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How to address and assess climate change adaptation? Results-based climate change adaptation and the role of trees and forests in projects funded by Adaptation Fund

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<p>As climate change is already affecting our planet, it is urgent to ensure adequate support to the most vulnerable communities, sectors, and ecosystems to adapt to the changing climate. The scale of the financial resources that are expected to flow into climate change adaptation is likely to lead to a stronger emphasis on measuring and verifying results as there is international consensus that climate change adaptation interventions should be results-based. However, currently, there is no scientific nor political consensus over what effective adaptation is and how it should best be measured. As a result of this, efforts are needed to improve both methodologies and guidance for assessing adaptation.</p> <p>Through a systematic review of projects funded by the Adaptation Fund, I categorize 30 adaptation projects. The act of cataloguing adaptation measures and further analysing their similarities and differences produces insights in two main areas: identifying how projects have been designed to address and assess adaptation effectiveness; and enhancing understanding on the role of trees and forests in adaptation initiatives.</p> <p>I analyse the ways these projects are planned to assess their effectiveness using three main research indicators: reducing vulnerability and increasing adaptive capacity; reducing exposure; and sharing of lessons-learned and increasing climate change adaptation science. This includes studying the defined expected project results, indicators and baselines stated in projects' results frameworks. The project proposals are further studied to gain understanding on how trees and forests are used to address and assess adaptation. The projects are analysed to test whether projects that address climate change adaptation similarly have also similarities in assessing effective adaptation. In order to do that the projects are categorized into four categories based on their approach: 1. ecosystem-based adaptation projects; 2. engineered or sectoral adaptation projects; 3. community-based adaptation projects; and 4. small-scale funding modality projects. I focus on exploring the objectives, types, and limitations of adaptation metrics used in assessing adaptation but also provide recommendations.</p> <p>Since the first years of the Adaptation Fund the projects have developed in regard to assessing their expected results with a few exceptions to the general trend. The national and regional implementing entities were more often struggling to set proper results frameworks. Trees and forests had a more prominent role than would be assumed by the limited number of projects classified as forestry projects as 80% of the projects included trees and/or forests as part of activities, outputs, outcomes, or indicators.</p> <p>It can be concluded that the studied projects had differences in addressing and measuring of adaptation. Effective adaptation was mostly framed to contribute to reducing vulnerabilities that include measures to increase adaptive capacity. Significantly less expected outcomes and outputs were set to reduce exposure to climate change impacts. Interestingly successful adaptation was also framed as sharing of lessons-learned or communicating other findings to a wider audience, and also to measure channelling of funding, project management, or social inclusion aspects. One of the key findings is that how the project is to address adaptation also influences how effective adaptation is to be measured and verified leading to different typical strengths and challenges in assessing effectiveness.</p>			
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<p>Ilmastonmuutos vaikuttaa jo maapalloomme, joten on kiireellistä varmistaa riittävä tuki kaikkein heikoimmassa asemassa oleville yhteisöille, sektoreille ja ekosysteemeille. Ilmastonmuutokseen sopeutumiseen tähtäävän rahoituksen odotetaan kasvavan ja johtavan tulosten mittaamisen ja todentamisen korostumiseen. On olemassa kansainvälinen yksimielisyys siitä, että ilmastonmuutokseen sopeutumistoimenpiteiden tulisi olla tulospohjaisia. Kuitenkin tällä hetkellä ei ole tieteellistä tai poliittista yksimielisyyttä siitä, mitä tuloksellinen sopeutuminen on ja kuinka sitä tulisi mitata. Tämän seurauksena menetelmiä ja ohjeistuksia tulisi kehittää, jotta sopeutumista voitaisiin arvioida.</p> <p>Tässä tutkimuksessa järjestelmällisen katsauksen menetelmin tutkittiin 30 Adaptation Fundin rahoittamaa ilmastonmuutokseen sopeutumisen hanketta. Sopeutumiseen tähtäävien toimien luokittelulla ja näiden erojen ja samankaltaisuuksien analysoinnilla lähestyttiin aineistoa kahdesta näkökulmasta: identifioitiin kuinka hankkeet oli suunniteltu tavoittelemaan ja arvioimaan tuloksellista sopeutumista sekä selvitettiin puiden ja metsien merkityksestä sopeutumistoimissa. Sitä kuinka hankkeet oli suunniteltu osoittamaan niiden tuloksellisuutta analysoitiin kolmen päätutkimusindikaattorin avulla: vähentämällä haavoittuvuutta ja lisäämällä sopeutumiskapasiteettia; vähentämällä altistumista; ja jakamalla oppeja ja vahvistamalla sopeutumisen tieteellistä perustaa. Tämä piti sisällään hankesuunnitelman tuloskehikossa määritelyjen tulosten, mittarien ja lähtötasojen tarkastelun. Hankesuunnitelmia tarkasteltiin myös muilta osin, jotta saatiin tietoa siitä, kuinka puita ja metsiä hyödynnetään sopeutumistoimissa ja niiden tuloksellisuuden arvioinnissa. Hankkeita vertailtiin, jotta pystyttiin selvittämään, onko samankaltaisesti ilmastonmuutokseen sopeutumista tavoittelevilla hankkeilla myös samankaltaisuuksia tuloksellisuuden mittaamisessa. Hankkeet luokiteltiin niiden lähestymistavan mukaisesti neljään luokkaan: 1. ekosysteemiperustaiset; 2. tekniset tai sektorispesifit; 3. yhteisöperustaiset; ja 4. pienrahoituksen kanavoitettiin keskittyvät hankkeet. Keskiössä ovat erilaisten valittujen mittaamistapojen mahdollisuuksien ja rajoitteiden selvittäminen, mutta tutkielma tarjoaa myös suosituksia.</p> <p>Adaptation Fundin ensimmäisten vuosien jälkeen hankkeet ovat kehittyneet tuloksellisuuden arvioinnissa muutamia poikkeuksia lukuun ottamatta. Kansallisten ja alueellisten hanketoteuttajien tuloskehikoissa oli useammin haasteita. Puilla ja metsillä oli merkittävämpi asema kuin mitä oli odotettavissa metsähankkeiden rajallisen määrän perusteella. 80 prosenttia hankkeista sisälsi toimintoja, tuotoksia, tuloksia tai mittareita, jotka liittyivät puihin tai metsiin.</p> <p>Voidaan todeta, että tarkastelluissa hankkeissa oli eroja siinä, kuinka sopeutumista ja sen tuloksellisuuden mittaamista lähestyttiin. Tuloksellinen ilmastonmuutokseen sopeutuminen pääosin käsitettiin johtavan haavoittuvuuden vähentymiseen pitäen sisällään sopeutumiskapasiteetin kasvattamiseen tähtääviä toimia. Merkittävästi vähemmän tuloksia ja tuotoksia oli määritelty liittyen ilmastonmuutoksen vaikutuksille altistumisen vähentymiseen. Tuloksellinen sopeutuminen näyttöä myös opittujen asioiden jakamisena ja hankkeen muiden löydösten viestimisenä laajalle yleisölle sekä rahoituksen kanavoitina, sosiaalisen inklusion ja hankehallinnon tavoitteiden saavuttamisena. Voidaan todeta, että se millainen hankkeen lähestymistapa sopeutumiseen on vaikuttaa siihen, kuinka tuloksellisuutta tullaan mittaamaan. Tämä johtaa erilaisiin tyypillisiin tuloksellisuuden mittaamisen vahvuuksiin ja heikkouksiin.</p>			
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1 INTRODUCTION

1.1 Background

The impacts and risks associated with climate change are already happening in many systems and sectors essential for human wellbeing (IPCC 2014b, IPCC 2018). Increase in global mean temperature cause for example increase in global vegetation loss, coastal degradation, as well as decreased crop yields in low latitudes, decreased food stability, decreased access to food and nutrition, and continued permafrost degradation and water scarcity in drylands (IPCC 2019). Even the most restrictive emission policies leave a substantial chance that significant climate change will occur over the next several decades (IPCC 2014b, IPCC 2018). That is why it is urgent to ensure adequate support to the most vulnerable communities, sectors, and ecosystems to adapt to the changing climate.

Adaptation to climate change did not receive much attention in the first years of the international climate change studies nor in international negotiations (Burkett et al. 2014). Until the mid-1990s, research on climate change focused on climate system dynamics, modelling of future climate and its impacts, and climate change mitigation (Kates 2000). Especially during the past few years adaptation has been covered more (Noble et al. 2014). Traditionally, climate change adaptation actions under the United Nations Framework Convention on Climate Change (UNFCCC) have not been as prominent as mitigation actions (IPCC 2014b). This trend is however anticipated to change (IPCC 2014b). During the UNFCCC Conference of the Parties in Cancun 2010, funding at the level of USD 100 billion per year was promised for long-term financing of adaptation and mitigation actions (Cancun Agreements 2010). How well and effectively these funds will be used to achieve the adaptation targets still remains the key question (Leiter et al. 2019). This question is in line with the findings of Adger et al. (2003), Thomas and Twyman (2005) Warner and Geest (2013) who pointed out that adaptation interventions have done little to alleviate underlying vulnerabilities. Therefore, assessment of the effectiveness of adaptation projects becomes a key task for the future (Owen 2020).

The main challenge is that there is no scientific nor political consensus over what successful adaptation is and how the effectiveness of adaptation interventions should best be measured (Owen 2019). There are multiple reasons for this. One reason is that because climate change adaptation can still be considered a relatively new field, there has been

debate and also confusion about the definitions of key terms (Janssen & Ostrom 2006, IPCC 2014a, Dilling et al. 2019). One explanation is that the terms are not independent concepts, but defined by each other, therefore making it impossible to remove the confusion around the definitions (Hinkel 2011). The differences in the definitions can also be seen to relate to the different entry points for looking at climate change risk (IPCC 2012, IPCC 2014a).

Adaptation itself is a broad term and there are many definitions. It can even be argued to be relatively vague term. Yohe and Tol in 2002 separated coping and adaptation so that coping is the short-term response to variability, whereas adaptation is the more fundamental change of the system to allow for a new coping range to be established. Adger et al. in 2003 defined that adaptation to climate change “is the adjustment of a system to moderate the impacts of climate change, to take advantage of new opportunities or to cope with the consequences”. Interesting in this definition is the positive dimension of taking advantage of the benefits and not just buffering the systems and dealing with negative effects. In 2008 Locatelli et al. defined adaptation, in short, to mean “reducing the vulnerability of societies and ecosystems to changes” therefore emphasizing the concept of vulnerability. Tompkins et al. in 2010 described that adaptation contains “reducing risk and vulnerability, seeking opportunities, and building the capacity of nations, regions, cities, the private sector, communities, individuals, and natural systems to cope with climate impacts, as well as mobilizing that capacity by implementing decisions and actions”. This definition brings in the concept of risk and capacity building dimension with the need to act accordingly. IPCC in its latest Assessment Report concludes that “adaptation requires adequate information on risks and vulnerabilities in order to identify needs and appropriate adaptation options to reduce risks and build capacity “ (Noble et al. 2014, p. 840).

During the early years of climate change adaptation literature vulnerability and adaptive capacity were discussed as key concepts for understanding how developing countries adapt to climate change (Adger 2006, Eakin & Luers 2006). There have been many attempts to define vulnerability. It has been defined for example as “the susceptibility of exposure to harmful stresses and the ability to respond to these stresses” (Adger 2006, Adger et al. 2007). IPCC in its latest Assessment Report defines vulnerability as “the propensity or predisposition to be adversely affected” (Noble et al. 2014, p. 839-840).

Since 2012 IPCC has defined that vulnerability focuses only on sensitivity and capacity, with exposure incorporated into the concept of risk (IPCC 2012, IPCC 2014a). Adger et al. (2009) argue that building adaptive capacity necessarily requires consideration of rights to development and security rather than just avoidance of risks. This points out the debate regarding the relationship between rights and resources and climate change adaptation but also highlights the linkages between development and adaptation objectives discussed later.

Since the IPCC's Fourth Assessment Report, the framing of adaptation has moved from a focus on biophysical vulnerability to the wider social and economic drivers of vulnerability and people's ability to respond (Noble et al. 2014). Already in 2003, Adger et al. (2003) have argued that vulnerability should be seen as "a socially constructed phenomenon influenced by institutional and economic dynamics". Adger et al. (2003) also bring resources into the centre stating that the vulnerability of individuals and societies is determined by the possible responses of the resources on which individuals depend, by the availability of resources and by the entitlement of individuals and groups to use these resources. The changes in the understanding of vulnerability have put more attention to the structural conditions of poverty and inequality that are linked to adaptation (Burkett et al. 2014). IPCC (2014a) have concluded that heightened vulnerability is a product of intersecting social processes that result in inequalities. These social processes include, for example, discrimination on the basis of gender, class, ethnicity, age, and disability. However, Adger et al. (2003) stress that vulnerability to climate change is not precisely synonymous with poverty. Poverty and marginalization are the key driving forces of vulnerability and constrain individuals in their coping and long-term adaptation. However, vulnerability to future climate change is expected to have distinctive characteristics and create new vulnerabilities. (Adger et al. 2003) It has been argued that both vulnerability and adaptation processes to climate change are in fact both likely to reinforce unequal economic structures (Kates 2000).

The scale, including timeframe, and ambition of adaptation are aspects that furthermore add complexity in defining adaptation. For a few years already there has been a trend for a call for more transformational adaptation (Kasdan et al. 2020). The goal of this transformational adaptation is to change the fundamental elements of systems in response to actual or expected climate change (Kates et al. 2012). This means that often the scale

and ambition are bigger than with incremental activities (Kates et al. 2012). This change has also been referred to as a change of paradigm including changes in activities and perceptions about the nature of climate change, adaptation, and their relationship to other natural and human systems (IPCC 2012, Kates et al. 2012). According to the two latest IPCC assessment reports (IPCC 2012, Noble et al. 2014) differentiation between incremental and transformative adaptation is important because it affects how we approach adaptation, how we integrate it into planning and policy, and how we allocate adaptation funding. It has been also argued that in situations where vulnerability is high and adaptive capacity low, changes in climate extremes can make it difficult for systems to adapt sustainably without transformational changes (IPCC 2012, p. 20).

1.2 Summary of previous research

The last decade have seen discussions on developing more operational definitions of terms and ways of showing evidence of adaptation effectiveness (Owen 2020). Part of this have been efforts to develop a metric that can be applied either universally or at least on a sectoral level to measure adaptation to show evidence of effectiveness (Christiansen et al. 2016). For example, Stadelmann et al. (2011) have proposed two potential universal adaptation metrics: saved wealth and saved health. However, it has been stated that there is no single approach to adaptation because of the complex, diverse, and context-dependent nature of adaptation (Christiansen et al. 2016, Dilling et al. 2019). According to the IPCC (2012) literature further illustrates that there are big differences in planning adaptation and its expected results. This finding is related to the context-specific nature of adaptation, but also highlights differences in resources, values, needs, and perceptions among and within societies that influence what is emphasised (IPCC 2012, Dilling et al. 2019).

