement Mondial (FEM).

Djibouti, 2006. Programme d'Action National d'Adaptation aux Changements Climatiques (PANA). Ministère de l'Habitat, de l'Urbanisme, de l'Environnement et de l'Aménagement du Territoire (MHUEAT) et Direction de l'Aménagement du Territoire et de l'Environnement (DATE) de La République de Djibouti, Programme des Nations Unies pour le Développement (PNUD) et Fonds pour l'Environnement Mondial (FEM).

Eritrea, 2007. National Adaptation Programme of Action (NAPA). Department of Environment of the Ministry of Land, Water and Environment (MLWE) of the State of Eritrea, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF).

Ethiopia, 2007. Climate Change National Adaptation Programme of Action (NAPA) of Ethiopia. National Meteorological Agency (NMA) and Ministry of Water Resources of The Federal Democratic Republic of Ethiopia, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF), Addis Ababa.

Gambia, 2007. Gambia National Adaptation Programme of Action (NAPA) on Climate Change. Department of State for Forestry & the Environment of the Government of The Gambia (GOTG), United Nations Environment Programme (UNEP) and Global Environment Facility (GEF), Banjul.

Guinea-Bissau, 2006. National Adaptation Programme of Action (NAPA) of Adaptation to Climate Changes. Ministry of Natural Resources and Environnment (MRN) of the Government of Guinea-Bissau, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF).

Guinnee, 2007. Plan d'Action National d'Adaptation aux Changements Climatiques (PANA) de la République de Guinee. Ministère de l'Agriculture, de l'Elevage, de l'Environnement, des Eaux et Forêts (MAEEEF) de la République de Guinee, Programme des Nations Unies pour le Développement (PNUD) et Fonds pour l'Environnement Mondial (FEM), Conakry.

Haiti, 2006. Plan d'Action National d'Adaptation (PANA). Ministère de l'Environnement (MDE) de la République d'Haiti, Programme des Nations Unies pour le Développement (PNUD) et Fonds pour l'Environnement Mondial (FEM).

Kiribati, 2007. National Adaptation Programme of Action (NAPA). Ministry of Environment, Lands and Agriculture Development (MELAD) of the Republic of Kiribati, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF), Tarawa.

Laos, 2009. National Adaptation Programme of Action (NAPA) to Climate Change. Water Resources and Environment Administration (WREA) of Lao People's Democratic Republic, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF).

Lesotho, 2007. Lesotho National Adaptation Programme of Action (NAPA) on Climate Change. Lesotho Meteorological Services (LMS) and Ministry of Natural Resources, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF).

Liberia, 2008. National Adaptation Programme of Action (NAPA). Environmental Protection Agency of Liberia (EPA), United Nations Environment Programme (UNEP) and Global Environment Facility (GEF), Monrovia.

Madagascar, 2006. Programme d'Action National d'Adaptation au Changement Climatique (PANA). Ministère de l'Environnement, des Eaux et Forêts (MINENVEF) de la République de Madagascar, Banque Mondiale (BM) et Fonds pour l'Environnement Mondial (FEM).

Malawi, 2006. Malawi's National Adaptation Programme of Action (NAPA). Environmental Affairs Department (EAD) of the Ministry of Mines, Natural Resources and Environment (MoMNr&E)of the Republic of Malawi, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF), Lilongwe.

Maldives, 2008. National Adaptation Programme of Action (NAPA). Ministry of Environment, Energy and Water of the Republic of Maldives, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF).

Mali, 2007. Programme d'Action National d'Adaptation aux Changements Climatiques (PANA). Direction Nationale de la Météorologie (DNM) et Ministère de l'Equipement et des Transports (MET) de la Republique du Mali, Programme des Nations Unies pour le Développement (PNUD) et Fonds pour l'Environnement Mondial (FEM).

Mauritania, 2004. National Adaptation Programme of Action to Climate Change (NAPA-RIM). Ministry of Rural Development and of Environment (MRDE) of the Islamic Republic of Mauritania, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF).

Mozambique, 2007. National Adaptation Programme of Action (NAPA). Ministry for the Co-ordination of Environmental Affairs (MICOA) of Mozambique, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF), Maputo.

