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Elements for an M&E Framework for Climate Change Adaptation Projects

Lessons from GEF Climate Change Adaptation projects

**Prepared by the GEF Evaluation Office
in Cooperation with the GEF Adaptation Task Force**

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EXECUTIVE SUMMARY

Monitoring and evaluation: a key need of the GEF adaptation programs

1. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) has made clear that climate change is happening now and taking a severe toll on societies throughout the world, particularly in developing countries. Therefore, the need for implementing adaptation measures on the ground is high on the sustainable development agenda. Although much work has been done on vulnerability and climate change impact assessments, the actual evaluation of adaptation actions on the ground is in its early stages. It is imperative to start thinking about this topic given that the world needs to rapidly learn lessons on how best to adapt to a changing climate.

2. The GEF has begun discussing a monitoring and evaluation (M&E) framework for its adaptation programs, in particular for the SCCF and LDCF funds. The present document is an input from the GEF Evaluation Office to this discussion and in particular to work started by the GEF Adaptation Task Force for the development of such a framework (for example, UNDP (2007)). The GEF Task Force has reviewed previous versions of this document and provided comments that have been incorporated. In addition, the review of M&E plans in GEF projects as well as the discussion on possible ways of evaluating adaptation will be part of the discussion at an upcoming international workshop on evaluation, climate change and sustainable development organized by the GEF Evaluation Office, to take place next May 2008 in Egypt.

3. The purpose of the report is to examine the current ‘state of the art’ of monitoring and evaluation (M&E) systems of GEF projects working with adaptation measures to climate change and also to identify possible problems with trying to develop an M&E framework for adaptation programs and projects. The document presents the review of M&E systems of seventeen GEF projects. With those inputs as the basis of analysis, plus the principles outlined by the GEF Monitoring & Evaluation Policy; a series of recommendations are given for the development of a GEF M&E Framework for Adaptation. These recommendations are given to the GEF Task Force as an input to their on-going discussion on M&E.

4. The Global Environmental Facility (GEF) is recognized as one of the largest international financiers of adaptation projects in the developing world, through the Strategic Priority on Adaptation (SPA), the Special Climate Change Fund (SCCF) and the Least Developed Countries Fund (LDCF). The SPA is an allocation within the GEF Trust Fund that supports projects dealing with adaptation within the implementation of the GEF focal areas programs, whereas the latter two funds enable the GEF to work explicitly for adaptation with development projects and programs outside its traditional focal areas. The SCCF provides complementary funding for climate change activities, with adaptation as its financing priority so far. The LDCF was originally created to support the preparation of National Adaptation Programs of Action (NAPAs), but has moved into a second phase of financing urgent and immediate adaptation needs of least developed countries. The priority adaptation areas of the SCCF and LDCF are water resources, disaster risk management including capacity building, food security and agriculture, infrastructure development, fragile ecosystems, public health, coastal zone

management, land and natural resource management, community based adaptation, establishment of rapid response networks to weather events, and monitoring, prevention and early warning of diseases and vectors affected by climate change.

5. The goal for an M&E system for adaptation is to identify the aspects that are working, those that are not working, and the reasons why, as well as providing mechanisms to adjust the adaptation process accordingly. A sound M&E system would have a framework with defined goals, objectives and measures, which enables planning for data collection in anticipation of the requirements for evaluation. It is important to distinguish monitoring and evaluation of adaptation interventions — ex-post evaluation – from vulnerability or climate change impact assessments — ex-ante evaluation. This document presents information on both aspects but with a focus on the ex-post evaluation experiences.

Approaches for evaluating GEF interventions for adaptation

6. Adaptation is the “*Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities*” as defined by the IPCC Fourth Assessment Report (Parry et al., 2007). GEF adaptation projects intervene to expand or shift the coping range of target systems to climate variability, responding to current climatic changes and anticipating future climate scenarios. They do this by implementing adaptation measures that enhance resilience, reduce vulnerability and increase adaptive capacity.

7. Although the broad mandates of the SCCF and LDCF are clear, further clarification is necessary to distinguish between different adaptation objectives that would require different methods for evaluation. Drawing from the Adaptation Policy Framework (Lim et al., 2004:190), five classes of adaptation objectives are identified:

1. Increasing the robustness of infrastructure designs and long-term investments in development
2. Increasing the flexibility of vulnerable managed systems
3. Enhancing adaptability of vulnerable natural systems
4. Reversing trends that increase vulnerability (mal-adaptation measures)
5. Improving societal awareness and preparedness

8. The following evaluation methods, techniques and strategies are suggested for further discussion:

1. Evaluation of project outcomes against climate change scenarios
2. Performance review of project interventions against climate impacts
3. Comparison of performance between the project area and a similar comparison area in an experimental procedure
4. Assessment of outcomes against known best practices, global targets or recommended standards
5. Comparison of vulnerability and adaptive capacity indicators via vulnerability assessments at project inception and project completion

6. Use of procedural indicators to track progress, context and proxy indicators when direct impact measurement is difficult.

9. The paper notes the difficulties of evaluating adaptation to climate change, such as having a reverse logic of being successful when impacts are avoided; defining success against uncertainty of impacts and moving baselines of climate conditions and disaster risk; selecting the appropriate time for evaluation; or determining GEF's contribution to particular outcomes. Adaptation projects include trade-offs and synergies with sustainable development objectives, so there should be priority to no-regrets and low-regrets measures, preventing maladaptation measures and accounting for the environmental and social impact of the adaptation measures themselves. Integrated assessments are necessary to minimize these kinds of problems.

Review of M&E systems and indicators in GEF adaptation projects

10. A review of seventeen projects supported by the GEF was conducted. These projects are still under implementation, most of them in the very early stages. The evaluation conducted a review of the proposed M&E systems, in particularly the indicators and methodologies identified by project proponents. Highlights from this review include:

- The indicators dealing with disaster risk management and water resources were more robust for assessing adaptation to climate change than indicators related to agriculture, public health, land management and biodiversity.
- There is a plethora of generic indicators that have the potential to be aggregated across multiple projects and make possible the evaluation of the total impact of the GEF. These indicators cover crosscutting issues such as policy mainstreaming, public awareness, funding and capacity building.
- Projects have a good balance of indicators of process, outputs, outcomes and impact; as well as indicators that cover the evaluative criteria of coverage, effectiveness, sustainability and replication. However, indicators within a project often lack connections between them. There were multiple cases of vague and ambiguous indicators, and efficiency indicators were altogether absent. With relative frequency, there was also a disconnection between the adaptation activities to be implemented and the actual indicators proposed.
- Simple binary indicators of a Yes/No category proved to be very straightforward and useful in many projects. These indicators can be aggregated successfully across projects.
- Quantitative indicators were also common, particularly documenting the number of actions, products and beneficiaries. Although these indicators are fairly easy to collect, the information they provide is limited if not given in the appropriate context.
- Overall, the indicators used by GEF adaptation projects do not comply fully with the SMART criteria (specific, measurable, achievable and attributable, relevant and realistic, time-bound, timely, trackable and targeted). This may have been expected given the difficulties of measuring adaptation.
- Few projects paid significant attention to the monitoring of baselines during the course of the project, something that is definitely critical with adaptation. Context indicators are not required and so they are rarely presented in a structured way.