The literature illustrates that emphasis is more on impacts-led approaches that focus on hazards and exposure through the construction of defensive infrastructure than on human vulnerability (Noble et al. 2014). However, the focus has been moving on tackling the underlying causes of vulnerability such as informational, capacity, financial, institutional, and technological needs (Noble et al. 2014). Engineered and technological adaptation options are seen as the most common adaptation strategies, although there is a growing

experience of the importance of ecosystem-based, institutional, and social measures (Noble et al. 2014).

Climate change adaptation interventions are in many cases not solely meant to bring in adaptation benefits but to connect these efforts for example with development and disaster risk management targets (Mertz et al. 2009, IPCC 2012). It is argued that climate change adaptation takes place as a response to multiple stresses and climate change is one of those stresses (Adger et al. 2003). Mertz et al. (2009) argue that for example adaptation needs to be very carefully planned because these efforts are implemented in complicated situations where the societies are poor and vulnerable because of many reasons. Additionally, the importance of climate change adaptation is influenced by how the issue is framed in a particular context. In many cases, the most attractive adaptation actions are those that offer development benefits in the relatively near term, as well as reductions of vulnerabilities in the longer term (IPCC 2012, p. 20). The national level plays a key role in adaptation planning and implementation, while adaptation options or responses have diverse processes and outcomes at the subnational and local levels (IPCC 2012).

IPCC concludes that identifying needs that are caused by climate change risk -that constitutes of exposures, hazards, and vulnerabilities- provides the basis for selecting adaptation options (Noble et al. 2014). Over the years, a number of categories of adaptation options have been identified. These options include a wide range of actions that are organized in IPCC's Fifth Assessment Report (Noble 2014 et al., p. 845) into three general categories: structural/physical, social, and institutional. According to the IPCC (Noble et al. 2014, p. 844) the structural/physical category includes much of the idea of "concrete activities" that is argued to reflect the priority of certain adaptation donors such as the Adaptation Fund. This IPCC categorization includes four sub-categories: engineered and built environment, technological, ecosystem-based, and services. For example, forest projects are said to automatically fall into the ecosystem-based sub-category. The social category includes sub-categories for educational, informational, and behavioural adaptation options. The institutional category includes economic, laws and regulations, and government policies and programs sub-categories. (Noble 2014 et al., p. 844)

It can be concluded that it is not yet clear how effective adaptation actions currently are and will be in the future. Most of the assessments of adaptation have been restricted to impacts, vulnerability, and adaptation planning, with very few assessing the processes of implementation and evaluation of actual adaptation measures (Noble et al. 2014, Owen et al. 2020). There is a tendency in the literature to consider adaptation planning as a problem-free process capable of delivering positive outcomes, underestimating the complexity of adaptation as a social process, and creating unrealistic expectations in societies (IPCC 2012). Wrongly focused and poorly conducted adaptation interventions can actually lead to maladaptation by increasing vulnerability or having no positive effect in improving the capacity of the vulnerable poor to adapt (Barnett & O’Neill 2010, IPCC 2012). The definition of maladaptation used by IPCC has changed between the Third and Fifth Assessment Report to recognize that maladaptation arises not only from unintentional badly planned adaptation actions, but also from “deliberate decisions where wider considerations place greater emphasis on short-term outcomes ahead of longer-term threats, or that discount, or fail to consider, the full range of interactions arising from the planned actions” (Noble et al. 2014). To conclude, the threat of maladaptation is therefore also linked to the debate regarding the differentiation between incremental and transformational adaptation.

Monitoring and evaluation are inherently challenging for development projects, but it can be argued that this is particularly the case for climate change adaptation projects. Reasons for this include the uncertainty related to climate and long-time horizons. Monitoring and evaluation (M&E) for climate change adaptation are areas of increasing interest and attention. According to Lamhauge et al. (2012) during the early years of adaptation literature, M&E primarily focused on the challenge of conducting M&E, categorization of adaptation interventions into thematic areas, consideration of possible M&E approaches, and identification of factors to be considered when implementing adaptation activities and creating indicators. Studies also show that adaptation projects have been frequently describing the activities rather than documenting the results they were able to achieve (Perspectives Climate Change 2011). It is expected that the scale of the financial resources that are projected to flow into climate change adaptation, combined with the increasing number of already funded adaptation projects coming to an end, is likely to lead to a much stronger donor emphasis on assessing and documenting results and impacts (Christiansen et al. 2016). As a result of this, efforts have been directed towards

improving both methodologies and guidance for assessing adaptation. The broadening of focus to consider the social and economic drivers of vulnerability can be seen. The standard adaptation approach, and that which has dominated previous IPCC reports, has been the climate scenario-driven impacts-based approach, where the focus is primarily on the biophysical climate change impacts to which systems and people need to adapt (IPCC 2014a). Emerging assessment approaches can be seen to be more focused on the social and economic factors that make people vulnerable (IPCC 2014a).

1.3 Defining the research topic

There are a number of international institutions set up to fund climate change adaptation and mitigation actions and contribute in efforts to develop means to show evidence of effectiveness of these actions. These institutions include adaptation funds that are mobilized under different financial mechanisms. One of these is the Adaptation Fund that finances concrete adaptation projects and programs in developing countries. This research focuses on the climate change adaptation projects funded by the Adaptation Fund. In 2001, at the Seventh Conference of the Parties in Marrakech delegates focused on both adaptation to climate change and mitigation measures and, for the first time, formally recognized the challenges of adaptation for the developing countries (Adger et al. 2003). This recognition led to the forming of the Adaptation Fund (Adger et al. 2003). The fund did not come into effect until the Kyoto Protocol was ratified in 2005 and negotiations over its governance and working modalities took almost five years (Adaptation Fund Board 2016). The first project was approved in 2010. The Fund is financed in part by government and private donors, and also from a two percent share of proceeds of Certified Emission Reductions issued under the Clean Development Mechanism projects. (Adaptation Fund 2020.) The basics about the Adaptation Fund's funding modality and the key findings of previous research on ways to address and assess adaptation funded by the Fund are summarized in chapter 2.3.

The OECD-DAC Paris Declaration stated in 2005 that management for results and clearly verifiable project outcomes are key operational requirements for international cooperation (Paris Declaration and Accra Agenda for Action 2019). Therefore, the need to define the anticipated results of adaptation measures, namely the adaptation-related results framework and results monitoring and evaluation became essential (Olivier et al.

2013). At its tenth meeting, the Adaptation Fund board adopted the approach to implementing results-based management (RBM) (AF 2015c). Adaptation literature and guidelines of the adaptation donors follow the standard results-based management terminology used widely in development cooperation that includes a results chain thinking from inputs to outputs, outcomes, and impacts (Olivier et al. 2013, Leiter et al. 2019), and the Adaptation Fund is not an exception.

The role of a results framework and related metrics is central in results-based management to set means to assess successful adaptation (Leiter et al. 2019). The Adaptation Fund requests the project proposal document to include a results framework that present project outcomes and outputs, the corresponding indicators, baselines and targets, and means of verification. Typically, the idea of results framework is that it would be used as a management, monitoring and evaluation tool that defines how the successful adaptation is to be measured. In general, in order to achieve the overall objective (goal, aim, or impact), the project identifies expected outcomes, and these are supported by outputs. It is common that each outcome has its own outputs, and indicators are defined to measure progress at both outcome and output levels.

As part of the Adaptation Fund's board decision on moving forward with results-based management, it requested the secretariat to develop a practical guide or manual on how project baselines and project results frameworks may be prepared. The document guidelines are stated to be meant as "a tool for project proponents to utilize when designing project or program level results frameworks and developing baselines to submit to the Adaptation Fund". It also clearly states that the document is not to provide guidelines to develop and analyse RBM frameworks; provide tools for selecting and measuring project-specific indicators or help set up or manage project monitoring and evaluation. It is stated in the document that every project requires a baseline that incorporates information from vulnerability and needs assessments and existing secondary sources. The information should be strictly aligned with each selected indicator by the project. Project staff should complete baselines by the start of the project so that proponents can accurately measure any change and the contribution to that change during the life of the project. (AF 2015c.)

According to Olivier et al. (2013) defining specific indicators is an important element in a systematic approach towards developing results-based adaptation projects. Outputs and outcomes frame what the project is expected to achieve, while indicators show how these results will be measured (Lamhauge et al. 2012). The Adaptation Fund funded projects should include project indicators and the Adaptation Fund indicators borrowed from the fund's own results framework (AF 2015a). The fund defines that indicators are not just to measure the achievement of results but also implementation progress (AF 2015c). The criteria for indicators that the Adaptation Fund lists are that the indicators should be valid, precise, practical, affordable, simple, reliable, sensitive, clear, useful, and owned (AF 2015c). The Adaptation Fund states in its guidance document that both quantitative and qualitative indicators may be useful, and selection should depend on the nature of the desired result. (AF 2015c.) In principle, as explained by Leiter et al. (2019) "any indicator that can plausibly be argued to capture aspects of adaptation can be an adaptation indicator". This implies that adaptation indicators do not necessarily need to be invented from scratch, but their adaptation relevance needs to be made explicit. This means according to Leiter et al. (2019) that it needs to be explained to what extent the indicator is indicating something directly about reductions to climate risk.

Indicators are commonly classified according to the stage in the change process that they refer to, in other words, whether they indicate the potential for adaptation or the realization of adaptation. The first ones are called process or output indicators and the latter are called outcome indicators (Leiter et al. 2019.) As the use of output indicators is common and the nature of adaptation indicators discussed before is evident, Leiter et al. (2019) point out the need for adaptation metrics to be analysed for their ability to actually measure adaptation to climate change. To ensure a reliable use of adaptation indicators, according to Leiter et al. (2019) it is not just the phrasing of the indicator that matters, but also how it is planned to be measured and which data sources are to be used. Leiter et al. (2019) also argue that this important aspect seems to be partly absent from the international debate on assessing adaptation.

In addition to choosing the right indicators and means of verification a key reference point for planning, monitoring, and evaluation is the baseline (Olivier et al. 2013, Lamhauge et al. 2012). Olivier et al. (2013, p. 26) define baseline as "the starting point before the beginning of an intervention". In its guidance document the Adaptation Fund uses OECD

definition of baseline data as “an analysis describing the situation prior to a development intervention, against which progress can be assessed or comparisons made” (AF 2015c). According to Olivier et al. (2013) the results framework with indicators and the adaptation context determine which baseline variables are most relevant. It is stated in the Adaptation Fund guidance document (AF 2015c) that every adaptation project should present baselines with respect to climate, development, vulnerability, and adaptive capacity. However, in the same guidance document another classification states that baselines may take the form of a vulnerability baseline, a climate-risk baseline, an adaptive capacity baseline, or an adaptation baseline. It is important to note that this classification is not fully aligned with the IPCC latest classification of climate change risk and its components.

Defining baselines is widely considered essential in order to measure results (Lamhauge et al. 2012), but it is difficult to define suitable baselines (Olivier et al. 2013). Lamhauge et al. have argued (2012) that in the context of adaptation, setting baselines requires consideration of future climate change, therefore taking a more future-oriented perspective than that has been standard in development cooperation in which results-based climate change adaptation management borrows from.

1.4 Research objectives

The aim of this research is to study how the projects funded by the Adaptation Fund were to address and assess climate change adaptation. The focus is especially on the role of trees and forests, and how the expected adaptation results were framed and planned to be measured and verified. The focus is on the project design and what the projects had planned to include because of the limited number of already completed projects.

The research questions are:

1. How the expected adaptation results were measured and verified?
2. What was the role of trees and forests in the projects in addressing and assessing adaptation?

The research hypotheses to be tested are:

1. The baselines have not been always set or they have not been set in a way that would be relevant, and that makes measuring and verifying of the results difficult.
2. Trees and forests have a more prominent role in the projects than would be assumed by the limited number of projects classified as forestry projects.

I trust this thesis is a welcomed addition to the currently still rather limited research on climate change adaptation measures and their evaluability. In the context of scaled-up funding for climate change adaptation, it is more important than ever to ensure the effectiveness of adaptation actions. In this study I am to identify some of the difficulties in designing a results-based adaptation project and measuring its effectiveness. However, in addition, I am to give recommendations that could help to inform future work in this area and hopefully also contribute to efforts towards better design and evaluability of climate change adaptation projects.

Next the research materials, methods, and sampling are presented. This also includes an overview of the Adaptation Fund as an adaptation donor. After that the results regarding the first research question are presented. This chapter explores the objectives, types, and limitations of adaptation metrics used in assessing adaptation in the Adaptation Fund projects. The second part of presenting the results of this study focuses on the second research question on the role of trees and forests in adaptation projects in addressing and assessing adaptation. After that the key findings are summarized. Then the findings of this study are compared with previous research. The focus on this reflection is mostly on the first research question regarding adaptation assessment. In addition, the limitations of this study are discussed. Lastly, the findings are concluded with a rather comprehensive section of recommendations for enhancing the ability to address and assess effective adaptation.

2 MATERIAL AND METHODS

2.1 General

The research material included project proposals and annual progress reports of 30 projects funded by the Adaptation Fund. The climate finance readiness grants were not part of the scope of this study. The mid-term and final evaluation reports prepared by independent evaluators were included in the research materials if these were available to be downloaded from the Adaptation Fund webpage by the time the project documents were examined. Altogether 6 final evaluation reports and 11 mid-term evaluation reports were included. It is important to note that the quality of the evaluation reports varied that lead to differences in their level of findings and recommendations regarding results-based management. The project mid-term evaluation reports that were written in other languages than English were excluded.

The project proposals were on average a hundred pages long and included the project's results framework table. The progress reports are delivered yearly and the information is mainly provided as a results framework table separated into different Excel spreadsheets. The guiding documents that are provided by the Adaptation Fund to the projects to meet the funding requirements were also studied. The documents included Methodologies for reporting Adaptation Fund core impact indicators, Operational policies and guidelines for parties to access resources from the Adaptation Fund, Alignment of Project Objectives/Outcome with Adaptation Fund Results Framework, and Results Framework and Baseline Guidance. All the research materials were downloaded from the Adaptation Fund webpage.

2.2 Sampling

The sample size of the study included 30 projects that had received funding from the Adaptation Fund (see Appendix 1). Cluster sampling was chosen to select the sample from all the 55 projects approved to be funded by the end of 2016. The Adaptation Fund finances climate change adaptation projects in nine sectors: agriculture, coastal management, rural development, disaster risk reduction, food security, forests, multi-sectoral projects, urban development, and water management. Four projects were randomly selected from each project sector except one extra project categorized as a

multisector project. Only one project had been categorized as a forestry project thus that was the only one chosen to represent that sector. Urban sector projects had not been approved yet hence these could not be included. By the time of the sampling only three projects had been completed and their final evaluations conducted. The projects evaluated included coastal management project in Senegal, food security project in the Solomon Islands, and disaster risk reduction project in Pakistan. The three completed projects were added to the sample, because of their importance in providing information on the whole project cycle, including final evaluations. However, as I went back to working life to practice monitoring and evaluation before finalizing this study the evaluation reports of the sample projects that were published after the sample selection was done were also studied.