Nepal, 2010. National Adaptation Programme of Action (NAPA) to Climate Change. Ministry of Environment of Nepal, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF), Kathmandu.

Niger, 2006. National Adaptation Programme of Action (NAPA). National Environmental Council for a Sustainable Development (CNEDD) of the Republic of Niger, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF).

République Centrafricaine, 2008. Programme d'Action National d'Adaptation (PANA) aux Changements Climatiques. Ministère des Eaux, Forêts, Chasse, Pêche et de l'Environnement (MEFCPE) de La République Centrafricaine (RCA), Programme des Nations Unies pour le Développement (PNUD) et Fonds pour l'Environnement Mondial (FEM).

Rwanda, 2006. National Adaptation Programmes of Action (NAPA-Rwanda). Ministry of Lands, Environment, Forests, Water and Mines (MINITERE) of the Republic of Rwanda, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF), Kigali.

Samoa, 2005. National Adaptation Programme of Action (NAPA). Ministry of Natural Resources, Environment & Meteorology (MNREM) Samoa, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF).

Sao Tome and Principe, 2006. National Adaptation Programmes of Action on Climate Change (NAPA). Ministry of Natural Resources and Environment of Sao Tome and Principe, The World Bank and Global Environment Facility (GEF).

Senegal, 2006. Plan d'Action National d'Adaptation aux Changements Climatiques (PANA). Ministère de l'Environnement et de la Protection de la Nature de la République du Sénégal, Programme des Nations Unies pour le Développement (PNUD) et Fonds pour l'Environnement Mondial (FEM).

Sierra Leone, 2007. National Adaptation Programme of Action (NAPA). Ministry of Transport and Aviation (MTA) of Sierra Leone, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF).

Solomon Islands, 2008. National Adaptation Programmes of Action (NAPA). Ministry of Environment, Conservation and Meteorology (MECM) of the Solomon Islands, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF), Honiara.

Sudan, 2007. National Adaptation Programme of Action (NAPA). Higher Council for Environment and Natural Resources (HCENR) of the Republic of the Sudan, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF), Khartoum.

Tanzania, 2007. National Adaptation Programme of Action (NAPA). Division of Environment of the Republic of Tanzania, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF).

Timor-Leste, 2010. National Adaptation Programme of Action (NAPA) on Climate Change. Ministry of Economy and Development (MED) and the Secretary of State for Environment (SEMA) of the Democratic Republic of Timor-Leste, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF).

Togo, 2009. Programme d'Action National d'Adaptation aux Changements Climatiques - PANA. Ministère de l'Environnement et des Ressources Forestières de la République Togolaise, Programme des Nations Unies pour le Développement (PNUD) et Fonds pour l'Environnement Mondial (FEM).

Tuvalu, 2007. Tuvalu's National Adaptation Programme of Action (NAPA). Ministry of Natural Resources (MNR) of Tuvalu, Environment, Agriculture and Lands, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF).

Uganda, 2007. Climate Change - Uganda National Adaptation Programmes of Action (NAPA). Department of Meteorology in the Ministry of Water, Lands and Environment of The Republic of Uganda, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF).

Vanuatu, 2007. National Adaptation Programme of Action (NAPA). National Advisory Committee on Climate Change (NACCC) of the Republic of Vanuatu, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF), Port Vila.

Yemen, 2009. National Adaptation Programme of Action (NAPA). Environmental Protection Authority (EPA) of the Republic of Yemen, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF).

Zambia, 2007. Formulation of the National Adaptation Programme of Action on Climate Change (NAPA). Environment and Natural Resources Management Department (ENRMD) under the Minsitry of Tourism, Environment and Natural Resources of the Republic of Zambia, United Nations Environment Programme (UNEP) and Global Environment Facility (GEF).

