Prioritizing Adaptation Options: Four Tools for Adaptation Planners

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Table of Contents

Executive Summary ............................................................................................................................ 3
1. Introduction .................................................................................................................................... 5
2. Developing the Tools to Prioritize Adaptation Options ................................................................. 7
   2.1 Defining “Adaptation Options” ................................................................................................. 7
   2.2 Methods Used for Selecting the Four Tools ............................................................................... 7
3. Applying the Four Tools to Prioritize Adaptation Options ............................................................ 9
   3.1 How Do the Four Tools Help to Address Key Adaptation Planning Questions? ..................... 10
4. Key Messages .................................................................................................................................. 16
References ........................................................................................................................................ 18
**EXECUTIVE SUMMARY**

Developing countries are beginning to build systems for developing “project pipelines” that will help them to access climate finance from international funds, such as the Green Climate Fund (GCF) and the Adaptation Fund, in order to implement adaptation measures. One component of the project pipeline is decision-making tools that equip national adaptation planners to prioritize suitable options that can be supported by global funds. The term “decision-making tools” in this paper refers to tangible, objective techniques that help planners to undertake an assessment process in support of decision making.

This paper targets national implementing entities (NIEs), which mainly comprise government agencies and national banks. NIEs are interested applying for climate finance, investing in climate change adaptation, overseeing implementation of individual initiatives, and ensuring that projects are aligned with a fund’s objective and meet its fiduciary standards and social safeguards. The paper also targets technical adaptation planners who regularly work with climate data, economic data, and social science research. NIEs may or may not have technical planners among their members. Therefore, outside technical planners often work with the NIEs that apply and manage climate finance, to help them select the adaptation options in which they will invest. Many NIEs and technical adaptation planners do not have the capacity to prioritize adaptation options using a technical approach. The tools presented in this paper provide alternative ways to prioritize options; they can be incorporated into proposals that will be submitted to global funding bodies.

Under the GCF Readiness Program, we worked with the National Environment Management Authority (NEMA), an NIE in Kenya, and the Climate Change Division (CCD) in Fiji. The aim was to identify the adaptation planning challenges they would like to address and the types of tools most relevant to their context. NEMA and CCD both agreed on the need for tools that enable the use of objective information and participation by stakeholders. They also agreed on the need for answers to adaptation planning questions, including the following:

1) **How can we assess whether an adaptation project has the potential to scale?**
2) **How can we engage businesses in the most climate-vulnerable sectors?**
3) **How can we factor climate and socioeconomic uncertainties into adaptation decision making?**
4) **Which option provides the highest net benefit?**
5) **Can we use multiple tools together to prioritize options?**

This paper is intended to brief NIEs and technical adaptation planners on four analytical tools that can be used to address these questions. To answer the first two questions on scalability and engaging the private sector, we review two new tools developed by the World Resources Institute, namely, the Assessing Scaling Potential and Business Sector Prioritization and Engagement tools. The final three questions involving uncertainty and costs and benefits are addressed via a review of two well-established tools, namely, Participatory Scenario Development and Cost Benefit Analysis. All four tools require the use of both science-based or other objective information and stakeholder participation. The tools are not discussed in depth in this paper because guidance documents already exist—web links are provided should the reader want to learn about the methodologies involved in each of the tools. The four tools are:

- **Assessing Scaling Potential (ASP):** This tool helps to assess the scaling potential of a project, that is, the extent to which a project can be scaled up in size and scope to benefit the maximum number of people. The methodological steps involved in this tool help to identify the conditions under which scaling could occur, whether good adaptation practices are in place, and whether monitoring and evaluation systems
exist to gather evidence of adaptation benefits. ASP is a new tool based on the WRI publication *Scaling Success: Lessons from Adaptation Pilots in the Rainfed Regions of India*.

- **Business Sector Prioritization and Engagement (BSPE):** This tool enables the user to determine where adaptation is necessary, based on ranking the most economically important and climate-vulnerable economic sectors. BSPE is a new tool based on the WRI and UNDP publication *Adapting from the Ground Up: Enabling Small Businesses to Adapt to Climate Change*.

- **Participatory Scenario Development (PSD):** PSD is a tool that helps users from a wide variety of disciplines to jointly create scenarios in a participatory manner that enables them to plan for the future and address climate and socioeconomic uncertainties.

- **Cost Benefit Analysis (CBA):** CBA helps decision makers to understand the economic repercussions of a decision. CBA enables the user to compare monetized costs and benefits of various options and prioritize the option that offers the greatest benefit at the lowest cost.