The sample represents 55% of the projects that had been funded by the time of the sampling. The sample can be considered geographically well-balanced as out of 30 projects 10 were in Africa, 8 in Asia, 7 in Latin America, and 5 in small-island state (see Appendix 1). 30% of the studied projects were approved in 2011, which was the second year of the Adaptation Fund's project funding operations. A multilateral organization (e.g. UN organisation) was responsible for project implementation in 60% of the studied projects. The vast majority of these projects were implemented by United Nations Development Programme. The remaining 40% of the projects were implemented by national or regional organizations such as ministries, development banks, and research institutions. The grant amounts varied between 2.4 and 10 million US dollars with an average 4.3-year planned project duration.

2.3 Adaptation Fund's funding modality and assessment of project performance

The Adaptation Fund has an explicit focus on financing measures that produce visible and tangible results on the ground (Adaptation Fund Board 2016). This can be considered as a distinct feature relative to other big donors in the adaptation field that are mostly to improve the enabling environment which makes it interesting to study. The stated objective of the Adaptation Fund and all adaptation projects and programmes under the Fund is to "reduce vulnerability and increase adaptive capacity to respond to the impacts of climate change, including variability at the local and national levels". The derived impact is defined as 'increased resiliency at the community, national, and regional levels

to climate variability and change'. It seeks to achieve this by funding concrete adaptation projects, which include climate adaptation and resilience activities that address the adverse effects of climate change. The project activities should have a specific objective(s) and concrete outcome(s) and output(s) that can be measured, monitored and verified. (Adaptation Fund Board 2016.)

By the end of 2016 when the sampling of this study was done the average project size was 6.4 million dollars over 4.3 years and it had approved 358 million dollars for 55 projects and programs. Country proposals usually bring multiple projects together into a single program with different executing entities (Canales Trujillo & Nakhooda 2013). Assessment published in 2013 by Canales Trujillo and Nakhooda found out that efforts to improve agricultural practices and strengthen food security had received the majority of funding. This was followed by building infrastructure to protect against flooding and improving hydraulic management, particularly in coastal areas. Furthermore, more than 10% of the approved projects were about non-infrastructure-based approaches to flood prevention and efforts to integrate climate change into disaster risk reduction. According to Canales Trujillo and Nakhooda (2013) most approved projects included enabling activities to strengthen laws, policies, and capacities that support adaptation to climate change. However, according to the same assessment most of the funding had in practice gone to investments in infrastructure, new management approaches, and technologies.

The Adaptation Fund board commenced an internal assessment of its project portfolio that was published in 2016 and included 21 funded projects. A half of these projects were the same which are included in this study. The assessment stated that frequently identified as of concern in the project proposals is the risk of food insecurity arising from climate-related drivers of impacts (droughts, floods, etc.), and the risk of livelihood losses, income, and agricultural productivity from water scarcity (AF 2015b). According to the same assessment (AF 2015b) this can be considered to reasonably align with the climate-related drivers most frequently identified, highlighting the link between precipitation changes and extreme events, and their impact on food security and livelihoods. Unsurprisingly risks related to coastal risks and small island states were prominent in the assessment as coastal management is also one of the project funding categories. In terms of the total number of expected outputs in the projects, social and institutional adaptation options were the ones most often targeted (AF 2015b). However, from the perspective of

the financial resources allocated to project outputs, structural/physical outputs dominate project activities, accounting for nearly 70 percent of project expenses (AF 2015b).

The internal assessment (AF 2015b) concluded that it is evident that projects are commonly concerned with reducing vulnerability through securing of human and natural assets that focus on peoples' livelihoods. With respect to the broadened definition of vulnerability, it argued that its mandate to finance concrete adaptation projects which typically address the risk from physical hazards and impacts is not at the expense of considering the wider social and economic drivers of vulnerability since it is also strengthening the enabling environment (2015b, p. 63).

2.4 Methods

This study consisted of a systematic review of project documents. A combination of qualitative and quantitative approaches was chosen to both collect the data from the documents and to analyse it in order to get a detailed analysis. The main method was content analysis with descriptive statistics and cross-tabulation. The data was collected and analysed with the help of building a research matrix with indicators in Excel. The research matrix was designed to provide the needed information to answer the research questions by dividing the actual research question into smaller sub-questions. The research matrix was designed and tested first with three projects and adjusted to be able to draw relevant data from the projects. The research matrix was then again piloted with ten projects one from each thematic sector, except two from both water management and coastal management sectors. The piloting resulted in eliminating two research questions and narrowing down the sample size to 30 projects. Also, the questions of the matrix were modified, and more answer categories (i.e. research indicators) were coded. Therefore, it can be concluded that the structure of the research coding matrix was compiled following the theoretical framework and further adjusted in a data-driven way by letting the categories emerge from the material.

The research matrix included three Excel sheets. The first sheet was used to collect the basic information about the funded projects and to manage the sample selection and the research process in a structured manner. The second sheet had approximately 80 columns for answering the first research question on measuring and verifying of adaptation and

another sheet with almost 50 questions for answering the second research question on the role of trees and forests in addressing and assessing adaptation. The process was such that a project proposal was first studied to answer the research question on measurement and verification of adaptation. Project that included actions, outputs, or outcomes related to trees or forests was then studied further to gather information regarding how trees and/or forests were used to address and assess adaptation. The research matrix was very detailed and going through the project documents and filling in the matrix was very time-consuming, but it made the study well-structured and facilitated an efficient analysis process.

The expected project outcomes and outputs and the indicators and baselines to be used to assess adaptation were classified based on how these addressed climate risk. The categories to define outcomes and outputs were 1. Reducing vulnerability, including increasing adaptive capacity; 2. Reducing exposure; and 3. Sharing of lessons-learned and increasing climate change adaptation science. The third category was included as the Adaptation Fund emphasizes knowledge sharing aspects. Therefore, studying how this approach is incorporated into projects' expected results was considered interesting. In this study defining whether developing protective elements is to be classified as reducing exposure or vulnerability the material that the protective feature is to be made did not matter but how that was framed to lead to adaptation to climate change was the key. If vegetation was to be used to reduce the impacts of hazards and lead to reduced exposure, then it was classified accordingly to reduce exposure. While if vegetation was used to bring multiple livelihoods benefits such as firewood, honey, or fish to the people it was considered to reduce vulnerabilities.

The key aspects included studying to what extent and in what ways the projects established a causal linkage between activities, outputs, outcomes and impacts, and how this was supported with indicators, targets, and baselines. This included examining what kind of indicators and baselines were used to measure climate change exposure, vulnerability, including adaptive capacity, and to bring in the element of increasing sharing of lessons-learned and increasing science. This also included a rather subjective analysis whether the results frameworks were easy to understand and used as a guiding framework to address and assess adaptation. The questions to be answered also included: Can the indicators be used to actually measure climate change adaptation and are the

indicators relevant? Are the indicators measuring the stated expected outcomes or are they to solely measure activities, beneficiaries, or concrete outputs?

The projects were analysed to test whether projects that address climate change adaptation similarly have also similarities in assessing effective adaptation. In order to do that the projects were first categorized into four categories based on their approach. These categories were 1. ecosystem-based adaptation projects; 2. engineered or sectoral adaptation projects; 3. community-based adaptation projects; and 4. small-scale funding modality projects. Colls et al. (2009) have defined that ecosystem-based adaptation is implemented through sustainable management of natural resources and conservation and restoration of ecosystems, to provide and sustain services that facilitate adaptation. Also, ecosystems will be affected by climate change, and the impacts on ecosystem services are likely to have significant implications for society (Schipper et al. 2010). In this study engineered approach is categorized to focus on the use of technologies and the design of climate-resilient infrastructure. Typical for engineered approaches is the use of defences such as dams and sea walls (IPCC 2014a). This category also included projects that were to focus on a specific sector, such as small-scale agriculture related to milk production. Community-based adaptation can be defined as “a community-led process, based on communities' priorities, needs, knowledge, and capacities, which empowers people to plan for and cope with the impacts of climate change” (Reid et al. 2009, p. 13). According to Reid et al. (2009) it is typical that this type of project aims to influence the potential impact of climate change on livelihoods and wider vulnerability by using local and scientific knowledge of climate change and its likely effects. The sample also included one project that was to function as a grassroots micro-project financier and therefore was categorized as a small-scale funding modality project. As this project was the only one representing financing approach findings related to this category are not presented when projects are compared based on which approach category they present. However, this project is included in findings when project approach category has not been part of analysis.

Categorizations used in previous studies were also used and modified to gather and categorize data. For example The World Bank (2010 in Olivier et al. 2013) has defined five categories of data of relevance to adaptation: climate data, socio-economic data, data on institutional and policy processes, ecosystem services, and coping strategies. This

categorization was used to categorize the baseline data of the projects. However, climate impacts were included in the climate data category.

3 RESULTS

3.1 Measured and verified adaptation results of the assessed projects

Similarities and differences in addressing and assessing adaptation

Next I present the results of the first research question. I elaborate on the different ways of addressing adaptation and how these influence assessment of effective adaptation using four adaptation approach categories. I focus on presenting how the different elements of climate risk are present in how projects' have set their ways to show effectiveness.

Engineered or sectoral approach was the most common adaptation approach as half of the projects fell into that category (see Figure 1). One-quarter of the projects were either community-based or ecosystem-based adaptation projects. However, some projects used the term ecosystem-based adaptation to describe its approach but there was not much evidence that it was something more than presenting a buzzword. One project in South Africa was very distinctive from others as it was solely to deliver smaller grants to other more grassroots entities and it formed its own category (financing) as already described in Materials and methods. These kinds of small grants elements were also part of a few other projects. Appendix 1 indicates the adaptation approach category of each studied project.

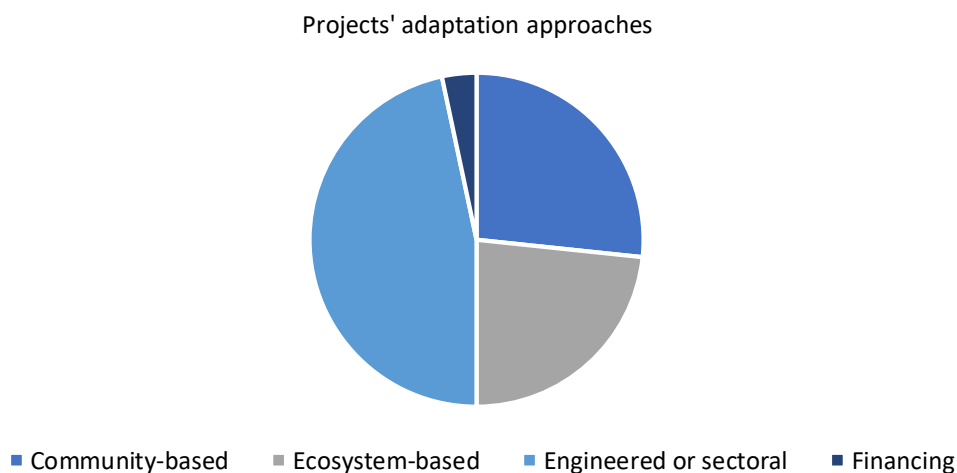


Figure 1. Project categorization based on how the project addressed adaptation.

Table 1 shows that projects that were categorized as ecosystem-based projects had defined less expected outcomes and outputs. Community-based adaptation projects had

on average more outputs than the other categories. Nine engineered or sectoral approach projects did not have a results framework with different levels of results i.e. both outcomes and outputs. In addition, only one project (ecosystem-based adaptation project in Columbia) was lacking output level.

Table 1. Number of project outcomes and outputs based on project’s adaptation approach.

Project approach	Average no. of outcomes	Range in the no. of outcomes	Average no. of outputs	Range in the no. of outputs
Community-based	4.3	2-10	14.0	11-21
Ecosystem-based	3.4	1-4	9.4	3-17
Engineered or sectoral	4.6	3-8	12.0	6-21

Of all the 30 projects studied, the vast majority (74%) of the expected outcomes and outputs were related to reducing vulnerabilities including increasing adaptive capacities. There were no significant differences between different project adaptation approach categories (see Figure 2). Reducing exposure was intended in more than 10 percent of the defined outcomes (14%) and outputs (11%) followed by only a slightly less outcomes and outputs targeting sharing of lessons-learned and increasing climate change adaptation science outside the beneficiaries of the project (12% outcomes, 11% outputs). Approximately 5% of the outcomes or outputs could not be classified into these three categories. These were mainly related to assessing project management, gender equality, and participation aspects.

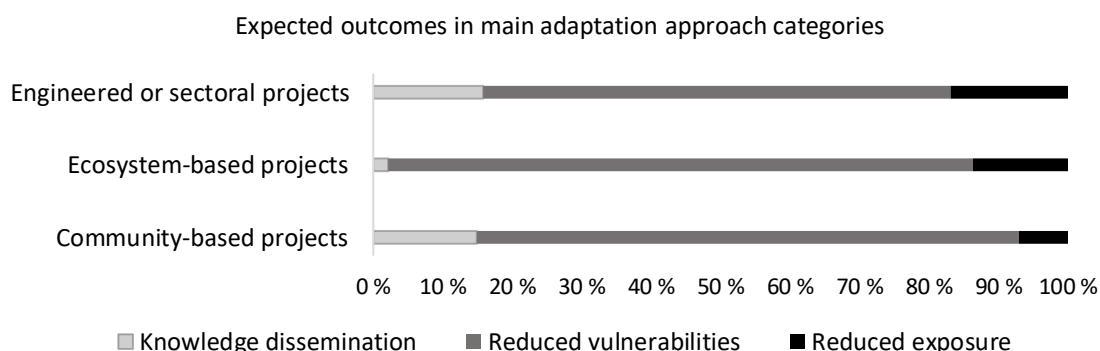


Figure 2. Engineered or sectoral projects showing smaller share of expected outcomes related to reducing vulnerabilities than the other two main categories.

It was common that the key concepts such as vulnerability and exposure were used without clear distinction and consistency. The project documents often classified

adaptation measures between "hard measures" that involved physical features, and "soft measures" which involved people and/or ecosystem services.

Measures that were to reduce exposure were not as common as measures to reduce vulnerability and increase adaptive capacity. One-third of the project's outcomes were related to reducing exposure. Slightly more (42%) of the outputs were related to reducing exposure. Exposure reduction measures mostly had to do with building protective walls, dikes or other physical elements or rehabilitation of vegetation to reduce exposure from hazards. Also, infrastructure modifications not directly linked to reducing exposure were funded such as building better storages for agricultural products for improvement of incomes of farmers. The idea of the storages was purely to increase production so namely about reducing vulnerabilities.

