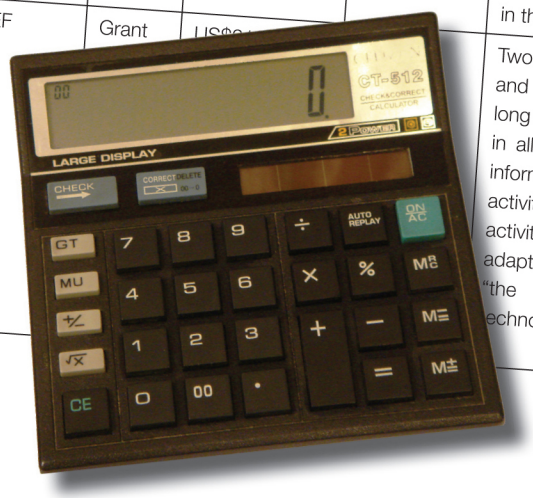
TNA Guidebook Series

Accessing International Funding for Climate Change Adaptation

– A Guidebook for Developing Countries –

Fund name	Managing organisation	Type	Total fund size including pledges (as of date)	Amount currently allocated (as of date)	Eligible sectors and activities	Geographical focus	Website
UNFCCC funds							
Adaptation Fund (AF)	Adaptation Fund Board/GEF	Grant	US$274 million (Jan 2012)	US$124 million (Jan 2012)	All vulnerable development sectors where "sufficient information is available to warrant adaptation activities".	Developing countries that are signatories of Kyoto Protocol.	www.adaptation-fund.org
Least Developed Countries Fund (LDCF)	GEF	Grant	US$415 million (Jan 2012)	US$189 million (Jan 2012)	All vulnerable development sectors identified in the National Adaptation Plan of Action (NAPA). Activities funded must be in line with the "urgent and immediate adaptation needs" identified in the NAPA.	Least Developed Countries who have completed a National Adaptation Plan of Action (NAPA).	http://www.thegef.org/gef/ldcf
Special Climate Change Fund (SCCF)	GEF	Grant			Two funding windows: (a) Adaptation and (b) Technology transfer. (a) Covers long and short term adaptation activities in all vulnerable sectors where sufficient information is available to warrant such activities". (b) Covers technology transfer activities related to both mitigation and adaptation, including, as a primary priority: "the implementation of the results of technology needs assessments".	All non Annex I signatories of the UNFCCC – with special emphasis given to the "most vulnerable" countries in Africa, Asia, and the Small Island Developing States (SIDS).	http://www.thegef.org/gef/sccf



UNEP RISØ CENTRE
ENERGY, CLIMATE AND SUSTAINABLE DEVELOPMENT

STRATUS CONSULTING
ENVIRONMENTAL RESEARCH AND CONSULTING

Accessing International Funding for Climate Change Adaptation

– A Guidebook for Developing Countries –

Authors

Lars Christiansen

Aaron D. Ray

Joel B. Smith

Erik Haites

UNEP Risø Centre on Energy, Climate and Sustainable Development
P.O. Box 49,
4000, Roskilde
Denmark
Phone +45 4677 5129
Fax +45 4632 1999
http://www.uneprisoe.org/
http://tech-action.org/

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info@magnumbooks.org

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Contents

List of Tables and Figures

List of Tables

List of Figures

Abbreviations

AdapCC	Adaptation for Smallholders to Climate Change
AF	Adaptation Fund
ADF	African Development Fund
BAU	Business-as-usual
CATIE	Centre for Investigation and Training on Tropical Agriculture
CWG	Chongqing Water Group
CDKN	Climate and Development Knowledge Network
DAI	Department of Agriculture and Irrigation
FDI	Foreign direct investment
GTZ	German Technical Cooperation
GEF	Global Environment Facility
GFDRR	Global Facility for Disaster Reduction and Recovery
GHG	Greenhouse gas
HBF	Heinrich Böll Stiftung
HARITA	Horn of Africa Risk Transfer for Adaptation
LDCF	Least Developed Countries Fund
MWC	Manila Water Company
MoANR	Ministry of Agriculture and Natural Resources
MCA	Multi criteria analysis
MIF	Multilateral Investment Fund
NAPA	National Adaptation Programmes of Action
NCARE	National Centre for Agricultural Research and Extension
NC	National Communication
NIEP	National Irrigation Expansion Programme

NGO	Non-governmental organisation
PPCR	Pilot Programme for Climate Resilience
PSDA	Private Sector Development in Agriculture
PMU	Project Management Unit
PMCF	Project Manager's Coordination Forum
PSC	Project Steering Committee
RWRP	Regional Water Retention Project
REACT	Renewable and Adaptation to Climate Technologies
RBM	Results-based management
SIDS	Small Island Developing States
SCCF	Special Climate Change Fund
SPCR	Strategic Program for Climate Resilience
TSAT	Technical Support and Advisory Team
TAP	Technology Action Plan
TNA	Technology Needs Assessment
URC	UNEP Risoe Centre
UNEP	United Nations Environment Programme
V&A assessment	Vulnerability and adaptation assessment
WESI	Water Efficient Subsurface Irrigation
WFP	World Food Programme

Preface

The deployment and faster diffusion of technologies for adaptation is an essential part of developing countries' response to a changing climate. The Technology Needs Assessment (TNA) Project implemented by UNEP and the UNEP Risø Centre (URC) and funded by the Global Environment Facility, is supporting 36 developing countries to conduct Technology Needs Assessments (TNAs) and prepare Technology Action Plans (TAPs), during which a number of project ideas are developed. Adaptation technology projects feature heavily in these efforts.

Identifying and prioritising technologies, and developing project ideas, is the first step towards successfully implementing TAPs. New external funding is often needed in sectors as varied as agriculture, water management, coastal zone management, health, infrastructure, disaster risk management and ecosystem management. While funding for implementing TAPs is increasingly available through international sources, accessing this funding can be challenging; going from project ideas to 'fundable' proposals is a major constraint for many TNA countries.

This guidebook reviews options for international financing of adaptation activities and projects in developing countries. It examines both public and private sources of funding and presents the most important technical criteria and concepts used by public donors and private financiers in evaluating proposals.

This guidebook has been co-authored by Lars Christiansen from the UNEP Risø Centre, Aaron D. Ray and Joel B. Smith from Stratus Consulting, and Eric Haites from Margaree Consultants Inc. Lars Christiansen has practical experience on international public sector financing through four years of service as co-reviewer and manager of proposals from the Least Developed Countries Fund, Special Climate Change Fund and Adaptation Fund. Aaron D. Ray, Joel B. Smith and Erik Haites bring more than forty years of experience and expertise on adaptation in developing countries. Joel and Erik have also led UNFCCC-supported studies and assessments of financial needs and flows for adaptation in 2007 and 2008.

The guidebook was reviewed by the following international experts on adaptation financing: Barbara Buchner, Director and Chiara Trabacchi, Research Fellow at the Climate Policy Initiative of Venice; Ermira Fida, head of UNEP's GEF Climate Change Adaptation Unit; Brad Gentry, Senior Lecturer in Sustainable Investments at Yale University; and Pradeep Kurukulasuriya, Senior Technical Advisor for UNDPs adaptation programmes. Their inputs were invaluable and deeply appreciated. Additional useful comments and suggestions were received from the TNA regional centre for Africa: ENDA (Environment and Development Action in the Third World). We also wish to express our gratitude to Anne Olhoff, Sara Lærke Meltofte Trærup, and Xianli Zhu, all from URC, for commenting on early drafts of this guidebook.

Jorge Rogat
Project Manager
UNEP Risø Centre

Mark Radka
Energy Programme Coordinator
UNEP DTIE

Executive Summary

The primary aim of this guidebook is to provide countries participating in the Technology Needs Assessment (TNA) Project with practical guidance that will help them secure financing for adaptation technology transfer project profiles identified in their Technology Action Plans (TAPs). The TNA project is being implemented by United Nations Environment Programme (UNEP) on behalf of the Global Environment Facility (GEF).

This guidebook provides a number of concrete tools and recommendations that will help TNA countries identify and access funding to implement their TAPs, such as:

- An overview of international public funding sources dedicated to adaptation investments (Chapter 3)
- Seven fundamental eligibility criteria for accessing international public funding and guidance on how to apply these concepts to project ideas (Chapter 3)
- A template (built on the abovementioned seven fundamental eligibility criteria) for developing/ presenting adaptation project ideas to international donors. Using this format when communicating project ideas to international donors and agencies is likely to facilitate greater interest and increase the chances of successfully accessing available funding (Chapter 3 and Annex I and II)
- An overview of critical concepts and requirements for accessing private financing for adaptation and a number of instructive case studies (Chapter 4).

Accessing climate finance

Studies have found that tens of billions of dollars per year may be needed within just a few decades to fully fund anticipated adaptation needs in developing countries.

There are two fundamental avenues of financing for climate change adaptation: public financing and private financing. The key difference between public and private adaptation financing is the investor's motivation. The primary motivation for suppliers of private finance is to maximise return on their investment (directly or indirectly). Public sector financing, on the other hand, does not necessarily need to be 'profitable' but is generally motivated by a desire to maximise 'impact' per invested dollar so as to demonstrate to their 'owners' (i.e. the tax payers) that funding is being spent wisely in the most vulnerable regions and making a positive difference to as many vulnerable people as possible.

Most likely, many climate change adaptation projects will be financed by a mix of public and private funds. Developing countries can take steps to improve their ability to secure these funds. There are a number of common principles for securing public and private climate change adaptation financing that include focusing on the return on investment, making use of collaborative action, communicating the rationale for adaptation action, and building local capacity. Improving the enabling environment for investment by providing the appropriate administrative framework and developing the capacity to absorb resources can improve a country's ability to attract finance and its ability to use that investment effectively. Both public and private funders will be attracted by investment climates that promise stability and good governance.

Adaptation projects will often be financed through collaboration between private sources of capital, public donors, non-governmental organisations (NGOs), and local institutions (both public and private). Similarly, the financing for these projects will likely include a mix of private, public, and philanthropic funds.[1] One of the key strategies for seeking funding for adaptation projects is to structure projects to take advantage of both of these sources of funding. Often public and philanthropic funding can serve a catalyst for the investment of private capital. Developing countries can use public funding to reduce the investment risk of a project thereby encouraging private investors to contribute. Public private partnerships are a particularly effective model for accessing financing and implementing adaptation measures. Public funds can be used to reduce the risk for private investors. Private investors then can contribute needed capital. In addition, philanthropic funds can be used to build capacity and pilot new adaptation strategies. Public private partnerships also allow the public sector to benefit from specialised skills that may exist only in the private sector.

Public sources for funding climate adaptation

A large number of public bilateral and multilateral donors are participating in adaptation financing, and each donor applies its own unique set of criteria and procedures. There are three operational funds for adaptation under the UNFCCC as well as a great number of other funds not directly tied to convention guidance. Many of these funding sources have been active for a number of years and a number of common fundamental concepts are now starting to become apparent. Based on the practical guidance and experience of these funding sources, this guidebook identifies seven criteria for fundamental proposal eligibility that are further discussed and explained in Chapter 3:

1. **Adaptation rationale and additional cost argument.** What is the business-as-usual development for the targeted sector? What are the projected climate change impacts? What are the specific adaptation activities to be implemented to reduce the climate change vulnerability compared to the business-as-usual situation?
2. **Urgency and prioritisation.** How and why was this particular project idea identified among the many alternatives that could have been addressed with the same funding?
3. **Weighting of project activities.** How much funding will be allocated to 'investment activities', 'capacity building activities' and 'project management activities' respectively?
4. **Sustainability of intervention.** How will the project assure that the benefits achieved through its investments are sustained beyond the lifetime of the project?
5. **Cost effectiveness.** A qualitative discussion of how the principle of cost effectiveness has been applied in the selection of the specific project activities among alternative options to achieve the same objective(s).
6. **Institutional setup and comparative advantage of implementing institution.** Who will implement the project and what are their comparative advantages and capacity compared to other potential implementing institutions? How will the project be coordinated with (and/or mainstreamed into) related development activities of the targeted sector?
7. **Results-based management and logical framework.** Presenting the project in a way that is consistent with principles of results-based management, which implies a strong focus on directly linking all project activities to clear 'measurable' adaptation 'outputs', 'outcomes', and 'impacts'.

1 See UNDP publication Catalyzing Climate Finance (UNDP, 2011a).

Based on these cross cutting fundamental eligibility criteria for accessing adaptation funding, the guide also proposes a practical template for developing and presenting adaptation project ideas to international donors, which is presented in Annex I and II.

Private sources for funding climate adaptation

The defining characteristic of private sector adaptation financing is the demand for a reasonable, predictable, and usually relatively quick market rate of return on investment. As such, the adaptation actions that will attract private sector capital are those that can produce reliable market returns in the short run or high returns over a longer time frame.

When identifying private sector funding opportunities, it is important to understand equity and debt. Debt must be repaid with interest as part of a loan or bond. Equity conveys ownership rights through the shares of companies that are publicly traded (e.g. on a stock exchange) or the net value of the assets in a privately held business. Private finance includes equity for privately owned assets and debt for sectors with public or private assets.

Private sources of finance will expect the same return on their investment in adaptation that is available from other investments with a similar risk profile. If adaptation to the impacts of climate change increases the cost of the asset, the mix of financing or the mix of debt and equity may need to change to generate the returns that private sources expect. In addition, the proportions and/or order in which losses are shared may change; the borrower or operator may be required to hold more and/or different insurance coverage; or some public funds may be needed. The sources that traditionally finance a particular type of asset should be able to suggest options for financing higher costs.

Financial institutions of all types are among the potential international sources of private sector climate finance for adaptation. These include, but are not limited to, banks, insurance companies, pension funds, multinational companies, private equity funds, sovereign wealth funds, and endowments. Any of these institutions may invest in adaptation in order to earn a return on their investment and/or protect assets they own.

Foundations and social investors represent an additional type of non-government finance for developing countries. The attraction of foundations and social investors for developing countries is that unlike traditional private finance, these investors may accept lower returns as a trade-off for making a positive social impact.

Developing countries can create conditions to attract investments by reducing risks or increasing rewards. A number of capacity- and institution-building measures can be taken to reduce uncertainty, regulatory barriers, and transaction costs for investors. In addition, developing countries can make use of equity, debt (e.g. senior loans and subordinated loans), guarantees, and insurance schemes to reduce investment risk for private capital. To be successful, these tools must be used with an understanding of the investors' needs. These tools could also be used to offset or reduce the additional investments for climate change adaptation.

The adjustments needed to adapt to the impacts of climate change are often an integral part of the asset itself, thus they can be financed as part of the asset. For example, the cost of larger culverts to reduce increased flood risks from climate change would be included in the cost of a road, rather than financed separately.

Most private finance for adaptation in developing countries is likely to come from domestic sources. The sectors with privately owned assets have traditionally obtained funds from domestic sources. In contrast, developed country financial institutions tend to invest directly in some assets, but these are typically large projects that involve entities with substantial financial resources such as national or state governments or large private firms. Specific arrangements such as project finance and public-private partnerships may be needed to attract international investors. Developed country financial institutions also channel funds through financial institutions in the recipient country for smaller projects.

Finally, developing country governments can increase the amount of international private finance that is available domestically. Strategies include encouraging local financial institutions to explore relationships with developed country institutions that have appropriate funds; using public-private project finance where appropriate; and encouraging foreign direct investment. In addition, developing countries should work with investors to identify the barriers to investment and design projects or implement measures that minimise those barriers.

Conclusion

Most likely, adaptation will be funded by a combination of public and private funds. To access this funding, developing countries should understand the similarities and differences between funding sources as well as the requirements for each of the sources. A number of public bilateral and multilateral donors are currently active in the area of adaptation financing and each donor applies its own unique set of criteria and procedures. However, there are seven criteria in common across many of the public sector donors. Private sector funders are often most concerned with the return on their investment. This requirement will often determine the appropriateness of private funding for any particular adaptation project. In many cases, public funds can be used to leverage a greater amount of private money.

1. Purpose and Outline of the Guidebook

1.1 Purpose of the guidebook

The aim of this guidebook is to provide countries participating in the UNEP implemented Technology Needs Assessment (TNA) Project with an overview of the many international funding opportunities (both public and private) currently available for climate change adaptation, and to provide guidance on the best strategies for accessing such funding for implementation of their national Technology Action Plans (TAPs). It should be noted here that the concept of 'technologies for adaptation' currently isn't clearly defined or delineated from the broader concept of 'adaptation' among international donors and stakeholders (see e.g. Christiansen et al. 2011). This guidebook therefore assumes that all funding sources for adaptation can be considered potential funding sources for implementation of TAP adaptation (technology transfer) project concepts.

TAPs are not the only source of adaptation project ideas. Adaptation projects are identified through several processes including the preparation of National Communications, National Adaptation Programmes of Action (NAPAs) and Technology Needs Assessments (TNAs) under the UNFCCC as well as other domestic and international processes, studies, and reports. In some cases funding is limited to projects identified by a specific process. Funding from the Least Developed Countries Fund (LDCF), for example, is limited to projects identified by NAPAs (however TAP project ideas consistent with the NAPA may also be able to access funding through the LDCF). The recommendations made in this guidebook may therefore be equally relevant to stakeholders seeking funding for adaptation project ideas under any of these other processes. Note that there will likely be many common elements across these planning processes, so in practice a cross cutting national funding strategy may be appropriate.

The global public financial architecture for climate change adaptation is a complex and evolving network of bilateral and multilateral funds. Each fund has a unique combination of thematic and geographic foci, and each has its own set of information requirements and eligibility criteria for funding requests. In addition to public funding sources, there are an even greater diversity of private and philanthropic institutions that invest in climate change adaptation projects. These sources also have diverse funding levels, motivations, and thematic and geographic foci. There have been recent actions such as the Copenhagen Accord (December 2009) and Cancun Agreements (December 2010), in which developed countries committed to jointly mobilise $100 billion per year by 2020 to support climate change mitigation and adaptation activities in developing countries. Therefore, further diversification of sources, agents, and channels of international adaptation funding can be expected in the coming years, not least through the establishment of the Green Climate Fund. Navigating this constantly changing terrain of international adaptation funding sources can be a very difficult task for an individual national project developer and it is the hope that this guidebook can help achieve more successful formulation and funding of adaptation project ideas.