Based on this review of tools and our experience with training partners in Fiji and Kenya on the tools’ applicability when selecting adaptation options, three key messages emerged:

- This suite of four tools helps to answer five critical adaptation-planning questions that are important to NIEs and technical adaptation planners. This audience expressed interest in learning more about how to scale adaptation projects, how to engage businesses in adaptation, how to address uncertainty in decision making, and how to prioritize options with the highest net benefit. However, these tools should be used with caution. The tools Assessing Scaling Potential and Business Sector Prioritization and Engagement have not been tested for their applicability and usefulness in a variety of real-world situations. Their value will become clear over time as they are applied in more countries. If NIEs and technical adaptation planners want to address uncertainty and identify net benefits, they should use Participatory Scenario Development and Cost Benefit Analysis, which are both well-established tools.

- Use of objective information and a multi-stakeholder approach to decision-making are important characteristics of effective adaptation planning. Using objective information is essential because it favors options that are evidence-based and grounded in reality. NIEs and adaptation planners should also use the types of tools presented in this paper because they encourage a multi-stakeholder approach, which is critical to the process of choosing options based on inclusive decision-making. However, we should stress that using a multi-stakeholder approach may yield different results each time that new stakeholders apply the tool; that is the nature of participatory tools.

- The tools can be used independently but they could potentially be used in combination to rank or compare adaptation options. Each tool prioritizes or ranks adaptation options based on a particular adaptation issue, such as scaling adaptation projects or finding economic net benefits. If more than one adaptation issue is important to an NIE, it may wish to use multiple tools.
1. INTRODUCTION

As climate change gathers pace, people around the world are already starting to feel its effects. In response, more and more national governments are launching processes to plan for worsening climate change impacts and mobilizing resources to take action. However, climate change impacts play out very differently in different locations because of a wide range of vulnerability factors (climatic, environmental, socioeconomic, cultural, and political, among others). This means there can be no “silver bullet” when it comes to building climate resilience—each country will need to tailor its adaptation activities to its specific development circumstances. In this context, decision makers in governments need tools to evaluate the many different activities and options that may offer adaptation benefits, and to prioritize those most likely to be effective in their national context.

Countries are starting to develop “project pipelines” that will enable them to access international funds such as the Green Climate Fund (GCF) and obtain climate finance to implement adaptation projects. Project pipeline development entails prioritizing needs and choosing among options to address climate change challenges. Between 2015 and 2016, under the GCF Readiness Program, the governments of Fiji and Kenya support to develop tools and provide training in their use. The aim was to develop the technical capacity of adaptation planners, as part of developing a strong project pipeline process. Planners can use the tools to prioritize adaptation options and make more effective use of limited resources. We were asked to focus on tool development and training because our experience and expertise in tool design and implementation. The process involved designing training materials and providing training to around 40 people in each country. Training participants included individuals from government, the private sector, and non-governmental organizations.

The primary target audience for this paper is National Implementing Entities (NIEs). NIEs can be private or public, non-governmental, sub-national, national, regional, or international organizations that meet GCF’s standards. Currently, most NIEs are drawn from government agencies and development banks. NIEs’ roles range from developing funding proposals to managing and monitoring projects and programs funded by global funds. The National Environmental Management Authority (NEMA) of Kenya is an example of an NIE accredited by the Green Climate Fund. NEMA is a semi-autonomous government agency in the Ministry of Environment, Water, and Natural Resources. It is the main national environmental regulatory body, responsible for implementing environmental policies in all sectors in Kenya (NEMA 2016). As an NIE, NEMA is able to apply for GCF grants up to US$10 million. Once it receives funding, the NIE will be responsible for administration, financial management, and project management. The authors consulted NEMA on tools to prioritize adaptation options before providing training in Kenya.

In Fiji, the Fiji Development Bank (FDB) is working toward achieving accreditation from the GCF to become an NIE. FDB is an autonomous statutory body and its operations are controlled by a Board of Directors appointed by the Minister of Finance (FDB 2016). FDB provides finance for projects that contribute to the economic and social development of Fiji, as well as loans to small- and medium-sized enterprises, and agricultural, corporate, and micro projects. The Government of Fiji uses the FDB as a financial operational partner in its development projects/plans. Once FDB receives accreditation, it too will be able to directly access funds from the GCF for climate change projects and programs. Although NEMA and FDB operate differently, they both play an important role in planning and deciding which adaptation options to include in proposals to be submitted to global funds. Based on conversations with FDB and NEMA, we conclude that they are looking for ways to prioritize adaptation options because many members of their staffs do not have the capacity to apply technical approaches to prioritizing options. Although FDB will most likely become and NIE, we consulted the Climate Change Division in Fiji, which is under the Ministry of Foreign Affairs on the tools to prioritize adaptation options because FBD is not an NIE year.
In addition to NIEs, this paper also targets technical adaptation planners. Technical planners work regularly with climate data, economic data, and social science research. They are able to use both quantitative and qualitative information for planning purposes and are familiar with using both online and off-line tools for decision making. NIEs sometimes employ technical planners, but technical planners may also work outside of a designated NIE. Technical planners are keen to find new tools that allow them to create adaptation plans and inform climate-oriented decisions that can potentially be implemented through an NIE.