Appendix 3 Keyword selection for Chapter 4

The analysis for chapter was conducted on cores of keywords, as they have different derivatives (examples are given in brackets). Both full words and abbreviations were analysed. Keywords like 'community based' were included with and without hyphenation. The 42 key words used are:

Actors:	bank, business, community-based, community-based organisation/CBO, compan(y/ies), corporate, non-governmental organisation/NGO, private sector, World Bank.
Instruments:	equity, foreign direct investment/FDI, insur(ance/ing), investment, micro credit, philanthrop(y/ic)
Sector-related:	agricultural sector, education, energy, forestry, health, health care, industr(y/ial), industrial sector, infrastructur(e/al), touris(m/tic), water sector,
Impact/adaptation related:	agricultu(re/ral), biodiversity, disaster risk reduction/DRR, drought, ecolog(y/ical), extreme weather, flood, forest, glaci(er/al), irrigat(ion/ed), malnutrition, rain-fed, renewable energy, sea level (rise), water, wildlife

Appendix 4 Case studies of the UNFCCC's Private Sector Initiative (N=101) analysed for Chapter 6

Acclimatise. Aware for Investments™ - Climate Risk Screening Tool.

Allianz. Insuring against climate impacts and rewarding sustainable business practices.

Anglian Water. Guaranteeing security of supplies.

Anglo American. eMalahleni: Water for adaptation.

Ankur Scientific Technologies Pvt. Ltd. Renewable energy building resilience of island communities.

Apple Vacations, Club Med, Sandals, SuperClubs, & TNT Vacations. Improving customer confidence in attractiveness of destination.

Banka BioLoo Pvt Ltd. Bio-toilets: Building a Climate Resilient Society through Environmentally Friendly Sanitation

BASF. Help crops adapt to changing climates.

BASF. New technologies for climate change adaptation.

BASIX and ICICI Lombard. Microinsurance reducing farmers exposure to weather risk.

Bayer. Developing stress-tolerant plants.

Bayer. Provide seed treatment for more efficient resource use.

BHP Billiton. Fighting malaria with communities and governments.

Bradesco Bank, Amazonas Sustainable Foundation, & Amazonas State Government. Bolsa Floresta Programme: Helping riverine communities in the Amazon.

Bunge. Conservation of forests and mangroves with economic diversification as a mean to adapt to climate change.

Cafédirect & GIZ. Adaptation for Smallholders to Climate Change (AdapCC).

Cafédirect plc. Climate change adaptation strategy for Kayonza Growers Tea Factory.

Calvert Investments Inc. Investing in adaptation.

CB Richard Ellis (CBRE) & UNICEF UK. Investing in adaptation as part of corporate carbon management strategy.

CEMEX. Sustainable and climate resilient housing.

Chiles de Nicaragua S.A. Strategic initiatives of adaptation to CC make a small business agroexporter sustainable as well as its value chain.

China Mobile Communications. Information-based mobile applications for adaptation.

Cisco Systems. Planetary Skin.

CLIMsystems Ltd & CH2M Hill. The SimCLIM modelling system for climate impact and adaptation assessment.

Cook Composites and Polymers Co. (CCP). Creating business value through ecological stormwater management.

Copa Airlines. Panama's Bay Wetlands Project for reducing the potential risk of flood around Airport areas.

Dow. Utilizing household wastewater in the large-scale.

Ecofys. Adaptation and the legal sector.

Ecotelhado. Green Infrastructure ,Waste Water Recycling and Organic Waste Integrated Treatment System.

EDP Energias do Brasil. ClimaGrid - Brazil.

EEAB (Bogotá Water and Sewage Company). Designing and implementing an adaptation program to support ecosystem services.

Egis. Adapting road infrastructure to climate change.

Entergy Corporation. Hurricane Katrina: A climate wakeup call.

EnterpriseWorks/VITA (EWV) a Division of Relief International. Rainwater harvesting and storage technology (bob).

Ericsson. Enabling access to weather and climate services in Africa.

Eskom. Ensuring reliability and continuity of energy supply.

Fasiam Agro Farms and Jammu & Kashmir Medicinal & Aromatic Plants (MAP) Growers' Cooperative. Adapting to climate change by growing medicinal and aromatic plants.

Femsa Foundation. The Latin American Water Funds Partnership.

Fonkoze (Fondasyon Kole Zepol). Natural disaster insurance protecting Haiti's micro-entrepreneurs.

Freshfields Bruckhaus Deringer LLP & UNICEF UK. Going beyond offsetting to invest in adaptation.