- The vast majority of projects had provisions for adaptive management, such as receiving feedback from M&E activities.
- Various projects had innovative M&E systems. Two employed UNDP's Vulnerability Reduction Assessment Scorecard as a tracking tool, whereas another one had participatory and experimental M&E provisions.

Suggestions for an M&E adaptation framework for the GEF

11. The paper concludes with a few suggestions on the development of a GEF M&E framework for adaptation at the program and project levels:

1: Given that the GEF adaptation programs do not have targets the GEF could use other proxies as measurements of its achievements.

12. GEF at present does not have targets in any of its programs making the reporting of achievements against targets more difficult. At different levels, for example projects or national reports, there are alternative measurements of achievements:

- Using the targets and goals proposed by countries in their NAPAs and National Communications and aggregating them at the program level
- Reporting achievements against targets defined and agreed within the work programs of specialized agencies and international conventions relevant to appropriate thematic areas at the global level
- Aggregating contributions of projects in certain sector, if they have common or similar indicators

13. Furthermore, another alternative to reporting achievements is to evaluate GEF support against global priorities for adaptation. There are several existing vulnerability indexes that could be used to define these prioritizations, for example: the Disaster Risk Index, vulnerability indicators (ie, disaster mortality coupled with socio economic measures), impact vulnerability index (ie, weather disaster index, sea level rise index, amount of GDP affected); and the Disaster Deficit Index (ie measurement of a country's capacity to absorb the financial costs of catastrophic events)

2. Development of an Adaptation Assessment Tracking Tool (AAT)

14. The use of a standard AAT, including sections on vulnerability and adaptive capacity questions, across GEF adaptation projects would facilitate evaluation at the project and program level. An ideal AAT would produce useful, generic indicators of change for all adaptation projects, regardless of sector, address the overall success of the project in light of GEF's goals and evaluative criteria and strike a balance between comprehensiveness and ease of use. UNDP's Vulnerability Reduction Assessment (VRA) scorecard (UNDP, 2007c), which captures the dimensions of change in adaptation, is a good model from which the AAT could evolve and it has been used by some UNDP/GEF projects already.

3. At the project level, the GEF should require monitoring and reporting of baselines and scenarios when appropriate.

15. Every project should have a presentation of baselines, in terms of climate, development, vulnerability and adaptive capacity. Projects should be explicit about the climate change scenarios they are employing and the adaptation targets they are pursuing, as well as the linkages between the two. Climate variability should be monitored during the project and adaptation measures tested if scenario-like conditions occur during project implementation.

4. Establish guidelines, identify best practices and compile references for adaptation indicators.

16. The GEF should develop a menu of recommended adaptation indicators both at the generic and the sectoral level to be made available to project developers. It should also encourage the combination and nesting of indicators, which help compensate for the flaws of individual indicators.

5. Evaluate trade-offs of adaptation.

17. Evaluators should explicitly look at the possible trade-offs involved with adaptation projects: maladaptation measures, sustainability at the local and regional scales, environmental and social impacts of adaptation measures; impacts on other sectors and cost-effectiveness of alternative adaptation options. Synergies and win-win situations should also be contemplated in project evaluation.

INTRODUCTION

1. As the impacts of climate change advance across the planet, societies throughout the world need to adapt to these changes. The need for implementing adaptation measures on the ground is now part of the sustainable development priorities of most countries around the world. In this context, the Global Environment Facility established the Strategic Priority on Adaptation as a pilot within the GEF Trust Fund, and two separate funds: the Special Climate Change Fund and the Least Developed Country Fund. The latter two funds are the first of their kind, which recognize that adaptation is a crosscutting issue affecting most socio-economic sectors, and as such, enable the GEF to work explicitly with development projects and programs outside its traditional focal areas. The GEF is recognized as one of the largest sources of funding for adaptation-specific projects for developing countries.

2. Although there has been enormous progress worldwide in carrying out vulnerability and climate change impact assessments for different regions of the world, as well as for different sectors of society and the economy, not much work has been devoted to the evaluation of actual adaptation activities and investments. However, it is important to start thinking about this topic in order to be able to measure progress in adapting to climate change, and to utilize this information to tackle the problems and issues that will certainly arise as societies learn to cope with a changing climate.

3. The GEF has begun discussing a monitoring and evaluation (M&E) framework for its adaptation programs, in particular for the SCCF and LDCF funds. The present document is an input from the GEF Evaluation Office to this discussion and in particular to work started by the GEF Adaptation Task Force for the development of such a framework (for example, UNDP (2007)). The GEF Task Force has reviewed previous versions of this document and provided comments that have been incorporated. In addition, the review of M&E plans in GEF projects as well as the discussion on possible ways of evaluating adaptation will be part of the discussion at an upcoming international workshop on evaluation, climate change and sustainable development organized by the GEF Evaluation Office, to take place next May 2008 in Egypt.

4. This document reviews seventeen GEF adaptation projects from the point of view of their monitoring and evaluation plans. With those inputs as the basis of analysis, a series of suggestions are given as inputs for the development of a GEF M&E Framework for Adaptation and for further discussion within the GEF Adaptation Task Force.

5. The document is divided in 6 chapters. After the introductory chapter, Chapter 2 presents the GEF program for adaptation and its various funds, as well as the GEF M&E Policy, which could help frame future M&E activities for adaptation. Chapter 3 aims to define concepts such as adaptation, vulnerability, risk reduction, and resilience, terms that are normally used in the context of GEF, but not always in a precise way, and not always consistent with IPCC definitions. Chapter 4 explores questions such as how the “reduction in vulnerability” and “increase in adaptive capacity,” two expected outcomes of the GEF adaptation program, can be measured in the context of GEF projects,

particularly for the SCCF and LDCF. Chapter 5 provides a review of the M&E plans (their indicators in particular) of 17 GEF projects under implementation within the SCCF and SPA. Finally, Chapter 6 provides suggestions as an input for further developments of an M&E framework for adaptation in the GEF.

THE GEF AND ADAPTATION TO CLIMATE CHANGE

6. The initial work on adaptation financed by the GEF consisted on studies and assessments of climate change impacts, as well as enabling activities for countries to prepare their National Adaptation Programmes of Action (NAPAs)– in the case of Least Developed Countries–, or their National Communications to the UN Framework Convention on Climate Change (UNFCCC), in the case of all other developing countries.

7. However, the GEF mandate under the UNFCCC has evolved significantly in recent years, focusing now on financing concrete adaptation actions. The GEF strategy on adaptation has also evolved in this direction.