It is important to understand what we mean by a “decision-making tool.” UNFCCC’s Nairobi Work Programme states that a “method” refers to a framework or approach for undertaking an analysis, where the emphasis is on process. A “tool” is something that assists with a specific task in the process (UNFCCC 2008 cited in Hammill and Tanner 2011). This paper uses a hybrid approach where a “decision-making tool” refers to a tangible (documented) technique based on a method that helps planners to undertake an assessment process, for example, assessing which adaptation option to prioritize. Tools can come in multiple forms, such as an online platform or a document explaining analytical procedures. The tools discussed in this paper belong to the latter category.

It is important to note that the four tools in this paper do not represent the full universe of possible tools. We selected the four tools discussed in this paper because they are well suited to address the following five questions of interest to adaptation planners:

**How can we assess whether an adaptation project has the potential to scale?**
**How can we engage businesses in the most climate-vulnerable sectors?**
**How can we factor climate and socioeconomic uncertainties into adaptation decision making?**
**Which option provides the highest net benefit?**
**Can we use multiple tools together to prioritize options?**

NIEs and technical adaptation planners in Fiji and Kenya are interested in big adaptation questions such as: how do we scale adaptation, address uncertainty, engage the private sector, and identify net benefits? The authors tried to address these big questions by developing two tools—Assessing Scaling Potential, and Business Sector Prioritization and Engagement—that are based on existing WRI publications (Appadurai et al. 2015; Dougherty-Choux et al. 2015). In addition, the training utilized two well-established tools, namely Cost Benefit Analysis and Participatory Scenario Development, to address questions related to uncertainty and net benefits. These are effective tools that have been successfully applied in many similar circumstances.

Furthermore, the Climate Change Division in Fiji and the National Environment Management Authority in Kenya, made clear their desire to make decisions that are based on two traits: scientific studies or other objective evidence and participation. The four tools share these characteristics. Objective information, such as socioeconomic and climate data, is the key input to the tools, which allows options to be prioritized based on research and evidence on the ground. And the tools enable multi-stakeholder engagement as part of the planning process, which allows options to be selected based on consensus among diverse stakeholders.

This paper is structured as follows: Section 2 provides a definition of “adaptation options” and describes how and why the four tools were chosen. Section 3 describes application of the tools to address the five questions that NIEs and technical planners ask when planning for adaptation. Section 4 summarizes key messages concerning the tools and their application in prioritizing adaptation options.
2. DEVELOPING THE TOOLS TO PRIORITIZE ADAPTATION OPTIONS

2.1 Defining “Adaptation Options”

Adaptation options are defined as choices among possible courses of action that can help reduce the degree of climate vulnerability and build resilience. Once options are chosen, they are incorporated into plans and activities. Various types of adaptation options exist and can be categorized as “discrete” and “integrated” (Dixit 2013). “Discrete adaptation options” address impacts of climate change directly. For instance, Kenya has been suffering from frequent droughts. In order to minimize the impact of drought and build resilience, NIEs and technical adaptation planners in Kenya could either implement a weather-based insurance scheme or enable farmers to plant more drought-tolerant maize. In Fiji, sea level rise is a significant concern. Relevant technical adaptation planners in Fiji could, for example, choose between relocating people from one island to another or building higher sea walls. “Integrated” options are adaptation activities that form part of a larger development project. An example of an integrated adaptation option would be for Kenya to attempt to climate-proof its agriculture development policy or for Fiji to include climate indicators in coastal zone management. Deciding on discrete or integrated options is influenced by country priorities, decision-making criteria, and the tools used to make adaptation decisions.