1.2 Technology needs assessments and technology action plans

A Technology Needs Assessment (TNA) is a set of country-driven activities aimed at enabling developing countries to identify national mitigation and adaptation technology priorities. The TNA is an opportunity for countries to identify their evolving needs for equipment, techniques, practical knowledge, and skills necessary to mitigate greenhouse gas (GHG) emissions and/or to reduce their vulnerability to the adverse impacts of climate change. A TNA is used to examine the contribution that different technologies can make to national mitigation and adaptation goals and to prioritise these technologies based on national development priorities and plans.

Technology Action Plans (TAPs) are used to identify barriers to the acquisition, deployment, and diffusion of priority technologies and to determine the logical and practical actions to overcome those barriers. The key outputs of TAPs are plans for domestic action at a sector level and identification of a number of specific project ideas to be pursued for funding.

Table 1.1 Examples of technology types for adaptation in different sectors. Three categories of technology are commonly used: hardware, software and orgware, each of which are eligible for the TAPs (source: Christiansen et al. 2011)

Sector/ Technology type	Hardware	Software	Orgware
Agriculture	Crop switching	Farming practices, research on new crop varieties	Local institutions
Water resources and hydrology	Ponds, wells, reservoirs, rainwater harvesting	Increase water use efficiency and recycling	Water user associations, water pricing
Coastal zones	Dykes, seawalls, tidal barriers, breakwaters	Development planning in exposed areas	Building codes, early warning systems, insurance
Health	Vector control, vaccination, improved water treatment and sanitation	Urban planning, health and hygiene education	Health legislation
Infrastructure	Climate proofing of buildings, roads and bridges	Knowledge and know-how	Building codes and standards

The TNA process consists of broad ranging consultations of stakeholders at the country level. The TNA team, which is responsible for project implementation at the national level, consists of representatives of governments, industries, financial institutions, technology experts, civil society, and others. In each country, national consultants are contracted to facilitate the stakeholder consultation process and prepare the TNAs and TAPs. The participating countries are provided with financial assistance by the Global Environment Facility (GEF) to conduct project activities. The United Nations Environment Programme (UNEP), UNEP Risoe Centre (URC) and regional centres facilitate this process with training and methodological support.[2]

2 For more information, see the Global Environmental Facility (http://www.thegef.org/gef/) and the UNEP Risoe Centre (http://uneprisoe.org/).

TAPs identify a number of specific project ideas that can be pursued for funding and implementation at the end of the TNA project. This output will help ensure that there is a clear strategy for continuation of the national TNA process once project funding runs out and that the TNA will ultimately lead to concrete action and benefits. Although identifying a portfolio of project ideas is an important first step in the TNA process, a few of these project ideas can be further developed into concrete project proposals that can be submitted for funding through international (or local) institutions. However, many TNA stakeholders do not have sufficient knowledge of the broad spectrum of potential funding sources for both mitigation and adaptation projects, nor are they familiar with the different eligibility criteria and information requirements of such institutions.

The URC is implementing a TNA project that aims to enable countries to carry out TNAs and TAPs through a bottom-up process. This project is a part of the Strategic Program on Technology Transfer supported by the GEF.

To date, the TNA process includes 36 developing countries. The 15 countries that started work on the TNA project in early 2010 are designated as first-round countries. These countries started submitting their TAPs in September 2011. An additional 21 countries initiated their national TNA process in early 2011. Countries include:

1. Asia and Eastern Europe: Azerbaijan, Bangladesh,* Bhutan, Cambodia,* Georgia,* Indonesia,* Kazakhstan, Laos, Lebanon, Moldova, Mongolia, Nepal, Sri Lanka, Thailand,* Vietnam*
2. Africa: Côte d'Ivoire,* Ethiopia, Ghana, Kenya,* Mali,* Mauritius, Morocco,* Rwanda, Senegal,* Sudan, Zambia
3. Latin America: Argentina,* Bolivia, Colombia, Costa Rica,* Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala,* Peru*

* = First-round TNA countries

1.3 Outline of the guidebook

Chapter 2 presents a general overview of the state of climate change adaptation financing. It also highlights general principles for accessing both public and private financing. It also discusses the complementary role public and private financing can play, particularly through public-private partnerships.

Chapter 3 covers bilateral and multilateral financing sources for adaptation technology projects. The chapter is divided into two parts. The first part provides an overview of the chief bilateral and multilateral sources available to countries seeking financial support to implement adaptation projects identified in the TAPs. The second part introduces key concepts and criteria used to evaluate adaptation project proposals for international financing. It also provides guidance on how these concepts can be incorporated into the development of TAP project ideas.

Chapter 4 introduces private sources for financing adaptation projects identified in the TAPs. The chapter provides a general overview and discussion of country-level options for leveraging private financing for adaptation technology projects. The general discussion is supplemented by case studies from countries that have successfully raised private financing for development projects that include adaptation considerations. It concludes with some guidelines for accessing private sector financing.

Chapter 5 summarises the guidebook by briefly restating the key findings from Chapter 2-4, noting that financing of many adaptation projects is likely to involve a mix of public and private funding sources. It also provides advice on how to secure the best mix for different types of adaptation projects.

2. Overview of Financing for Adaptation

2.1 State of climate change adaptation financing

Adapting to the impacts of climate change imposes significant costs on developing countries. Table 2.1 summarises three studies that have estimated the costs of annual climate change adaptation funding needs of developing countries by 2030. The three studies found that tens of billions of dollars may be needed. Of the sectors identified in these studies, some are primarily public, such as infrastructure and natural ecosystems. Other sectors are primarily private, for example, agriculture and fisheries. Sectors such as water supply and human health, involve a mix of public and private activities that varies between countries.

Table 2.1. Comparison of published estimates of climate change adaptation funding needs in developing countries by 2030 ($billion).

Sector	Study		
	UNFCCC (2007)	Parry et al. (2009)	World Bank (2010a)
Agriculture, forestry, fisheries	$7	$7	$6
Water resources	$9	Much higher than other two studies	$11
Human health	$5	At least $10	$3
Coastal zones	$5	$10	$29
Infrastructure	$22–41	$65–154	$29
Extreme events	$2	$2	$7
Fisheries	$2	$2	$2
Ecosystems	$2	$33–40a	$2
Total	**$54–73**	**> $129–225**	**$80–90b**

a. Parry et al. (2009) reported a global estimate of $65–80 billion. We assume that half of this amount is in developing countries.
b. Range is from the World Bank (2010a) report. Estimates by sector are based on reported numbers for the 2020s and 2030s.
Source: Smith et al., 2011.

The range of estimates and the differences between the estimates of the three studies shows the uncertain nature of adaptation finance calculations. Reasons for the variation in estimates include: differences in coverage and methodology; uncertainties related to future climate changes and how best to adapt to them; and the lack of an agreed operational definition of adaptation.[3]

3 CTI PFAN Background Paper on Adaptation, Chapter 3.

Sources of climate finance can be public and private. Public sources include domestic budgets contributions, multilateral and bilateral development agencies, and UNFCCC funds. Private sources include domestic and foreign firms and individuals, financial institutions (e.g. banks), capital markets (e.g. stock exchanges), environmental markets and finance (e.g. carbon finance and payments for ecosystem services), pension funds, and philanthropic organisations.

The majority of developing countries face financial constraints (public as well as private) and significant additional costs imposed on their development by the impacts of climate change. Therefore bilateral, multilateral, and private financing are all likely to be important sources of funding for adaptation activities. The Cancun Agreements which confirmed the Copenhagen Accord, include a pledge by developed countries to jointly mobilise $100 billion per year by 2020 from "public and private, bilateral, multilateral, and alternative sources of finance" to meet the needs of developing countries.

Adaptation funding currently lags behind mitigation funding both in the public and private arenas. Of an estimated $97 billion in total climate finance available in 2009/2010, $93 billion was used for mitigation measures while adaptation projects received only $4.4 billion. Of the funds devoted to adaptation, over 90% came from public sources (Buchner et al., 2011). Bilateral institutions were the largest source of adaptation funding ($3.6 billion), with multilateral institutions ($475 million) and philanthropic organisations ($210 million) contributing smaller shares (Buchner et al., 2011).

Although public funding for climate change adaptation appears to be increasing, this funding is likely to remain well below the estimated need (see table 2.1 above). The World Bank (2010a) reports that $1.5–1.8 billion has been pledged for adaptation (out of the total current funding of $9 billion for both mitigation and adaptation). The OECD reported $9.3 billion in adaptation related aid by members of the Development Assistance Committee in 2010.[4]

One of the challenges in assessing the state of adaptation finance is the variance in estimates of the amount of money available. The variance of estimates presented here is due to use of different methodologies when accounting for adaptation finance; different sources being included in the sums; and the use of different time frames. Despite the variance in the estimates, there are two common findings. First, adaptation funding lags behind funding for mitigation. Second, the majority of adaptation funding has come from the public sector.

Table 2.2 shows data from UNEP on the financial instruments used by the public sector to fund climate change mitigation and adaptation projects and their distribution in 2010. It is clear that mitigation projects capture the vast majority of the funding, while in both cases, concessional loans are the most commonly used financial instrument. Concessional loans are typically provided to developing countries and carry lower interest rates and longer repayment periods than market rate (or non-concessional) loans. When considering financing options from public institutions, developing countries often pursue these financial instruments.

4 See OECD, 2011 for more information. $3.5 billion was for projects whose "principal" objective was adaptation while $5.9 billion was for projects that had adaptation as a "significant" objective. $4 billion of the adaptation aid also had a mitigation objective.

Table 2.2. Public sector financial instruments ($million).

Instrument	Mitigation	Adaptation	Total
Grants	$857 (6%)	$771 (27%)	$1,628 (10%)
Concessional loans	$8,904 (69%)	$2,030 (71%)	$10,934 (70%)
Non-concessional loans	$3,100 (24%)	$54 (1.9%)	$3,154 (20%)
Other	$4 (<1%)	$0 (0%)	$4 (<1%)
Total	**$12,865**	**$2,855**	**$15,720**

Source: UNEP, 2011. Percentages in parentheses indicate the percent of total sectoral spending delivered via each financial instrument.

Note that less than 2% of public sector adaptation funding is distributed as loans with market terms (non-concessional); a much smaller share compared to mitigation funding. Since private finance expects to earn a market return, these figures suggest that only a small fraction of adaptation measures is likely to be attractive for private finance. This is confirmed by the dominance of bilateral and multilateral funding for adaptation mentioned above. Thus, private finance for adaptation actions is likely to be combined with some public funding. Grants and concessional loans - among the others - can be used to enable the private finance to earn a market return commensurate with the risk. In addition, a significant amount of private investment in adaptation is likely to be made by private firms whose property is threatened by climate change and who are interested in protecting those investments.

Figure 2.1 illustrates the variety and magnitude of current climate finance flows (Buchner et al., 2011). Public financing originates as carbon market revenues, carbon taxes, and general tax revenues. These funds are funnelled through bilateral and multilateral banks, agencies and funds, and are disbursed largely as grants, concessional loans, and market rate loans. Private financing comes from capital markets; offsets and the voluntary carbon market; and philanthropic organisations, as well as corporate social responsibility initiatives. The majority of this money is directed toward market rate loans and equity. The terms and conditions of private financial instruments will likely be different from those offered by public institutions. However, private financing represents the largest share of current and future climate finance and so offers a potentially attractive source of funding for adaptation projects in developing countries. Of the estimated $97 billion currently available as climate finance, $55 billion is provided by the private sector (Buchner et al, 2011).

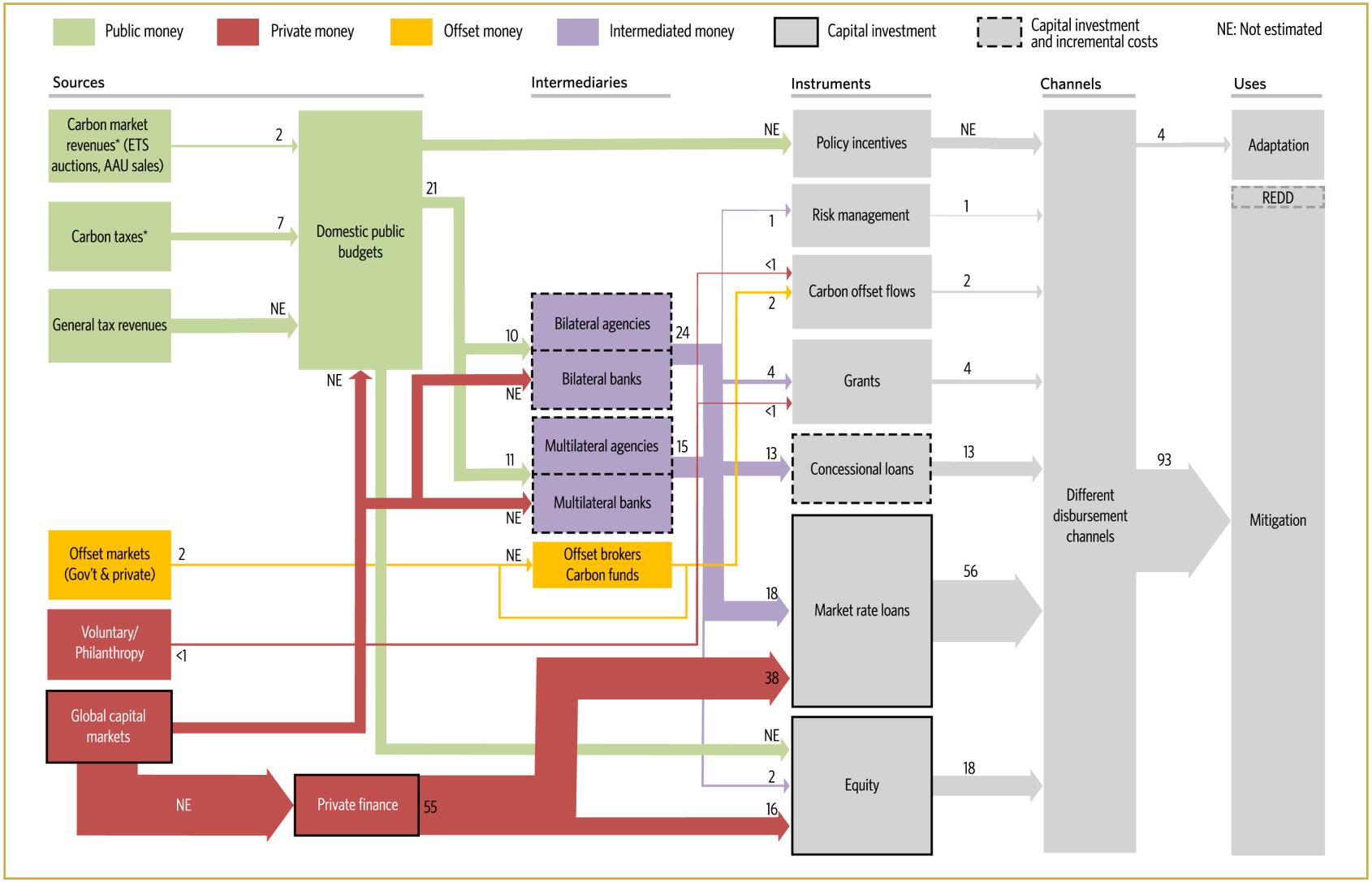
2.2. Creating conditions for accessing public and private financing

Many of the actions developing countries can take to access public financing are similar to those that will attract private financing. While Chapters 3 and 4 deal with these arenas separately, there are common principles that apply to both funding sources.

1. **Return on investment**

   Both public and private funders seek to maximise the return on their investment, although the criteria by which they measure the return may differ. Bilateral and multilateral donors will be concerned with the cost effectiveness and sustainability of a funded project. Private investors will focus on the rate of return and risk of their investment. In either case, developing countries and institutions that can demonstrate a project's effectiveness and ability to reduce risk may be more likely to secure funding.

Figure 2.1: Current climate finance flows ($billion)



*Source: Buchner, B. et al. 2011. Note: Figures presented are indicative estimates of annual flows for the latest year available, 2009/2010 (variable according to the data source). Figures are expressed in USD billion and are rounded to whole numbers. Estimates spanning multiple years are adjusted to produce annual-equivalent estimates. Where ranges of estimates are available, the mid-point is presented. All flows are incremental except for those identified as full or partial 'capital investment'. Most data presented relate to commitments in a given year, due to limited availability of disbursement data. *Estimated carbon pricing revenues indicated are not necessarily wholly hypothecated for climate finance.*

2. **Collaborative action**

   The cross cutting and complex nature of climate change adaptation projects often requires a collaborative approach in which multiple agencies and institutions with complementary capacities work together on a single project. When developing a project, candidate countries can engage with public funders, private investors, NGOs, local institutions, and government agencies. This kind of collaboration allows the project to bring the capacities and resources of multiple organisations to bear on a given problem. This type of collaboration also allows the costs and risks of different categories of activities (e.g., physical investment, capacity building, and project management) to be borne by the most appropriate funder. In practice, this can be a complex process that requires careful planning and execution.

3. **Adaptation rationale**

   Public funders will want to know how the adaptation activity in question will address an existing or potential vulnerability relative to the business-as-usual scenario. The private sector may be interested in reducing risks to their investment which could include reducing the vulnerability of a project to climate variability and climate change. Project developers should be able to justify any additional cost for a project in qualitative or quantitative terms.

4. **Policy and institutional framework**

   The UNDP argues that developing countries can "create conditions that enable public and private investment flows to address pressing environmental problems" (UNDP, 2011a). To do that, the UNDP advises developing countries to create the conditions to attract investment by reducing risks or increasing rewards. Developing countries can take capacity-building and institution-building steps to attract investment from both public and private funders. Reducing uncertainty, regulatory barriers, and transaction costs and improving transparency all make a country more attractive to investment by both public and private institutions.

2.3 Opportunities to coordinate private financing and public financing

Public and private financing should not be seen as mutually exclusive alternatives. In many cases the two funding sources may be symbiotic. Public-private partnerships represent a particularly effective method in which public sector money can be used to leverage private sector investment, particularly in infrastructure projects.[5] These partnerships can also bring in technical expertise from the private sector that may not be available in the public sector. In addition, private sector engagement can improve the sustainability of an investment, ensuring that the project is funded over time. Private financing is currently a component, along with public funds, of numerous infrastructure projects in the developing world. Table 2.3 shows the distribution of infrastructure projects with private participation by sector. Most investment goes to electricity supply, transportation, and water supply, all of which are sectors that are sensitive to climate change.

Table 2.3. New infrastructure projects in developing countries that had private participation in 2010, by sector.

Major sector	Subsector	Investment (USD billion)
Energy		**$106**
	Electricity	$104
	Natural Gas	$2
Telecommunications		**$8**
Transport		**$92**
	Airports	$6
	Railways	$1
	Roads	$69
	Seaports	$16
Water and sewerage		**$25**
	Treatment plant	**$17**
	Utility	$7
Total		**$231**

Source: World Bank, 2011.