Only very few projects included measures to reduce the exposure with the resettlement of people or changing the location of infrastructure. The projects did not approach adaptation as directly trying to change people's livelihood practices such as crop species or areas to be cultivated but emphasized the need to introduce a wider menu of livelihoods options to increase the resilience mainly by increasing the income level. It was not common that the projects directly involved measures to replace certain crops or other livelihood options that are causing exposure to changing climate by moving directly to alternative livelihoods (off-farm or off-forest livelihoods). Instead, the strategies were to reduce the vulnerabilities by widening the livelihood options. This can be considered to increase resilience by building safety nets for people. However, it is interesting to note that this was not translated into the results-frameworks as only 27% of the projects had at least one indicator that included the idea of measuring the building of coping strategies or safety nets. Though, based on the rather limited information in the project documents it was difficult to define whether the crop farming interventions were specifically to reduce vulnerabilities or was the aim to reduce exposure.

It was typical that the results frameworks involved very concrete and technical elements to reduce exposure. This was accompanied by simplified measuring at the outcome level by using process indicators and having baseline value as zero. A common example of such metrics was meters to be built during the project duration. This leads to the fact that these outcome indicators were actually quantitative output indicators. Project in Rwanda

was the one that most clearly showed exposure-related measures as people were to be relocated to less exposed areas and non-agriculture livelihood options were promoted.

Knowledge sharing was often part of the project which is an element emphasised by the Adaptation Fund as was earlier mentioned. The most common indicators related to knowledge production and sharing of lessons-learned were the completion of a communications product or capacity-building event or number of communications products produced. Regarding efforts towards increased adaptive capacity and sharing of lessons learned the outcomes, outputs, indicators, activities, and targets were often mixed up. The indicators included also activities, targets, and means of verification. Indicators were mostly quantitative and very similar to each other, mainly the number of people participating, or a number of events held, or the type of materials produced.

The production of climate studies, including scenarios and impact assessments, were included in categories for sharing of lessons learned outside the project target area (mainly to regional, national, or international level). The indicators of these measures were process-oriented and measured how to proceed in order to scale up or duplicate adaptation activities. Thus, the indicators express the capacity and tools to prepare for and to deal with climate adaptation by for example reducing exposure and vulnerability and sharing lessons learned to the wider scientific community. This category included examples where the indicators were too generic to be measured as unspecific statements such as “sharing information” or “dissemination” were used.

It is important to note that the studied projects included projects that had challenges in presenting a clear adaptation logic in the narrative part of the project proposal document and the results framework was not an exception to this. Some projects managed to present a clear logic but the necessary details including what actually is to be done (e.g. related to trees and forests) was not presented or these details were confusing as these were presented differently in other parts of the document. Mostly there was a clear link between the narrative proposal document and the results framework matrix but in some cases the text contained impacts, outcomes, outputs, or indicators that were not mentioned in the actual results framework matrix. Results frameworks were normally prepared well when the project proposal was clear, consistent, and informative. An exception was the majority of the projects by national implementing entities that were facing more challenges in

presenting the project in the results framework. In only few cases the project results frameworks were too short and did not seem to grasp the contents described, or the expected results stated in the project proposal document. There were cases where there were clear errors and mistakes such as information in the wrong column and unfinished sentences.

As mentioned, in general, the national and regional implementing entities were more often struggling to set proper results frameworks. There were however exceptions such as project by national implementing entity in Rwanda, which had an exceptionally strong project proposal, including a well-structured results framework. Projects by national implementing entities included examples of innovative ways to tackle the challenge of clearly not being used to preparing results frameworks. There were also examples where more guidance should have been given before the approval of the project as the objectives of the intervention were not able to be monitored or evaluated with the help of that tool. However, the evident problems that the first approved and evaluated project had were not present in projects approved after it.

Projects in Jamaica and Senegal are interesting examples of how differently projects that have a lot of similarities (both are executed by national entities and include building of protective dikes) can integrate and approach measuring and verifying. Project in Senegal was one of the first ones approved and basically did not have a working results framework and results-based management in place. Project in Jamaica however had a rigorous results framework that does not resemble the ones built by UN organisations. The project in Senegal was the first one evaluated. The evaluation report indicated serious challenges regarding the project's results framework and M&E plan and actual implementation of the plan leading to the inability to assess the project using standard evaluation methods (Palazy 2015). Several problems were noted in the results framework, and the AF's indicator had a typing error that created uncertainty regarding the objectives of the project (Palazy 2015). The results framework was geared towards verifying activities and outputs. It was completely lacking separate levels for outcomes and outputs. Indicators were partly irrelevant, partly outputs or activities or otherwise confusing as they included information that was not related to measuring. Binary indicators were included that

combined quantitative indicators and vague adjectives, such as *good* and *sound*. Targets were framed as completed activities or measuring was not planned.

The evaluation report of the project in Senegal (Palazy 2015) gave recommendations that an M&E system with rigorous and quantitative indicators and targets should have been applied from the beginning of the project to effectively demonstrate the impacts of the funds. Baseline studies should be undertaken at the outset of a project before initiating any activities and these must provide detailed and quantitative data on the baseline situation of the selected beneficiaries. The report also recommended that the M&E system must be clearly defined in the proposal. (Palazy 2015.)

The findings of this project comparison are in line with the general findings of this study that since the first years of Adaptation Fund funding operations the projects have developed in regards to assessing their expected results with a few exceptions to the general trend.

Setting baselines to measure adaptation results

The Adaptation Fund guidance states that the baseline data should be compiled before the project or programme starts. If major baseline data are not identified, proposals should show how the project would address the lack of a baseline within one year of implementation. (AF 2015c.) Half of the project proposals indicated that the project was to make the baselines more detailed after the beginning of the project for example at the inception phase. It has been a bit confusing that the project proposal form has requested to include a results framework “including milestones, targets, and indicators” but not baselines. It is worth noting that the Uruguay project did not include any baseline values. None of the projects studied included milestones. Half of the projects included all the needed baselines at the outcome level. Less than one third (29%) of the projects having engineered or sectoral approach set all the needed outcome baselines. Even with relatively low sample size this is considerably weaker than with community (75%) and ecosystem-based adaptation (57%) projects.

Data on institutional and policy processes and infrastructure development were dominating and especially this was the case with projects that were categorized as

engineered or sectoral projects (see Figure 3). Socio-economic baseline data was used more often in community-based projects while engineered or sectoral projects included baseline data on institutional or policy processes and infrastructure development significantly more often than the other projects. There were projects that also included some baseline data that did not match these categories. However these were few and represented for example data on behaviour (use of certain methods or practises), media coverage, level of investment in climate change adaptation or replication of the project of a certain target group, project management performance, perceptions (change from one to another predefined) or level of understanding, skills or knowledge. The third most common category of baseline data was ecosystem services. Mostly the state of the ecosystem was not measured while instead the areas rehabilitated were measured. Almost all of the projects falling into ecosystem-based adaptation category included this kind of data. It was not common to assess the project using data on climate or climate change impact (e.g. changes in water flow/flooding), or people’s coping strategies. Climate impacts both as perceptions of people and measurements were planned to be used only in 20% of the projects. In general, information on the perceptions of the local population collected by participatory methods, such as interviews or focus group discussions was used at setting baselines only in few cases.

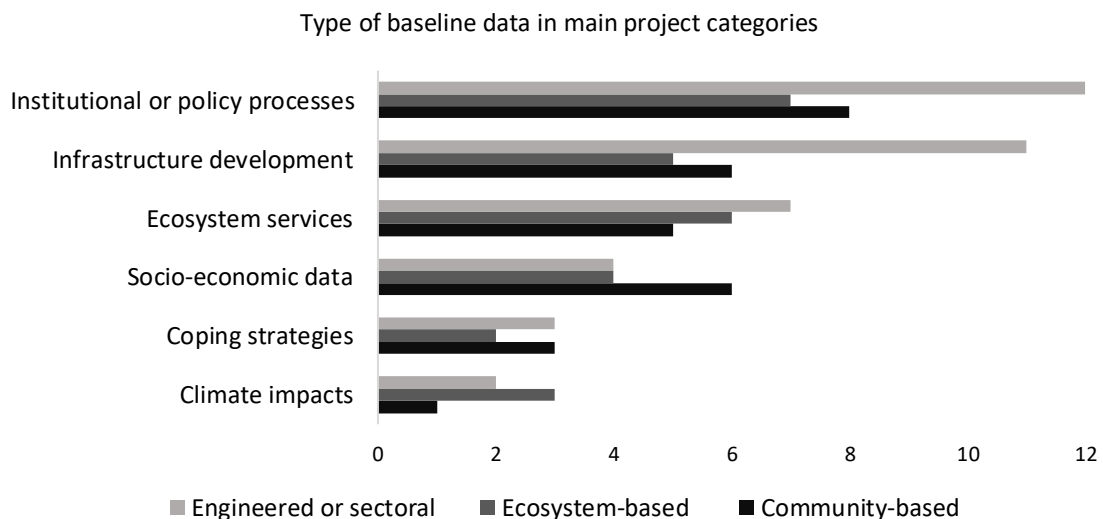


Figure 3. Six baseline data categories were created to analyse the differences and similarities between three main project categories.

The project in Rwanda already mentioned before as an example of integrating exposure reduction into its results-framework was the only project that had outcome baselines that matched all the defined baseline categories of this study: climate data or climate change

impacts; socio-economic data; institutional and policy processes, ecosystem services; coping strategies; and infrastructure development. The baselines were proper, and the project proposal claimed to develop them even further.

It can be stated that there is clearly much difficulty in defining baselines. For example, the Niger project had a baseline “insufficient training and documentation about the adaptation practices of the agriculture sector to climate change and its effects on food security.” which can be used as a baseline, but it is not without challenges. Unpacking the word insufficient would be needed. It can be argued that in practise it is difficult to assess change in state with this kind of baselines and the evaluators understanding of the context needs to be thorough. However, if the indicators and targets are well planned the rationale of the results chain can be assessed, and it is possible to verify activities and outputs.

Setting indicators and targets to measure results

60 percent of the projects included a project’s goal or objective or impact with an indicator making it possible to be measured. Outcome level indicators were measuring a change in absolute terms e.g. change in the level of the indicator for the beneficiary population or target area. None of the indicators were measuring change in relative terms, e.g., comparing the indicator level for the beneficiary population or target area with the indicator level for a defined control.

There were two projects that set indicators only at the outcome level. The projects that included assessing the project results at the outcome level had defined between 3 and 21 outcome indicators and on average each expected outcome had two indicators to measure it. This difference in numbers of outcome indicators to be measured in addition to output level indicators reveals the differences in designing how successful adaptation is framed to be assessed. However, when examining the numbers of indicators at the outcome level there were no significant differences between the three main adaptation approach categories and the average number of outcome indicators varied between 9 and 10. At output level, however, it can be estimated that the wider menu of benefits that the community-based adaptation approach projects are to deliver and assess that had led to bigger number of expected outputs consequently leads to setting more indicators.

Most engineered or sectoral approach projects had indicators that are relatively easy to measure, give a clear result, e.g. meters of irrigation channels or walls built; and do not tackle quality, usability or social inclusion aspects. Defining indicators can be challenging and a bit more than half of the projects managed to set SMART (specific, measurable, achievable, relevant, time bound) indicators at the outcome level. It is interesting that projects that approached adaptation using engineered or sectoral approach were struggling to define SMART indicators more than the other projects. Only 36% of the engineered or sectoral approach projects had all the required indicators set and also sufficiently defined or aligned with the outcome to assess adaptation. It is interesting to note that the two ecosystem-based adaptation projects that were struggling with defining proper indicators were projects in Mongolia and Georgia that in other aspects were impressive in setting the project logic. The only community-based adaptation project (Morocco) having clear problems with indicators was having challenges to set clear project logic throughout the project proposal. One reason to explain the good ranking of community-based projects may be that they were more often than the other projects implemented by multilateral organisations that are more used to developing results frameworks as these are standard parts of development project formulation.

More than 20% of the projects raised serious doubts whether measuring at least one of the outcome indicators was possible. This does not imply that the baseline value was missing but that the actual outcome indicator and the related means of verification information were not sufficient at all. Less than one third (27%) of the studied projects had at least one outcome indicator that could be considered to be a project learning tool. Two-thirds of the projects had at least one outcome indicator that was to measure actual outcome level adaptation and not just activities, reached beneficiaries or outputs. It was as common that the project was lacking outcome indicator that would focus on measuring more profound change and including indicator at outcome level just to verify activities, beneficiaries, or outputs. Almost half of the projects included both of these aspects, so overlooked quite obvious ways to include actual outcome indicators but in addition was able to include at least one actual outcome indicator. Qualitative indicators or binary indicators that included some words to define the quality of change were rarely found but less than half of the projects had at least one such indicator.

It can be concluded that the simplest ways to measure adaptation were the most commonly found in projects as can be seen in Figure 4. The two most common measuring systems of the expected outcomes resemble means of verification data rather than actual systems to measure change process. All the projects, except one in Senegal, included at least one expected outcome to be measured as counting the existence of something. The second most common way to measure was checking if something has been done and it includes using a list of participants to verify. Two projects did not include at least one of the expected outcomes to be measured based on checking if something has been done.

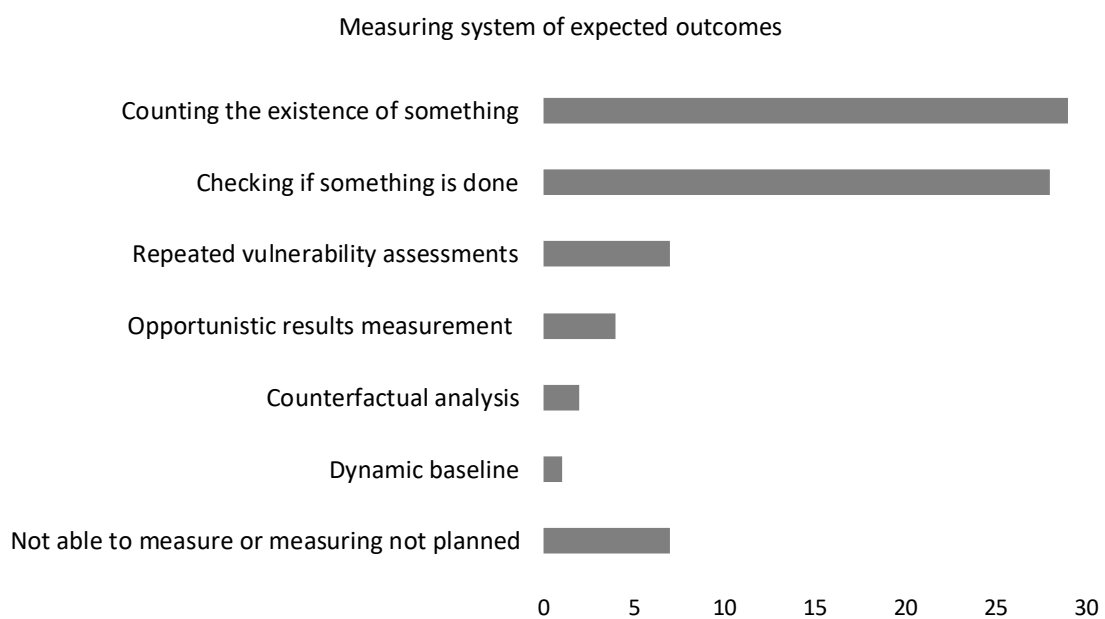


Figure 4. Seven categories were created to study the measuring systems of expected outcomes.