2.2 Methods Used for Selecting the Four Tools

We worked with NEMA in the Ministry of Environment in Kenya (NEMA is an NIE) and the Climate Change Division (CCD) in the Ministry of Foreign Affairs in Fiji between 2015 and 2016 to fulfill their request for training on decision-making tools. The process of selecting which tools to develop and train on began with discussions over Skype and email on decision-making needs in both countries. While communicating with NEMA and CCD it became evident that many adaptation planners in Fiji and Kenya do not use a technical process to objectively determine the options in which they will invest. This realization led us, NEMA, and CCD to agree to develop and choose tools that would enable adaptation planners to draw on different types of quantitative, evidence-based information, such as climate data and socioeconomic research, to make the most effective decision. Using national-level climate and weather information helps planners to directly address the potential impacts of climate change on the natural environment. Factoring in research on social vulnerability, and economic and political conditions in specific locations, is also important if decision makers are to consider the human impacts of climate change in a particular context. Using natural and social science to choose options provides a way to make decisions that are based on evidence.

Discussions among the partners also led to an understanding that NEMA and CCD are eager to create spaces where government agencies can interact with non-governmental organizations and the private sector in the course of making adaptation decisions. Multi-stakeholder engagement allows different participants to come up with ideas based on local knowledge that lead to viable options. Participation in the process of choosing options together also helps to develop strong partnerships. This is especially important when adaptation options are cross-sectoral and agencies from different sectors need to work together to implement options that have been prioritized (Dixit 2013). Tools that allow decision making through multi-stakeholder engagement and consensus building will likely lead to more effective implementation of the adaptation option because they incorporate diverse perspectives on a challenge (Dixit 2013).

Once we established the types of tools that were being sought, NEMA and CCD were asked if they would be interested in learning about two new tools that WRI developed. The two new tools are for Assessing Scaling
Potential, and Business Sector Prioritization and Engagement. WRI developed the two new tools on the basis of, respectively, the framework on scaling adaptation used in *Scaling Success* (Appadurai et al. 2015) and the framework on how to engage the private sector in adaptation in *Adapting from the Ground Up* (Dougherty-Choux et al. 2015). The frameworks were converted into tools that use checklists, guiding questions, and scoring systems to prioritize adaptation options. CCD and NEMA agreed that these new tools could be of interest because adaptation planners in Fiji and Kenya frequently grapple with how to scale adaptation projects and engage the private sector. We also asked NEMA and CCD if they would like to learn about well-established tools such as Cost Benefit Analysis (OECD 2006) and Participatory Scenarios Development (World Bank 2010) because we are able to offer expertise in the use of these tools. NEMA and CCD agreed with this suggestion also, because they identified the need for training on economic tools and how to design scenarios that incorporate decision making under future climate and socioeconomic uncertainties.

Once the types of tools were decided upon and the adaptation planning questions identified, we began developing training material and training programs on the tools in Fiji (January 2016) and Kenya (April 2016). The training sessions not only helped participants understand how to use the four tools, they also served as a testing ground for the two new tools, Assessing Scaling Potential and Business Sector Prioritization and Engagement. Testing involved asking trainees to assess whether the tools were easy to use, whether they helped trainees/users address the adaptation-planning question, and whether the trainees/users could potentially see themselves using the tools in real-life decision-making situations. Testing also involved asking the trainees/users for feedback on how to improve the tools; this feedback was subsequently incorporated and the tools improved. In spite of this valuable feedback from the trainees, we were not able to co-design the Assessing Scaling Potential and Business Sector Prioritization and Engagement tools through deep engagement with partners beyond the training sessions due to time constraints. It is anticipated that WRI will further test for the usefulness of these tools in the future to make them more robust.
3. Applying the Four Tools to Prioritize Adaptation Options

This section provides a more detailed description of the four tools, depicted in Figure 1, and their application in adaptation decision making.

Figure 1: Tools for Adaptation Decision Making

- **Assessing Scaling Potential (ASP):** This tool helps planners to assess the scaling potential of a project. It involves five steps, which help to identify the conditions under which scaling could occur, whether good adaptation practice are in place, and whether monitoring and evaluation systems exist to gather evidence of adaptation benefits. It also involves designing scaling pathways and prioritizing adaptation options based on their scaling potential. Prioritization takes place through a scoring and ranking system that involves a wide range of stakeholders. ASP is a new tool that draws on the WRI publication *Scaling Success: Lessons from Adaptation Pilots in the Rainfed Regions of India.*

- **Business Sector Prioritization and Engagement (BSPE):** The tool enables users to rank the most important yet climate-vulnerable economic sectors where adaptation is necessary. The tool then helps users discuss what drives small- and medium-sized enterprises (SMEs) to invest in adaptation in a particular sector, identify the barriers that SMEs face with regard to investing in adaptation, and formulate interventions to help SMEs invest in adaptation in vulnerable economic sectors. BSPE is a new tool based on the framework developed in the WRI and UNDP publication *Adapting from the Ground Up: Enabling Small Businesses to Adapt to Climate Change.*