Public-private partnerships usually involve a management or ownership stake for the private partner. The Public-Private Infrastructure Advisory Facility of the World Bank reported on private investment in infrastructure, including energy, telecommunications, transportation, and water and sewerage projects, in East Asia and the Pacific in 2009 (World Bank, 2010b). The largest share of new projects took the form of build-operate-transfer (BOT)[6], build-own-operate (BOO)[7], build-rehabilitate-operate-transfer (BROT)[8], merchant, and rental schemes. Divestitures[9] and concessions[10] were also common. Worldwide in 2009, water sector projects in developing countries included 23 BOT schemes, 8 concessions, 2 lease contracts, 1 management contract, and 1 divestiture (World Bank, 2010c). Of 50 new transport projects, 32 were

5 For more information on public-private partnerships, see IMF, 2004.

6 In the BOT framework the public administration delegates a private sector entity to design and build infrastructure and to operate and maintain these facilities for a certain period. During this period the private party has the responsibly to raise the finance for the project and is entitled to retain all revenues generated by the project and is the owner of the facility. The facility will be then transferred to the public administration at the end of the concession agreement, without any remuneration of the private entity involved.

7 In a BOO project ownership of the project remains usually with the private sector entity. Therefore the private company gets the benefits of any residual value of the project. This framework is used when the physical life of the project coincides with the concession period. A BOO scheme involves large amounts of finance and long payback period.

8 Under the BROT arrangement, a private developer builds an add-on to an existing facility or completes a partially built facility and rehabilitates existing assets, then operates and maintains the facility at its own risk for the contract period.

9 In a divestiture a private entity buys an equity stake in a state-owned enterprise. However, the private stake may or may not imply private management of the enterprise. True privatisation, however, involves a transfer of deed of title from the public sector to a private undertaking. This may be done either through outright sale or through public floatation of shares of a previously corporatised state enterprise.

10 In a concession the government defines and grants specific rights to an entity to build and operate a facility for a fixed period of time. The government may retain the ultimate ownership of the facility and/or right to supply the services. In concessions, payments can take place both ways: concessionaire pays to government for the concession rights and the government may also pay the concessionaire, which it provides under the agreement to meet certain specific conditions. Usually such payments by government may be necessary to make projects commercially viable and/or reduce the level of commercial risk taken by the private sector, particularly in the initial years of a program in a country when the private sector may not have enough confidence in undertaking such a commercial venture.

concessions, 14 were BOT contracts, and 2 were lease contracts (World Bank, 2010d).

The World Bank reported that 65 infrastructure projects with private participation reached financial or contractual closing in seven low- and middle-income countries in East Asia in 2009 (World Bank, 2010b). Total investment commitments in infrastructure in the region amounted to USD 15.3 billion in 2009, a 7% decline from 2008 (World Bank, 2010b). Investment in East Asia was focused on China and the Philippines. The energy and water and sewerage sectors captured the most projects. The most common form of investment was BOT contracts (World Bank, 2010b).

Existing public-private partnerships represent a model for the financing of adaptation projects, particularly in infrastructure. Such investments may not be possible with public money alone. The two projects described below illustrate the potential for using public financing to leverage private investment for infrastructure projects in sectors vulnerable to the impacts of climate change. While these projects are not explicitly oriented toward reducing climate vulnerabilities, there is a lesson here for developing countries. A public-private partnership, in which the private partner has a financial incentive to invest, can leverage private money for investment in infrastructure projects in climate sensitive sectors. These projects could then be designed to include components aimed at reducing climate vulnerability[11].

In 2008, Suez Environment signed an agreement with Chongqing Water Group (CWG), a state-owned enterprise, to invest in a drinking water concession in the Yuelai area of Chongqing, China (Suez Environment, 2008). The project included the construction and management of a drinking water treatment plant to serve the area's 1.2 million residents. This agreement continued an existing relationship between Sino French Water Development, a subsidiary of Suez Environment, and the CWG. In 2002, a 60/40 cooperative joint venture, the Chongqing Sino French Water Supply, was established to provide drinking water in the region. The Chongqing Sino French Tangjiatuo Sewage Treatment plant, a 50/50 joint venture was created in 2007 to build, operate, and manage waste treatment facilities for 1 million people. In 2008, Suez acquired a 7.5% stake in CWG for RMB1.5 billion (rem min bi, Chinese currency) (GWI, 2011). Suez Environment and CWG signed a BOT contract with the City of Chongqing in 2009 to operate the water distribution concession for the Yuelai district (World Bank, 20010b; Suez Environment, 2009). This 40-year contract is expected to generate Euro3 billion in revenues and include Euro150 million in additional investment (Suez Environment, 2009).

In 2009, the Manila Water Company (MWC) was awarded the water concession for Boracay Island, a popular tourist destination in Manila (BusinessWorld, 2009). MWC, in a public-private partnership with the Philippine Tourism Authority, will have a 25-year contract and a 90% equity stake in the privatised water system (BusinessWorld, 2009). The contract set up a BROT concession scheme (World Bank, 2010c). The goal of the partnership is to allow for the expansion and management of the water system to meet congestion and environmental challenges (BusinessWorld, 2009). MWC planned to invest PHP1.2 billion (Philippine peso) over three years to improve service (BusinessWorld, 2009). In 2011, the joint venture, Boracay Island Water Company, closed a PHP500 million loan with the Development Bank of the Philippines and Security Bank Corp. to finance upcoming capital expenditures (Go, 2011). The loan carries a 20-year tenor and an upsize feature that could raise the total loan amount to PHP1 billion (Go, 2011).

To address existing and potential climate vulnerabilities, developing countries will need to access the combined financial and technical resources of the public and private sectors. Having an understanding of the priorities and needs of donors and investors in both sectors and pursuing creative ways to combine the resources and capacities of both will improve the ability of developing countries to access needed financing for adaptation projects.

11 Additional examples of how climate projects can be funded can be found at Climate Finance Options (http://climatefinanceoptions.org/cfo/index.php).

3. Bilateral and Multilateral Financing Sources for Adaptation Technology Projects

3.1 Introduction and overview

The objective of this chapter is to provide TNA countries with an overview of the many international funding opportunities available for adaptation and to provide guidance and strategies for accessing such funding.

Due to the sheer multitude of funds and the changing nature of the financial landscape as well as the individual fund, this guidebook will not attempt to provide an exhaustive and detailed description of each fund, nor will it attempt to provide a full list of all international public financing sources. Table 3.1 provides an overview of the largest multilateral (and a few bilateral) funds currently in existence.

For detailed and updated information on each of these funds (including for example, access modalities[12], application procedures, eligibility requirements, governance structure, and contact points) readers are referred to either the funds' own websites (links are provided in Table 3.1) or one of the excellent existing online resources such as:

- http://www.climatefundsupdate.org (Heinrich Böll Foundation/Overseas Development Initiative)
- http://www.climatefinanceoptions.org (World Bank/UNDP)
- UNFCCC's (somewhat older) 'adaptation funding interface' available at: http://unfccc.int/adaptation/implementing_adaptation/adaptation_funding_interface/items/4638.php.
- UNFCCC's upcoming (more comprehensive) finance portal for climate change, which may be useful for TNA project developers. For details please see: http://unfccc.int/cooperation_support/financial_mechanism/finance_portal/items/5824.php.

The same online resources include references to other, smaller, bilateral and multilateral financing sources[13], which may be of interest in an individual country context. However, even these may not provide the full picture of options available – in particular in terms of bilateral funding, so a country specific investigation is highly recommended.

12 Different funding sources may offer or require different modalities of access. E.g. for UNFCCC funds, funding from the LDCF and SCCF must be delivered through an international 'Implementing Agency' (e.g. UNDP, UNEP, World Bank, regional banks, FAO, IFAD), while the Adaptation Fund offers a choice between accessing funding through an implementing agency and 'direct access' for a national institution. Getting accredited as an Adaptation Fund 'National Implementing Entity', however can be both difficult and time consuming in practice. Other sources will apply different sets of access modalities – details can be found in the resources listed in the main text.

13 Examples include e.g.: Indonesia Climate Change Trust Fund (Indonesia only), and Caribbean Catastrophe Risk Insurance Facility (disaster risk reduction and Caribbean only).

Table 3.1: Overview of a number of the most important (in terms of available financing) multilateral sources of adaptation funding as well as a few important bilateral sources. *Please note that this account is not meant to be fully exhaustive, and that the scope of available multilateral and (in particular) bilateral sources of adaptation financing available to the individual country and region is likely to be much broader and more diverse than indicated by this table. Please refer to the main text for more comprehensive resources available online. This table is prepared primarily on the basis of www.climatefundsupdate.org, www.climatefinanceoptions.org (both accessed in April 2012). TA in column 3 = 'Technical Assistance'.*

Fund name	Managing organi-sation	Type	Total fund size including pledges (as of date)	Amount currently allocated (as of date)	Eligible sectors and activities	Geographical focus	Website
UNFCCC funds							
Adaptation Fund (AF)	Adaptation Fund Board/GEF	Grant	US$274 million (Jan 2012)	US$124 million (Jan 2012)	All vulnerable development sectors where "sufficient information is available to warrant adaptation activities".	Developing countries that are signatories of Kyoto Protocol.	www.adaptation-fund.org
Least Developed Countries Fund (LDCF)	GEF	Grant	US$415 million (Jan 2012)	US$189 million (Jan 2012)	All vulnerable development sectors identified in the National Adaptation Plan of Action (NAPA). Activities funded must be in line with the specific "urgent and immediate adaptation priorities" identified in the NAPA.	Least Developed Countries who have completed a National Adaptation Plan of Action (NAPA).	http://www.thegef.org/gef/ldcf
Special Climate Change Fund (SCCF)	GEF	Grant	US$216 million (Jan 2012)	US$143 million (Jan 2012)	Two funding windows exist: (a) Adaptation and (b) Technology transfer. (a) Covers long and short term adaptation activities in all vulnerable sectors where "sufficient information is available to warrant such activities". (b) Covers technology transfer activities related to both mitigation and adaptation, including, as a primary priority: "the implementation of the results of technology needs assessments".	All non Annex I signatories of the UNFCCC – with special emphasis given to the "most vulnerable" countries in Africa, Asia, and the Small Island Developing States (SIDS).	http://www.thegef.org/gef/sccf

Fund name	Managing organi-sation	Type	Total fund size including pledges (as of date)	Amount currently allocated (as of date)	Eligible sectors and activities	Geographical focus	Website
Other bilateral and multilateral funds funds							
African Development Fund (ADF)	AfDB	Loan	Approx. US$9.3 billion (Budget for 2011-2013)	Unknown	No sectoral limitations. The ADF contributes to the promotion of economic and social development in 40 least developed African countries by providing concessional funding for projects and programs, as well as technical assistance for studies and capacity-building activities. For the replenishment period 2011-2013 adaptation will be a key priority of the fund e.g. in infrastructure and agriculture investments.	Sub-Saharan Africa	http://www.afdb.org/en/about-us/african-development-fund-adf/
Africa Enterprise Challenge Fund: Renewable and Adaptation to Climate Technologies (REACT)	KPMG on behalf of donors	Grant Loan Risk mgmt.	US$50-100 million (total size of fund)	Unknown	No sectoral limitations. The fund is exclusively focused on supporting innovative business ideas from private entities within the areas of renewable energy and adaptation e.g. products and services that help smallholder farmers adapt such as weather insurance, drought resistant seeds and early warning systems.	East African Community of Burundi, Kenya, Rwanda, Tanzania and Uganda. Private entity applicants only.	http://www.aecfafrica.org/react/

Fund name	Managing organi-sation	Type	Total fund size including pledges (as of date)	Amount currently allocated (as of date)	Eligible sectors and activities	Geographical focus	Website
ClimDevAfrica Special Fund	AfDB	Grant	€144 million (budget 2012-2014)	Unknown	No clear sectoral limitations. The fund will support 'implementation of demonstration adaptation practices' as well as various capacity building activities.	Africa. AfDB member countries.	http://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/climate-for-development-in-africa-climdev-africa-initiative/
Climate and Development Knowledge Network (CDKN)	UK/Neth-erlands	TA Grant	£45 million (2010-2015) Additional funding expected from Netherlands.	Unknown	Very broad mandate on climate change (both mitigation and adaptation) research, technical assistance, knowledge sharing and co-funding of projects.	Developing countries in Latin America and the Caribbean, Africa and Asia.	http://cdkn.org/

Fund name	Managing organi-sation	Type	Total fund size including pledges (as of date)	Amount currently allocated (as of date)	Eligible sectors and activities	Geographical focus	Website
Global Climate Change Alliance	EU	Grant	€164 million (budget for 2008-2010)	€140 million (Jan 2012)	Broad mandate on climate change (both mitigation and adaptation activities). Adaptation is a top priority. Specifically for adaptation the fund supports: (a) Development of adaptation plans in vulnerable countries other than LDCs, (b) Support for NAPA implementation, (c) Adaptation activities in the water and agriculture sectors, (d) Sustainable natural resource management, (e) Promoting disaster risk reduction.	Currently activities in 18 countries globally (Bangladesh, Belize, Cambodia, Ethiopia, Guyana, Jamaica, Maldives, Mali, Mozambique, Mauritius, Nepal, the Pacific region, Rwanda, Senegal, Seychelles, Solomon Islands, Tanzania, and Vanuatu), others could potentially join in subsequent funding periods.	http://www.gcca.eu
Global Facility for Disaster Reduction and Recovery (GFDRR)	World Bank	Grant	US$324 million (Feb 2012)	Unknown	Mainstreaming of disaster risk reduction in development e.g. activities to reduce risks from climate related disasters (flooding, cyclones, droughts etc.), climate resilient reconstruction of infrastructure after disasters, and other DRR related adaptation activities.	Global	http://www.gfdrr.org

Fund name	Managing organi-sation	Type	Total fund size including pledges (as of date)	Amount currently allocated (as of date)	Eligible sectors and activities	Geographical focus	Website
Japan's Fast Start Financing	Japan	Grant Loan TA	US$738 million for adaptation (budget 2008-2012)	Unknown	Not clear. This is not a fund as such, but an initiative covering all of Japan's international activities in relation to climate change. Sectoral focus and eligibility is dependent on bilateral discussions with Japan.	Global. Dependent on bilateral discussion with Japan	http://www.faststartfinance.org/contributing_country/japan
International Climate Initiative	Germany	Grant Loan	€120 million/ year (of which 50% - €60 million - is for adaptation/ biodiversity) (2012 estimate based on sales of CERs)	€64 million for adaptation to date	No clear sectoral limitations. Mentioned sectors include: food security and agriculture, sustainable land management, water resource management, sustainable biomass production, human health, disaster risk reduction and migration management. Ecosystems Based Adaptation seems to be a particular priority.	Global. "Particularly vulnerable countries and regions".	http://www.bmu-klimaschutzinitiative.de
Multilateral Investment Fund (MIF)	IADB	Grant Loan Equity TA	Approx. US$120 million/year	Unknown	No clear sectoral limitations. The MIF works primarily with the private sector (small businesses, microfinance etc.). Adaptation is one of the priority themes.	25 countries in Latin America and Caribbean where IADB have offices.	http://www5.iadb.org/mif/

Fund name	Managing organi-sation	Type	Total fund size including pledges (as of date)	Amount currently allocated (as of date)	Eligible sectors and activities	Geographical focus	Website
Strategic Climate Fund – Pilot Programme for Climate Resilience (PPCR)	World Bank	Grant Loan TA	US$982 million (Nov 2011)	$800 million in national investment plans (SPCRs) $148 million in approved projects (Jan 2012)	All development sectors and priorities identified in NAPAs or other relevant country studies and strategies. A specific Strategic Program for Climate Resilience (SPCR) will be developed in each PPCR country and will guide further implementation and funding.	The PPCR is active in 18 countries globally: Bangladesh, Bolivia, Cambodia, Dominica, Grenada, Haiti, Jamaica, Mozambique, Nepal, Niger, Papua New Guinea, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Tajikistan, Tonga, Yemen, Zambia.	http://www.climateinvestmentfunds.org/cif/ppcr

Fund name	Managing organi-sation	Type	Total fund size including pledges (as of date)	Amount currently allocated (as of date)	Eligible sectors and activities	Geographical focus	Website
Adaptation funding sources currently under discussion							
Green Climate Fund	TBD	TBD	TBD	Not yet operational (officially designated at COP17 in Durban, but practical operation, including call for funding proposals, unlikely to start until 2013-2014)	Eligibility criteria TBD. Resource allocation will be 'balanced' between mitigation and adaptation.	Eligibility criteria TBD. Funding will be prioritised taking into account the needs of those developing countries particularly vulnerable to the adverse effects of climate change.	http://unfccc.int/cooperation_and_support/financial_mechanism/green_climate_fund/items/5869.php and http://unfccc.int/files/meetings/durban_nov_2011/decisions/application/pdf/cop17_gcf.pdf

It should be noted (unless otherwise stated) that the funding sources referenced in Table 3.1 are for adaptation in the broader sense, not specifically for technology transfer activities. The concept of 'technology for adaptation' is not clearly defined or delineated from the broader concept of 'adaptation' among international donors and stakeholders (Christiansen et al. 2011). As such, all funding sources for adaptation can be considered potential funding sources for implementation of TNA adaptation project concepts.

3.2 Key concepts and criteria used in the evaluation of adaptation project proposals for international financing

As outlined above, a large number of bilateral and multilateral donors are currently active in the area of adaptation financing, each of which applies its own unique set of criteria and procedures. Navigating the multitude of templates[14], eligibility criteria and technical terms can be a time consuming and confusing task for the project developer trying to match a TAP adaptation project idea with the right funding source.

Now that many of the funding sources for adaptation have now been active for a number of years, some common fundamental concepts and criteria are starting to become apparent across the funds. This section, and the one following, will identify common concepts and criteria, and provide a generic adaptation concept 'template'. These can be used as a guide by project developers as they consider the various eligibility elements of their project ideas and strive to 'translate' project ideas into a format that will be acceptable and conducive for bilateral and multilateral funding.

With differing weights and formulations the fundamental concepts and criteria suggested below will almost invariably influence the decision of a fund on whether or not to finance a particular adaptation project[15]. A focused effort to address such issues will, therefore, be a very strong starting point regardless of the specific funding source that is eventually targeted by the project development team. It is important to emphasise, however, that the guidance provided here is a simplification that doesn't cover the nuances and additional requirements that may apply for the individual fund. For the specific requirements of any particular fund, always refer directly to the fund (e.g. through the links provided in table 3.1 above)[16].