8. The GEF currently has three avenues for funding adaptation-related projects: the Strategic Priority on Adaptation (SPA) under the GEF Trust Fund, the Least Developed Countries Fund (LDCF), and the Special Climate Change Fund (SCCF). The LDCF and SCCF are independent funds with their own governing body and operational guidelines outside of the GEF Trust Fund. One of their main tenets is that they fund the additional costs of adaptation for development activities. The term “additional costs” refers to the costs superimposed on vulnerable countries to meet their immediate adaptation needs, as opposed to the term “incremental costs,” paid by the GEF in projects that generate global benefits. Simplified methods and procedures were proposed and adopted to estimate the costs of adaptation. These funds are not tied to the GEF focal areas but to the priorities outlined by the NAPAs and the National Communications to the UNFCCC. These priorities are mostly linked to development sectors that are vulnerable to climate change.

9. From a sectoral perspective, as of today, some sectors have been covered more extensively than others by GEF adaptation projects in the SPA, SCCF and LDCF. For example, almost all projects have a component of water resources. Disaster risk management is the second most important component; followed roughly on equal terms by natural resources/biodiversity, agriculture and coastal zone management. The sectors with fewer GEF projects insofar are public health and disease monitoring, land management and infrastructure development.

SPA – Strategic Priority to Pilot an Operational Approach on Adaptation

10. The SPA is a funding allocation within the GEF Trust Fund whose objective is to support “pilot and demonstration projects that address local adaptation needs and generate global environmental benefits in all GEF focal areas” (GEF, 2006). In these projects, the main threat to the global environmental benefits is climate change. The objective is to reduce vulnerability and increase adaptive capacity to the adverse effects of climate change in the focal areas in which the GEF works (in particular Biodiversity,

International Waters, Land Degradation and, when appropriate, in projects that combine mitigation and adaptation). Projects that generate both local and global benefits are eligible under the SPA, so long as their benefits are primarily global in nature. An initial US \$50 million pilot was set aside, and \$41.9 million allocated officially as of October 2007, with several ongoing projects or under preparation or processing. From the point of view of monitoring and evaluating these projects, M&E should be conducted following the processes already under implementation in the GEF and using the tools of each of the focal areas (ie, for example, in the case of projects dealing with protected areas and biodiversity, the management effectiveness tracking tool should be used). Seven SPA projects are included in the review of indicators presented later in this report. All SPA projects include a logical framework with indicators to measure progress and have an M&E plan as part of the project design.

LDCF – Least Developed Country Fund

11. Initially, the LDCF supported preparation of National Adaptation Programs of Action (NAPAs) for least developed countries (LDCs), many of which are nearing completion (as of October 2006, 44 NAPAs had been funded). The second phase of the LDCF involves financing priority activities that address the “urgent and immediate climate change adaptation needs of the LDCs”. Many of these are in development sectors not eligible under the GEF Trust Fund, such as health, agriculture and infrastructure (GEF, 2006). Projects for this second phase are in the processing and approval stages, and therefore not included in the present review of indicators. The LDCF has \$163 million pledged as of October 2007. About \$9.4 million have been allocated to the NAPA preparation and \$28.5 million are committed to NAPA implementation projects so far.

12. Individual countries determine their own adaptation priorities via their NAPAs. So far, the priority areas for action by the LDCF as they relate to the experience of specific national NAPAs are the following (GEF, 2006b):

- Water Resources
- Food Security and Agriculture
- Health
- Disaster Preparedness and Risk Management
- Coastal Zone Management and Infrastructure
- Natural Resource Management
- Community-Based Adaptation

13. So far, the UNFCCC guidance on the LDCF has not specified targets for any of these areas; although the broader objective is to reduce vulnerability to climate change impacts and increase the adaptive capacity of least developed countries.

SCCF – Special Climate Change Fund

14. The Special Climate Change Fund (SCCF) was established by the UNFCCC to finance activities, programs and measures relating to climate change that are complementary to those funded by the resources allocated to the climate change focal area of the GEF and by bilateral and multilateral funding. This includes efforts in the areas of (a) adaptation; (b) technology transfer; (c) economic sectors including energy, transport, industry, agriculture, forestry, waste management; and (d) economic diversification. Consistent with Convention guidance with respect to the SCCF, adaptation to climate change is the top priority among the four avenues listed above. As of October 2007, \$59 million had been pledged for adaptation; with \$35.3 million officially allocated to projects and \$41.7 million in the pipeline (approved in preliminary stages). Seven SCCF projects are included in the indicator review presented below.

15. The SCCF defined the following priority areas for adaptation activities:
- Water Resources Management
 - Land Management
 - Agriculture
 - Health
 - Infrastructure Development
 - Fragile Ecosystems (including mountain ecosystems)
 - Integrated Coastal Zone Management
 - Capacity building for disaster risk management
 - Establishment of rapid response networks to weather events
 - Monitoring, prevention and early-warning of diseases and vectors affected by climate change

Like with the LDCF, Convention guidance has not set any targets for these priority areas.

The GEF Monitoring and Evaluation Policy

16. The GEF Council approved the GEF M&E policy in February 2006 (GEF EO, 2006) in order to explain, standardize and institutionalize M&E within the GEF at the various levels: project, portfolio, national and global levels.

17. According to the policy, monitoring and evaluation have the following objectives in the GEF:

- Promote accountability for the achievement of GEF objectives and the contribution of GEF results to global environmental benefits; and
- Promote learning, feedback, and knowledge sharing on results and lessons learned as a basis for decision-making on policies, strategies, program management, and projects, and to improve knowledge and performance.

18. The GEF defines evaluation as the “systematic and impartial assessment of an activity, project, program, strategy, policy, sector, focal area...” whereas monitoring is a “continuous or periodic function using systematic collection of qualitative and quantitative data to keep activities on track and thereby help identify implementation issues that warrant decisions at different levels of management." The GEF Evaluation Policy follows internationally recognized guidelines for evaluation and outlines five major criteria to be systematically reviewed in GEF evaluations (GEF EO, 2006):

- Relevance: The extent to which the activity is suited to local and national development priorities and organizational policies, including changes over time.
- Effectiveness: The extent to which an objective has been achieved or how likely it is to be achieved.
- Efficiency: The extent to which results have been delivered with the least costly resources possible; also called cost effectiveness or efficacy.
- Results: The positive and negative, and foreseen and unforeseen, changes to and effects produced by a development intervention. In GEF terms, results include direct project outputs, short to medium-term outcomes, and longer-term impact including global environmental benefits, replication effects, and other local effects.
- Sustainability: The likely ability of an intervention to continue to deliver benefits for an extended period of time after completion. Projects need to be environmentally as well as financially and socially sustainable.

19. At the project level, the policy determines various requirements for M&E:

- Each project should incorporate an M&E plan as part of the work program.
- The plan should contain SMART indicators (*Specific, measurable, achievable and attributable, relevant and realistic, time-bound, timely, trackable and targeted*), as well as clearly defined baselines and identifications of the reviews and evaluations to be carried out; and
- Large projects (full-sized) require an independent terminal evaluation, which will assess at a minimum the achievement of outputs and outcomes.