General Electric. Technologies that build climate resilience.

GlaxoSmithKline (GSK) (Ribena) & Scottish Crop Research Institute. New variety of blackcurrants to survive mild winters.

Global Climate Adaptation Partnership (GCAP). Mainstreaming adaptation into projects: the Climate Safeguards System prototype.

Green Farm Administradora de Imóveis Rurais & Preservação Ambiental. Green Farm Project in Itaquiraí, MS, Brazil.

Green Mountain Coffee Roasters (GMCR), International Center for Tropical Agriculture (CIAT), & Catholic Relief Services (CRS). Coffee Under Pressure: Climate Change and Adaptation in Mesoamerica (CUP).

Greenfield Hydroponics Systems Inc. Climate controlled greenhouses.

Himal Power Limited. Building community adaptive capacity.

HiNation AB. Provision of solar energy builds resilience of rural population.

HSBC. New insurance products and climate risk.

Ignitia AB & Ignitia Ghana Ltd. Preventive weather forecasting for West African farmers to increase agricultural yield.

Ilhas do Brasil (Islands of Brazil) Institute. Brazil Adapt Project: Building resilience in coastal areas. Partnership between Instituto Ilhas do Brasil, Bovespa - Environmental and Social Stock Exchange, and HSBC Institute.

Intact Financial Corporation & University of Waterloo. Climate Change Adaptation Project (CCAP).
Intel. Water Wars.
International Union of Railways (UIC). Adaptation of Railways to Climate Change (ARISCC).
Intrawest. Relocation to improve snow pack and lengthen ski season.
ITC Limited. Adaptation to climate change impacts through diversification of farming systems.
John Deere. Water conservation through precision irrigation, a growing business.
Levi Strauss & Co. Levi's® Water<Less™.
Maplecroft. Climate Change and Environmental Risk Atlas.
Mario Cucinella Architects (MCA). The 100K Home.
Mars, IBM, & U.S. Department of Agriculture. Unraveling the cocoa genome.
McKinsey & Company. Learning about the economics of adaptation.
Meinert Enterprises. Adapting to climate change through changing growing patterns and spreading risks.
Microsoft Corporation. Research4Life and Eye On Earth.
Munich Re. Building alliances around climate insurance.
Naturally Advanced Technologies (NAT). More resilient fibers to replace cotton.
Nestlé. Providing farming training and assistance.
Network Rail Infrastructure Limited. Tomorrow's railway and climate change adaptation.
Nova Oceanic Energy Systems Inc. Wave Energy Converter.
O Instituto Ambiental (OIA) & State Street Nicaragua (SSN). Integrated Biosystems applied in wastewater treatment of humid coffee processing plant.
ÖBB. InfraWeather.
Pepsico India. Replenishing water.
PepsiCo South America, Caribbean, & Central America Foods. Adapting to Climate Changes for Potato Production in The Andes.
Rabobank. Expertise Reduces Climate Change Risks for Most Vulnerable.
Rifugio Dorigoni. Mountains of change.
Rio Tinto. Reappraising "Normal" - Designing to Weather, Climate, and Climate Change.
Riverside Technology. Disaster preparedness, local capacity building, and planning.
Royal Engineers and Consultants. Climate resilient reconstruction.
Royal HaskoningDHV. Water Vision Schiphol 2030: Creating a Water Sensitive Airport - at Amsterdam Airport Schiphol, the Netherlands
Scotch Whisky Association (SWA) & Scotch Whisky Research Institute (SWRI). Working collectively to address whisky industry's long-term risks.
SEKEM Holdings Group. Integrating adaptation into core business practices.
Siemens. SkyHydrant Water Purification Technology

Sompo Japan Insurance Inc. Insure yourself against changing climatic conditions.

Starbucks Coffee Company & Conservation International. Ensuring future supply of high-quality coffee

Sunlabob. Meeting energy needs for climate-resilient development.

Suntory Limited. “Bringing Water to Life".

Swiss Re & Oxfam America. Horn of Africa Risk Transfer for Adaptation (HARITA).

Syngenta. Boosting crop yield for every drop of water.