Based on official guidance and practical experience from e.g. the LDCF, SCCF, AF and PPCR, the following seven fundamental eligibility criteria can be distilled:

1. Adaptation rationale and additional cost argument
2. Urgency and prioritisation
3. Weighting of project activities
4. Sustainability of intervention
5. Cost-effectiveness
6. Institutional setup and comparative advantage of implementing institution
7. Results-based management and logical framework.

14 It should also be noted that projects implemented through Implementing Agencies (see footnote 13) may have to provide project information in two different formats: one for the donor template (e.g. AF) and one for the Implementing Agency (e.g. UNDP/UNEP/WB standards and policies)

15 The common criteria suggested here are based on the author's practical experience from e.g. the LDCF, SCCF, AF and PPCR, as well as an overall alignment with the information on eligibility provided on the websites mentioned in table 3.1 above.

16 For more general guidance on the basic steps involved in designing of adaptation activities a good resources is UNDP's 'A toolkit for Designing Climate Change Adaptation Initiatives' available online at: http://www.undp-adaptation.org/projects/websites/docs/KM/PublicationsResMaterials/UNDP_Adaptation_Toolkit_FINAL_5-28-2010.pdf

1. Adaptation rationale and additional cost argument

The first, and arguably most important, criterion to be addressed in any adaptation proposal is that of the project idea's **'adaptation rationale'**. The purpose of the adaptation rationale is to provide the donor with the basic justification for the proposed project and why it is 'worth' funding. For example, what activities it will implement, how they will work, and what impact they are expected to have on vulnerability, resilience and adaptive capacity[17]. The more concretely and detailed this can be outlined in the initial project concept the better the odds of successfully convincing the donor to support the proposal.

The adaptation rationale can be said to consist of three important questions. All of these need to be fully explored to achieve a convincing adaptation rationale for the proposed project:

1. What is the likely business-as-usual (BAU) development for the targeted sector in the absence of climate change?
2. What are the observed and current climate variability and the projected physical impacts of climate change based on available climate models and scenarios (i.e. temperature increase, decreasing precipitation, seasonal changes and variability, sea level rise etc.), and how will these impacts be manifested in terms of climate vulnerabilities to BAU development in the targeted sector and region (e.g. risk of failing crops, coastal flooding, reduced opportunity for income etc.)?
3. What are the specific adaptation activities to be implemented to reduce the climate change vulnerability compared to the BAU situation?

Another important outcome of the adaptation rationale argumentation is the estimation of the so-called **'additional costs of adaptation'**. The additional costs of adaptation are closely related to the adaptation rationale described above, and can be said to represent its quantitative conclusion. Most adaptation interventions are (and should be) highly integrated into 'regular' development planning and investments. Therefore, bilateral and multilateral donors for adaptation will generally only cover the additional costs of making development resilient to the impacts of climate change - not the costs of development itself. It is therefore of vital importance for any adaptation proposal to clearly delineate the costs of BAU development (i.e. the investments in development that would/should[18] happen even in the absence of climate change) and the costs of implementing the activities necessary to make BAU development more resilient to the impacts of climate change.

The difference in cost between BAU development and climate resilient development constitutes (at least in theory) the 'additional cost of adaptation'. In practice, however, separating BAU development costs and the cost of adaptation dollar by dollar is an almost impossible task. Therefore some degree of approximation and estimation is needed, which is generally accepted by donors.

A project developer's primary focus should therefore be to present a logical and clear qualitative adaptation rationale, particularly in the early project idea presentation phase. With a solid description of expected BAU development and a fully developed and consistent adaptation rationale, a rough estimate of the additional

17 For a more comprehensive description of the differences between these concepts, OECD's: 'Adaptation to Climate Change: Key Terms' provides a good overview: http://www.oecd.org/dataoecd/36/53/36736773.pdf. For practical purposes, the terms resilience and vulnerability are interpreted here as being two ends of the same spectrum i.e. the ability/inability to cope with the impacts of climate change.

18 Even in cases where no or insufficient funding is available to implement BAU development to address the starting situation (step 1 and 2 of figure 3.1), adaptation funding cannot be used for such purposes. Financing for the costs of BAU development, would in such cases have to be sought elsewhere (e.g. national budgets, or other bilateral and multilateral sources) before proceeding with a request for adaptation funding. Only in very special cases will 'stand alone' adaptation (i.e. adaptation without significant BAU development investments) be feasible and acceptable to donors (e.g. some rare examples of coastal protection in areas with few existing development and environmental issues could qualify, at least in theory).

costs should be relatively straightforward in most cases.

Figure 3.1 provides a schematic example of the thought process needed to present the adaptation rationale and additional cost argument in a logical and coherent way to a potential project donor. Further inspiration can be found in the example presented in Annex II.

Criterion 1 is reflected in section C.1. of the template attached in Annex I.

2. Urgency and prioritisation

Most bilateral and multilateral adaptation funds will only support proposals that respond to the highest priority adaptation needs in the targeted region/country and sector. This is due to a combination of factors:

a. Resource constraints in the individual fund, which leads to a strict focus on maximising impact per dollar or euro invested (see also criterion 5 below)

b. Very high demand for adaptation funding in all developing countries and sectors

c. Significant international political focus (e.g. UNFCCC negotiations) on effective delivery of climate change adaptation funding.

Therefore the first priority of any project developer should be to demonstrate to the donor how and why this particular project idea was identified among the many alternative adaptation needs that could have been addressed with the same funding. This evaluation cannot be based on the subjective opinion of any one individual or narrow group of stakeholders (e.g. a project development team or a single ministry). It must be based on objective criteria, a transparent and comprehensive evaluation of climate risks and impacts across regions and sectors, as well as consultation with a broad group of stakeholders.

The best way to present such an argument is through a **'vulnerability and adaptation assessment' (V&A assessment),** as well as additional decision analysis tools such as **multi criteria analysis (MCA)** or others[19]. Most countries have already engaged in one or more cross sectoral national V&A assessments and prioritisation exercises based on MCA (e.g. National Communications (NCs), National Adaptation Programme of Action (NAPA), or the Technology Action Plans (TAPs) developed through the Technology Needs Assessment Project). Therefore, these should be the natural starting point for any funding proposal. A more focused V&A assessment should also be conducted specifically for the project intervention, but this is generally not required to determine the basic eligibility of a proposal or project idea.

The successful project concept should always aim to clearly demonstrate that the targeted region and sector (and subsector) is both:

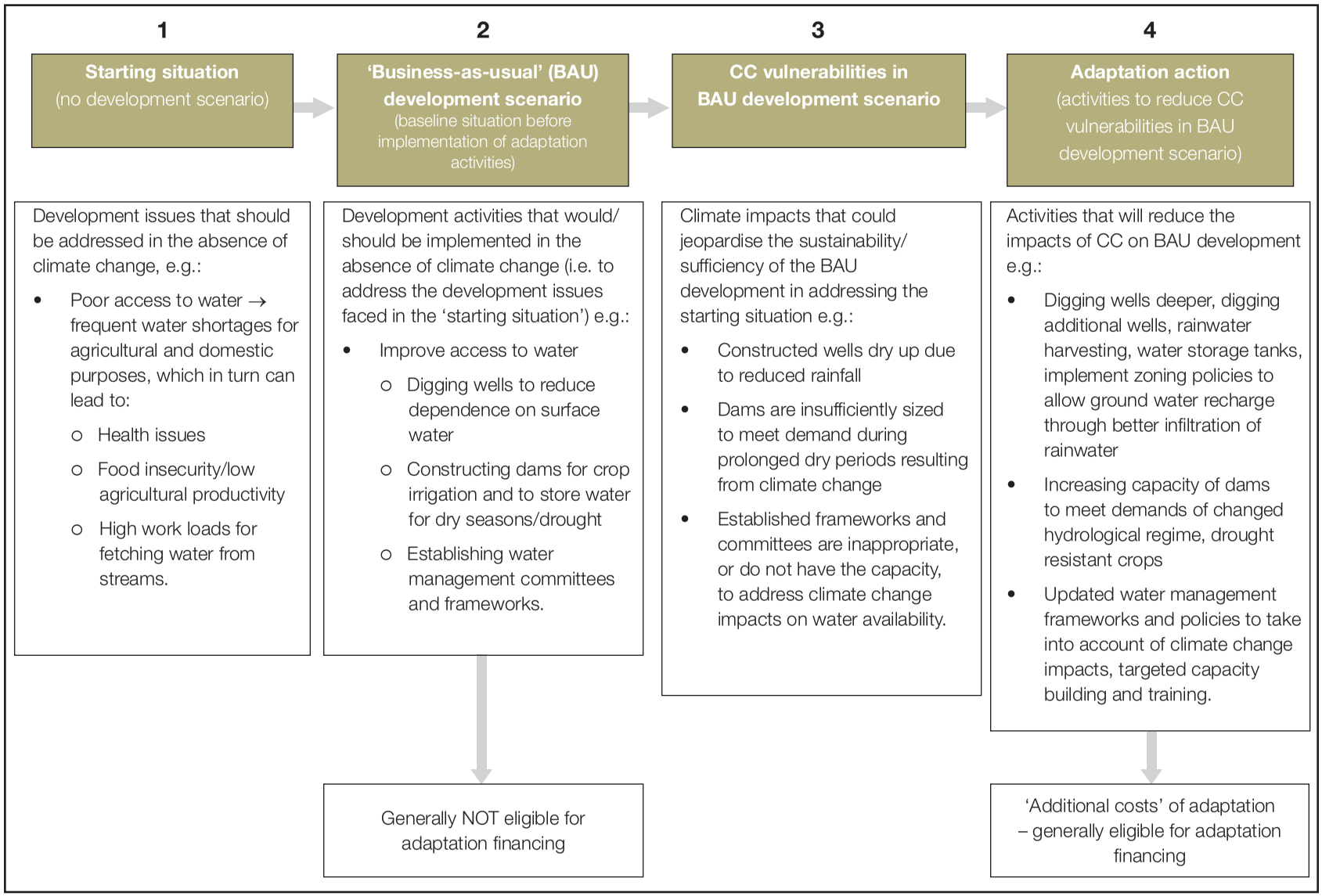
a. Among the most vulnerable to climate change based on objective criteria (e.g. in terms of the magnitude of economic impacts, livelihood impacts, risks to lives or vital infrastructure) and evaluated through a comprehensive multi-stakeholder V&A assessment

b. Politically determined as a national priority based on broad national consultation and subsequent high level political adoption/ratification of the outcome (again NCs, NAPAs and TAPs are great examples of this, but it could also be e.g. a nationally executed adaptation plan or policy that would fit the same requirements).

Criterion 2 is covered by section C.2. of the template attached in Annex I.

19 More information and guidance on V&A assessments and Multi Criteria Analysis can be found e.g. in the UNFCCC's 'Handbook on Vulnerability and Adaptation Assessment found here: http://unfccc.int/resource/cd_roms/na1/v_and_a/index.htm

Figure 3.1: Schematic presentation of the adaptation rationale and additional cost argument for a generic example in the water sector. *Steps 2, 3 and 4 correspond to the three sub-questions of the adaptation rationale identified the main text. Theoretically the cost of 4 can be considered 'the additional cost of adaptation' (or simply 'the cost of adaptation')*



3. Weighting of project activities

As described in Criterion 1 above, the 'additional cost' argument is the foundation on which the size of the total funding request of an adaptation project should be built. However, many donors will also emphasise the way the proposed funding is weighted among different 'types' of activities as an additional (sometimes tacit) eligibility criterion.

In this context, three broad categories of activities should be considered by the project developer:

a. **Investment activities** can be considered those adaptation activities that lead to concrete, measurable impacts on the ground (e.g. building a sea wall, investing in climate resilient water supply systems, introducing drought resistant crops, etc.)

b. **Capacity building activities** are those activities that increase the adaptive capacity of institutions and individuals to deal with the impacts of climate change, but do not necessarily lead to immediate physical and measurable results (e.g. mainstreaming of climate change adaptation into sectoral policies and development plans, training of key national and regional experts and staff, awareness raising activities etc.)

c. **Project management** comprises the administrative activities needed to manage, implement and document the project's activities.

Donors tend to have a strong preference for investment activities, which are more 'visible' and therefore more capable of demonstrating concrete impacts of the funding delivered. Most donors will, of course, also recognise that some capacity building measures (such as those mentioned above) are needed for successfully adapting to the impacts of climate change. However, they will often be reluctant to finance projects which consist primarily of such activities. In other words, careful consideration of the balancing of investment activities and capacity building activities is a wise strategy when designing an adaptation proposal for bilateral and multilateral funding. While donors give very little concrete guidance on the preferred cost-distribution of adaptation projects, a rule of thumb could be to aim for at least 50% of the project budget going to concrete, investment-like, activities. Clearly, there are many grey zones[20], and this 'rule' should not be interpreted too strictly (the main priority should always be to implement the activities that achieve the highest impact). However, the '50% rule' is a good guiding principle to keep in mind.

Criterion 3 is reflected in section C.3. (a) of the template attached in Annex I.

4. Sustainability of intervention

An all-important element of any development project is how benefits achieved through its investments are to be sustained beyond the lifetime of the project. Implementation of a project's activities will be on-going for a certain period of time (anything from a few months to several years). At some point the project will close, having (hopefully) achieved a certain objective, such as a particular level of agricultural productivity. At this time the oversight, financial backing and external capacity brought about through the project will no longer be available. The real test of project success is thus not only if the project achieves its objective

20 Many investment activities will also contribute directly to capacity building (e.g. small scale investment in pilot testing and demonstration of climate resilient agricultural practices, which will have both a direct impact in the pilot area, but also create essential knowledge and awareness among a broader group of stakeholders, which will then have the capacity to upscale positive experiences). Likewise, some capacity building measures can appear 'soft' but have very concrete and even measurable impacts short term (e.g. training of farmers in climate resilient agricultural practices). In such cases, a higher weight of capacity building activities may be acceptable, as long as the adaptation rationale is strong and clear, and as long as appropriate indicators are assigned to measure the specific impact of the capacity building activities on the ground.

within its implementation period, but whether the physical benefits and human capacity created through its investments are maintained and used after the project's support framework is withdrawn. For example, if the abovementioned agricultural productivity gains quickly fall back to pre-project levels then it is hard to see any long time benefit of that project.

Adaptation projects in particular need to carefully consider the sustainability of its interventions due to their inherently long-term nature[21]. The impacts of climate change (which are what an adaptation project is designed to address), will only gradually manifest themselves over the coming 50+ years. The conditions we are ultimately trying to adapt to will thus rarely have evolved fully within the project lifetime. Therefore, the first true test of a successful adaptation measure is simply to sustain it long enough to actually test it against the full impacts of climate change. The second test, of course, is whether the adaptation measures introduced by the project are then actually successful in addressing these conditions. However, this is something that cannot truly be tested until those conditions physically materialise. This makes M&E for adaptation particularly complicated, but this is a discussion beyond the scope of this guidebook.

Given this inherent nature of adaptation projects, most donors will require the project proponent to clearly discuss and articulate how the project will ensure that its interventions are maintained beyond the lifetime of current project funding. This can include, e.g.:

a. Commitments from the national government to provide sufficient budget to maintain installed infrastructure and human capacity
b. Building sufficient local capacity to perpetuate and upscale pilot activities
c. Developing a strategy for securing additional external funding for extending and/or scaling up the project activities post project
d. Choosing adaptation measures that require low maintenance as opposed to those that are heavily dependent on the availability of financial and human capacity (e.g. mangrove restoration as opposed to sea walls).

Criterion 4 is reflected in section C.3.(b) of the template attached in Annex I.

5. Cost-effectiveness

As hinted at in the previous criteria, cost-effectiveness of the funded activities (i.e. achieving maximal impacts per dollar invested), is one of the guiding principles for most bilateral and multilateral donors. In general, the concept of cost-effectiveness is best applied when outputs/outcomes across a number of potential actions can be measured by (or converted into) a single factor of comparison. A good example of this could be in climate mitigation projects where CO_2 emission reductions can be used as a comparative factor for outputs from a number of different mitigation options (e.g. building a wind farm and planting a forest).

Unfortunately, a standard unit of measurement for the outputs of adaptation projects does not exist (Stadelmann et al, 2011b). This makes quantitative documentation of cost-effectiveness in adaptation practically impossible or, at best, highly ambiguous. For example, how can one quantitatively compare the costs and benefits of an adaptation project aimed at reducing the vulnerability of basic subsistence

21 It should be noted that the concept of 'adaptation' (i.e. making development resilient to the impacts of climate change) is in itself an important element of sustainable development. Development investments without the consideration of long term climate impacts cannot be claimed to be truly 'sustainable' as they would (even with all other factors being sustainable) risk failing under future climate conditions. In practice it can be difficult to separate the two concepts from each other: sustainable development is a crucial element of any adaptation project and sustainable development needs to always consider adaptation.

food production in an inland agricultural community, to an adaptation project aimed at protecting economically valuable (but not critical to the sustenance of life) coastal infrastructure from the impacts of sea level rise?

However, while the concept of cost effectiveness may not be meaningfully applied to quantify adaptation benefits per invested dollar across sectors, it can still be used as a qualitative guiding principle in the detailed design of specific adaptation activities. For example, if a particular sector and vulnerability (such as coastal agriculture threatened by impacts of climate change induced sea level rise) has already been determined as a priority for a country, cost effectiveness should be applied as a one of the guiding (qualitative) principles when deciding on the best way to overcome such vulnerabilities.

Using the example above, a number of potential adaptation options may be available to reduce climate change vulnerability of coastal agriculture, such as building a sea wall, introducing salt tolerant crops or relocating agricultural activities inland. Each of these options will have very different financial, social and environmental cost structures, and these should be taken into consideration when deciding between the options. The aim is for an optimum mix of maximised adaptation benefits and minimised costs (and this reasoning can then be presented in the funding proposal). As mentioned, such a discussion is best kept at a qualitative level, and this is generally accepted by donors.

This criterion is reflected in section C.3.(c) of the template attached in Annex I.

6. Institutional setup and comparative advantage of implementing institution

Another question of key interest to donors is the institutional context in which the proposed adaptation project will be implemented. Climate change is generally considered as an 'environmental issue' and thus often institutionally placed within the Ministry of Environment. However, the issue of adaptation to climate change is truly a cross cutting development issue that will impact the jurisdictions, and require the expertise of, many (if not all) national ministries and departments (as well as a wealth of other public and private stakeholders active in the national context). It is vital to ensure that planned adaptation investments and activities are properly balanced with, and integrated into, the relevant sectoral planning and existing (non climate change focused) development activities of the sector targeted. To achieve this it is imperative to directly involve the most relevant sector institutions, experts and other stakeholders in the implementation of the project (this is also highly related to the adaptation rationale mentioned under Criterion 1 above).