20. At the June 2007 Council meeting, the GEF Secretariat presented to Council an implementation proposal for a Results Based Management (RBM) framework for the GEF (GEF, 2007), which calls for a greater focus on evaluating outcomes rather than evaluating outputs. The current M&E approach by the GEF is the logical/results framework or log frame, which consists of a chain of hierarchies that links inputs, activities, outputs, outcomes and goals. This shift would align the GEF with several of its implementing agencies, which have already established RBM systems for their projects

and programs. The proposal will be further developed for likely approval in a future Council meeting.

Implications for a monitoring and evaluation framework

21. Although the SPA, the LDCF and the SCCF all target adaptation activities, the differences between the SPA and the other two funds are significant enough to demand two different approaches for monitoring and evaluation.

22. The SPA is subject to the operational guidelines of the GEF Trust Fund. SPA projects have to demonstrate global environmental benefits and follow the rationale of the incremental cost principle. Currently, the GEF Secretariat is formulating a strategy to “climate-proof” GEF projects in all focal areas, that is, make the global benefits achieved with them resilient to climate change. Therefore, it is more appropriate to integrate the discussion of the M&E strategy for the SPA under the framework of climate-proofing global environmental benefits. Presumably, each focal area would have adaptation indicators and evaluation procedures to add to their M&E schemes already established. This “climate-proofing” approach is not discussed further in this paper.

23. In contrast, it makes sense to have a single M&E framework for adaptation projects under the SCCF and LDCF funds. Not only is there significant overlap among their priority thematic areas, but also explicit links to development activities established for both funds, and to the national priorities given by the NAPAs and National Communications to the UNFCCC.

24. If such a framework is established, it has to strike a balance between coherence with GEF M&E policy, and flexibility to keep pace with new developments, both from the GEF side, (such as the implementation of an RBM system), and from the UNFCCC side, (such as evolving mandates for the LDCF and SCCF). It should also recognize the difference of working with adaptation and development rather than with global environmental benefits and focal areas. Lastly, it should stem from a strong scientific basis but also have strong political backing. The present document and review may be also relevant to the operationalization of the Adaptation Fund (AF).

MONITORING AND EVALUATION WITHIN THE ADAPTATION PROCESS

GEF projects within the context of adaptation¹

25. In its latest report (Parry et al., 2007), the IPCC defined adaptation to climate change as follows:

“Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory, autonomous and planned adaptation:

- *Anticipatory adaptation – Adaptation that takes place before impacts of climate change are observed. Also referred to as proactive adaptation.*
- *Autonomous adaptation – Adaptation that does not constitute a conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or welfare changes in human systems. Also referred to as spontaneous adaptation.*
- *Planned adaptation – Adaptation that is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state.”*

26. The main focus of action for the GEF is on anticipatory and planned adaptation, although it could also support market and welfare changes that trigger adaptation responses.

27. Figure 1 presents the different concepts within adaptation applicable to GEF projects. For a given *historical climate* baseline, with a given mean and variability (as shown by the left side of the blue-lined time series), there is a *coping range* within which a system (i.e. a community, an economic sector, an ecosystem) can cope with climatic variability. For instance, some years are naturally wetter than others, but for the most part rainfall is within the system’s minimal needs and/or does not exceed the amount that it can tolerate. Beyond these thresholds, the system is *vulnerable*, and a disaster may happen if the weather exceeds them. The coping range is a measurement of the *resilience* of the system.

28. In a changing climate, the climate is moving incrementally towards new *scenarios* as projected by models, with subsequent modifications in the means and variability of climatic variables. Some of these changes are manifesting now, and as a result, the normal resilience of the system is under stress and less able to cope with some events.

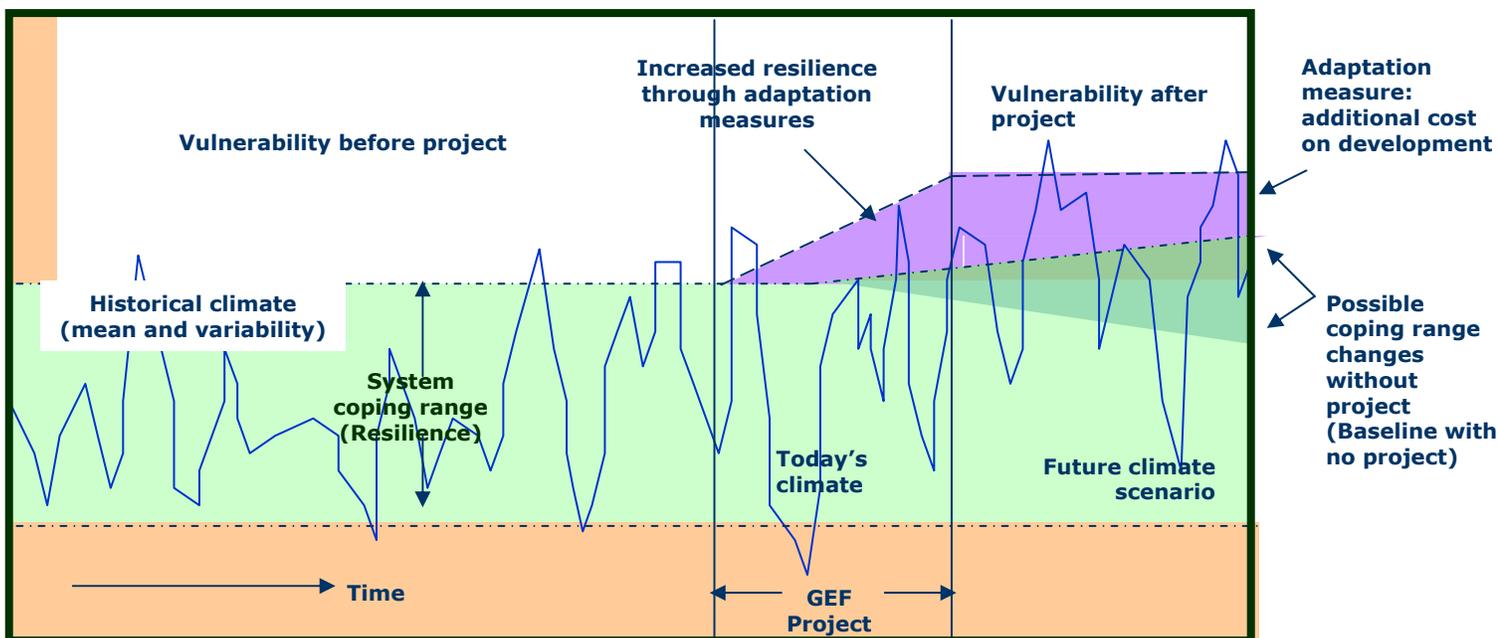
¹ Throughout the research conducted during the preparation of this report, the author found many inconsistencies in definition of terms and concepts related to climate change adaptation, so it was thought that a conceptual review was necessary.