- **Participatory Scenario Development (PSD):** PSD is a tool that helps users from a wide variety of disciplines to co-create scenarios in a participatory manner that enables them to plan for the future. By building multiple scenarios and identifying adaptation options that are flexible and applicable across multiple scenarios, users are able to identify and prioritize options that are most likely to withstand future uncertainties. Although PSD is not a new tool, it is relatively new to many adaptation planners and is especially important in the context of climate uncertainty.
Cost Benefit Analysis (CBA): CBA helps decision makers to understand the economic repercussions of a decision. CBA enables users to compare the monetized costs and benefits of different options and prioritize the option with greater benefits than costs. CBA allows users to incorporate risk into the calculation, which is a quantifiable probability of a climate event occurring. CBA has been in use for decades by planners, but the purpose of the training sessions was to highlight the relevance of CBA in the adaptation context.

The four tools discussed in this section help to evaluate and rank options. It should be noted that the usefulness of the Assessing Scaling Potential and Business Sector Prioritization and Engagement tools has not been tested through application in actual decision-making contexts and, therefore, their effectiveness is unknown. Testing did not take place due to budgetary and time constraints. The tools appear to have potential value, given that partners in Fiji and Kenya have expressed interest in learning about them. We anticipate that their value will become clear over time as they are applied in more countries. The Cost Benefit Analysis and Participatory Scenario Development tools have, however, been tested and applied in various decision-making contexts for decades. Because the version of the tools that we utilized are participatory (to different extents), they lead to different results with each application of the tool depending on which stakeholders are involved in the tool application process.

3.1 How Do the Four Tools Help to Address Key Adaptation Planning Questions?

Question 1: How can we assess whether an adaptation project has the potential to scale and benefit many people?

Fiji and Kenya are countries where numerous individual, small, time-bound, and geographically scattered climate change projects are under way. Although these projects benefit people in a particular locality, they may not be benefiting people at a larger scale. Climate change activities need to benefit many people across a landscape and projects need to yield lessons that can inform broader policy. Planners in Fiji and Kenya face the challenge of finding ways to incorporate scaling components into projects that will enable those projects to grow and replicate. Transformational solutions are now needed so that projects benefit large populations across large areas and scaling is one way to achieve transformation. Transformation can be defined as “increasing [the] scope or reach of an activity, program, project, or initiative so that it serves more people or delivers more or better benefits” (WRI 2008). The issue of scale is strongly emphasized in the GCF’s Investment Criteria, used by the GCF when selecting projects to fund. The GCF refers to scale as creating a “paradigm shift,” which is the “degree to which the proposed activity can catalyze impact beyond a one-off project or programme investment” (GCF 2015).

WRI has developed a new tool called Assessing Scaling Potential to assess the potential for scaling up a project (see Section 3). Prioritization takes place through a scoring and ranking system that involves a wide range of stakeholders. It is a simple tool that uses checklists and guiding questions throughout five steps. NIEs and technical adaptation planners should have a good understanding of how project implementation takes place before using the tool. More information and explanation of how to use this tool can be found at: http://www.gcfreadinessprogramme.org/sites/default/files/Assessing%20Scaling%20Potential%20Tool%20and%20Guidance%20.pdf

10
Question 2: How can we engage businesses in the most climate-vulnerable sectors?

The governments of both Kenya and Fiji face the challenge of how to include the private sector, which plays a critical role in supporting livelihoods, in efforts to mitigate or adapt to climate change. The Government of Kenya recognizes this challenge and, in Kenya’s National Climate Change Action Plan 2013–2017 (GoK 2012) explicitly states that the private sector should be involved in helping to finance low-carbon, climate-resilient investments. The Intended Nationally Determined Contributions (INDCs)2 of both Kenya and Fiji strongly feature the need to work with the private sector on both mitigation and adaptation solutions. Examples include working with private companies to provide solar energy in Fiji or making tourism more climate-resilient in Kenya (GoF 2015; GoK 2015). Furthermore, GCF’s Private Sector Facility encourages NIEs to engage with private sector investors, developers, entrepreneurs, corporations, and small- and medium-sized enterprises in climate change projects to mobilize private sector funding to build climate resilience (GCF 2015).