Project developers should therefore carefully consider the appropriate institutional setup for the proposed project and how it will ensure that its project activities are effectively mainstreamed into on-going sector development planning and activities. When presenting these arguments to the donor two questions should be considered:

1. **Who will implement the project (this may include several levels of implementing and executing institutions) and what are their comparative advantages and capacity compared to other potential implementing institutions?** E.g. if a project is proposing to implement community based adaptation activities in the agriculture sector, it may be more logical to appoint the ministry of agriculture as the coordinating/implementing institution rather than the ministry of environment, who may have the overall political responsibility for climate change activities. Similarly it may be more effective to have a regional institution (or regional office of a national institution) handle the on the ground investments and activities. It all depends on the specific context of the project.

2. **How will the project be coordinated with (and/or mainstreamed into) related development activities of the targeted sector?** E.g. if the proposed project is planning to implement adaptation activities to reduce the vulnerability of agricultural production in a specific geographical region (e.g. a number of villages), it is crucial to first consult and coordinate such activities with all other stakeholders currently involved in agricultural development (or even other adaptation) activities in the same region. In some cases it may be sufficient to informally share lessons and expertise. For example, if the other stakeholder is implementing related activities in a different sub region/village but doesn't have obvious potential for direct collaboration. In other cases it may be appropriate to set up formal coordination groups or even institutional integration of activities (e.g. sharing of management structures, infrastructure, staff etc.) to assure that full coordination is taking place, synergies taken advantage of, and duplication is avoided. Again, this is highly context specific.

This criterion is reflected in section C.4. of the template attached in Annex I.

7. Results-based management and logical framework

The principles of results-based management (RBM) are increasingly being adopted in the management of bilateral and multilateral development funding – and thus also in the management of most adaptation funds. RBM is a way of managing (projects) whereby the manager (in this case the project developer) ensures that all processes, products and services contribute to the achievement of desired results. In other words, complying with the principles of RBM in adaptation projects implies a strong focus on directly linking all project activities to clear, measurable adaptation 'outputs', 'outcomes', and 'impacts', which in turn are linked to a number of indicators and specific reporting requirements (RBM is also an important tool for tracking project progress).

To demonstrate the logical links between inputs, activities, outputs, outcomes and impacts, most donors will request that the project idea is presented in the form of a 'logical framework' structuring the project idea based on the principles of RBM described above (an example is provided in the template presented in Annex II). Additional details on RBM (including a definition of central concepts such as 'output', 'outcome' etc.) can be found in a number of online resources[22].

This criterion is reflected in Section B of the template attached in Annex I.

22 E.g. Asian Development Bank's 'An Introduction to Results Management' available at: http://www.adb.org/Documents/Guidelines/MfDR/Introduction-to-Results-Management.pdf, the World Bank's 'Ten Steps to a Results Based Monitoring and Evaluation System' available at: http://www.oecd.org/dataoecd/23/27/35281194.pdf, and United Nations Development Group's 'Results Based Management Handbook' available at http://www.un.cv/files/UNDG%20RBM%20Handbook.pdf.

3.3 A 'template' for presenting TNA adaptation project ideas for bilateral and multilateral funding

Based on the key criteria applied by international adaptation donors in the evaluation of project proposals (presented above), this guidebook provides a generic template for presenting adaptation project ideas for bilateral and multilateral funding in Annex I. There are two aims of the template:

1. To guide the thought process of project developers in the early design phase of converting TNA project ideas into fundable proposals
2. To provide a generic format in which project ideas can be informally presented and discussed with a variety of potential donors[23].

In both cases, the hope is that the template will help achieve faster and more successful application processes for TNA project ideas. Annexed to the template is also a short section containing brief guidance on each section/question of the template. However, for more detailed guidance on concepts and thinking lying behind these questions, please refer to section 3.2 above. Annex II also contains a practical example (using a fictional adaptation project idea) of how to fill the template using the concepts and questions introduced[24].

23 However, as mentioned in section 3.2, for formal applications, each fund has its own unique set of information requirements and many provide fund-specific templates which must be used when submitting applications.

24 Further real life examples of successful adaptation project applications can also be found on many funding institutions' websites (e.g. the GEF, AF, PPCR and others provide open access to accepted project applications).

4. Private Financing Sources for Adaptation Technology Projects

4.1 Introduction

According to the UNDP, finance for mitigation and adaptation will come primarily from three sources:

a. International public finance

b. International carbon finance and ecosystem finance

c. Private finance (UNDP, 2011).

Based on current agreements, international public finance is expected to provide up to $100 billion in funding (cumulatively) by 2020. International carbon and ecosystem finance could provide another $100-200 billion cumulatively. Domestic and international private finance for low-emission climate-resilient technologies in developing countries (a mix of mitigation and adaptation measures) is projected to account for up to $1 trillion cumulatively by 2020 (UNDP, 2011).

In developing countries, public financial support for adaptation often comes from bilateral and multilateral sources. Despite efforts to mobilise additional resources, public funding for adaptation appears unlikely to be adequate given the estimated needs of tens of billions of dollars per year by 2030. Therefore, private sector financing, both domestic and foreign, will need to be mobilised to fulfill adaptation needs.

The private sector has additional investment capacity that has not yet been mobilised. According to the UNDP, "global capital markets, representing $178 trillion in financial assets, have the size and depth to step up to the investment challenge" (UNDP, 2011) of shifting to a low-emission climate-resilient economy. Businesses are able to use on-balance-sheet financing, borrowed funds, or equity to finance climate investment projects. The UNDP suggests that the borrowing capacity of the private sector represents a significant pool of potential climate finance.

This chapter provides TNA countries with an overview of the private sector funding opportunities currently available for adaptation. The chapter also provides guidance on strategies for accessing such funding.

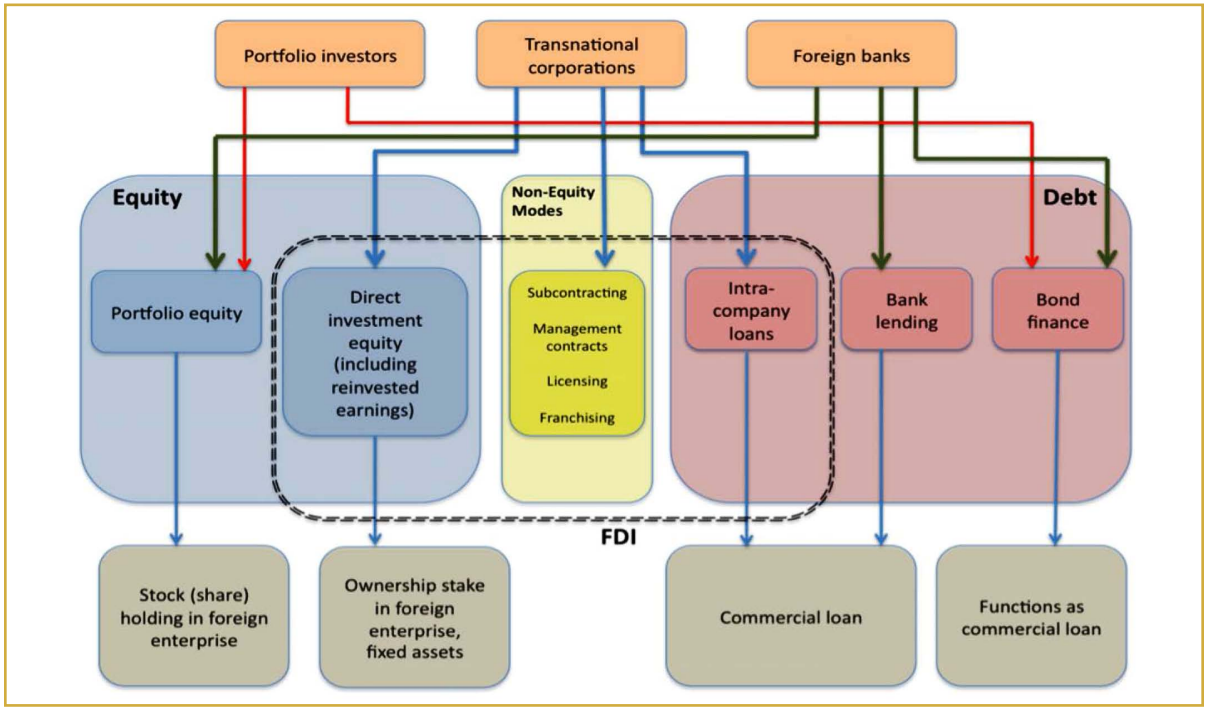
4.2 Overview of private sector finance

Although there are many variants of each, it is convenient to discuss private finance in terms of equity and debt. Debt must be repaid with interest primarily through either a loan from a bank or a bond sold in the capital markets. Equity conveys ownership rights through the shares of companies (such as those traded on a stock exchange or held in a private company) or other assets (e.g. land, buildings, equipment, etc.). Private finance includes equity for privately owned assets and debt for sectors with public or private

assets. Thus, a local or national government may sell bonds to private investors in the capital markets or borrow from a financial institution to help finance the cost of infrastructure. Sectors such as agriculture and fisheries, which are primarily private and locally owned, are likely to draw on domestic debt and equity private financing for adaptation costs not covered by public funds. Private financing may also contribute to some public sector adaptation costs, for example, through loans or other forms of debt to cover the cost of infrastructure facilities.

Figure 4.1 illustrates the diversity of private financial flows available in all sectors, not exclusively climate finance (Atteridge, 2011). Portfolio investors, transnational corporations, and foreign banks make investments, primarily in the form of either debt or equity.

Figure 4.1: Private commercial (non-trade) finance flows



Source: Atteridge, A. 2011.

The defining characteristic of private sector adaptation financing is the demand for a market rate of return on investment. As such, the adaptation actions that will attract private sector capital are those that can produce market returns. For example, private capital may be preferable for projects that have a fixed asset component that can be captured through ownership, either as a revenue stream or through increasing ownership value (SEI, 2010). Infrastructure projects in which the investor accesses a stream of returns through a BOT contract or concession are examples. These projects are common in the transportation, water, and energy sectors. Within the agriculture sector, insurance and agricultural development projects that can promise a return on investment are most likely to attract private sector finance. Some adaptation sectors, such as flood prevention, health, and disaster planning, may be less likely to attract private capital because the economic benefits are difficult to capture (SEI, 2010).

Life insurance companies, pension funds, sovereign wealth funds, and endowments are among potential sources of domestic and foreign private sector climate finance (UNDP, 2011). They invest in both debt and

equity. Life insurance companies are characterised as having a long-term investment horizon, a high level of risk aversion, and high regulatory constraints. Regulations may specify the types of debt (e.g. issuers or credit rating) and equity (e.g. exchange listed stocks) insurers may invest in. The share of funds invested domestically may also be regulated. Risk aversion will lead to a diverse portfolio of investments. Pension funds also have a long-term investment horizon but have a moderate to high level of risk aversion and moderate regulatory constraints. Endowments have a mid- to long-term investment horizon, a low to moderate level of risk aversion, and low regulatory constraints.

Regulations and/or risk considerations will constrain foreign investments and the types of securities and debt instruments pension funds and endowments invest in. Sovereign wealth funds carry a mid- to long-term investment horizon, a moderate level of risk aversion, and low to moderate regulatory constraints. They often invest a large share of their resources outside the country, but regulations and risk aversion considerations will constrain the types of investments they make. While the assets of insurance companies, pension funds, endowments, and sovereign wealth funds are enormous, regulations and risk aversion considerations mean that only a tiny fraction of those assets is likely to be available for adaptation investments in foreign countries. Furthermore, they will be interested primarily in relatively large investments due to the relatively high transaction costs associated with foreign investments that are not exchange-traded instruments.

There are number of other types of investors that may be threatened by climate change. Both multinational and domestic owners and operators of manufacturing, production, and resource extraction firms may find that their assets are vulnerable to the impacts of climate change. International banks and private equity firms may also consider the vulnerability of the projects they finance. In addition, they may be called upon to invest in projects designed to reduce the vulnerability of their assets.

In addition to these private sources of market rate funds, foundations and social investors represent an additional kind of private climate finance for developing countries. The UNDP cites an analysis by J.P. Morgan that finds that social investing could supply between $400 billion and $1 trillion to the housing, water, health, education, and financial services sectors over the next decade (UNDP, 2011). The attraction of these funds for developing countries is that unlike traditional private finance, these investors may accept lower returns as a trade-off for making a social impact.

4.3 Suitability of adaptation projects

It is widely accepted that climate change will affect many sectors including infrastructure, coastal zones, water supply, storm water management, agriculture, fisheries, forests, human health, natural ecosystems, and tourism. The assets in some of these sectors, such as natural ecosystems and infrastructure, are typically owned or subsidised by governments. In other sectors, such as agriculture and fisheries, assets are typically owned by individuals and corporations. Sectors such as human health and water supply, use a mix of public and private assets that varies between countries.

In many cases, the adaptation adjustments needed are an integral part of the assets. Examples of adaptations that can be made as modifications or adjustments to activities such as road building, fishing, or agriculture are: larger culverts for a road to cope with the runoff from more intense precipitation; a larger fishing boat to travel to more distant fishing grounds; or new equipment to enable a change in crops produced by farmers.

Because the adjustments needed to adapt to the impacts of climate change are an integral part of the assets, they can be financed as part of the asset. For example, the cost of the larger culverts can be

included in the cost of the road. The construction of the road will be financed and the culverts will most likely not be financed separately. Thus, the sources and institutions that have traditionally financed the purchase of assets in a sector will most likely continue to be the ones that finance the purchase of assets adjusted for the impacts of climate change. However, as discussed below, the mix of finance may change.

Private sources of finance will expect the same return on their investment in an adaptation activity as they would on any other investment. For example, a lender will expect the same rate of interest and repayment schedule. An equity investor will expect the same returns on the capital invested taking into account the risk. Usually, private finance is only available for projects that yield a cash flow to repay the debt or equity and, possibly, yield marketable assets to provide security for the investment. Adaptation measures that do not have these attributes, such as coastal protection and natural ecosystems, must rely on public finance. Some infrastructure projects, such as water supply and toll roads, can meet these requirements if structured as public-private partnerships.

For developing country governments, there are three core challenges in involving the private sector in adaptation finance:

a. Getting private players to understand the need to adapt and and act on it
b. Sharing the cost of adapting public infrastructure (user charges, energy, water, agricultural extension services, roads)
c. Leveraging private funds for adaptation.[25]

Sectors with the potential to attract private investment for adaptation measures, by definition, must be both vulnerable to climate change and be attractive for private sector financing approaches. Such sectors feature, inter alia:

a. Fungible assets that can be used as security for financing
b. A market demand for the services provided
c. Generation of revenue to service the investment.[26]

The sectors which currently appear to offer the most promise for private finance for adaptation measures are agriculture (agri-business and agri-processing); water and sanitation; energy and energy access; and tourism.[27]

4.4 Types of private sector financing

Foreign private financing can take several forms, including FDI, debt, and export credits. Information on foreign debt for adaptation measures in developing countries is not available, such as on loans from commercial banks and other sources in foreign countries, and bonds sold on foreign capital markets.

FDI tends to be concentrated in a few sectors, primarily natural resources and manufacturing, in a limited number of countries.[28] Consequently, FDI may have limited availability for many adaptation funding needs,

25 CTI PFAN, 2012. P. 19.
26 CTI PFAN, 2012, p. 22.
27 CTI PFAN, 2012, p. 50.
28 Foreign direct investment (FDI) refers to the net inflows of investment to acquire a lasting management interest (10 per cent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, other long-term capital, and short-term capital as shown in the balance of payments.

although companies that have already invested in production facilities will invest in protecting their assets. Natural resource developments may involve new or upgraded infrastructure that could be designed to be appropriate for the projected future climate.

Export credits include credit, guarantees, insurance, and other assistance that developed countries provide to exporters to make their products and services more competitive. This benefits importers in developing countries, although the benefits are usually not large enough to qualify as bilateral aid. Nevertheless, export credits are a possible source of private financing of adaptation measures in any sector. Insurance for climate risks has been widely recognised as a key component of adaptation and one that will likely involve a significant role for the private sector (e.g. Climate Wise et al., 2010).

Both the process and criteria by which private sector funds are allocated differ from those for public financing. To effectively mobilise private sector funds, candidate countries must understand these processes and be able to meet the criteria. Seekers of private finance should put forward projects that offer a reasonable, predictable, and relatively quick return to investors. Projects that promote climate resilience need not be excluded. The UNDP cites estimates that about three-quarters of asset-based adaptation measures, such as irrigation systems and improved soil techniques, could return higher benefits than costs (UNDP, 2011). In addition to requiring a market rate of return, institutional investors have specific investment horizons, risk appetites, and information requirements that must be taken into account (UNDP, 2011).

4.5 Conditions for securing private finance

A government in a developing country can increase the international private finance available domestically by encouraging local financial institutions to explore relationships with developed country institutions that have relevant funds, using public-private project finance where appropriate, and encouraging foreign direct investment. The development of a risk management package for a project could involve a number of options to provide a competitive risk-adjusted return to private investors including cost sharing, loss sharing, insurance, and the investment of public funds.

The public sector can also use financial tools to reduce the risk associated with an adaptation measure and so leverage private sector capital (See Table 4.1). Developing countries can make use of equity, debt (e.g., senior loans[29] and subordinated loans[30]), guarantees[31], and insurance schemes to reduce investment risk for private capital (Stadelmann et al., 2011a). Senior debt takes priority over subordinated debt and thereby reduces the risk for the investor. To be used successfully, these tools must be employed with an understanding of the investors' needs.

29 Senior debt is debt that takes priority over other unsecured or otherwise more 'junior' debt owed by the issuer. Senior debt has greater seniority in the issuer's capital structure than subordinated debt. In the event the issuer goes bankrupt, senior debt theoretically must be repaid before other creditors receive any payment.

30 Subordinated debt has a lower priority than other bonds of the issuer in case of liquidation during bankruptcy. Because subordinated debt is repayable after other debts have been paid, they are more risky for the lender. It is unsecured and has lower priority than that of an additional debt claim on the same asset. Subordinated loans typically have a much higher rate of return than senior debt due to the decrease of a money devolution and therefore a higher risk. Subordinated bonds usually have a lower credit rating than senior bonds.