According to Oliviera et al. (2013, p. 9) comparison with what would probably have occurred without the adaptation measures is central to an assessment of the effectiveness of adaptation. This analysis is called counterfactual analysis and it explores how climatic changes would have affected society and ecosystems without the relevant adaptation measures and therefore requires assumptions about alternative scenarios that can have a considerable influence on the measurement of results (Olivier et al. 2013, p. 9). This type of information was used only in two of the project results frameworks. However, the Adaptation Fund proposal form has one section where the applicants are asked to elaborate on the business as usual scenario and the alternative adaptation scenario with the Adaptation Fund funding. In this section the information provided was mainly narrative

and did not provide much help in the evaluation of results, but in most cases was very informative in setting the adaptation rationale of the project.

Projects were managing the dilemma of having too vague indicators that are difficult to measure and having too narrow, output-focused indicators that only provide a disconnected picture of the whole by developing a results framework table that spreads onto tens of pages. Almost 90% of the projects indicated that they (project staff, consultants) are to collect at least some of the needed monitoring data themselves. More than half of the projects indicated that collecting the data includes observing or participatory methods.

One common feature was that there was too much in the indicator, which makes it difficult to know what actually is to be measured. The use of process indicators and the use of quantitative indicators concerning changes in states of assets was common with the use of absolute numbers in metric systems. Institution development indicators were the most common indicators. These types of indicators were to measure for example process in institutional level vulnerability and adaptive capacity, quantity of adaptation planning and implementation, and quantity of strategies.

Although having more secure access to livelihood assets is part of the Adaptation Fund's results framework this was not directly addressed in the projects studied. The percentage of targeted population applying appropriate adaptation responses is part of the Fund's results framework. However, as a key indicator for ownership and sustainability it was not frequently included in the studied projects' results frameworks. Community-focused projects had a tendency to include livelihood results. With projects focusing on improving livelihoods it was not common to include multiple indicators measuring different aspects of livelihoods. Mostly increased income level was chosen as the indicator to measure livelihood aspects and avoided decrease in income was not used. Projects categorized as food security projects by the Adaptation Fund mostly did not include an indicator about food security. Inputs directed to better water management of agriculture and improved alternative livelihoods were expected to lead to better food security but measuring this goal was not found. One example of measuring food security however was the food security index that was to be developed during the project in Sri Lanka.

The 40% of the projects including indicators that were not SMART had following issues: indicators were not actually measuring the expected outcome; indicator/s were completely missing; results framework table was organised in a way that it was not possible to know for sure which indicator was linked to which expected outcome; or indicator was completely the same for the outcome and output level. Indicators to measure whether some document had been produced or a number of people had participated in a training were the most common indicators found and mostly did not have an adjoining indicator.

Target values are also needed in order to effectively monitor progress and evaluate results (Lamhauge et al. 2012). The Adaptation Fund has defined that final targets are values or conditions to be achieved by the end of the project (AF 2015c). One third (37%) of the projects were missing at least one outcome target or a significant part of it or the target was not aligned with the outcome. There were projects that had very relevant targets and indicators, but these were not related to each other. An example of such a project is the Uruguay project that claimed to have an M&E software in use to track progress.

3.2 Role of trees and forests in the assessed projects

Patterns of including trees and forests

Next I will present the results regarding the role of trees and forests in addressing and assessing adaptation in the studied projects. First I will focus on presenting patterns of including trees and forests and then present more in detail findings related to one of the most common adaptation methods related to trees and forests - agroforestry, which was elaborated on more than other common methods.

Only one of the studied projects' proposal did not mention forests or trees. It did not mention forests or trees for quite obvious reasons as it was focusing on fisheries in Peru. 80 percent of projects included directly forest and/or tree-related activities, outputs, or outcomes. Appendix 1 indicates these projects. Out of these projects both trees and forests were included in 45 percent of the projects. Slightly less projects (40%) included only measures regarding trees, and all of these projects were related to agroforestry. While 20 percent of the projects were designed to address adaptation with the help of forest areas.

These projects were to rehabilitate and/or conserve forest areas. However, a mid-term evaluation report of a project in Ecuador (Rodriguez Ariza 2015) states that rehabilitation of tropical forests on hill slopes and other ecosystem-based adaptation measures were erased from the project design. Therefore, there is a possibility that there are also other projects that have after the inception removed forests or trees from the project.

All of the projects that were classified to approach adaptation with a community-based angle included forests and/or trees as activities, outputs, or outcomes. While 70 percent of the ecosystem-based and engineered or sectoral project typologies included forests and/or trees. Including only forest areas and not trees in agricultural systems was more common with community and ecosystem-based adaptation projects than with engineered or sectoral approach. None of the ecosystem-based adaptation projects included only trees in agricultural systems and not forests. Forest-related activities, outputs, or outcomes were part of one-third of the engineered or sectoral approach projects while forests were more prominent in other projects.

Projects in Mali, India, Cuba, Tajikistan, and Guatemala all addressed adaptation by including elements of adaptation for forests, and valuing nature as a main beneficiary of the adaptation measures related to forests or trees. While, the other projects addressed the needs of the local communities in a more straight-forward manner. When values related to forests or trees were described in the project proposal, they were most often related to ecological values; social values being the second and economic values the third most common. Cultural issues related to trees and forests were described in only three project proposals (India, Guatemala, and Uruguay).

Adaptation measures related to forests or trees varied (see Figure 5). The three most common measures were rehabilitation, agroforestry, and setting up different types of protected areas (excluding community-based conservation) or enhancing law enforcement.

Adaptation measures related to trees or forests

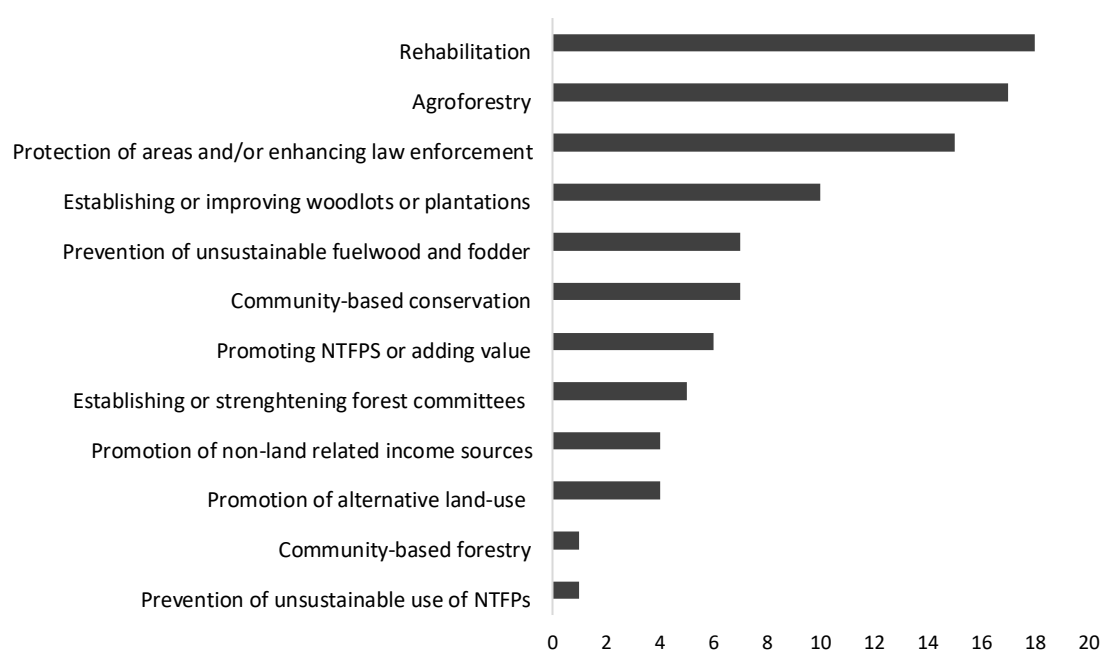


Figure 5. It is important to note that the categories on adaptation measures are interlinked, and the measures specifically related to forests for adaptation are considered, e.g. promotion of non-land related income sources and alternative land use which are related to specifically easing stress on trees and forests.

In general, based on the project proposals it was not easy to understand the ways and planned effectiveness of the protection and/or rehabilitation measures. This was mainly because these activities and their targets were described rather vaguely. Less than half of the forests or tree-related projects provided some information on how many hectares, seedlings or meters of riverbanks, etc. were to be rehabilitated or protected.

Trees and forests were to bring adaptation benefits in multiple ways. In over 90 percent of the projects with forests and/or trees the adaptation measures were to protect soil from erosion or improve soil conditions. Almost as many times watershed protection or rehabilitation (87%) was linked to forests and/or tree measures. While 78% were linked to enhancing hydrology, 70% biodiversity protection or rehabilitation, and 17% coastal protection. Climate change mitigation was rarely mentioned and only two projects presented climate change mitigation estimates.

Almost all of the projects that had elements of coastal protection included concrete investments in forest ecosystem recovery. This was to be achieved through taking advantage of the potential of forests to limit the effects of e.g. wave erosion and coastal

flooding. This included mainly mangrove vegetation leading to improved coastline resilience to the impacts of wave action, improvements to coastal morphology which reduce seawater intrusion, including the role of mangroves in retaining sediment and the prevention of flooding in general. Promoting mangroves to reduce vulnerabilities was not as common as using mangroves or other vegetation to buffer the systems to reduce exposure. However, there were sometimes minor elements supported that were to bring livelihood benefits to the communities. In addition to using vegetation to limit the effects, also different types of walls and dikes were developed. The projects that addressed adaptation through coastal protection which did not include forests at all were projects in Jamaica and Senegal already examined before.

To enhance the functionality of the landscape as a whole ridge to reef and watershed approaches were used. In addition to measures including trees and forests, there were projects to approach adaptation to protect and restore neighbouring marine ecosystems which also provides ecosystem-based adaptation benefits, namely coral reefs which buffer wave impact and seagrass beds which trap sediments in shallow coastal waters. These measures were argued to be a more cost-effective and sustainable alternatives to the construction of coastal protection infrastructure. The approach of restoring degraded areas with larger environments, thus enhancing overall ecosystem functioning, is well-founded in the scientific literature (Devissher 2010). Restoring mosaics of interconnected ecosystems was to ensure that if some much degraded areas are only slowly recovering, other functioning ecosystems will provide services and structure to build on. Therefore, by broadening the scale of intervention through the spatial arrangement of ecosystems positive interactions could be optimized.

Ecosystem-based adaptation focuses on the need to sustainably manage the ecosystems that provide ecosystem services we all depend on (Munang et al. 2013). It includes for example a range of local and landscape-scale strategies for managing ecosystems to increase resilience and maintain essential ecosystem services and reduce the vulnerability of people, their livelihoods and nature in the face of climate change. One example of such a project logic is Cuba's project in which ecosystem-based adaptation with a ridge to reef approach was designed simultaneously combatting the negative implications of climate change by increasing resilience to climate change impacts and generating significant co-benefits in terms ecosystem services. The ecosystem benefits to be generated were to

include the maintenance of the role of coastal ecosystems as reproduction and grow-on sites for commercially important fisheries species and other coastal and marine fauna, and realization of the additional potential for the generation of income in local communities through the sustainable management of mangroves for honey production.

Agroforestry as a dominating adaptation method

Agroforestry was included in almost 60 percent of all the studied projects. This represents over 70 percent of all the projects that included adaptation methods based on trees or forests. However, based on available evaluation reports two of the projects had been redesigned after the inception phase to leave out agroforestry. Also a few projects left open whether agroforestry would eventually be part of the project's sub-projects, and there were projects that mentioned agroforestry as part of context analysis but did not ultimately include it into the project design. One project described agroforestry rationale, but it was not clear if agroforestry was actually part of the project. No particular geographical area was dominating projects that included agroforestry.

Agroforestry systems are typically classified on the basis of their structure, i.e., the nature and spatial and/or temporal arrangement of tree and non-tree components. Three broad classes are generally distinguished, based on the inclusion of agricultural crops and/or livestock in these systems: 1. agrisilvicultural systems involving combinations of agricultural crops and trees or shrubs; 2. silvopastoral systems that include combinations of trees and pasture for grazing livestock; and 3. agrosilvopastoral systems combining crops, pastures, and trees (Nair 1993). The most common agroforestry classes were agrisilvicultural and agrosilvocultural systems. Silvopastoral systems and combining multiple agroforestry classes in the same project were also found.

It was interesting that one-fourth of the projects that included agroforestry provided enough information to be able to distinguish which of the three broad classes they belonged to. In addition, it was common that the project proposal claimed that the project was to include a certain class of agroforestry system but then when it was described in more detail it did not match this class. In this study these were categorized based on the additional information -not by the term the projects used.

Agrisilvicultural systems included an array of agroforestry sub-systems and practices involving the cultivation and management of trees and/ or shrubs, in combination with agricultural crops. These included homegardens with fruit trees, rehabilitated areas with fruit or medicinal trees, and alley cropping or contour farming. The reasoning supporting these practises included objectives such as soil and hydrology conservation and an increase in food security and economic resilience. Soil and hydrology conservation included measures to control soil erosion and leaching and measures to increase infiltration potential to withstand rainfall variability and prolonged drought. Measures to increase economic resilience included widening the spectrum of income sources by diversifying local agricultural production, and increasing income, incl. women's income by selling excess production.

Silvopastoral systems included trees with pastures and animals and more precisely trees on rangeland or pastures, and concentrated production of tree fodder outside of grazing areas. Reasons for promoting these systems comprised providing food, fodder, shelter, and shadow; soil and hydrology conservation including erosion control and water retention, improved nutrient recycling, and increased organic matter.

Agrosilvopastoral systems were as common as the already described agrisilvicultural systems. Agrosilvopastoral systems included homegardens with domesticated animals, multipurpose woody hedgerows for browsing; apiculture with trees; and multipurpose woodlots. Reasons for promoting these systems included the same reasons already mentioned with agrisilvicultural and silvopastoral methods but also exposure-related reasons were used. This type of reasoning included for example that by introducing agroforestry systems it would be possible to reduce the speed of water flow during flooding and therefore limiting the loss of crops and cattle. In addition, also carbon sequestration and habitats for biodiversity conservation were mentioned.

Within and across the three categories, agroforestry systems varied in the functional characteristics of their trees and shrubs. In the majority of projects there was a balance between emphasizing the productive and protective functions. However, there were also projects that highlighted only either protective or productive functions. Productive functions included production of food, fodder, fuelwood, timber, medicines, honey, and other non-timber forest products. While, protective functions included slope, wind and

flood erosion control, soil conservation and fertility improvement, moisture conservation, and shade for crops.