Under the new climate scenario, the existing coping range is no longer as suitable. There is therefore a need to *adapt* to changing conditions.

29. GEF adaptation projects intervene to expand or shift the coping range of the target system so that by the end of the project it encompasses a greater portion of the variability under the new climate scenario. They do this by implementing *adaptation measures* and activities that *reduce vulnerability* or *increase adaptive capacity*. The increase in adaptive capacity will hopefully enable systems to further expand their coping range once the GEF project is over.

30. But the climate baseline is not the only moving baseline and not the only one affecting the coping range. There is also constant change in terms of socioeconomic conditions, infrastructure, demographics, political context and other variables. Changes along these axes can narrow or expand the coping range of societies. Therefore, the GEF project baseline—the situation projected into the future without the project—has to take into account not only forecast in climate (and its impacts) but also forecasts in socioeconomic, environmental and technology indicators when planning and evaluating adaptation interventions and determining the adaptation measures needed.

Figure 1 - Adaptation to climate change and the role of GEF LDCF/SCCF adaptation projects (Adapted from *Adaptation Policy Framework* (Lim et al., 2004, Technical Paper 5, Figure 5-2)



31. Several activities directed toward the accomplishment of Millennium Development Goals (MDGs), as well as other development initiatives, are in peril because of climate change. For instance, efforts to reduce the incidence of malaria might be hampered by an increased risk of epidemics due to an expansion in the range of

malaria-prone areas. In order to secure the development gains in fields such as public health, infrastructure building and poverty reduction, many of these activities need to incorporate climate change risk considerations, so as to “climate-proof” them. Also, improved environmental management is needed as a preventative measure to reduce the breeding grounds in which vectors thrive. This takes on a more prevention approach rather than a post-contraction response. In principle, all this involves additional costs. That is why the LDCF and SCCF funds finance the additional costs of adaptation on development activities, although it is acknowledged that a common methodology to estimate these additional costs is still a work in progress carried out by academic institutions, international organizations, and developed and developing countries.

32. A successful adaptation intervention would ideally result in a new coping range that covers most of the new climate patterns and variability under the scenario conditions. The scenario conditions in most cases will have not materialized at the time of the project termination, although the adaptation measures might be tested by one-time events that resemble future scenario conditions (i.e., extreme drought or precipitation events, cyclones causing storm surges similar to the sea level rise predicted for the future). The GEF LDCF/SCCF investment is, of course, not the only factor affecting the system’s resilience.

33. Figure 1, however, cannot capture all the dimensions of adaptation. Sometimes, the climate changes are so dramatic that an expansion of the coping range is too expensive, impractical or impossible. In such a case, adaptation may involve accepting the losses and changing activity altogether. In these cases, natural systems will probably change state whereas human systems will have to be abandoned.

Vulnerability and adaptive capacity

34. *Enhanced resilience, vulnerability reduction* and *improvement in adaptive capacity* are measured as outcomes for the GEF LDCF/SCCF-financed adaptation activities (GEF 2006, 2006b and 2007, UNDP, 2007). As indicated above, clarity of definitions is important. Given that the GEF is the financial mechanism of the UNFCCC, the present document proposes to use IPCC definitions (Parry et al., 2007):

“Resilience is the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change”.

*“Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its **adaptive capacity**.”*

“Adaptive Capacity is the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.”

35. For the IPCC, vulnerability is an overarching concept that includes many dimensions, one of which is adaptive capacity. If the GEF adopts these definitions it would be appropriate to state that the overarching measure of progress in adaptation is singular: reduction in vulnerability. Indicators of increase in adaptive capacity could be considered a part of vulnerability reduction, yet it is useful to leave them as a subset. For purposes of the M&E framework, the so-called vulnerability reduction activities can refer to all adaptation actions that do not include adaptive capacity, although specific adaptive capacity activities also ultimately reduce vulnerability. Increased adaptive capacity also allows for further reductions in vulnerability as the climate progressively changes. Indicators of enhanced resilience can be thought of as indicators of vulnerability reduction.

36. In the context of GEF LDCF/SCCF projects, **vulnerability reduction** would thus entail activities that reduce directly the susceptibility of ecosystems and human systems (human populations, human landscapes and infrastructure) from the adverse impacts of climate change, making them more resilient and less prone to damage from a changing climate. It must be emphasized though, that vulnerability depends on the nature of the climate hazard and the affected system.

37. Activities to **improve adaptive capacity** would target the capacity that is used in response to or in anticipation of climate change (technological ability, information availability, policy reform, early warning systems, economic means, diversification of activities, climate change awareness, risk management, etc.)

38. Conceptual clarity is fundamental for monitoring and evaluation of adaptation, as it defines what is being monitored. Typically, when the concepts are fuzzy and undefined, everybody adopts different definitions and therefore measurements and indicators become incomparable, or people become mired in semantic discussions. Although these discussions are valid for their own sake, the GEF cannot wait for scientific consensus to emerge on the definitions to start monitoring its results. For this reason, the GEF must adopt definitions and use them explicitly and consistently. Some of them will be political rather than scientific, but this is natural given that the GEF is the entity operating as a financial mechanism of the United Nations Framework Convention on Climate Change (UNFCCC).

The link of adaptation with disaster risk reduction

39. Many of the impacts of climate change are related to disasters²; therefore, the study of disasters is an appropriate analogy. However, there are important differences to note.

40. *Disaster Risk Reduction*³ of weather related disasters is the area closest to adaptation because it aims to reduce the risk of disasters by targeting its different dimensions. The risk of a disaster (regardless of the nature, but applicable to weather related ones) is a function of the magnitude and probability of a hazard, the region exposed, and the vulnerability:

$$\text{Risk of disasters} = \text{Hazards} * \text{Physical exposure} * \text{Vulnerability}$$

Where: Hazard = magnitude and probability of a natural hazard occurring

Physical exposure = people and assets exposed to the hazard

Vulnerability = susceptibility to be harmed/killed/destroyed/affected by the hazard

Taking the same equation and using it for disasters under climate change conditions in some future time would look as follows:

$$\text{Risk of disaster in a changed climate (at time } T_n) = \text{Hazards at time } T_n * \text{physical exposure at } T_n * \text{Vulnerability at } T_n$$

41. The equation is the same but the magnitude and probability of a natural hazard will be different given the predicted changes in climate. The indication of time is the key component that differentiates natural disasters from climate change impacts, because the risk varies according to the scenarios for change, usually in incremental fashion (e.g. 1° C increase in 10 years, 2° C increase in 25 years). This distinction is important, because in the standard disaster framework, the hazards magnitude and probability did not change much over time, whereas the exposure and vulnerability were the most variable factors. Nowadays, the hazard profiles are changing and are expected to keep doing so. Thus, adaptation interventions need to understand current vulnerabilities, but also project them into the future with the new expected hazard intensities and probabilities.