The Business Sector Prioritization and Engagement tool is designed to help NIEs and technical adaptation planners identify specific areas where the private sector could engage. WRI developed the tool by merging its framework on engaging small businesses to adapt (see Section 3) with a prioritization framework developed by the International Finance Corporation (IFC) and European Bank for Reconstruction and Development (EBRD). The aim is to prioritize economic sectors that are vulnerable to climate change and identify ways to build climate resilience in such sectors. Users discuss what drives adaptation investment in a sector, identify the barriers to adaptation, and formulate interventions to help a sector adapt to climate change impacts. In order to use this tool, NIEs and technical adaptation planners will need access to GDP data disaggregated by economic sector and climate data that can be used to determine the sensitivity of a sector to a climate threat. NIEs and technical adaptation planners using this tool should have a good understanding of the important contribution that economic sectors such as agriculture and manufacturing make to the national economy. The tool involves simple and technical approaches where a combination of checklists, guiding questions, tables, and analytical steps are used to determine how the private sector could engage in adaptation. Guidance on how to use this tool can be found at: http://www.gcfreadinessprogramme.org/sites/default/files/Business%20Sector%20Prioritization%20Tool%20and%20Guidance.pdf

Question 3: How can we factor climate and socioeconomic uncertainties into adaptation decision making?

Climate change uncertainties make planning difficult. In the case of Fiji, changes in rainfall patterns are highly uncertain in the Pacific area where Fiji is located. Fiji lies in the path of trade winds and highly variable and uncertain precipitation is already a pertinent issue (IPCC 2014). In Kenya, although there is a discernible trend in rising temperatures and dryness, there is some uncertainty about rainfall patterns (Herrero et al. 2010). Although planners know about these uncertainties, very few projects are designed to incorporate future uncertainties because many planners do not know how to address unknown future events.

Participatory Scenario Development is a tool that can be used to address uncertainty and help to prioritize projects that will be robust in the face of unknown futures. PSD has been in use for decades and is a well-established tool that has been applied in various contexts using local data. It is, however, new in the adaptation

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2 Countries have publicly outlined the post-2020 climate actions they intend to take under the new Paris Agreement on climate change in documents known as Intended Nationally Determined Contributions (INDCs). The climate actions communicated in these INDCs largely determine whether the world will achieve the long-term goals of the Paris Agreement: to hold the increase in global average temperature to well below 2°C, to pursue efforts to limit the increase to 1.5°C, and to achieve net zero emissions in the second half of this century (http://www.wri.org/indc-definition).
field. PSD is a tool that helps users create scenarios in a participatory environment where planners from a wide variety of disciplines come together to plan for the future. Using both quantitative information such as climate projections, and qualitative information such as social science research, as well as expert knowledge, PSD enables users to incorporate a range of possible climate and socio-economic futures into the process of prioritizing options. By building multiple scenarios, adaptation options can be tested within each scenario. The options that work in most scenarios are considered to be flexible and better able to withstand future uncertainties; these options are prioritized. Because PSD allows for “out of the box” thinking, it requires skilled facilitators who are trained in the method and can help guide the steps of the scenario-building process. They also need to be able to handle the power dynamics among participants with different backgrounds, who want to develop scenarios to address climate uncertainty in their own planning processes. NIEs and technical adaptation planners involved in PSD do not need a strong technical background but they should be able to understand graphs that indicate climate projections, given that PSD involves future planning. The tool uses five analytical steps to envision the future and apply “back-casting” methods. More information on using the PSD tool can be found at:

**Question 4: Which option provides the highest net benefit?**

Fiji and Kenya are keen to use and mainstream **Cost-Benefit Analysis** (CBA) in decision making. This objective is explicit in Fiji’s Climate Finance Readiness Plan (GoF 2013). Kenya’s INDC and National Climate Change Action Plan 2013–2017 make several references to understanding the costs of climate change activities. CBA helps planners to meet GCF investment criteria related to “effectiveness and efficiency,” which refer to “economic and...financial soundness of the project” (GCF 2015).

CBA is a decision-support tool commonly used for making investment decisions. CBA enables practitioners to compare monetized costs and benefits of an adaptation option and prioritize the option with the highest net benefits. Because economic valuation methods are well established for estimating market and to some extent non-market environmental and social costs and benefits (e.g., climate mitigation benefits; avoided health costs, and environmental damages), CBA may capture externalities associated with investment decisions in adaptation. The challenge of conducting CBAs for adaptation options is that the analytical timeframe must be long enough to capture social and development changes resulting from the adaptation option over medium- and long-term periods. The distributional impacts of adaptation options are also of concern because poor and vulnerable populations are often disproportionately impacted by climate change. CBA can address both of these challenges through good analysis design and sensitivity analyses.