31 A loan guarantee is a promise by one party (the guarantor) to assume the debt obligation of a borrower if that borrower defaults. The term can be used to refer to a government assuming a private debt obligation if the borrower defaults. Most loan guarantee programs are established to correct perceived market failures by which small borrowers, regardless of creditworthiness, lack access to the credit resources available to large borrowers.

Table 4.1: Financial leveraging tools

Mechanism	Direct public financing or guarantees	Debt or equity?	Risk level	Estimated leverage ratio	When tool most useful/in what contexts?
Loan guarantees	Guarantee	Debt	High	6x-10x	Countries with high political risk, dysfunctional energy markets, lack of policy incentives for investment
Policy insurance	Guarantee	Debt	Medium	10x & above	Countries with strong regulatory systems and policies in place, but where specific policies are at risk of destabilising
Forex liquidity facility	Direct financing	Debt	Low	?	Countries with currency fluctuations
Equity 'pledge' fund	Direct financing	Equity	Low	10x	Projects with strong IRR, but where equity cannot be accessed. Projects need to be proven technology, established companies
Subordinated equity fund	Direct financing	Equity	High	2x-5x	Risky projects, with new or proven technologies, new or established companies

Source: Brown, J. and Jacobs, M., (2011).

Large adaptation projects will often be initiated through collaboration between private sources of capital, public donors, non-governmental organisations (NGOs), and local institutions, both public and private. Similarly, the financing for these projects will likely include a mix of private, public, and philanthropic funds.

One of the key strategies for developing countries seeking funding for adaptation projects is to structure projects so as to take advantage of each of these sources of funding. Often public and philanthropic funding can serve a catalyst for the investment of private capital. Developing countries can use public funding to reduce the investment risk of a project thereby encouraging private investors to contribute.

4.6 Securing private finance

Most private finance for adaptation in developing countries is likely to come from domestic sources. The sectors with privately owned assets have traditionally raised the funds they needed from domestic sources. Most of the entities involved, such as farmers, fishermen, small businesses, are small and do not have the capacity to negotiate arrangements with financial institutions in foreign countries.

Some developed country institutions have private funds to invest in adaptation measures in developing countries. They invest directly in some assets, but these are typically large projects that involve entities

with substantial financial resources – national or state governments, or their entities, or large private firms. Specific arrangements such as project finance and public-private partnerships may be needed to attract international private finance for adaptation measures. Developed country financial institutions also channel funds through financial institutions in the recipient country for smaller projects.

If adaptation to the impacts of climate change increases the cost of the asset, the mix of financing may need to change to generate the returns private sources expect. This can be done in any of several ways including changing the mix of debt and equity, the proportions and/or order in which losses are shared, the insurance coverage the borrower or operator is required to hold, or the provision of some public funds (e.g. grants, concessional loans, equity). The sources that traditionally finance a particular type of asset usually will be able to suggest the best options for financing the higher cost. For example, if private lenders are only willing to lend the same amount to a fisherman for the larger boat, some form of government support may be needed to make the purchase feasible. In some cases, adapting the assets for the impacts of climate change may benefit private investors despite the higher cost.

The rate of return expected by private investors depends on the risk. An adaptation measure can increase the investment required, but some measures can also reduce the risk. Larger culverts, for example, may reduce the risk associated with a loan to a toll road because the risk of washouts and associated loss of revenue is lower and the prospects for repayment of the loan are higher than with smaller culverts. A lender may be willing to finance some or all of the additional cost due to the larger culverts given the reduced risk of revenue losses.

The technology needed to adapt to the impacts of climate change may affect how assets are financed. Most technology is privately owned and is partly embodied in products (e.g. drought-resistant seeds) or equipment (e.g. water supply systems, irrigation equipment). In addition to purchasing the product or equipment, training is often required (e.g. when to plant, care of the crop, how to operate and maintain the equipment).

Each technology has its own set of international (and possibly domestic) suppliers. The conditions under which they are willing to supply their technology vary by firm and country and range from being available to any purchaser to being available only to a specific entity (e.g. subsidiaries, joint ventures) controlled by the owner of the technology. If the desired technologies are widely available internationally (e.g. water supply systems, irrigation equipment), export credits may be available from some supplier countries.[32] Such credits are then a form of international private finance for adaptation.[33]

If the international suppliers tightly control the desired technology, one or more local firms may need to license the technology from the owner.[34] The owners of some technologies limit their availability to subsidiaries or joint ventures. In these instances, the technology supplier may need to establish a local subsidiary/joint venture that would channel foreign direct investment (FDI) from the technology supplier. To the extent that the inward foreign investment addresses adaptation, it is a form of international private finance for adaptation.

32 These credits are generally provided in the form of direct loans, insurance, or guarantees and are meant to facilitate export to riskier markets.

33 The government of the exporting country offers various forms of financial support to exporting firms. Because the financial support is reflected in the price offered by the exporter, the export credits are considered a form of private finance for the purposes of this guide. For more information on export credits, see the OECD's Export Credit Division at http://www.oecd.org/topic/0,3699,en_2649_34169_1_1_1_1_37431,00.html

34 A limited number of suppliers of a given technology usually implies that the suppliers control intellectual property associated with the technology. The intellectual property may take various forms including patents and 'trade secrets.' To protect their intellectual property, suppliers may supply the technology only as exported products,through subsidiaries/joint ventures, or under license. This can affect how an adaptation measure that uses the technology is financed.

Access to private finance is best pursued through the sources and institutions traditionally used to finance the purchase or maintenance of such assets. Traditional financing arrangements may be adjusted to cover the added cost of adapting to the impacts of climate change. Many adjustments are possible, and the traditional sources are likely to be able to find the best one. In some cases, more public funding may be required to offset the incremental costs of the adaptation action.

4.7 Case studies

The following case studies were selected as examples of the use of private sector funds to support climate adaptation projects in developing countries. These case studies focus primarily on the agricultural sector but illustrate the collaborative approach that will be an important factor in achieving successful outcomes in all sectors. In theory, private sector capital can be used to finance projects in every region and in every sector. However, the investment climate must be suitable to the needs of investors.

1. Horn of Africa risk transfer for adaptation

The Horn of Africa Risk Transfer for Adaptation (HARITA) project began as a joint effort by Oxfam America, Swiss Re, and others to develop a risk management package for farmers in Ethiopia (Oxfam America, 2009). The project includes a mix of risk reduction, insurance, and credit products to reduce vulnerability to weather and climate risks. The project is designed to encourage communities to practice improved natural resources management in order to reduce food insecurity. Farmers are provided with access to microcredit and insurance coverage against crop loss. They are also encouraged to increase their savings rate. Farmers pay their insurance premiums through labor on community projects in an insurance-for-work program (IISD, 2011). The International Research Institute for Climate and Society, Swiss Re, Nyala Insurance Co., and Dedebit Credit & Savings Institution cooperated to develop affordable drought insurance based on a weather index insurance model (Oxfam America, 2009).

The project was started in one village, Adi Ha, in 2009, and involved 200 households. In 2010, the project was expanded to 1,308 households (Oxfam America, 2011a). In 2010, insurance take-up rates in all villages served, a measure of the percentage of households participating, ranged from 6 to 36%, with an average of 19% (Oxfam America, 2011a). The program was expanded again in 2011 to 13,195 households in 43 villages (Oxfam, 2011b). In each year, the actual take-up rate for the program exceeded the annual goal. This expansion allowed the program to directly affect approximately 75,000 people in 2011 (UNFCCC, 2011).

The program allows farmers to pay their insurance premiums with labor as part of an insurance-for-work program (Oxfam, 2011d). They contribute labor to efforts to reduce the impact of climate change on their communities, such as irrigation or forestry projects. Farmers that have the means can pay their premiums with cash and as farmers become more prosperous they can graduate from paying with labor to paying with cash (Oxfam, 2011d). The insurance-for-work program builds on the Ethiopian government's food- and cash-for-work program. This Productive Safety Net Program serves eight million food-insecure households in Ethiopia (UNFCCC, 2011).

Weather index insurance is available for short-cycle crops (e.g. teff and beans) and long-cycle crops (e.g. maize, wheat, barley, and sorghum) and is delivered by the Africa Insurance Company and Nyala Insurance Share Company, both based in Ethiopia (Oxfam, 2011b). Insurance payouts are triggered

automatically when rainfall drops below a pre-determined level. The weather data collection and analysis underlying the weather index insurance was supported by the Ethiopian National Meteorological Agency (UNFCCC, 2011). Local microfinance institutions also allow farmers the option to bundle credit and savings services with the insurance program (UNFCCC, 2011).

Risk reduction activities undertaken as part of the program include financial literacy training and a number of natural resource management activities (Oxfam, 2011b). In 2010, 15,000 trees were planted and 2,000 meters of erosion prevention trenches were constructed (UNFCCC, 2011). In the third quarter of 2011, approximately 6,200 farmers received financial literacy training. In addition, 43 extension agents and 86 village leaders were trained in compost making, 2,875 compost-making pits were constructed in 43 villages, and 2,875 female-headed households prepared vegetable gardens. To improve water management, 24 run-off diversion structures were developed, irrigating 930 hectares of land and benefiting 1,884 farmers.

In 2011 the HARITA program made its first payouts to small-scale farmers (Oxfam, 2011c). In response to drought conditions in seven villages, 1,800 farmers received a total of $17,392 in insurance payments (Oxfam, 2011c).

In 2011, the World Food Programme (WFP) and Oxfam America announced that they would expand the initiative from Ethiopia to Senegal and two other countries (Oxfam, 2011d). Swiss Re agreed to invest $1.25 million in the expansion in return for being the exclusive insurance sector partner (IISD, 2011). USAID is also contributing $8 million through the WFP to support the expansion (Oxfam, 2011d). The collaboration involves no co-mingling of funds. WFP is sponsored by USAID and Oxfam America is sponsored by Swiss Re (Oxfam, 2011d). The expanded program is known as the R4 Rural Resilience Initiative (Oxfam, 2011c). The 'R4' initiative represents a strategy to strengthen food and income security by improving natural resource management (risk reduction), providing access to microcredit (risk taking), promoting insurance coverage (risk transfer), and increasing savings (risk reserves) (Oxfam, 2011c).

2. Adaptation for smallholders to climate change

Adaptation for Smallholders to Climate Change (AdapCC) began as a pilot initiative in 2007 to help smallholder coffee and tea organisations strengthen their capacity to adapt to climate change (Cafédirect/GTZ, 2011). AdapCC was established as a public-private partnership between Cafédirect, a British beverage company, and the German Technical Cooperation (GTZ) on behalf of Germany's Federal Ministry for Economic Cooperation and Development (BMZ) (AdapCC, 2010). The AdapCC project was jointly funded by Cafédirect and GTZ. Initially, Cafédirect was responsible for 52% of the financing while GTZ accounted for the remaining 48% (Cafédirect/GTZ, 2011). Over three years, Cafédirect invested €450,000 while GTZ invested €506,000. The higher figure for GTZ reflects an additional contribution made in light of the project's early success. The total financial commitment to the program was €956,000 (Weinmann, 2011). Of Cafédirect's contribution, €248,000 was transferred to GTZ to support project management and technical assistance. Another €202,000 was invested in the form of in-kind contributions and support for the implementation of concrete adaptation measures by producers (Schepp, 2011).

At the start of the project, AdapCC program staff interviewed approximately 400 small holders in six countries: Kenya, Tanzania, Uganda, Mexico, Nicaragua, and Peru. They identified a number of

adaptation strategies, including strengthening resilience by adopting sustainable agriculture practices, diversifying crops to reduce dependence on monocultures susceptible to climate change, and selecting more resistant crop varieties (AdapCC, 2010). These adaptation strategies were implemented in four pilot groups between 2007 and 2010:

1. Michimikuru Meru in Kenya
2. CEPICAFE Piura in Peru
3. Más Café Chiapas in Mexico
4. PRODECOOP in Nicaragua (AdapCC, 2010).

Each of these producers adopted strategies suited to their particular vulnerabilities (GTZ, 2009).

In Kenya, AdapCC partnered with the Michimikuru Tea Factory to identify climate risks to the company's 9,000 registered small-scale tea famers. Those risks include increasing pests and diseases, food shortages and malnutrition, degraded soils and landslides, and reduced water availability (AdapCC, 2010). To address these risks, the program pursued food and income diversification, water and soil management, improved agricultural practices, and increased energy efficiency. AdapCC cooperated with the Kenyan Ministry of Agriculture to introduce demonstration plots of vegetable crops as well as passion fruit as an alternative cash crop (AdapCC, 2010). New agricultural practices, such as double digging plots and planting multistory gardens were also introduced and planting materials were distributed at reduced prices. In addition, 2,891 growers were trained in the use of compost to improve soil fertility (AdapCC, 2010). To reduce erosion, 63 km of riparian zones were protected through the education of local farmers, the establishment of conservation associations, and the planting of indigenous trees. Farmers were also assisted in starting their own tea nurseries to propagate clones with high soil nutrient efficiency (AdapCC, 2010). New energy efficiency measures at both the household and factory level resulted in a 30% savings in energy consumption. In addition, the Private Sector Development in Agriculture (PSDA) programme of the GTZ facilitated the adoption of rocket stoves for 2,000 farmers that reduced fuel wood use between 30% and 70% (AdapCC, 2010).

CEPICAFE includes 90 cooperatives with 6,600 farmer members in Peru. Workshops with coffee farmers identified the following climate related risks: drought, frosts and fogs, pests and diseases, erosion and landslides, and strong winds (AdapCC, 2010). Along with CEPICAFE, AdapCC implemented a reforestation and carbon sequestration program and promoted the use of integrated coffee management practices. A 285 hectare area in the Choco region was selected for the reforestation project and native tree nurseries were established to produce approximately 50,000 seedlings (AdapCC, 2010). The project was pre-financed by the sale of 5,092 carbon credits over five years to Cafédirect to allow the company to offset its own emissions (AdapCC, 2010). Ten per cent of the income from the project is being reinvested in additional climate adaptation projects at small-scale coffee farms (AdapCC, 2010). In addition to the reforestation project, AdapCC worked with CEPICAFE to promote improved management practices: 872 producers were educated about the need to adapt to changing climatic conditions, 860 farmers installed measures to reduce erosion, 729 farmers applied integrated pest management measures, and 10 solar driers were installed to enable the drying of coffee beans in the case of unexpected rainfall (AdapCC, 2010).

In the Chiapas region of Mexico, Más Café has 2,250 producer members organised into eight cooperatives in 153 communities (AdapCC, 2010). Among the climate risks identified by AdapCC and

local producers were deforestation, reduced water availability, poor soil fertility, erratic rains and strong winds, and difficultly drying coffee beans given changing precipitation patterns (AdapCC, 2010). Más Café's adaptation strategy included measures to maintain and increase forest cover, improve pest management, promote carbon sequestration, increase energy efficiency, and secure the coffee drying process. Funds to implement these strategies came from AdapCC, Más Café, and Mexican institutions like the Bank of Chiapas. To reduce deforestation, burning practices were banned by the cooperatives, the Más Café nursery was expanded, and 300 energy saving stoves were provided (AdapCC, 2010). Pest management practices were improved through an agreement by the cooperatives not to apply chemical pesticides and the provision of training workshops on Integrated Pest Management strategies. Soil fertility was improved by the adoption of composting by 90% of cooperative members and the development of six vermi-compost tanks (AdapCC, 2010). Finally, 30 solar driers were set up to allow for drying of coffee in the case of unexpected rainfall.

PRODECOOP, based in Nicaragua, represents 2,300 member farmers in 39 cooperatives. Participatory workshops organised by AdapCC found that coffee farmers were facing the following climate risks: drought, landslides and erosion, and pests and diseases (AdapCC, 2010). PRODECOOP adopted an adaptation strategy focused on training members in adaptation measures and promoting more efficient water use. To build capacity, AdapCC contracted with the Centre for Investigation and Training on Tropical Agriculture (CATIE) to train 21 trainers on the impacts of climate change on coffee production and appropriate adaptation measures (AdapCC, 2010). In addition, a meteorological station was constructed at Miguel Angel Ortéz to allow for the monitoring and collection of weather data. To improve water management practices, rainwater reservoirs were installed and 4,800 meters of irrigation ditches were constructed (AdapCC, 2010).

At the end of the pilot phase in 2010, AdapCC recommended the extension of these projects to the Cafédirect network of 40 small-scale coffee, cocoa, and tea producer organisations representing 280,000 farmers (AdapCC, 2010). Cafédirect will continue to financially support these efforts through its Cafédirect Producer Partnership Program. Additional funding may be obtained from the German PPP Africa Facility and Programme (AdapCC, 2010).

AdapCC identified a number of relevant lessons from the pilot phase of the project that can be applied to the financing of adaptation projects. First, the generation of carbon credits and other systems of payment for environmental services present opportunities for sustainably financing adaptation measures in the agricultural sector. Second, AdapCC found that building long-term partnerships between private and public actors strengthens the capacity of public institutions to support climate change adaptation measures. The AdapCC project represents one example of a mixed investment model that may be pursued to finance adaptation measures. Unlike the infrastructure projects cited in Chapter 2, Cafédirect was not motivated strictly in this case by return on investment. The company chose to reinvest profits from their operations to assist their suppliers improve resilience to climate risks. This commitment was complemented by public funding and in-country support.

4.8 Lessons learned

The case studies presented here indicate the importance of a collaborative approach to developing and financing adaptation projects. In each case, private sector actors partnered with public donors, NGOs, local institutions, and host country agencies to develop an integrated program. This collaborative approach leverages the capacities and resources of multiple stakeholders and creates both social and private benefit. One lesson for nations seeking funding for adaptation projects is that projects must be carefully

constructed to take advantage of all the resources, both internal and external, that will be needed to make the project a success.

Investing in climate change adaptation is something new. However, many investments in adaptation are justifiable even under current climate conditions. Incremental additions to infrastructure can essentially be justified as prudent investments. Making infrastructure and other investments less vulnerable to more heat, flooding, drought, and sea level rise provides an extra margin of safety. This can help ensure that investments will continue to function and provide revenues well into the future, particularly if climate change happens more quickly than thought or climate variability increases (as could already be the case).

Adaptation is often difficult to distinguish from development. This makes private finance for adaptation difficult to identify, describe, and quantify. Most private finance is probably domestic. But there is no information on how much of the private equity and debt is for the incremental cost of adaptation. Aggregate figures on export credits and foreign direct investment are available. But how much of each of these international private flows is for adaptation cannot be determined. Because the scale of other international private flows, such as commercial loans to governments or funds committed by international financial institutions directly or through local financial institutions, is also not known, the portion devoted to adaptation is not known.