42. The main conceptual difference between the two fields is, nonetheless, that adaptation to climate change not only implies adjusting to one-time disasters, but also to changes in mean conditions. These changes may deem necessary a shift in activities and livelihoods, not just “disaster-proofing” them. For instance, an agricultural adaptation to

² For instance, increased risk of droughts, flooding and wildfires, increased intensity of storms, heat waves, coastal flooding, glacial lake outburst floods.

³ Disaster recovery or emergency response (after the disaster) is another important area in the disasters field but it is not discussed in this paper.

a higher mean temperature is to change crops and/or farming techniques altogether, whereas preventing damage from one-time extreme heat events can simply mean acquiring an insurance policy.

Monitoring and Evaluation within an Adaptation Policy Framework

43. UNDP developed an Adaptation Policy Framework (APF) as a guidance document to assist developing countries for the implementation of GEF and other adaptation initiatives (Lim et al., 2004). It lays out an Adaptation Policy Process as a useful step-wise framework for developing and implementing adaptation policies and strategies. Although there are other frameworks available (for example, DEFRA in the UK) it was decided to use the one prepared by UNDP because it includes a direct relationship to the GEF, a developing countries context, and it does help to place the monitoring and evaluation components of adaptation within the larger context of the whole range of adaptation activities.

44. The five components of UNDP's APF Adaptation Policy Process are as follows (Lim et al., 2004):

- i. Component 1: Scoping and designing an adaptation project (appraisal, define objectives, integrate in planning and policy)
- ii. Component 2: Assessing current vulnerability (climate and socioeconomic baseline)
- iii. Component 3: Assessing future climate risk (scenarios)
- iv. Component 4: Formulating an adaptation strategy (defining the level of risk acceptable for each hazard, and the selection of measures)
- v. Component 5: Continuing the adaptation process (involves implementing, monitoring, evaluating and sustaining the initiatives launched by the adaptation project)

45. Monitoring and Evaluation activities are within Component 5 of the Adaptation Policy Process. The goal for an M&E system for adaptation is to identify the aspects that are working, those that are not working, and the reasons why, as well as providing mechanisms to adjust the adaptation process accordingly. A sound M&E system would have a framework with defined goals, objectives and measures, which enables planning for data collection in anticipation of the requirements for evaluation.

46. The above sequence is an ideal progression of an adaptation project, in which monitoring and evaluation are relatively straightforward. Even so, there are elements of uncertainty given that climate change scenarios remain imprecise. Occasionally, such as after an extreme weather event, a reactive evaluation without such a step-wise process can be undertaken. If the event is similar to one predicted by a climate scenario, one can tell how well a society has fared or adapted.

47. It is important to distinguish monitoring and evaluation of adaptation interventions —ex-post evaluation, from vulnerability or climate change impact

assessments —ex-ante evaluation. Confusion arises sometimes, particularly in other languages where the word “assessment” has similar translation as “evaluation”, such as in Spanish.

48. UNDP’s APF is a useful conceptual framework for project evaluation but its application is limited at the programmatic scale for the GEF, while global strategies necessarily account for other considerations. Other adaptation policy frameworks are being developed too, from which further insights could be garnered.

EVALUATION OF ACHIEVEMENTS OF GEF INTERVENTIONS FOR ADAPTATION

49. How can “reduction in vulnerability” and “increase in adaptive capacity,” the two expected outcomes of the GEF adaptation program, be measured in the context of GEF projects, particularly for the SCCF and LDCF?

50. The evaluation of achievement of objectives in GEF adaptation projects has to satisfy both scientific and technical scrutiny, as well as the political and institutional context in which the SCCF and the LDCF were set up. Politically and institutionally, the mandates and objectives of these funds are clear: enhance resilience, reduce vulnerability and increase adaptive capacity, address the urgent and immediate adaptation needs of least developed countries (LDCF), and secure development achievements that are sensitive to climate change (SCCF).

51. Yet, it is practical to translate those objectives into a more rigorous technical categorization, in order to identify different components of adaptation that require different methods for evaluation. UNDP’s APF outlines the objectives of adaptation as follows:⁴

1. Increasing the robustness (capacity to withstand new climate regimes and extremes) of infrastructure designs and long-term investments in development.
2. Increasing the flexibility of vulnerable managed systems
3. Enhancing adaptability of vulnerable natural systems
4. Reversing trends that increase vulnerability (mal-adaptation measures)
5. Improving societal awareness and preparedness

52. *Increasing the robustness of infrastructure.* Achievement of this objective would be to effectively climate-proof infrastructure and development investments. Investments should be judged then by how they perform against an expected climate scenario, not against a current historical climate. For instance, the first hurricane ever recorded in the South Atlantic hit Brazil in 2004. A plausible climate change scenario for Brazil might include hurricanes as a new occurrence every few years. Thus, investments such as housing projects would be judged successful in adaptation if they adhered to higher standards and were strong enough to withstand hurricane-level winds (the question of

⁴ This classification is only one of several possible, and likely not the most appropriate in the long run. However, UNDP’s APF spans a continuum of adaptation approaches, it is appropriate for the GEF context and it is useful for the purposes of this document to illustrate the various evaluation methods needed.

cost-effectiveness should be recognized). This would be considered a vulnerability reduction activity.

53. Increasing the flexibility of vulnerable managed systems. Achievement of this objective might be evaluated by having a wider coping range of a system, either by increased resilience or by the availability of alternatives for the people dependent on such system. For instance, in an agricultural area where crop failure is becoming frequent, successful adaptation would mean that farmers are able to shift to a less water demanding crop if the seasonal precipitation forecast predicts dry conditions. It can also mean that crop insurance is available for farmers. This would be considered an adaptive capacity activity. The larger share of adaptation interventions belong in this category, as it virtually includes all sectors of development.

54. Enhancing adaptability of vulnerable natural systems. The classic case of a successful adaptation in terms of this objective involves reducing non-climatic pressures on natural ecosystems. For example, the reduction of land-based marine pollution, elimination of dynamite fishing and anchor damage from scuba diving boats on coral reefs may enable the coral reefs to be more resilient to high sea surface temperatures, diminishing the impact of coral bleaching. This would be considered a vulnerability reduction activity.

55. Reversing trends that increase vulnerability. A successful adaptation entails preventing vulnerability in the first place. Thus, it would be measured more by activities avoided than by those carried out. As an example, the reversal of deforestation in the upper parts of a watershed will reduce chances of water scarcity for users downstream in a new climate change scenario. Also, denying the building of a hotel development project on a coastline that is highly vulnerable to storms and sea level rise will be a measure of success in the reversal of mal-adaptation. These would be considered vulnerability reduction activities.

56. Improving societal awareness and preparedness. This refers almost entirely to improvements in adaptive capacity to react to climate change. Success may range from the inclusion of climate change considerations at all levels of policy, to the education and training of the population in adaptation strategies, changes in public attitudes and behaviors; and/or the existence of early warning systems to react promptly to warnings of natural hazards. An example of a successful case would be a city where a campaign effectively reduced water consumption, and where an early warning system for heat waves enabled the city authorities to prepare beforehand, establishing cooling centers for residents, while attending to the needs of the homeless and elderly population.