Tartari and Friendship. Weather resilient boats

Tata International Limited (Tata Consultancy Services (TCS)). mKRISHI: Empowering rural farmers.

Telefônica Brasil S.A. Vivo Clima.

Thames Water. Taking care of water: Adapting business operations.

The Climate Corporation. Taking the uncertainty out of climate and weather for stakeholders.

The Coca-Cola Company (TCCC) & The World Wildlife Fund (WWF). Building reputations, securing resources: Teaming up for water conservation.

The Travelers Companies Inc. An Ounce of Prevention—Linking the Interests of Homeowners, Business, and Insurance Providers.

Unilever. Adapt to local climatic conditions and reduce impacts.

Unilever. Product solutions for a future of more constrained resources.

URS Corporation. The effects of climate change on highway network policies and standards.

Veolia Water. Desalination: Kurnell Project.

WayCarbon. Vulnerability assessment of the city of Goiania, Goias, Brazil.

WSP Group and Foster + Partners. Masdar City.

Appendix 5 Policy documents analysed for Chapter 7

Biennial Report 1 (BR1)

Canada (2014). Canada's Sixth National Report on Climate Change. Government of Canada

European Union (2014). Sixth National Communication and first biennial report from the European Union under the UN Framework Convention on Climate Change (UNFCCC). Technical Report - 2014 – 075. European Union, 2014.

Japan (2014). Japan's First Biennial Report under the United Nations Framework Convention on Climate Change. Government of Japan.

New Zealand (2013b). New Zealand's First Biennial Report under the United Nations Framework Convention on Climate Change. Wellington: Ministry for the Environment.

Norway (2014). Norway's sixth national Communication under the Framework Convention on Climate Change. Norwegian Ministry of Climate and Environment

United States (2014). First Biennial Report of the United States of America under the United Nations Framework Convention on Climate Change. U.S. Department of State, 2014.

Biennial Report 2 (BR2)

Canada (2016). Canada's second biennial report on climate change. Government of Canada

European Union (2015). Second Biennial Report of the European Union under the UN Framework Convention on Climate Change. European Union, 2015.

Japan (2015). Japan's Second Biennial Report under the United Nations Framework Convention on Climate Change. Government of Japan.

New Zealand (2015). New Zealand's Second Biennial Report under the United Nations Framework Convention on Climate Change. Wellington: Ministry for the Environment.

Norway (2015). Norway's second Biennial Report under the Framework Convention on Climate Change. Norwegian Ministry of Climate and Environment

United States (2016). 2016 Second Biennial Report of the United States of America under the United Nations Framework Convention on Climate Change. U.S. Department of State, 2016.

Strategies and Approaches for Mobilising Scaled-up Finance of 2013 (MSF1)

Canada (2013). Information on strategies and approaches for mobilizing climate finance. Submissions from Parties on Information on strategies and approaches for mobilizing scaled-up finance. Government of Canada

European Union (2013). Strategies and Approaches of the EU and its Member States for mobilising scale-up climate finance towards the developed countries' goal to jointly mobilise US$ 100 billion. Submissions from Parties on Information on strategies and approaches for mobilizing scaled-up finance.

Japan (2013). Submission by Japan on Strategies and Approaches for Long-Term Finance (October 2013). Submissions from Parties on Information on strategies and approaches for mobilizing scaled-up finance.

New Zealand (2013). Strategies and approaches for mobilising scaled-up climate finance. New Zealand Submission to the Conference of the Parties. Submissions from Parties on Information on strategies and approaches for mobilizing scaled-up finance. Wellington: Government of New Zealand

Norway (2013). Submission by Norway on strategies and approaches for mobilizing scaled-up climate finance. Submissions from Parties on Information on strategies and approaches for mobilizing scaled-up finance. Royal Norwegian Ministry of the Environment

United States (2013). Strategies and approaches for scaling up long-term finance**.** Submissions from Parties on Information on strategies and approaches for mobilizing scaled-up finance.