Reasonably good information is available for developing country projects that attract international private finance, as illustrated by the case studies. To attract private equity, the investor must acquire some control, such as in a joint venture company operating a concession. Then the returns depend on the concessionaire's management skills both during construction and operation over the life of the agreement. These arrangements appear to be best suited to specific types of infrastructure projects such as toll roads and water supply systems where revenue can be collected from the users of the infrastructure.

In general, private financing for investing in climate change adaptation seems best pursued through the sources and institutions traditionally used to finance the purchase of similar (non-adapted) assets. Traditional financing arrangements may be adjusted to cover the added cost of adapting to the impacts of climate change. Many adjustments are possible and the traditional sources are likely to be able to find the best one.

A developing country government can increase the international private finance available domestically by encouraging local financial institutions to explore relationships with developed country institutions that have relevant funds, accessing public-private project finance where appropriate, and encouraging foreign direct investment.[35] Public-private partnerships are one promising method for encouraging private sector financing. Participation of the public sector can help reduce risk to the private sector and thus encourage investment. But the public sector will need to be flexible and nimble to enable the private sector to move quickly to take advantage of opportunities.

The bottom line is that there is a history of successful private sector investments in developing countries that can be built on to seek private funding to support adaptation projects. To be sure, investment has tended to go to the most developed countries and some of the largest markets among them. Poorer countries,

35 For more information on improving financial cooperation between developed and developing country institutions, see the United Nations Conference on Trade and Development (http://www.unctad.org/Templates/Startpage.asp?intItemID=2068&lang=1) and the World Business Council on Sustainable Development (http://www.wbcsd.org/home.aspx).

particularly in Africa, will need to increase their efforts to demonstrate that the investment environment in their countries will be stable and profitable. Yet, as the two case studies above demonstrate, private sector investment for climate change even in the least developed countries is possible to arrange.

The key lesson learned from the long history of private sector financing for infrastructure and natural resource development projects is that the private sector is willing to invest in developing countries if it can be assured of making a reasonable profit.

5. Conclusions

Most climate adaptation projects will be financed by a mix of public and private funds, and of these many will need public finance to cover the additional cost of adaptation. However, sufficient public funds are not available to cover the additional costs of all adaptation projects, which means that more private finance will be needed. Some adaptation projects may yield an attractive risk-adjusted return despite the added costs for adaptation due to the reduced risks and/or changes to the financing structure. Other adaptation projects will need some public finance to leverage the private finance needed to cover the balance of the additional costs and still yield a competitive risk-adjusted return. There are a number of common principles for obtaining both public and private climate adaptation financing. These include:

1. Focus on return on investment
2. Make use of collaborative action (which can share risk or combine complementary capabilities)
3. Communicate the rationale for adaptation action
4. Build local capacity.

Public-private partnerships present a particularly effective model for accessing financing and implementing adaptation measures. Public funds can be used to catalyse private investment by reducing the risk for private investors.

Developing countries can create conditions to attract both public and private investments by reducing risks or increasing rewards. A number of capacity- and institution-building steps can be taken to reduce uncertainty, regulatory barriers, and transaction costs for investors. In addition, developing countries can make use of equity, debt, guarantees, and insurance schemes to reduce investment risk for private capital.

The critical difference between public and private adaptation financing is the investor's motivation. Suppliers of private finance are motivated primarily by maximising the return on their investment. The defining characteristic of private sector adaptation financing is the demand for a reasonable, predictable, and relatively quick market rate of return on investment. As such, the adaptation actions that will attract private sector capital are those that can produce reliable market returns. Public sector financing, on the other hand, does not necessarily need to be 'profitable' but is generally motivated by a desire to maximise 'impact' per invested dollar to demonstrate that funding is being spent wisely in the most vulnerable regions and making a positive difference to as many vulnerable people as possible.

As a country explores the options for securing financing for a TAP, the following questions should be considered. First, given the characteristics of the project, is private finance an option? If so, it may be beneficial to approach traditional sources of finance first. The project managers should also structure a risk management package for the project, including the adaptation components. This step may involve incorporating public or philanthropic funding to reduce investment risk and catalysing private funding. International private finance will likely be an option only for selected projects. If private finance is not

appropriate, countries should seek domestic or international public funding. A number of international public funding sources are cited in Chapter 3.

The global public finance architecture that is available to support investments in climate change adaptation is a complex and evolving network of bilateral, multilateral, and private funds. Each fund has a unique combination of thematic and geographic foci, and each has its own set of information requirements and eligibility criteria for funding requests. There are three operational funds for adaptation under the UNFCCC and a number of other funds from other funding sources. The following seven criteria that are necessary to establish fundamental eligibility for public adaptation funding have been identified. Countries interested in accessing public funding should carefully consider each of these criteria:

1. Adaptation rationale and additional cost argument
2. Urgency and prioritisation
3. Weighting of project activities
4. Sustainability of intervention
5. Cost effectiveness
6. Institutional setup and comparative advantage of implementing institution
7. Results-based management and logical framework.

This guidebook has provided a number of concrete tools and recommendations that will help TNA countries identify and access funding for implementation of their TAPs, including:

- An overview of international public funding sources dedicated to adaptation investments
- Seven fundamental eligibility criteria for accessing international public funding and guidance on how to apply these concepts to project ideas\
- A template (built on the abovementioned seven fundamental eligibility criteria) for developing/ presenting adaptation project ideas to international donors. Using this format in communication of project ideas to international donors and agencies is likely to facilitate greater interest and thus increase the chances of successfully accessing available funding
- An overview of critical concepts and requirements for accessing private financing for adaptation and a number of instructive case studies.

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ANNEXES

Annex 1. Template for Presenting Adaptation Project Ideas

Section A: Project overview

Project title:	
Country (ies):	
Primary implementing institution[1]:	
Other executing partners[2]:	
Expected project duration (in months):	
Total budget requested (in US$)[3]:	

Section B: Logical framework

Project objective[4]:			
Project component[5]	**Expected outcomes[6]**	**Expected outputs[7]**	**Budget (US$)**
1.	1.1 1.2 …	1.1.1. 1.1.2. 1.2.1. …	
2.	2.1 2.2 …		
3.			
4.			
5.			
6. Project management[8]			
Total amount of financing requested by project			

Section C: Project description

C.1. Adaptation rationale

(a) What is the likely business-as-usual (BAU) development for the targeted sector in the absence of climate change?[9] (½ page)

(b) What are the projected physical impacts of climate change based on available climate models and scenarios and how will these impacts be manifested in terms of climate vulnerabilities to BAU development in the targeted sector and region?[10] (½ page)

(c) What are the specific adaptation activities to be implemented to reduce the climate change vulnerability compared to the BAU situation?[11] (2-3 pages)

C.2. Urgency and prioritisation

(a) Is the project consistent with the priorities and needs identified in national, and politically endorsed V&A assessments?[12] (½ page)

C.3. Impact and cost effectiveness of proposed project activities

(a) Will the project lead to concrete and demonstrable vulnerability reduction on the ground?[13] (½ page)

(b) How is consideration for project sustainability reflected in the project design?[14] (½ page)

(c) How has cost effectiveness been taken into consideration in the project design?[15] (½ page)

C.4. Institutional setup and comparative advantage of implementing institution

(a) Who will implement the project and what is/are their comparative advantage(s) compared to other potential implementing institutions?[16] (½ page)

(b) How will the project be coordinated (and/or mainstreamed into) related ongoing initiatives in sector and region?[17] (1-2 pages as appropriate)

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1 This should be the institution leading the proposal and eventually the implementation of the project.

2 This can list all other institutions that will support and participate in the implementation of the proposed project.

3 Amount should include all budgeted activities listed in Section B (including management costs). The figure should thus match the 'total amount of financing requested by the project' of the project logical framework.

4 This should outline in one or maximum two sentences the overarching objective of the proposed project.

5 Dividing the project into components is a way of structuring the proposal around a number of practical implementation 'blocks'. For example, individual components may contain similar types of action, or result in an output that may be used as an input to another component. Components may be utilised to help organise the logical work of projects, may represent similar work, be executed by a certain organisation, or include different types of work, such as technical assistance component versus an investment component. The project may have as many (or few) components as is found practical (the table can be adapted as needed).

6 Each component should be divided into a number of short or medium term 'outcomes' (or 'effects') each of which will contribute to the overall long-term impact of the project towards the project objective. Each component can contain a number of outcomes and the table can be adapted accordingly.

7 Each outcome is divided into a number of specific 'outputs' (i.e. the immediate products, capital goods and services resulting from the project activities). Every outcome should thus be logically linked to one or more associated outputs (the table can be adapted as needed) using the numbered subheadings as indicated in the table (outputs referring to outcome 1.1 should be stated as 1.1.1, 1.1.2 etc.). The purpose of the logical framework is to clearly link every project activity, output, and outcome to the ultimate objective of the project.

8 Project management costs are the budgeted costs for general administrative services which are not directly related to any of the project outcomes and outputs.

9 This section should contain a brief description of the starting situation (see Figure 3.1) and the relevant development activities that would/should be implemented in the absence of climate change in the targeted sector and region.

10 This section should contain a summary of the most important climate change risks facing the targeted sector (based on best available national/regional climate scenarios and data) and a brief discussion of how those risks will affect the sustainability and sufficiency of BAU development described under (a).

11 This section should give a concise description of each of the specific adaptation activities/investments that the project would implement, how they build on to existing development activities (i.e. the activities identified in (a) above), how they will be implemented in practice, and what impacts they are expected to have in terms of reducing the CC vulnerabilities described under (b). The description should be organised along the structure of the project logical framework in section B, and provide the fundamental logic behind each of its outcomes and outputs and budgeted costs (qualitative additional cost argument).

12 This section should relate the proposed project to the outcome(s) of existing national V&A assessments (aiming to confirm that the project is consistent with the priorities and needs identified, and endorsed politically, here). National Communications, NAPAs or the TAP are all good references for this section, but it could also be, e.g., a nationally executed adaptation plan or policy that would fit the same requirements. The main adaptation rationale (i.e. why the sector is vulnerable, why the project is needed etc.) should be presented in Question 1, and does not need to be repeated here. In case the proposed project is not addressing the top priorities identified in the V&A assessments, the proponent should justify why this project is being pursued instead of higher and more urgent priorities.

13 This section should demonstrate to the donor how the project will lead to concrete and measurable impacts on vulnerability in the targeted sector and/or region. The discussion can take its starting point in the differentiation between 'investment activities' and 'capacity building activities' as discussed in section 3.2 of this guidebook (criterion 3).

14 This section should demonstrate to the donor how the project interventions have been designed in a way that insures that adaptation benefits are sustained beyond the lifetime of the project. This discussion could include elements both of financial, social and environmental sustainability as relevant.

15 This section should contain a qualitative discussion of the 'cost-effectiveness' of the proposed project activities as compared to alternative options for achieving the same objectives. The project activities proposed should reflect an optimum mix of maximised adaptation benefits and minimised costs.

16 This section should clearly outline the institutional setup of the proposed project (i.e. who will do what and when, what will be the management structure for the project, how will the activities of different executing partners be coordinated etc.). The comparative advantage of the implementing institution(s) (compared to other potential implementing institutions) should also be outlined here.

17 This section should briefly identify all relevant related initiatives/projects that are currently being carried out in the targeted sector and region, and discuss how the proposed project will ensure that its activities are appropriately linked and coordinated with these. The aim is to assure the potential donor that the project will not overlap, duplicate or negatively impact any other development activities and that all potential synergies and appropriate collaboration with existing activities are fully exploited. This question is partly linked with question C.1. (a), as the project will need to coordinate/cooperate with any relevant BAU development activity underpinning the proposed adaptation project (refer to section 3.2 for details on the adaptation argument).

Annex 2.
Example of Filled Template for Adaptation Project Ideas

Section A: Project overview

Project title:	Increasing the resilience of Senegal's food production through the transfer and implementation of Water Efficient Subsurface Irrigation (WESI) technology[1].
Country (ies):	Senegal
Primary implementing institution:	Ministry of Agriculture and Natural Resources (MoANR)
Other executing partners:	Department of Agriculture and Irrigation (DAI), National Centre for Agricultural Research and Extension (NCARE), MoANR regional offices in Kaffrine, Kaolack and Fatick.
Expected project duration (in months):	48 months
Total budget requested (in US$):	$2,000,000

Section B: Logical framework

Project objective:	To reduce the agricultural system in Senegal's vulnerability to climate change, particularly in relation to water resources, by testing the innovative and efficient water use technology - WESI.		
Project component	**Expected outcomes**	**Expected outputs**	**Budget (US$)**
1. Piloting of the WESI technology in three regions.	1.1. Reduced vulnerability of food production to climate change induced water shortages in the pilot sites. 1.2. The WESI technology is tested and adapted to local conditions.	1.1.1. Water use per tonne of grain production in the pilot sites reduced by at least 30% 1.2.1. The WESI technology is installed in three pilot sites covering 200ha in the Kaffrine, Kaolack and Fatick regions. 1.2.2. The performance of the pilot installations is monitored, and appropriate revisions are made to optimise performance, as well as installation and maintenance processes. 1.2.3. The WESI technology is installed in three additional sites covering 200ha in the Kaffrine, Kaolack and Fatick regions using processes optimised for local conditions (output 1.2.2).	$1,500,000
2. Targeted training for installation, use and maintenance of the WESI technology.	2.1. Farmers' capacity to install, use and maintain the WESI technology is enhanced 2.2. Awareness of government representatives at national and regional levels on the potential of WESI technology as an adaptation measure is increased.	2.1.1. Completion of 20 training sessions on the use and maintenance of the WESI technology targeting around 200 farmers in the pilot sites 2.1.2. Training of 20 irrigation technicians on the installation and maintenance of the WESI technology 2.2.1. Two presentations (one at mid term and one at project completion) delivered to government representatives from national and regional levels to showcase results of the project 2.2.2. Preparation of flyers and other outreach material aimed at policy makers 2.2.3. Technical report to document results and lessons learned from the project (to be prepared at project completion).	$350,000
3. Project management			$150,000
Total amount of financing requested by project			**$2,000,000**

Section C: Project description

C.1 Adaptation rationale

(a) What is the likely business-as-usual BAU development for the targeted sector in the absence of climate change?

Senegal continues to rely on rain-fed agriculture, which occupies about 75% of the national workforce, of which most are subsistence farmers. Millet, rice, corn and sorghum are the primary food crops. Only 5% of the land is currently irrigated. Given Senegal's geographic position in the Sahel region, precipitation is highly variable: geographically (ranging between as little as 300mm/year in the extreme north to more than 1500mm/year in the south), seasonally, and between years. Rainfall variability can severely impact agricultural yields. Water management is thus a critical theme in Senegal's agricultural sector even under current climate conditions.

A number of development activities are therefore being pursued to increase the resilience of Senegalese agriculture to current rainfall variability. These include rehabilitation and expansion of irrigated areas, small scale damming, and rainfall capture and storage facilities.

Recent development efforts in the three central Senegalese provinces of Kaffrine, Kaolack and Fatick have aimed primarily at establishing water retention basins and expanding and rehabilitating irrigation infrastructure. This infrastructure includes the Regional Water Retention Project (RWRP) funded by the AfDB, and the National Irrigation Expansion Programme (NIEP) funded and implemented by the Ministry of Agriculture and Natural Resources. These investments have led to significant improvements in agricultural productivity, and have reduced yield variations between dry and wet years. However, the recent expansion of irrigation has further increased competition for limited groundwater and surface water.

(b) What are the projected physical impacts of climate change based on available climate models and scenarios and how will these impacts be manifested in terms of climate vulnerabilities to BAU development in the targeted sector and region?

Recent climate studies carried out in Senegal show that water resources are highly vulnerable to the impacts of climate change. Climate scenarios predict a temperature increase of 2 to 4 degrees Celcius and a 5 to 25% drop in annual precipitation, as well as increasing year-to-year variability. Groundwater resource levels, which have already decreased, will continue to be negatively affected as will the average flow of streams and rivers.

Both ground and surface water are being exploited at close to maximum sustainable capacity in the irrigated areas of Kaffrine, Kaolack and Fatick provinces. As a result, there is a high risk that the combined impacts of climate change in terms of increasing water demand (due to higher temperatures) and decreasing water availability (due to reduced annual rainfall and increasing variability) could lead to water shortages that will negatively impact the productivity and food security of the region. There is, therefore, a high risk that the positive trends achieved through the RWRP and NIEP could be reversed, and that additional measures and investments will be needed to maintain the current levels of productivity and food security under projected climate change conditions.

(c) What are the specific adaptation activities to be implemented to reduce the climate change vulnerability compared to the BAU situation?

With the abovementioned vulnerabilities in mind, two mutually complementary adaptation options appear to be necessary for bridging the gap between agricultural water supply and demand in the targeted regions (as well as in Senegal as a whole):

i. Increasing water use efficiency (thus reducing demand)

ii. Developing alternative water sources (thus increasing supply).

As indicated above, further development of groundwater and fresh surface water sources to compensate for climate change induced reductions in water availability, will not be possible (or at least not sustainable in the medium to long term). However, a number of currently undeveloped 'non conventional' water resources could help bridge the gap between supply and demand in the agricultural sector. These include treated wastewater (from urban and industrial water use) and brackish water (from groundwater, irrigation return flows, stagnant surface water and coastal environments).

This project proposes to test and introduce the innovative 'Water Efficient Subsurface Irrigation' (WESI) technology in Senegal. WESI is a technology which shows considerable promise as an adaptation measure in arid and semi-arid environments. The WESI technology consists of irrigation tubes with a special permeable membrane installed at appropriate intervals in the field and connected to a water source. Once installed the membrane will actively interact with the soil environment and water will only be delivered when plant demand exceeds free moisture in the soil. The water is delivered as a water vapour through the permeable membrane. This allows for substantial water savings and avoids over saturation of the soil and roots. In addition, the special permeable surface will only allow clean water to permeate and any impurities remain in the irrigation tubes, which can easily be cleaned by flushing them with high-pressure water. This way, even contaminated water can be used for irrigation, including treated wastewater and brackish water with no need for pre-cleaning or desalinating water. Once installed, the system requires almost no major maintenance and the maintenance required is very low cost. The WESI system, therefore, has the potential to achieve both of the above adaptation targets: increase water use efficiency and increase supply by enabling the use of non-conventional water sources.