57. It should be clear that success in adaptation does not necessarily mean an improvement in the current conditions. In some cases, the best outcome that can be expected is to maintain the present state of a system and prevent it from deteriorating. Win-win situations, where adaptive capacity or vulnerability reduction is achieved concurrently with other development objectives, are not possible in some sectors and trade-offs are unavoidable. In other cases, particularly where climate change impacts seem irreversible, such as with glacier melting or coral bleaching, the most realistic

positive outcome is to reduce the extent of collateral damage caused by these impacts. In some cases, climate change impacts could present opportunities for enhanced development. For instance, adaptation measures may involve developing markets for new technologies more resilient to new climate scenarios.

Methods and strategies for evaluating adaptation success

58. In all the above cases there are several crosscutting criteria through which projects can be evaluated. Adapted from Horrocks (n.d.), the following paragraphs include a list of possible techniques for evaluating adaptation projects. These techniques depend on the sector in which the adaptation project is implemented and the hazards involved.

1. Evaluation against climate scenarios

59. The project's outcomes should be measured against the future climate scenarios and specific hazard to which the system is adapting to, regardless of whether the scenario or hazards have actually materialized by the end of the project. Unidirectional trends like sea level rise, melting of glaciers and increase in temperatures have a higher degree of certainty in the scenarios, albeit with uncertainty in the timing; whereas precipitation variability and trends in extreme weather events generally have less precise predictions. In any case, adaptation projects should account for these conditions and be evaluated with the range of potential risks in mind, although focusing more on those with higher likelihood of occurrence.

2. Performance of project interventions against climate impacts

60. Project activities can be tested against forecasted climate conditions (drought, storms surges, coral bleaching, wildfires, etc.) if they occur during the implementation of the project. A particular building code, a particular strength of a crop or the performance of an early warning system set by a project can be tested by the advent of a storm or a heat wave, with similar conditions to the ones expected in the future.

3. Comparison of performance between areas

61. Another evaluation method that can be used for adaptation is a control comparison of the project area with similar areas outside the project, examining differences in performance. This experimental procedure can facilitate the attribution of success or failure to a project intervention and generate compelling information that induces replication or abandonment of such a strategy. Other comparisons can be made between areas that have suffered similar disasters at different times, in terms of relative damage or number of victims, to assess the effectiveness of disaster risk reduction measures.

4. Assessment of outcomes against known best practices, global targets or recommended standards

62. A multitude of disciplines and authoritative organizations (ISO, World Health Organization, IUCN, etc.) have issued quality standards, recommended benchmarks, targets and codes of practice that apply to numerous development investments. The engineering discipline is an example where the codes of practice reflect a risk management approach; with established codes for incorporating flood risk into infrastructure design taking into account return periods and magnitude of flood events. A climate-proofed bridge, seawall or levee would then be built with a return period of floods adjusted for the climate change scenario available for the region.

63. In other cases, where adaptation means maintaining development growth, measures of success will mean maintaining certain benchmarks such as nutritional indicators, water availability per capita or agricultural productivity.

5. Comparison of vulnerability and adaptive capacity indicators via vulnerability assessments at the project completion

64. The field of disaster risk reduction (DRR) has ample experience on measuring reductions in vulnerability and improvements in adaptive capacity to natural disasters by developing indicators and benchmarks⁵. Many of their indicators can be carried to the adaptation field to account for success or failure of project interventions. Given that adaptation projects by the SCCF and LDCF presuppose the existence of a previous vulnerability assessment, a reassessment of vulnerability at the end of a given project can be an excellent tool to measure project success and sustainability into the future. However, it is necessary to distinguish the role that other factors besides the project have played in changing vulnerability over time.

65. The use of a standard vulnerability and adaptive capacity tracking tool would be very helpful in order to facilitate evaluation at the project and program level, aggregation of indicators, comparability among projects, and attribution of adaptation outcomes to project interventions. The GEF already has experience with such tools: the Tracking Tool for Management Effectiveness of Protected Areas (GEF, 2003) is required for all GEF projects working with protected areas. A similar tool for adaptation projects could be called “Adaptation Assessment Tool” and could be derived from previous work such as the Vulnerability Reduction Assessment (VRA) scorecard (Appendix 3), which has already been used in some UNDP GEF projects⁶. (*See Section 6 on Recommendations for an M&E framework for adaptation at the GEF*).

6. Proxy indicators and procedural indicators

⁵ Although not covered in this paper, DRR of technological disasters (eg. Nuclear power, chemical spills) might give some insights for climate change adaptation.

⁶ Community Based Adaptation” and “Adaptation to Climate Change” and “Responding to Coastline Change and Its Human Dimensions in West Africa through Integrated Coastal Area Management”

66. Procedural indicators, those that account for the advancement of project activities but not their completion, are the ones that show the quickest changes within the timeframe of GEF interventions, so they are appropriate to provide milestones in the process of adaptation. However, process indicators alone are not sufficient to assess achievements, and it is desirable to require projects to complement them with concrete indicators of adaptive capacity improvement or vulnerability reduction (eg. Policy approved, enforced, evaluated) rather than only have procedural indicators, such as “policy drafted”.

67. Proxy or indirect indicators are necessary when the actual measurement of an impact is difficult to directly calculate, or its timeframe for achievement lies beyond the project lifetime. For instance, the indicator “Mangrove density and extent” would be a proxy indicator for the strength of a coastal defense against storm surges, in the absence of direct measures of resistance to storms.

The Role of Context Indicators

68. Depending on the type of projects, different indicators might be relevant and useful as a reference to put the GEF interventions in context. Some of them might be local in nature, while others can be national. National level indicators such as the Disaster Risk Index (UNDP, 2005) or literacy rates can help assess progress at the scale of a program. Local level data can include water quality measures and poverty levels. Changes in context indicators from the onset to the end of the project can also help assess the impact of GEF interventions.

69. Most countries have established development and sectoral targets and indicators. By referring to them it is possible to assess how a GEF adaptation project contributes to the development policies and strategies of the country.

Difficulties of Evaluating Adaptation

70. The following paragraphs present different issues related to adaptation that could add difficulties in evaluating adaptation investments at the end of the day.

1. Success when nothing happens

71. Akin to the natural disaster prevention field, there is a reverse logic in many adaptation projects: success occurs when nothing happens. Success is easily detectable if a climatic extreme occurs and the system effectively withstands it, but it is much more difficult to detect when such an extreme does not happen or changes are more gradual. In these cases, an evaluator also needs to be satisfied that the system could not have withstood the extreme event or a projected future average condition anyway without the project intervention. Proxy indicators measuring adaptive capacity to manage change may be a way to overcome this.