Key to adaptation planning is how to deal with risk. CBA allows the practitioner to incorporate climate risks into the calculation, which is expressed as a quantifiable probability of a climate event occurring. CBA is more effective when there are known climate risk probabilities and data, and climate sensitivity is small relative to total cost/benefits. However, the method is less effective when non-market factors are difficult to value, as is often the case with the loss of environmental goods and services. Risk is incorporated into CBA through sensitivity analysis, which is a systematic method for examining how the outcome of a CBA changes with different assumptions about project components that might change unexpectedly in the future, for example, as

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3 In order to compare economic effects that occur at different points in time, the practice of applying a discount rate to future effects is essential, as the selection of the discount rate (or rates) may greatly alter CBA’s results and ultimately, influence decision-making (Ding et al. 2016). The interested reader may refer to Convery and Wagner (2015) for a recent discussion on guidance for cost-benefit decisions for climate change and the role of the discount rate.
a consequence of climate change. In order to conduct CBA, NIEs and technical adaptation planners will need to access data on costs (e.g., capital, labor, materials, monitoring, operating, and maintenance) as well as the environmental and social impacts that the action will create. The tool involves analytical steps corresponding to predefined rules, methods, and procedures that have been well established in the economics field. NIEs and technical adaptation planners need to be knowledgeable about economic valuation and statistical methods to use CBA. For more details on how to use CBA, please go to: http://www.gcfreadinessprogramme.org/sites/default/files/Cost%20Benefit%20Analysis%20Tool%20and%20Guidance.pdf.

Table 1 provides a summary matrix to help NIEs and technical adaptation planners compare the tools discussed in this section. The tools are compared in terms of their approach to prioritization, function, history and uses, typical users, required inputs, and limitations.
<table>
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<th>How tools help to rank adaptation options</th>
<th>Assessing Scaling Potential</th>
<th>Business Sector Prioritization and Engagement</th>
<th>Participatory Scenario Development</th>
<th>Cost-Benefit Analysis</th>
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<td>Assessment of a project’s scaling potential is carried out via a scoring system. Options that address many of the socioeconomic conditions necessary for scaling, incorporate good adaptation practices, have a strong monitoring and evaluation system to capture benefits from the project, and have feasible scaling pathway are prioritized.</td>
<td>A ranking tool that enables users to discuss what drives adaptation investment in a sector, identify the barriers to adaptation, and formulate interventions to help a sector adapt to climate change impacts. This tool is designed to rank economically important yet climate-vulnerable sectors and identify adaptation interventions that help small- and medium-sized enterprises adapt to climate change.</td>
<td>A participatory tool designed to create multiple scenarios representing plausible futures. Adaptation options, plans, and projects can be tested through each of the scenarios to assess whether the adaptation option is robust in the face of future uncertainty.</td>
<td>A decision-support tool that compares monetized costs and benefits of policy/investment options. Adaptation options can be prioritized by comparing costs and benefits using a variety of metrics including net present value (discounted benefits minus costs) or benefit-cost ratio.</td>
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**Table 1. Summary Matrix of Tools**

- **Assessing Scaling Potential**: This tool is based on the WRI publication, *Scaling Success: Lessons from Adaptation Pilots in the Rainfed Regions of India*. The framework to understand scaling of adaptation projects was converted into a tool that allows users to assess potential for scaling. It is newly developed by WRI and has not been tested widely.
- **Business Sector Prioritization and Engagement**: This tool was developed based on WRI’s and UNDP’s publication *Adapting from the Ground Up: Enabling Small Businesses to Adapt to Climate Change*. The tool merges the framework in the WRI publication with the prioritization framework developed by the International Finance Corporation and European Bank for Reconstruction and Development to understand which sectors of an
- **Participatory Scenario Development**: Scenario development was first used by the US military during the Second World War and by multinational corporations. It is now slowly gaining ground in adaptation decision making and has been tested through application in various developing countries.
- **Cost-Benefit Analysis**: The theoretical origins of CBA date back to infrastructure appraisal in the 19th century. It was traditionally used in the fields of environmental policy, transport planning, and healthcare.
The economy could be priorities for investments in climate resilience. It is newly developed by WRI and has not been tested widely.

### Typical users
- Project planners and project portfolio managers.
- Government agencies and NGOs responsible for working with the private sector.
- Adaptation planners with various backgrounds.
- Frequently used by decision makers (public and private sectors) to compare policy or investment options.