While the WESI technology has proved effective in a number of environments around the world, it has never been tested in Senegal. The technology itself and the installation and maintenance procedures may need to be adapted to the unique context in Senegal, for example, in terms of climate, type of crops grown, water availability and culture. The project will pilot the WESI technology in three irrigated regions of Senegal with two primary aims:

i. To test the WESI technology under Senegalese conditions to optimise performance, installation and maintenance processes

ii. To create political awareness for the potential of the WESI technology as an adaptation measure in Senegal, and to provide the necessary technical know-how to further scale up the technology.

The project will have two components:

COMPONENT 1 – Piloting of the WESI technology in three regions

This component will initially install a standard WESI system on 200ha of agricultural land in Kaffrine, Kaolack and Fatick regions, with approximately 5,000 m/ha of pipes installed. Following installation, the fields will be grown for one full cropping season using standard guidelines for use and maintenance. Following this initial 'test run' a team of international WESI specialists, in cooperation with the project team, will evaluate the experiences and performance of the WESI under standard operation, and propose improvements to optimise use, installation and maintenance of the system.

In the following growing season, the adapted WESI system and guidelines will be piloted on an additional 200ha of land adjacent to the previous test sites. Both the standard and the adapted systems will then be operated for another two full growing seasons, before a final evaluation is conducted.

The technology is expected to improve water use efficiency by at least 30% and it is expected to provide good performance using a number of unconventional water sources. Furthermore, because contaminants are retained within the irrigation pipes, land does not suffer from raised levels of salinity (often a problem in conventional irrigation systems).

COMPONENT 2 – Targeted training for installation, use and maintenance of the WESI technology

Farmers and local stakeholders will be trained on the installation, use and maintenance of the new technology. Also, extension services providers will be a target of the proposed training program. Training sessions will be tailored to the needs and capabilities of the beneficiaries. Furthermore, an awareness campaign will be launched targeting government representatives at both the regional and national level.

The awareness campaign will consist of two presentations (made at mid term and project completion) showcasing project results as well as a number of fliers and other information material. The aim is to create political awareness and interest in the WESI technology and demonstrate how it can be an effective adaptation measure in Senegal. At project completion a full technical report will be created with practical guidelines and lessons learned that can be used as a foundation for subsequent scaling up of the WESI technology.

C.2 Urgency and prioritisation

(a) Is the project consistent with the priorities and needs identified in national, and politically endorsed V&A assessments?

Climate change and its effects on sustainable development and poverty alleviation is a high priority for the government of Senegal as evidenced by its ratification of the UNFCCC and Kyoto Protocol and its recent establishment of a National Climate Change Committee. The current proposal supports the implementation of water resources-related adaptation priorities as identified by the Government in its climate-related national policies and plans.

The Initial National Communication to the UNFCCC (1997) and its annexed implementation strategy recognised water resources as a key sector for short to mid-term intervention to address

the impacts of climate change. The National Adaptation Programme of Action (NAPA) of Senegal submitted to the UNFCCC in 2006 lists the water sector as a key priority for adaptation to climate change in the country. More specifically, the NAPA identifies improved water retention capacity and increased irrigation efficiency as priority activities to counteract the effects of climate change on water resources. The NAPA also identifies the links between climate change induced water shortage and/or groundwater depletion and the increased risks of reduced agricultural production and food insecurity. Finally, the recently completed Technology Action Plan (TAP) identified drip irrigation and reuse of treated water as priority adaptation technologies for the water sector.

C.3 Impact and cost effectiveness of proposed project activities

(a) Will the project lead to concrete demonstrable vulnerability reduction on the ground?

The majority of the proposed project funding will go towards concrete investments in pilot installation of WESI equipment on at least 400ha of land in the three regions of Kaffrine, Kaolack and Fatick. This investment will actively reduce water consumption in the pilot fields and thus increase the climate resilience of the associated agricultural production. Increases in water use efficiency in the pilot fields will be measured throughout the project's lifetime with the aim of a 30% reduction in water use per tonnes of grain production. These will be measured to demonstrate the direct impact of the investment and to demonstrate that the system is successfully achieving full functionality.

Other measurable outputs will include: successful completion of training for at least 200 farmers and 20 irrigation technicians on installation, use and maintenance of the WESI systems, production of political outreach material to make policy makers aware of the potential of the WESI system as an adaptation measure, and the creation of a technical report at project completion to compile the results and lessons learned from the project.

(b) How is consideration for project sustainability reflected in the project design?

Several aspects of the project design and its activities reflect a dedication to creating conditions that will sustain project impacts beyond the immediate investment horizon of the project. First of all, of course, the fundamental premise of the project (as outlined in section C.1) is that without adaptation measures to decrease water demand in the agriculture sector (e.g. through the WESI technology system), unsustainable levels of water extraction is the only way to sustain the current levels of production. Thus the project, by its very nature, is promoting a more sustainable path of agricultural development.

Furthermore, creating the necessary local capacity to sustain and replicate the installed systems is a fundamental aim of the project activities. For example, the pilot installations will not only showcase the WESI system's potential as an adaptation measure in the water and agriculture sectors, but also actively look for ways to adapt the system to make it more attractive in the local context (not only in terms of climate and physical environment, but also in terms of cultural traditions, economic conditions etc.). By closely involving and training farmers, extension services and other local stakeholders, the project will create a critical mass of capacity needed to potentially replicate the WESI system in other communities and regions through a principle of 'training of trainers'. As outlined in section C.1. the project will also actively seek to create awareness and support among relevant decision makers at both regional and national levels. It will aim to mobilise necessary budget and political support to mainstream the WESI systems into national sector planning and investments to create

the necessary political momentum for achieving the full and sustained potential of the technology. Furthermore, through close collaboration with the National Irrigation Expansion Programme (NIEP), which includes more than $50 million in planned irrigation investments until 2016 (see section C.4. below), the project has a unique opportunity to directly influence ongoing investment decisions by creating a timely demonstration of the full potential of the WESI system.

Finally, once installed, the WESI system is simple to operate, it functions on a farm scale, and it requires minimum maintenance other than regular flushing of the tubes. There is therefore little or no need for external support and oversight (beyond the original materials and the local extension services trained through the project). This makes the system relatively resilient and sustainable compared to regular drip irrigation systems or larger scale traditional irrigation systems, which generally requires more technical expertise and maintenance to operate on a continuous basis.

(c) How has cost effectiveness been taken into consideration in the project design?

In spite of relatively high installation costs (compared to regular drip or surface irrigation), the WESI system allows for a highly efficient performance. This is because it delivers water directly to the plants roots and therefore leakages due to evaporation and run-off that occur with traditional irrigation systems are minimised. Also, maintenance costs are low because once the pipes are laid the system requires little maintenance.

A few alternatives leading to similar outcomes (i.e. increased efficiency/availability of water for irrigation) were considered. One option would be to expand the water capture and storage systems by expanding the size of dams and retention basins. However, the scale of infrastructure installation needed to make this functional on a regional or even local level would be significantly more expensive than the proposed project. The infrastructure would also remain highly vulnerable to climate variability.

Another option would be to increase the use of drought resilient crop varieties, which in turn would reduce the water needs of production. However, drought-resistant species of local crops previously tested in Senegal tend to have 10-20% lower yields per hectare than currently produced (less water-efficient) crops. When considering total water needs of crops (including continued inefficiencies of the irrigation systems), total water savings per tonnes of crops using an isolated strategy of drought resistant crops would thus not be as high as the 30% envisaged under this project. Because maintaining and increasing national food production is a high national priority, the proposed project was considered a more effective way of meeting this objective. Drought-resistant crops, however, could be a promising supplementary strategy that would further increase the climate resilience of agricultural production.

Finally, building the pilot project activities onto existing community mobilisation and activities initiated under the Regional Water Retention Project (RWRP) and the National Irrigation Expansion Programme (NIEP) (see section C.4b below) in the three regions will further reduce the share of ‘soft activities’ implemented by the project, leading to a stronger investment and higher return.

C.4 Institutional setup and comparative advantage of implementing institution

(a) Who will implement the project and what is/are their comparative advantage(s) compared to other potential implementing institutions?

The project will be implemented over a period of four years beginning in 2012. The project will be nationally implemented and coordinated by the Ministry of Agriculture and Natural Resources (MoANR), with active participation of its regional offices in the three pilot regions. Overall coordination of project execution will be undertaken by MoANR's Department of Agriculture and Irrigation (DAI). DAI is perfectly positioned to lead the project with its dual mandate in agriculture and irrigation. The DAI will also take executing lead for component 1 on the procurement and installation of the pilot WESI systems.

Component 2 will be executed by the National Centre for Agricultural Research and Extension (NCARE) which has the governmental mandate and expertise to address both agricultural research and development as well as training and extension services. NCARE will maintain project-specific staff for field implementation activities at the central level and within the pilot sites, and is also a key beneficiary of the project through the training of 20 NCARE irrigation technicians. Furthermore, NCARE will lead the coordination role at the operational field level to facilitate harmony in the planning and implementation process. It will also seek to be complementary with other ongoing government and donor initiatives in the proposed project area (see next section).

A Technical Support and Advisory Team (TSAT), comprising a number of relevant national experts, will provide technical support to the project during the implementation of activities related to each pilot site. The TSAT will meet once before the implementation of the work at each site and as and when required hereafter. It will provide technical advice and backup support to the Project Management Unit (PMU) during the implementation of work at the site.

(b) How will the project be coordinated (and/or mainstreamed into) related ongoing initiatives in sector and region?

As mentioned above, the project will build on the ongoing achievements of two recent investments aimed at increasing water availability and increasing agricultural production through expansion of irrigated agriculture. These are the Regional Water Retention Project (RWRP) funded by the AfDB and the National Irrigation Expansion Programme (NIEP) which are both active in the three pilot regions.

The RWRP, a $3 million project funded through the AfDB, started implementation in 2010, with expected completion in 2014. The RWRP project aims to increase rural water supply during the dry season through the construction of rainwater retention basins to capture and store rainwater from the rainy season for domestic, agricultural and pastoral purposes. A substantial proportion of the rainfall in the rainy season tends to fall in high intensity events, which means that most of the water is lost through surface run off and is thus lost for productive purposes. In support of these objectives, investments will be implemented in five central regions, including the three regions targeted by this project. The RWRP constitutes one of the two primary development activities underpinning the proposed project.

The NIEP is a government-led initiative funded through government budget as well as bilateral support from a number of international partners. Total budget allocation is $50 million for the period 2008-2016. Aiming to increase national food security and reduce reliance on imported food, the objective of the NIEP is to expand irrigation infrastructure in suitable areas of Senegal in order to: 1. Improve productivity of agriculture, 2. Reduce vulnerability of agricultural production to natural variations in seasonal precipitation. The NIEP will invest in irrigation infrastructure in a number of suitable sites across Senegal, including a number of sites in the three pilot regions targeted by this project. The NIEP constitutes the other primary development activity underpinning the proposed project.

A number of other nationally and internationally funded initiatives/projects and programmes focusing on the water and agriculture sector are currently under planning or implementation in Senegal. This includes the AfDB-led "Rural water supply and sanitation initiative" (the second phase started in 2009) with a main focus on drinking water and sanitation infrastructure; the FAO-supported "Improving Small-scale Irrigation in the Groundnut Basin"; a GEF/WB study on Regional Climate, Water and Agriculture, that analyses the impacts on, and adaptation of, agro-ecological systems in Africa, including Senegal; and a study to better understand the impacts of climate change in Senegal undertaken through the Netherlands Climate Assistance Programme. While thematically related, most of these will not be directly relevant in the implementation of this project as they have different thematic and/or regional foci to this project.

A full baseline analysis of relevant current and planned activities (nationally as well in the three pilot regions) will be conducted during further project preparation. The possibility of creating links with such projects will be explored to ensure that the project strategically contributes to the wider sustainable development agenda in the country and regions.

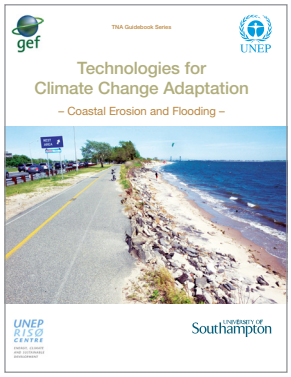
To ensure full coordination of project activities with ongoing initiatives, the following coordination mechanisms will be developed by the project:

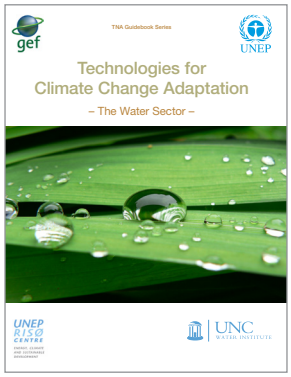
i. **A Project Manager's Coordination Forum (PMCF).** This group will have representation from all primary investment stakeholders in the pilot region (the MoANR - with representation from this project and the NIEP; NCARE; and AfDB), and will focus on practical day-to-day coordination of activities. The group should meet as often as necessary, but every 3 months as a minimum during project implementation. Other stakeholders may join the group based on the baseline analysis mentioned above.
ii. **A Project Steering Committee (PSC).** The PSC will provide political oversight for the proposed project and be a higher-level coordination forum. Stakeholders from all relevant activities identified in the baseline analysis mentioned above, as well as from all relevant national institutions and ministries, will be invited to have a seat on the PSC.

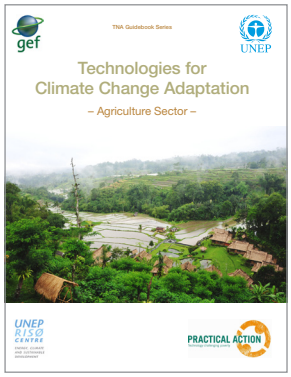
NCARE will actively engage local stakeholders at the field level in each of the three pilot sites. Their aim will be to facilitate harmony in the planning and implementation process and to complement other ongoing government and donor initiatives in the proposed project area.

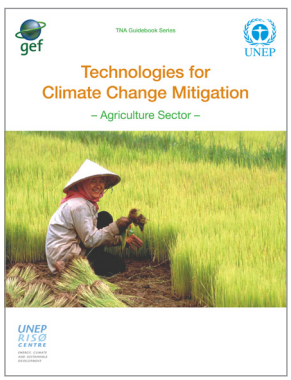
1 This example is loosely based on the SCCF-funded, IFAD-implemented project approved in 2011: 'dRHS Irrigation Technology Pilot Project to face Climate Change impact in Jordan'. Instead of the dRHS (which is a patented and copyrighted technology of DTI-r (www.dti-r.com)) this example introduces an imaginative technology (inspired by, but not in any way representative of the dHRS) – the 'WESI'. Country-specific information is partly drawn from the LDCF-funded, IFAD-implemented project 'Climate Change adaptation project in the areas of watershed management and water retention' approved in 2011.

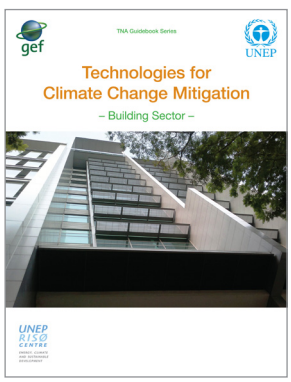
OTHER TNA GUIDEBOOKS AVAILABLE

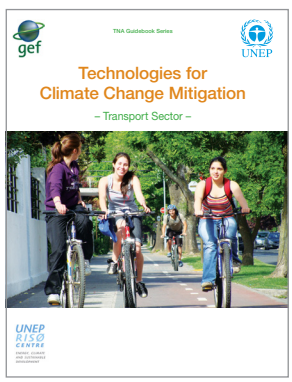


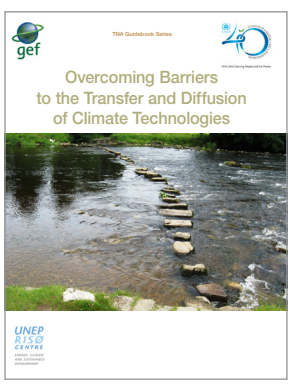


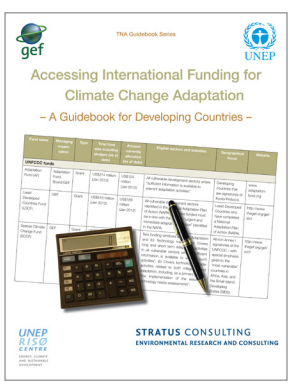


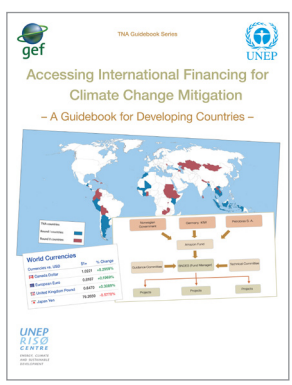












Fund name	Managing organi-sation	Type	Total fund size including pledges (as of date)	Amount currently allocated (as of date)	Eligible sectors and activities	Geographical focus	Website
Other bilateral and multilateral funds funds							
African Development Fund (ADF)	AfDB	Loan	Approx. US$9.3 billion (Budget for 2011-2013)	Unknown	No sectoral limitations. The ADF contributes to the promotion of economic and social development in 40 least developed African countries by providing concessional funding for projects and programs, as well as technical assistance for studies and capacity-building activities. For the replenishment period 2011-2013 adaptation will be a key priority of the fund e.g. in infrastructure and agriculture investments.	Sub-Saharan Africa	http://www.afdb.org/en/about-us/african-development-fund-adf/
Africa Enterprise Challenge Fund: Renewable and Adaptation to Climate Technologies (REACT)	KPMG on behalf of donors	Grant Loan Risk mgmt.	US$50-100 million (total size of fund)	Unknown	No sectoral limitations. The fund is exclusively focused on supporting innovative business ideas from private entities within the areas of renewable energy and adaptation e.g. products and services that help smallholder farmers adapt such as weather insurance, drought resistant seeds and early warning systems.	East African Community of Burundi, Kenya, Rwanda, Tanzania and Uganda. Private entity applicants or	http://www.aecfafrica.org/react/

This guidebook reviews options for international financing of adaptation action in developing countries. It presents the most important technical criteria and concepts used by public donors and private financiers in evaluating proposals. It also provides practical advice on how to present project ideas to potential donors. The guidebook is a useful tool for adaptation planners and project developers looking to develop successful adaptation project proposals for international funding.

This guidebook is intended to be used by countries participating in the Technology Needs Assessment (TNA) project which are currently developing project ideas for implementation of their Technology Action Plans (TAPs). However, the general overview and guidance provided here is also relevant to other developing countries preparing adaptation proposals in support of any other national adaptation planning processes.

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