Strategies and Approaches for Mobilising Scaled-up Finance of 2014 (MSF2)

Canada (2014). Strategies and approaches for long-term climate finance. Government of Canada

European Union (2014). EU submission 2014 on strategies and approaches for scaling up climate finance Submission by Italy and the European Commission on behalf of the European Union and its Member States

Japan (2014b). Submission by Japan on Strategies and Approaches for Long-Term Finance. Government of Japan

New Zealand (2014). Updated strategies and approaches for scaling up climate finance from 2014 to 2020. Wellington: Government of New Zealand

Norway (2014). Norwegian submission on Strategies and Approaches for scaling up climate finance. Royal Norwegian Ministry of Climate and Environment.

United States (2014). United States Biennial Submission on Strategies and Approaches for Scaling up Climate Finance. November 2014, United States

Currciculum Vitae

Pieter Pauw was born on the 15th of April 1984 in Putten, the Netherlands. After finishing his secondary education at the *Gemeenschappelijke Scholen Gemeenschap* in Schagen, he did a BSc in Earth Sciences and a MSc in Envrionment and Resources Management, both at the VU University in Amsterdam, the Netherlands. During his studies, Pieter was an active member of the academic community. Among others, he served as a board member of the student associataion GeoVUsie (2004), as a member of the QANU (Quality Assurance Netherlands Universities) evaluation committee on environmental education (2006-2007), and as a member of the Core Committee which developed the new BSc. Earth & Economics (2005-2007).

After finishing his MSc, Pieter worked at the Institute for Environmental Studies (IVM) at the VU University (2008 -2011). He conducted research in the fields of climate change and sustainability. Here, Pieter worked on projects in, among others, the Netherlands, Mozambique, Botswana, Cameroon and Ghana, for the World Bank, FMO and the Netherlands Ministry of Foreign Affairs and others. In his time at IVM, Pieter (co)authored several reports and papers, and assisted Prof dr Pier Vellinga in writing the popular-scientific book *'Hoezo klimaatverandering, feiten en fabels'* ('On climate change. Facts and myths').

Since 2011, Pieter works at the German Development Institute/*Deutsches Institut für Entwicklungspolitik* (DIE) in Bonn, Germany. Pieter conducts research and provides policy advice on international climate policy, adaptation finance and equity.

Pieter followed UN climate negotiations, (co)authored a variety of publications, became contributing author to the IPCC's fifth assessment report, and a lead author of the Adaptation Finance Gap Report of the United Nations Environment Programme (UNEP). Pieter also led the development of the internationally renowned *NDC Explorer*, an online tool that allows users to analyse and compare Nationally Determined Contributions under the UNFCCC. Furthermore, Pieter did consultancies for the Organisation for Economic Cooperation and Development (OECD), UNEP Financial Inquiry and others, and is an associate at Stockholm Environment Institute since 2015. Finally, Pieter also writes op-eds on environment and climate issues for the Dutch quality

newspaper NRC Handelsblad on a regular basis. Currently, Pieter is seconded to the German Federal Ministry for Economic Cooperation and Development (BMZ) as a senior policy advisor to support the organization of the 23rd Conference of the Parties of the UNFCCC, taking place in Bonn in November 2017.

In December 2013, Pieter officially started his PhD on private adaptation finance under supervision of prof.dr. Frank Biermann and prof.dr.ir. Pier Vellinga. First at the VU University and since October 2015 at Utrecht University. Pieter's doctoral dissertation was formally submitted in May 2017.

Colophon

From public to private climate change adaptation finance: Adapting finance or financing adaptation? (PhD dissertation, Utrecht University)

In Dutch: *Van publieke naar private financiering voor aanpassing aan klimaatverandering: aanpassing van financiering, of financiering voor aanpassing?* (proefschrift, Universiteit Utrecht)

Author: W.P. Pauw

ISBN: 978-94-028-0841-4

Cover photo: Pillars with member-country flags in front of the venue of the 21st UN climate summit (UNFCCC COP23) in Paris. The picture was taken by Wikimedia commons and altered by the author.

Funded by: This research was financed through various projects for the German Federal Ministry for Economic Cooperation and Development (BMZ) and benefitted from additional funding through the OECD project 'Scaling up and replicating effective climate finance interventions' and the UNEP FI project 'demystifying private adaptation finance'.

Printed by Ipskamp Drukkers BV, Enschede, the Netherlands