Trees in agroforestry were to be managed for food and/or non-food values. The agroforestry related adaptation measures differed in the predominant end uses of the products ranging from subsistence use that were directly contributing to household food security and timber, fuelwood and fodder needs to predominantly commercial use, as in the case of coffee and sago palm. Emphasizing both subsistence and commercial end uses was dominating. It was interesting that fuelwood and timber were not as often mentioned as agroforestry end products as fruits and nuts. The specific tree species that were to be used were not always mentioned. Tree species that were mentioned included both native and exotic species while some endemic species were also included.

3.3 Key findings

It can be concluded that the studied Adaptation Fund financed projects had differences in framing and measuring of adaptation. One of the key findings of this research is that how the project is to address adaptation also influences how effective adaptation is to be measured and verified (see Table 2).

Table 2. Different ways to address and assess adaptation based on four project approach categories.

Category	Addressing adaptation	Assessing adaptation
Community-based	Aims to bring in a wide menu of benefits to the local level with focus on community livelihoods aspects in reducing vulnerabilities.	Many different activities, outputs, and outcomes and therefore many baselines, targets and indicators and means of verifications. Ways to show effectiveness resembles development co-operation with a need for repeated vulnerability analysis and participatory approaches. Refining rather than replacing development agencies existing M&E frameworks.

Ecosystem-based	Landscape approach with clear geographical area/s. Aims to increase the resilience of an ecosystem or inter-related ecosystems in a clearly defined landscape with rehabilitation measures.	Ways to show effectiveness resemble large-scale restoration projects with ways to verify what has been promised to deliver and measure differences in the status of ecosystems and livelihoods.
Engineered or sectoral	Concrete technical adaptation needs and/or sector-specific needs that need to be tackled. Adaptation related infrastructure or sector-specific projects that government finds important.	Clear quantitative indicators and targets that measure activities and outputs rather than change in exposure, vulnerability or adaptive capacity.
Small-scale funding modality	Project/programme that includes a grant facility. Applications for funding of small-scale activities will be invited that are within targeted objectives and operational framework that is defined in the project/programme proposal.	(Lack of data)

Effective adaptation was mostly framed to contribute to expected outcomes related to reducing vulnerabilities that include measures to increase adaptive capacity. Significantly less expected outcomes and outputs were set to reduce exposure to climate change impacts. Interestingly successful adaptation was also framed as sharing of lessons-learned or communicating other findings to a wider audience, and also to measure channelling of funding, project management, or social inclusion aspects.

Since the first years of Adaptation Fund, the projects have developed in regard to assessing their expected results with a few exceptions to the general trend. However, projects could have benefited from getting help with setting the results framework in place. The national and regional implementing entities were more often struggling to set

proper results frameworks. The majority of the project results frameworks were geared to produce concrete adaptation results measured in the metric system. More than half of the projects did not have one or more outcome baselines, or the presented baselines were not such that would allow measuring the change. Therefore, it can be concluded that the first hypotheses of this study proved correct as the project baselines had not been always set or they had not been set in a way that would be relevant making measuring and verifying of the results difficult.

It can be concluded that formulating good indicators is not easy. More than half of the projects had proper outcome level indicators to allow the project expected outcomes to be measured and verified. On average nine outcome indicators were set and almost 80% of those indicators were to measure adaptation as reducing vulnerabilities. It is important to note that the adaptation rationales in the projects were strong as there were no outcome level indicators that were not adaptation-related such as measuring purely development as such.

The second hypothesis proved correct as trees and forests had a more prominent role in the projects than would be assumed by the limited number of projects classified as forestry projects. All except one project proposal mentioned forests and/or trees. 80% of the projects included forests and/or trees as part of activities, outputs, outcomes, or indicators. In general, trees and forests were to bring adaptation benefits in multiple ways but the assessment of effectiveness of these measures was not emphasised.

4 DISCUSSION

4.1 Differences and similarities with previous research

During the course of working with this study the second evaluation of Adaptation Fund was published. It concludes that at the "project level, M&E is generally conducted in a favourable manner although some gaps highlighted include the need for improved results frameworks at project levels to measure impact, the need for more rigorous community-based monitoring of activities to detect project problems early" (Tango International 2018). The evaluation indicated similar problems as this study in the design of project results frameworks where outputs and outcomes were not coherent with the overall project objective, and outputs and indicators were either not selected or sufficiently developed to measure project performance. The evaluation team's structured review of project evaluation reports showed that the projects lacked sufficient baseline and endline data. It is worth noting that the evaluation study sample was smaller than the sample of this study, but it shares similar findings.

The issues introduced in the Introduction chapter concerning complexities of adaptation interventions are present in Adaptation Fund projects. There are divergent views as to what constitutes adaptation and the role of development objectives in adaptation projects. As stated in the Introduction chapter, according to IPPC (IPCC 2012, Noble et al. 2014) differentiation between incremental and transformative adaptation is important because it affects how we approach adaptation, how we integrate it into planning and policy, and how we allocate adaptation funding. In addition, I would argue that it also significantly affects what we consider effective adaptation and how we measure it.

Adaptation, as well as transformational adaptation, still lacks clear operational definitions which creates difficulties for the identification, evaluation, and practice of transformational adaptation as also stated by the Adaptation Fund (Tango International 2019). It can be recommended that the Adaptation Fund defines further transformational and concrete adaptation actions that it states to fund. Transformational adaptation is typically concerned with the wider and less visible root causes of vulnerability. If vulnerability is framed as an outcome of wider social processes that define how people see themselves and others, how they construct their relationships with the environment, and how they play a role in political processes, then adaptation is concerned with much

broader, societal-construction issues, rather than specific climate impacts (Pelling 2011). Transformational adaptation can then be seen as an act of shifting the way people and organisations behave and perceive their place in the world, and typically requires changes to established systems that are maintained and protected by powerful interests (O'Brien 2012). However, the IPCC Fifth Assessment Report (IPCC 2014a) synthesizes potential criteria of what would constitute transformational adaptation that fits in a wider spectrum of projects that are not solely focusing on vulnerability and its interlinkages with structural issues. The potential criteria include a significant increase in the magnitude of an adaptation response; introduction of new technologies or practices; formation of new structures of systems of governance; geographic shifts in the location of activities; normative elements involving changes in desired values, objectives, and perceptions of problems. Therefore, these criteria could fit in also projects funded by the Adaptation Fund.

The Adaptation Fund in its study paper (2016) states that there is potential for the project outputs financed by the Fund to achieve transformational impacts. However, the way project results frameworks have been built in general does not make bringing in evidence to support this easy. The Fund has spelled out that it is hard to demonstrate how outcomes related to social or institutional outputs will be sustained, and also acknowledges that their sustainability is however critical to projects forming the basis for scaled-up, replicated, and transformative adaptation measures. Based on this research it is evident that using project results frameworks that are focusing on verifying activities and outputs rather than trying to detect changes in outcome and impact level is not leading to learning-focused project monitoring and evaluation.

Most engineered or sectoral approach projects had indicators that are relatively easy to measure and give a clear result that is in line with the findings of Cesar et al. (2013). Lamhauge et al. (2012) have emphasized the importance of combining different types of indicators, especially when evaluating complex systems. Indicators to measure institution development were the most common indicators. This result matches the argument of Christiansen et al. (2016) that the use of output indicators related to institutional adaptive capacity are becoming common practice in results frameworks for climate change adaptation. The importance of institutional context is increasingly being acknowledged in academic literature as a useful process indicator of adaptation as it has been shown to

give an indication of the sustainability of the results of an adaptation intervention (Christiansen et al. 2016). However, there are also previous studies (e.g. Cesar et al. 2013 on adaptation projects funded by SIDA) stating the shortcomings of the indicators attempting to measure institutional aspects. Typically, these indicators are process-related; too vague, or too output-oriented as was also the case with some Adaptation Fund financed projects.

Sensitizing and educating communities are important building blocks for adaptation projects. Trainings and other capacity development activities are seen as necessary elements in building adaptive capacity and sustainability of the projects. Considerable investments (although not as much as towards physical structures and other engineered solutions) have been directed to these efforts. However, it is not completely evident that these efforts are providing people with improved skills, knowledge, motivation, relationships, and channels for influence that lead to adaptation in practice. I am not to argue that building adaptive capacity is not an important component of adaptation and measures to build it are not an important part of project but more focus should be placed on planning and assessing whether increase in adaptive capacities has been reached and has that lead to any further changes.

Simple quantitative indicators that were used to measure knowledge production and sharing of lessons-learned can be considered problematic as these used solely do not capture the changes of behaviour or the quality of the products produced. Also, if a project aims for systematic dissemination of climate change and adaptation knowledge (as the project in the Solomon Islands) then there should be a first systematic collection of information and the setup of a knowledge-sharing platform to access the collected information that would enable the production of communication products. The Solomon Islands project's evaluation report (Cabo Bujan & Sura 2016) argues that the main factor underlying the shortcomings related to sharing of information and learning was that the project's communication strategy was completed less than two years before the end of the project. The lack of strategy can lead to range of communication and training products that do not have clear objectives, e.g. increasing the awareness of a specific target group or developing specific skills of another group. The lack of quality assurance and means of verification of the materials and trainings can lead to poor quality, unsatisfied target groups and ineffective use of resources. It is hard to monitor and evaluate the

effectiveness of materials if the rationale of that material is not stated anywhere. The evaluation report also questioned the production of project videos that merely outlined project activities in a visually attractive manner for a limited international audience with Internet access.

For many adaptation projects no evident change may take place over the lifetime of the project. It can be argued that therefore in fact emphasis should be on verifying activities and outputs rather than more profound adaptation outcomes. If an expected outcome is increased awareness regarding some issue related to reduced exposure or vulnerability of people, then it is common to use a number of participants of trainings as an indicator. However, participating in a training does not necessarily lead to increased awareness. In order to assess the outcome of a training, it is necessary to collect and analyse the lessons learned or the extent to which participants have done things differently as a result if the time span of the project allows that. Such differentiation helps to clarify the contribution towards the long-term expected results. One option would be to include an additional indicator measuring the quality of the training for example by asking feedback on the training or including a small sample survey on how the new skills and information have led to changes. Surveys and focus group discussions or other means of consultation with beneficiaries were not commonly used as part of verifying the indicators. However, it can be concluded that there is rampant use of quantitative indicators when assessing education and training measures. These outline the number of training sessions conducted or educational material published but they do not capture the effects of these activities specifically on adaptive capacity, exposure, and vulnerability.

Another important aspect that was evident is the project dilemma whether to have a rather focused approach or deliver a wide range of adaptation benefits. Spreading the project too wide means that its results framework is to be spread accordingly to monitor and evaluate the project. This implies that in order for the monitoring and evaluation to include the whole range of the project it will demand more resources than a more concise project. Spreading resources thin is not cost-efficient as the management costs become relatively big if the scale of the activity is small. This kind of approach also makes it difficult to pay attention to potential co-benefits. The very large number of measures and sites, the relatively small funds for them, and the lack of integration of interventions may suggest that the cost-effectiveness of a project was not properly assessed in the project

design. Therefore, finding balance between having too scattered or too narrow focus is a relevant issue. Project in Kenya demonstrates that wide geographical area and wide spectrum of objectives is not recommended if there is a need to measure its results using conventional resources, tools and methods.

All of the four adaptation approach categories included projects that considered climate change impacts on vital ecosystem functions such as the provision of trees and forests, water, soils, and other ecosystem services. These elements, however, were not taken to landscape-level except with projects classified as ecosystem-based adaptation projects. It can be argued that relatively fragmented activities may yield an impact in a given locality or sector, but lack consideration of generating ecosystem-wide resilience to climate change. There is a risk that the long-term impacts of these approaches are not strategic or sustainable with diminished efficiency and cost-effectiveness (IPCC 2014a). A key challenge that some of the projects categorized as community-based adaptation projects faced was that the operating context was scattered because of multiple reasons. There were island states with very different islands and other small-scale landscapes with multiple small watersheds. How to bring in strategic and holistic logic into projects that operate in such contexts is a key challenge. However, Reid et al. (2009) have stated that “vulnerability to climate change is not just a function of geography, or dependence on natural resources; it also has social, economic, and political dimensions which influence how climate change affects different groups”. Land-ownership structures may considerably limit the options to aim for landscape approach, as was the case with the ecosystem-based adaptation project in Columbia.

Having an indicator of food security if the project is categorized to be a food security project was not common. Considering that there exists high confidence in science that food security will be increasingly affected by projected future climate change, and observed climate change is already affecting food security through increasing temperatures, changing precipitation patterns, and greater frequency of some extreme events (IPCC 2019) it was surprising how this aspect was not included in assessing of adaptation. Although food security is a complex issue that involves many dimensions still there exists examples of well-functioning food security indices that could be included to the results framework to measure changes in food security. Interestingly inputs to better water management of agriculture and improved alternative livelihoods were expected to

lead to better food security but measuring this goal was not found. One option could be to construct more food security or other resilience indices combining several indicators into one overall score. There were seldom any notions of already having or creating such indices. One example however was the food security index that was to be developed during the project in Sri Lanka.

Half of the projects were governed by sector-specific visions or focusing on specific and concrete technical measures. The challenge with these types of projects is that there is a risk that the project design may have failed to consider the longer-term benefits and cost-effectiveness of avoiding damage to ecosystems which have the potential to provide ecosystem-based adaptation services. For example, the project in the Maldives which was one of the first projects funded and evaluated stumbled because of too narrow, technical, and sector-specific vision. Sector-specific interventions that included testing a wide menu of actions and indicators from the country's commitments were found. These were designed to deliver a wide spectrum of expected results that is prone to lead to extensive results framework. Projects with clear logic for example project with ecosystem-based adaptation approach in a relatively limited area are easier to be assessed but the outcomes take a relatively long time to mature if process indicators derived from the project's theory of change are not used. It can be argued based on this study that the evaluability is limited with projects that include many sectors, are in wide and scattered geographical areas without well-defined direct beneficiaries and baselines.

In general, most of the projects aimed to deliver multiple no-regrets adaptive actions that will deliver development benefits while addressing the specific climate-related vulnerabilities and exposure. Reducing exposure was not as prominent part of projects as reducing vulnerabilities. Targeting unsustainable human activities that contribute to the degradation of ecosystem services and reduce climate change resilience was not as common as bringing in more sustainable alternatives. That is one reason why exposure reduction objectives were less dominant. Increase of adaptive capacities through means such as trainings and communication materials where part of all the projects but almost half of the projects included outcomes that aimed to share lessons learned or other new data to a wider scope than the stated direct or indirect beneficiaries of the project.

Introducing engineered solutions including the construction of physical structures such as dikes, drainage systems and weatherproofing of buildings to address the impacts of climate change should be considered carefully. These were extremely costly, and these infrastructures have high recurrent costs associated with maintaining. These should be critically analysed to make sure these types of interventions are sustainable. Also, with community-based and sectoral projects there could be more room for assessing whether the interventions are transformative or actually maladaptive in the long run. Creating or continuing with the existing short-term and reactive disaster response and rehabilitation measures can be costly although they are naturally something that communities and institutions are used to and may prefer as they bring multiple tangible benefits. Thus, reducing exposure was framed as minimizing exposure but not aiming at removing or changing the level of exposure in a transformative manner. As IPCC report (2014a) has pointed out appropriate attention should be given to the temporal and spatial dynamics of exposure as adaptation measures can reduce risk in the short term but may increase exposure over the longer term, e.g., dike systems can reduce exposure by offering protection, but also encourage settlement patterns that may increase risk in the long term.