### Required inputs
- Understanding of climate projections, local context in which scaling would take place, actors involved in scaling, and project design and implementation.
- GDP data disaggregated by sectors, climate data to identify climate sensitive sectors, an understanding of various economic sectors and how they operate, and knowledge of the impact of climate change on the economy.
- Knowledgeable and effective facilitators, qualitative information (social science research, experiential knowledge), quantitative information (maps, graphs, data, climate projections), time and funds.
- Monetized values for costs (capital, labor, transaction, operating and maintenance) and benefits (economic, environmental, and social). Users need an understanding of economic valuation methods and statistical techniques for sensitivity analysis.

### Limitations
- Does not help to implement options because the focus is on choosing options that have potential to scale.
- Addresses only private sector adaptation considerations and does not compare with the public sector.
- The process takes a minimum of two days, with associated staff time costs. It may be difficult to get the right people in the room and constructive participation may be a challenge due to power dynamics.
- Betters suited to addressing the allocation of resources than the efficiency of policies/investments or their distributional impacts. Requires technical understanding of economic valuation methods and statistics for risk/uncertainty analysis.

### Notes:
**Question 5: Can we use multiple tools together to prioritize options?**

The four tools can be used independently to help NIEs and technical adaptation planners prioritize adaptation options. Each tool allows the user to rank adaptation options based on key functions: Assessing Scaling Potential ranks adaptation options based on their potential to reach scale, Business Sector Prioritization and Engagement ranks climate vulnerable sectors within the private sector based on their contribution to the economy and their degree of climate vulnerability, Participatory Scenario Development allows users to rank options based on how well each option copes with future climate uncertainty, and Cost Benefit Analysis ranks adaptation options based on their economic value to society.

The authors have not carried out “real-world” testing to demonstrate that the tools can be used together. However, it is our belief that they could be used in combination to rank or compare adaptation options. When combined, the tools could be used in a particular sequence. For example, if both economic and scaling considerations are important to an NIE, the NIE could first complete a CBA to determine which adaptation options have the highest net benefit to society. If adaptation options need to be further ranked, for example, due to budget considerations, options with the highest net benefits could then be ranked again according to their potential to be scaled up. Some tools could also serve as inputs to others. For instance, Participatory Scenario Development is both a prioritization tool in itself, and a potential input to the three other tools. In some instances, when a combination of tools is applied, the tools might result in different rankings. In such a situation, we would encourage users to discuss which is the most feasible option and come to a decision through consensus. The extent to which the tools can be combined has yet to be fully determined. Users of these tools can identify their own sequence, depending on their decision-making priorities.

**4. Key Messages**

Prioritizing needs and options to address climate change challenges is a critical step for developing project pipelines, and ensuring effective use of resources. This paper helps to create awareness among NIEs and technical adaptation planners of how four different tools can help address questions and planning challenges that adaptation planners face when trying to prioritize adaptation options. Three key messages can be distilled from the authors’ experience of researching, developing, and training in the use of these decision-making tools.

First, the suite of four tools introduced in this paper helps to answer five critical questions (discussed in Section 3) that NIEs and technical adaptation planners face when planning for adaptation. The questions reflect country partners’ interests on particular adaptation issue such as engaging with the private sector in adaptation, scaling adaptation projects, incorporating uncertainties in adaptation decision making, and identifying adaptation options that have net benefits. Assessing Potential to Scale and Business Sector Prioritization Engagement tools are, however, new and not tested in a variety of real-world contexts. They should be used with caution because their effectiveness is unknown. Their value will become clear over time as they are applied in more countries. All four tools are highly participatory and results will differ with each application of the tool, based on which stakeholders are involved in the process. As such, it is important that NIEs and technical adaptation planners carefully consider who should be involved in the application of each tool so that adaptation options are prioritized strategically.
Second, it can be challenging for NIEs and technical adaptation planners to navigate through various tools. We encourage NIEs and technical adaptation planners to use science-based decision-support tools that use objective information and steer policymaking toward options that are well grounded in evidence. Tools that promote participation of a range of stakeholders in the decision-making process are also important. Decisions based on consensus are more inclusive and can be easier to implement.

Third, these tools can be used independently and they can potentially be used in sequence or in combination to rank or compare adaptation options. Each tool prioritizes or ranks adaptation options based on a key function or adaptation topic. If more than one function is important to an NIE, it may wish to use multiple tools. For example, if both economic and scaling considerations are important for an NIE, the NIE could first complete a CBA to determine which adaptation options have the highest net benefit to society. If adaptation options need to be further ranked, options with the highest net benefits could then be ranked according to scaling potential.
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