Based on the projects studied the specificity of adaptation poses a number of challenges for measuring and verifying results that is following the findings of Olivier et al. (2013). It is however not evident that the projects would address the need to follow results-based management with results frameworks differently than development cooperation projects. In general, the specificity of adaptation is not integrated into assessing successful adaptation. The special challenges related to setting climate change adaptation baselines, such as the effects of weather or uncertainty of climate change impacts, articulated in adaptation literature (Lamhauge et al. 2012), were not realized in these projects as climate data was rarely used. It was not visible that the projects analysed draw on climate models to establish baselines and targets although the projects were all at some level scenario-based. However, projects analysed their additionality compared to situation without funding in the project proposal.

In relation to the arguments presented about the need to consider rights, resources, and power relations (e.g. Adger et al 2009, Owen 2020), the projects were dominated by needs-based discourses and the project proposal document content follows a needs-based logic with focus on problem definition and strategies to address different needs. One

important aspect to be discussed is the question of whether to target to decrease the vulnerability and exposure of the masses or the most vulnerable people. Interrelated to this issue is also whether it is advisable to finance adaptation measures that can be considered as low hanging fruits: cheaper and bring benefits to more people; or is it strategic to target the still relatively limited funds to the most vulnerable people and to measures that are more transformative in nature although these measures would be more expensive. For example, the projects did not mention people with disabilities, and the Adaptation Fund results framework table that is to be attached to the project proposal document disaggregated data only to women and youth. None of the project results frameworks included notions about other vulnerable groups than women. In the project proposals it was common to find blanket descriptions of groups of people as ‘vulnerable,’ without indication as to what these groups are vulnerable to. However, there were exceptions. This is a similar finding as other adaptation studies have found before (e.g. Hilhorst & Bankoff 2004, Cardona 2011).

It can be argued that there is a need to focus more on stakeholder analysis as part of vulnerability analysis and a better understanding of non-climatic issues. There is little analysis of enabling and hindering factors of different stakeholder groups and lack of human rights analysis is evident in the studied projects. Increasingly development cooperation projects are requested to be human rights-based in their approach that includes proper human rights, gender, and stakeholder analysis, and incorporating these elements into the results framework. Adaptation literature is still not integrating discourse on duty bearers and rights holders to adaptation, which in development is to be meant to lead away from a needs-based development approach to tackle more structural issues and to consider people as actors of change increasing their ownership and sustainability of the intervention. Therefore, I argue that the following question will be asked increasingly in the near future: Why would not adaptation to climate change consider human rights aspects such as non-discrimination, equality, and empowerment?

There is a growing debate about whether it is meaningful to assess adaptation through universal indicators. Narrowing down the measuring of adaptation only to certain indicators (e.g. Stadelmann et al. 2011) is not advisable based on the wide spectrum of different ways to address adaptation highlighted in the projects. In addition to this aspect, I find these global indicators problematic as for example the suggested metrics by

Stadelman et al. are valuing well-being using monetary and people-focused standards. There is a risk that framing successful adaptation such a way may lead to trade-offs with climate change mitigation and not understanding the potential of ecosystem-based approaches. Any universal metric is inevitably going to define some sectors, regions, and countries more vulnerable or exposed than others and thus more entitled to financial assistance. As stated earlier, adaptation to climate change takes place within specific and diverse socio-cultural, socio-political, and local or regional settings, therefore adaptation measures are equally diverse (Olivier et al. 2013, p. 8-9) and range from planting mangroves and building dikes to the diversification of income sources. By contrast with mitigation projects, this diversity means that the success of adaptation measures cannot be assessed in a meaningful way by means of a universal indicator (Olivier et al. 2013, p. 8-9). This same notion applies to assessing sustainable development. I also argue that climate change adaptation should be a truly transformative process that has synergies with climate change mitigation. If we frame successful adaptation to be measured for example as saved wealth or saved health, there is no guarantee that the people are less exposed or vulnerable in a longer time span or that path to low-carbon development is followed. In addition, sustainably managed ecosystems are the basis of our possibilities to adapt to the changing climate. Therefore, we should not forget the ecosystems when framing successful adaptation. In the studied projects adaptation was often framed to focus on infrastructure or some specific sector needs or community-based adaptation to contain measures involving trees and forests rather than having a more holistic landscape vision. Therefore, classifying forest projects automatically as ecosystem-based adaptation projects as IPCC (Noble et al. 2014, p. 844) had suggested seems not to match with the conclusions of this study. It is also interesting that framing effective adaptation to include behavioural adaptation measures and ways to monitor this was rarely included in the studied projects although it is part of the Adaptation Fund's results framework.

How effective climate change adaptation is framed is not trivial. As Levine (2014) has pointed out that “when we try to measure what is important, we make important what it is that we measure”. Therefore, building of results frameworks is merely not a technical problem although many of the projects studied could have needed help with technical issues. There is room for research and debate on adaptation problematics, similarly as there is around the concept of development. Who defines that adaptation should be about concrete adaptation interventions? Is adaptation about technical innovations, healthier

ecosystems, or more about bringing multiple benefits to local people? Whose adaptive capacity is to be increased? Do you need to be trained about results-based management in order to be empowered to frame successful adaptation? Are the notions of accountability with projects with limited duration more powerful than the demand to frame adaptation as a longer and more transformative process? Ultimately, it comes to the discussion about power relations and who are the winners and losers of different adaptation discourses.

4.2 Key strengths and weaknesses of the study

In this study I identified some of the difficulties in setting up a results-based adaptation project. By focusing on the challenges, it may have led to giving a rather negative perception of the projects funded by the Adaptation Fund. With the Adaptation Fund supported projects, the results-based management is evident but there is a focus on measuring outputs and short-term outcomes. It is however understandable as the projects are relatively short and are to produce concrete and tangible results. It is clear that monitoring and evaluation of adaptation faces a number of challenges, ranging from defining of results-based adaptation to the choice of indicators and baseline information. For example, if the baseline information is clearly insufficient it can be questioned how well developed the adaptation strategy of the project is. However, it needs to be understood that the implementation of projects and programmes that specifically target adaptation is still relatively recent and it can be concluded that the project designs have developed since the early years of Adaptation Fund.

The key strengths and weaknesses of conducting this study are interlinked and partly tied to the fact that I went back to working life before finalizing this study. As adaptation processes are similar to and often inseparable from development and require similar approaches to establishing and using metrics (e.g. Leiter et al. 2019), I argue that my background as working with development cooperation (and recently also with adaptation) M&E through consultancies, donors and project implementers has been an important element in bringing depth and reflection into addressing the first research question on measuring adaptation. However, focusing on the first research question has meant that the second research question on the role of trees and forests in adaptation has not received as much attention. Although the research questions were narrowed down after piloting

the research matrix, still focusing on either measuring and verifying or the role of trees and forests in projects could have made it possible to dig even deeper into one of the topics. The exploratory nature of the research however gave opportunity to study adaptation from two quite different but interesting angles.

It is evident that there were challenges in keeping the focus of the research as concise as needed as I stepped back to working life. As adaptation research, especially regarding metrics is still a relatively new field there was a need to react to the relevant latest research and evaluations that made the process even longer. I also admit that the research process took more time because I was sometimes carried away by my interesting research material and used the projects as guinea pigs to experiment with some of my ideas at work in developing programme and project level results frameworks and guidance materials to applicants. There is a possibility that some of the findings and recommendations may be considered too detailed and trivial. However, I wanted to go into detail as the details are vital when M&E practitioner is to utilize information in designing better tools and guidelines whether it is related to assessing development or adaptation.

In addition, it is important to understand that the actual projects were not evaluated but their project designs were studied. There was much material to be read and the results frameworks demanded a lot of hours. The whole proposal document was not studied with precision, but the focus was more on results frameworks and those parts of the proposals where the role of trees and forests were discussed. Therefore, the categorization of each project into one of the categories includes subjective evaluation. In few cases the project could belong to two of the four project approach categories and hence were reviewed again.

Critical reflection is needed regarding what results frameworks can do and whether alternative or complementary ways of assessment might be required. It is also important to pay attention to the fact that naturally these frameworks are meant to simplify complexity and therefore something is always left out and somethings valued more than others -sometimes unintentionally. It is also important to emphasize that good on paper does not automatically mean good in practice. As was the case with some studied projects the lack of good project management, critical turnover in agencies, limited capacities of the staff and unexpected incidents can lead to challenges in reaching results. The Solomon

island project is demonstrating well the importance of not blindly focusing on the results framework as a sign of effective project delivery. Because of serious project management problems, the relatively well-planned project was not executed as planned from the start. The lack of overall coordination resulted in a situation where for example the food processing equipment procured was never used because training to the communities how to use them was never conducted. Vice versa the trainings of a specific component had not resulted in systematic integration of climate data into vulnerability assessments or land use plans. There weren't any indicators to track progress related to these aspects. Therefore, evaluations should not focus solely on the verification of the results framework, but to employ other methods such as Outcome Harvesting to explore behaviour changes and unintended results -both negative and positive.

It is important to emphasize that having shortfalls in the results framework does not necessarily imply that the project design, strategy, and implementation would be problematic. However, having shortfalls with the results framework implies that the ability to assess and report results can be challenging. There were examples where the project proposal and evaluations indicated impressive project formulation and management capacities but the results framework and monitoring design, in general, were weak for example in projects in Georgia, Uruguay, Chile, and India.

There were cases where the lack of logic of the results framework was visible through the whole project proposal document. The most alarming cases were project designs in Kenya, Morocco, and Jordan which may lead to problems in delivering and reporting results. The issue of donor's responsibility when funding such projects that are not properly designed should be reviewed. There were also cases where the mid-term evaluators had reported reluctance of project staff to develop results frameworks further because they considered them as already accepted by the donor. This is also something worth addressing.

5 CONCLUSIONS

It can be concluded that the studied projects had differences in addressing and measuring of adaptation. One of the key findings is that how the project is to address adaptation also influences how effective adaptation is to be measured and verified leading to differing strengths and challenges in assessing effectiveness (see Table 3). Therefore, donors should understand the implications if they limit the ways to design a results-based adaptation project as there is a risk of favouring certain ways to address adaptation. Also consequently different ways to address and assess adaptation should be taken into consideration when designing methodologies and guidance. It is also important to note that efforts to assess and claim effectiveness derived from project implementers, donors and researchers contribute in constructing the idea of effective adaptation.

Table 3. Characteristics to be taken into consideration in designing results-based adaptation based on four adaptation approach categories.

Category	Characteristics
Community-based	Comprehensive but scattered results-framework with few measures to assess overall vulnerability and exposure. Demanding and costly to collect data and analyse it with wide menu of outcomes and outputs and their indicators. Demands a lot from the project management and differing skills from the staff or the use of consultants.
Ecosystem-based	Focused set of key indicators with a need for a strong scientific commitment to measure and verify relevant results with precision. Possibilities to include ways to address and assess social structures and behavioural change.
Engineered or sectoral	Focus on delivering concrete and tangible products with a need for a strong adaptation theory of change in order to set relevant expected outcomes and outputs with more efforts needed in outcome level and its indicators.
Small-scale funding modality	(Lack of data)

In general, there are opportunities to improve the assessing of adaptation effectiveness. The analysis of results frameworks gave an indication both about difficulties to develop a results framework and difficulties to interpret and understand the contents of it so that it can be used to set up the M&E system. In general, more effort would have been needed for developing a results-based management system to enable meaningful assessment and reporting of results that go beyond outputs. Measures to include adaptive capacity, such as organising trainings and producing communications materials requires more focus on improving their evaluability since they form one of the bases for the sustainability of the interventions. The guiding documents of Adaptation Fund have not yet focused on this aspect.

Next recommendations regarding addressing and assessing adaptation are presented. Appendix 2 presents recommendations specifically tailored for the Adaptation Fund. In general, it can be stated that it would be important to make projects accountable for demonstrating that they are progressing towards their objectives. Understanding that the impact of a project is to be building a transformative process is something that I would wish to see in the field of adaptation funding. Focus could be put more on learning and improving rather than verifying and taking credit.

Based on the finding of this research it is recommended that the Adaptation Fund and the projects are to focus on designing a strong theory of change and the projects to include it to the project proposal. This recommendation is in line with Tango International's Adaptation Fund evaluation from 2018 and the defined best practices of GTZ and WRI (McGray & Spearman 2011). The theory of change document would demonstrate the logic of the project and work well with the results framework that states the means to measure and verify the change process. If there is not a clear theory of change the intervention may be lacking necessary elements and focusing on an easy fix and narrow strategies. Without a clear logic and the necessary related thinking process or a lack of power to limit the strategies the project may be spreading itself too thin and leading to problems with showing its contribution to the expected results.

The results framework tables presented by the applicants and the Excel forms provided by the Adaptation Fund do not provide a holistic picture about the changes needed to adapt to the changing climate and the information is scattered in the proposals. The theory

of change could also give more room for thinking about realistic monitoring and the long-term outcomes and impacts as now the focus has been on output and short-term outcome level. However, the results framework is still needed to present the results chain logic and most importantly clearly indicate the chosen expected outcomes, outputs and their indicators, baselines and targets. The results framework table should have a simple thing - rows, which based on my research were lacking and made the results chain “brake” and seriously hampered its clarity. The table should always present all the objectives with their expected outcomes and outputs. Outputs should be formulated in a way that they clearly are something that are produced to reach the related expected outcome.

It is important to think about how to move beyond confusing and difficult results frameworks formulated by project staff or consultants. If the formulation of the results framework is seen solely as a requirement of the donor and it does not include any proper participatory process, then there is a possibility that it is not a working M&E tool. The fundamental issue, however, is not related to project management but how to give voice to local people and other climate change adaptation experts to frame what is successful climate change adaptation in project-specific context. There are some weaknesses with standard evaluations that the latest evaluation of Adaptation Fund indicates in its review of evaluations. There is in general tendency to see evaluation as an expert-led exercise to verify the effectiveness of the use of funds. However, there are other supplementary and alternative ways to conduct and approach evaluations that could be piloted.

As the name also suggests adaptation should be considered as a continuous process of analysis and adjustments. Therefore, adaptation projects should be implemented using a learning-by-doing approach, and consequently it should require continuous adaptive management. Results-based management tools should enable and preferably be tailored further to support that. Project contexts and projects itself are influenced by various external factors not controlled by the project management hence flexibility in measuring of effectiveness is required. The original indicators, baselines and targets might have to be adjusted. Adapting the M&E of a project requires additional time, human and financial resources. However, it may be worth the effort as the projects can be complex and challenging contexts can further increase complexity which increases the need for adaptive management.

The general recommendation for the majority of the projects is to simplify their measuring of effectiveness to achieve maximum use and usefulness and to make learning and adaptive management possible. It is especially important to pay attention to the framing of the project logic and its monitoring when the project has objectives with different groups, stakeholders and implementers in different geographical locations and with different timeframes. There is a risk that the transformative change process is lost during the project if the expected results of the change process are presented as something too concrete and the target indicators as end results -not steps towards deeper transformation. Although the Adaptation Fund focuses on concrete adaptation with tangible results it could put more emphasis on having the projects to present concrete and transformative change processes.

It is important that the choice of indicators depends on the objectives of a specific project. In many cases there were too many and/or too vague indicators. Furthermore, in general, it is beneficial to utilize a few but clever indicators measuring output, outcome, and impact level change processes. I would strongly suggest putting more effort into the formulation of indicators in general but also piloting indicators that bring in elements of social inclusion, behavioural change, sustainability, and ownership in measuring effective adaptation. When using qualitative or binary indicators all adjectives should be explained and especially with policy mainstreaming and awareness-raising the ways how to verify the results should be clarified. This study identified some vaguely defined targets, such as “ability”, “robustness” or “well-being”, which are difficult to monitor unless carefully defined and, in some cases, combined with guidelines on how they should be assessed or a scoring system against which they can be ranked.

As Lamhauge et al. (2012) have stated the usefulness of quantitative indicators depends on the nature of the data, scale, and time horizon. With big projects it takes more resources to assess the reaching of the results by using qualitative research than with smaller ones. It is evident that the requirement to use objectively verifiable indicators can lead to the use of indicators that are easily measurable within the timeframe of the project, rather than those that are most closely aligned to the expected outcomes. In the short-term, the use of numerical indicators, such as trainings held, or the number of policies developed and implemented might be easiest. However, in order to measure results and impact in the long-term, a change in people’s knowledge or skills or even deeper change such as a

change in behaviour or percentage change in policies contributing to the enabling environment may be more informative.

The use of process indicators was common. Process indicators can be defined as proxies for longer-term outcomes (Christiansen et al. 2016). These are not measuring the actual adaptation but are to verify the process towards adaptation (Cesar et al. 2013). The wide use is present because of the timeframe of the project compared to the long timeframe for the adaptation to materialize (Christiansen et al. 2016). Process indicators that have baseline values as zero do not take into consideration already existing climate change adaptation measures. Incomplete baseline information restricts projects in measuring their effectiveness using standard evaluation methods. If the evaluability is low other approaches to evaluate should be used. Especially in the outcome level baseline should rarely be considered to be zero. However, this was the case mostly. In reality, ecosystems have existing services, communities have institutions, households have coping strategies and people have a certain knowledge base. The levels of these may be low before the project starts, but still there should be a process to set the starting point and assess end results. It is also worth considering the implications of long periods before the project is able to actually start and how this might influence the validity of the baselines.

Assessing adaptation outcomes should not be about verifying project activities or products and services provided by the project. These aspects are important to be verified but in order to assess the actual adaptation it is needed to step up the results chain ladders to outcomes and impacts to measure changes. The Fund states that it finances concrete adaptation actions. It is recommended that in the future it continues funding concrete measures, but this should not translate into funding concrete outputs without doing its best in more thoroughly assessing the ability to reduce exposure and vulnerabilities and increase adaptive capacity.

The Adaptation Fund has put a lot of effort in having projects to do their share in reporting Adaptation Fund's results by the use of a set of Strategic Results Framework indicators. Although it is important for the Adaptation Fund to demonstrate its results to the global community including its donors the focus should not be on reporting how many beneficiaries have been targeted or livelihoods assets to be improved, but truly transforming the systems to be able to adapt and assessing these changes. It is evident

that these are difficult or even impossible to grasp within a donor level results framework. However, the Adaptation Fund could encourage innovative ways of approaching results-based management regarding adaptation in the project level and not further limit the possibilities to be innovative although there can be international pressure to standardize the way adaptation is to be measured and verified.

The Introduction presented how IPCC (2012) explains that differences in adaptation definitions can be seen to relate to the different entry points for looking at climate change risk. My hypothesis based on this study is that the concept of development and how we all as individuals and organisations consider it differently is interlinked to how climate change adaptation is framed differently. It would be interesting to study further how similar the approach and the results frameworks of development projects designed by these same organisations are, and how much the specific focus on adaptation or the donor requirements have influenced the framing of the projects. Development is a much-problematized concept that people define differently depending on their values and interests. The same applies to adaptation as it is not a neutral term and every donor and project aims towards adaptation in their own way. It would be interesting to study further whose understanding of adaptation is the dominant discourse in the Adaptation Fund funded projects (inside the framework that Adaptation Fund has defined) and what was the level of participation when designing the projects. This is important since the way the project approaches adaptation and what it emphasizes constructs “vulnerable beneficiaries” and can change or further strengthen power relationships. It would also be interesting to study how people’s or organisations’ discourses on adaptation and development differ and are for example the same kind of measures emphasized although the theoretical framework of these two concepts differs.

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APPENDIX 1 - Studied projects

Table 4. Research sample included 30 projects funded by the Adaptation Fund.

Project	Year of approval	Planned duration	Grant (USD)	Implementing entity	Country	Sector	Approach	Trees & forests
Enhancing the climate and disaster resilience of the most vulnerable rural and emerging urban human settlements in Lao PDR	2016	4 years	4 500 000	UN-Habitat	Lao People's Democratic Republic	Disaster Risk Reduction	Engineered or sectoral	No
Building Adaptive Capacities in Communities, Livelihoods and Ecological Security in the Kanha-Pench Corridor in Madhya Pradesh	2016	5 years	2 556 093	NABARD	India	Forestry	Community-based	Yes
Enhancing Resilience of Agriculture to Climate Change to Support Food Security in Niger, through Modern Irrigation Techniques	2016	5 years	9 911 000	BOAD	Niger	Food Security	Engineered or sectoral	Yes
Adaptation to the Impacts of Climate Change on Peru's Coastal Marine Ecosystem and Fisheries	2016	4 years	6 950 239	PROFONANE	Peru	Coastal Management	Ecosystem-based	No

Climate changes adaptation project in oasis zones PACC-ZO	2015	4.5 years	9 970 000	Agence pour le Developpe-ment (ADA)	Morocco	Agriculture	Community-based	Yes
Programme support for climate change adaptation in the vulnerable regions of Mopti and Timbuktu	2015	3 years	8 533 348	UNDP	Mali	Food Security	Engineered or sectoral	Yes
Increasing the resilience of poor and vulnerable communities to climate change impacts in Jordan through implementing innovative projects in water and agriculture in support of adaptation to climate change	2015	4 years	9 226 000	Ministry of Planning & International Cooperation (MOPIC)	Jordan	Multisector Projects	Engineered or sectoral	Yes
Increased Resilience to Climate Change in Northern Ghana through the Management Water Resources and Diversification of Livelihoods	2015	4 years	8 293 972	UNDP	Ghana	Water Management	Community-based	Yes
Enhancing Resilience of Climate Change of the Small Agriculture in Chilean Region of O'Higgins	2015	4 years	9 960 000	Agencia de Cooperacion Internacional (AGCI)	Chile	Agriculture	Engineered or sectoral	Yes
Taking Adaptation to the Ground: A Small Grants Facility for Enabling Local Level Responses to Climate Change	2014	4 years	2 442 682	SANBI	South Africa	Multisector Projects	Small-scale funding modality	Yes

Integrated Programme to Build Resilience to Climate Change Adaptive Capacity of Vulnerable Communities in Kenya	2014	3 years	9 998 302	NEMA	Kenya	Multisector Projects	Engineered or sectoral	Yes
Reduction of Vulnerability to Coastal Flooding through Ecosystem-based Adaptation in the South of Artemisa and Mayabeque Provinces	2014	5 years	6 067 320	UNDP	Cuba	Coastal Management	Ecosystem-based	Yes
Developing climate resilience of farming communities in the drought prone parts of Uzbekistan	2014	6 years	5 415 103	UNDP	Uzbekistan	Agriculture	Engineered or sectoral	Yes
Reducing Vulnerability to Climate Change in North West Rwanda through Community Based Adaptation	2013	4 years	9 969 619	Ministry of Natural Resources (MINIRENA)	Rwanda	Rural Development	Community-based	Yes
Addressing Climate Change Impacts on Marginalized Agricultural Communities Living in the Mahaweli River Basin of Sri Lanka	2012	3 years	7 989 727	WFP	Sri Lanka	Rural Development	Community-based	Yes
Enhancing the Resilience of the Agricultural Sector and Coastal Areas to Protect Livelihoods and Improve Food Security	2012	3.5 years	9 965 000	Planning Institute of Jamaica (PIOJ)	Jamaica	Multisector Projects	Ecosystem-based	No

Developing Agro-Pastoral Shade Gardens as an Adaptation Strategy for Poor Rural Communities in Djibouti	2012	5 years	4 658 556	UNDP	Djibouti	Rural Development	Engineered or sectoral	Yes
Reducing Risk and Vulnerability to Climate Change in the Region of La Depression Momposina in Colombia	2012	5 years	8 518 307	UNDP	Colombia	Disaster Risk Reduction	Ecosystem-based	Yes
Enhancing Resilience of Samoa's Coastal Communities to Climate Change	2011	4 years	8 732 351	UNDP	Samoa	Coastal Management	Engineered or sectoral	Yes
Building resilience to climate change and variability in vulnerable smallholders	2011	5 years	9 967 678	Agencia Nacional de Investigacion e Innovacion (ANII)	Uruguay	Agriculture	Engineered or sectoral	Yes
Implementation Of Concrete Adaptation Measures To Reduce Vulnerability Of Livelihood and Economy Of Coastal Communities In Tanzania	2011	5 years	5 008 564	UNEP	Tanzania	Coastal Management	Engineered or sectoral	Yes
Developing Climate Resilient Flood and Flash Flood Management Practices to Protect Vulnerable Communities of Georgia	2011	4 years	5 316 500	UNDP	Georgia	Disaster Risk Reduction	Ecosystem-based	Yes

Climate change Resilient Productive Landscapes and Socio-Economic Networks Advanced in Guatemala	2013	3.5 years	5 425 000	UNDP	Guatemala	Rural Development	Community-based	Yes
Increasing climate resilience through an Integrated Water Resource Management Programme in HA. Ihavandhoo, ADh. Mahibadhoo and GDh. Gadhdhoo Island	2011	4 years	8 989 225	UNDP	Maldives	Water Management	Engineered or sectoral	No
Ecosystem Based Adaptation Approach to Maintaining Water Security in Critical Water Catchments in Mongolia	2011	6 years	5 500 000	UNDP	Mongolia	Water Management	Ecosystem-based	Yes
Enhancing resilience of communities in Solomon Islands to the adverse effects of climate change in agriculture and food security	2011	4 years	5 533 500	UNDP	Solomon Islands	Food Security	Community-based	Yes
Reducing Risks and Vulnerabilities from Glacier Lake Outburst Floods in Northern Pakistan	2010	4 years	3 906 000	UNDP	Pakistan	Disaster Risk Reduction	Engineered or sectoral	No
Reduction of Risks and Vulnerability Based on Flooding and Droughts in the Estero Real River Watershed	2010	4 years	5 500 950	UNDP	Nicaragua	Water Management	Ecosystem-based	Yes

Enhancing resilience of communities to the adverse effects of climate change on food security, in Pichincha Province and the Jubones River basin	2011	5 years	7 449 468	WFP	Ecuador	Food Security	Community-based	Yes
Adaptation to Coastal Erosion in Vulnerable Areas	2010	-	8 619 000	Centre de Suivi Ecologique (CSE)	Senegal	Coastal Management	Engineered or sectoral	No

APPENDIX 2 - Recommendations

Table 5. Recommendations on results-based management to the Adaptation Fund (AF)

Challenges	Way forward
Confusion over key climate change adaptation terms and approaches	<p>Update guidance documents to include the latest IPCC definitions.</p> <p>Define what transformative adaptation is and is not.</p> <p>Encourage a focused-approach (e.g. not spreading project resources too thin) and experiment how transformative climate change adaptation can be addressed and assessed.</p>
Challenges with providing a clear project logic that is translated into results framework	<p>Encourage the use of a Theory of Change as a tool in crystalizing what the projects are aiming towards.</p> <p>The formulation of a Theory of Change with an actor focused element such as spheres of influence and concern could be something that AF could pilot the applicants to apply.</p>

Challenges with setting baselines and indicators

Provide more technical guidance to the applicants on designing results frameworks.

If baseline studies are included in the project these should be made during the first year of the project; preferably as soon as possible. However, this baseline study should be something extra that clarifies or adds more details to the baseline information that already has been gathered. Request the applicants to increase their science-based approach that could facilitate the measuring of the outcome level change processes.

Analysis could be done to determine the baseline regarding changes in skills or use a more targeted communications strategy and define Progress Markers used in the Outcome Mapping approach to set the baseline and monitor the change process.

Create a menu of different kinds of indicators including process indicators, and quantitative and qualitative indicators.

Include expected impact with indicators to move beyond assessing outcomes and outputs.

Encourage the use of indicators and related means of verification that are designed to be used also as tools for learning.

If effectiveness is assessed to be based on a document to be produced, the M&E of the project should define what the criteria of the document includes. The quality and implementation of documents should be more included in the expected results and not just simply to count outputs.

AF guidance related to including livelihood assets and diversified or adapted livelihoods could highlight more the measuring of assets and defining of income levels that take into account often hidden data related to poor rural households such as the role of NTFPs.

Vague definitions leading to low evaluability

Encourage the formulating of communication, advocacy, or training strategy to be drafted at the beginning of the project. These strategies would guide the conducting of activities, help to make them more results-oriented, and ease the monitoring and evaluation of these otherwise, in general, too vaguely defined components.

Challenges with providing evidence (means of verification) to make judgments on how the baselines have been set and what the measuring of results is to include

Requesting detailed M&E plans to be delivered for example as a condition for the first instalment. The plan could include clear indicator data needs, roles, methods for data collection, scheduled room for reflection, and analysis of the monitoring data.

It would be important to indicate where the baseline information is derived from, how are the indicators to be measured, and by whom. This would increase the transparency and accountability significantly. For example, it should not be enough that it is stated that the indicator data shall come from the midterm report.

Addressing and measuring of effective climate change adaptation as the delivery of activities and outputs

Providing higher-quality guidance documents to the applicants that also includes guidance on project results-based management.

Including changes in behaviour into results frameworks could be considered. In addition, it could be worth considering to encourage a mixed-methods approach and pilot Outcome Harvesting in monitoring and evaluation to learn more about the link between adaptation interventions and changes in people's behaviour, attitudes, relationships, and policies.

Experimenting how human rights-based approach could be integrated into how adaptation is addressed and assessed. This could increase the beneficiaries (i.e. rights holders and duty-bearers) ownership of the change process and therefore increase the sustainability of the intervention. This could also facilitate to integrate social inclusion targets into project designs.