2. Evaluations occur too early

72. Another problem relates to the timing of the evaluation. There is no established reference time to which adaptation measures should be targeted; although the most commonly cited years are 2020, 2050 and 2100. Evaluations will usually occur much earlier than the date of the targeted scenario and the expected impacts⁷. To have regular ex-post evaluations a few years after a project's completion would be a good strategy to address the timing problem, at least partially. Evaluating adaptive capacity in lieu of adaptation measures themselves is also helpful here because it dwells less on the effectiveness of measures and more on the flexibility and readiness to change.

3. Uncertainty in climate scenarios

73. Some areas of the world have a great deal of uncertainty regarding their climate variability and change, as provided by existing models, although a common trend of many scenarios is to anticipate greater variability between dry and wet periods. The approach most commonly taken then is to plan for adaptations to extremes of drought and flood simultaneously.

4. Short-term weather variability may affect the effectiveness of adaptation measures but not in the long term

74. Furthermore, not only is there uncertainty in climate projections, but the adaptation baseline is also moving, so the project evaluation has to be calibrated accordingly. The weather during the project may affect the performance of the adaptation measures carried out by the project, either positively or negatively. Therefore, it is important to monitor the climate baseline during the course of the project to discern the effect. For instance, good rainy seasons during an agricultural adaptation project may not really test measures directed to adapt to drought, so the performance of crops during those years would not be the best measure of success for the project. Vice versa, apparent failures in adaptation might actually be project successes if it is evident that without the project intervention the situation would have been much worse (UNDP, 2007).

5. Contribution rather than attribution

75. According to the GEF M&E policy (GEF EO, 2006), rather than demonstrating that a particular impact or outcome is due to a GEF intervention, it is sufficient to document a contribution to that outcome. This is in recognition of the fact that besides GEF, there are many other influential actors and events at project sites. This is aligned to current M&E thinking and removes a burden on project managers and evaluators. For instance, it is not necessary to have a clear-cut separation between a project's traditional development costs and the additional costs of adaptation. The GEF realizes that this is impossible to determine this accurately in many circumstances and thus has eased the procedures for establishing these additional costs at the project inception phase. The contribution of GEF interventions to adaptation benefits is much easier to determine through adequate baseline monitoring. There can be situations where projects that claim

⁷ This happens in all GEF focal areas; after a 5 year intervention it is difficult, for example, to prove that biodiversity has been conserved.

adaptation successes might in reality have benefited more from a very favorable climate during the project years (contrary to climate change scenarios) than from GEF interventions themselves.

Trade-Offs and Synergies

76. A full evaluation of success in adaptation has to consider the trade-offs made to carry out those adaptation actions as well as the synergies involved in implementing them. The ideal adaptation actions GEF projects fund are activities aligned to sustainable development principles: those that benefit development objectives, are not harmful to the environment, and yield social dividends as well: “win-win situations.” SCCF and LDCF adaptation projects, although not part of the GEF trust fund, should not work against the environmental targets the GEF has set for its focal areas. It may be worth noting, however, that in cases when the adverse impacts of climate change include the risk of loss of human life, should the suitable adaptation measure have some environmental impact, it should not be automatically excluded. This is the nature of trade-offs; they need to be decided most likely at the national level, under acceptable safeguards.

Maladaptation measures

77. A successful adaptation action should not enhance the vulnerability of the system to climate change. If it does, it is a maladaptation measure. At a local level, for instance, an adaptation action that taps groundwater supplies in lieu of rainwater for agriculture would become a maladaptation action if the groundwater were to be extracted at an unsustainable rate; thereby depleting water table levels and making people even more vulnerable to water scarcity in the long term. There are trade-offs at the spatial and temporal scales as well. A local adaptation action might also increase overall vulnerability at a global level. One fictional case could involve a GEF project facilitating the purchase of air conditioning units for each household in an area to better cope with heat waves, without regard for the efficiency of the air conditioning units, or the adequate insulation of the dwellings. Unless there were renewable energy sources powering this new demand, the electricity consumption would increase substantially and along with it, greenhouse gas emissions. An adequate alternative project would definitely take GHG mitigation into account and favor a comprehensive program not only of air conditioning units, but also improve building insulation and design, and create cooling centers for communities.

78. Vulnerability assessments made before the onset of project are useful to prevent the implementation of measures that might be maladaptive in the end.

No-regrets and low-regrets measures

79. A ‘no regrets’ adaptation action is one that yields development or environmental benefits on its own, even if the regional climate scenario or hazard to which it is adapting does not materialize as expected. A classic example is mangrove replanting for storm protection. If tropical storms do not actually intensify and increase frequency in coming decades, healthy mangroves still provide nursery grounds for fish and shellfish.

80. Low-regrets adaptation actions are ones where the investments would be slightly regretted if the climate scenario did not materialize, but given the limited additional costs involved, are judged appropriate to perform anyway. For instance, investment on an early warning system for a heat wave involves personnel time, planning and certain equipment, but rarely massive investments. Therefore, it is judged appropriate even if heat waves fail to occur.

81. High-regrets adaptation actions are actions that are very costly and might not be worth it, either because they are not able to mitigate climate impacts effectively or because the economical and societal costs of the measures outweigh the benefits they bring. For instance, a massive seawall that protects a road against erosion, sea level rise and storms might be judged a high regrets option if there were no guarantee that the seawall is an effective protection for stronger cyclones. In such a case, it may actually be less costly to build an alternate road inland and let the ocean eventually reclaim the previous road.

82. Efficiency, cost-effectiveness and the level of risk a system can tolerate should be considered when evaluating adaptation investments. Of course, no-regrets actions are preferred to low or high regrets investments for adaptation. Actual implementation will provide better assessment of the actions’ level of regret.

Environmental and social impact of adaptation measures

83. The least desirable result of adaptation measures is that we find the cure worse than the disease. Therefore, when evaluating the implementation of adaptation measures, their environmental and social impact has to be taken into account beyond their impact on vulnerability and adaptive capacity to climate change.

84. Many vulnerability assessments carried out so far have been sectoral and do not lend themselves to understanding likely impacts of adaptation in one sector on another related sector. For instance, building a dam with irrigation infrastructure to boost agricultural production might adversely affect health outcomes that were never considered. Integrated assessments are necessary to minimize these kinds of problems.

85. In terms of environmental impact, much has been discussed about the negative effects of the promotion of bio-fuels as a GHG mitigation activity, such as its incentives for deforestation of tropical forests and the relative increase in the price of food. Adaptation activities could have similar problems if promoted without care. One example is the migration of ski resorts uphill in the Alps; an adaptation measure that could alter

even more the fragile ecology of pristine high mountain ecosystems, even if it succeeded in taking the ski resorts to areas with more reliable snow every year.

86. Conversely, another parameter by which to evaluate adaptation projects is the synergies and win-win activities with the global development and environmental agenda, such as the achievement of Millennium Development Goals, linkages with Poverty Reduction Strategies, contribution to biodiversity loss reduction, greenhouse gas mitigation and opportunities with carbon markets, and the phasing out of Persistent Organic Pollutants (POPs), among others. National level priorities should also be considered when evaluating synergies.

MONITORING, EVALUATION AND INDICATORS IN GEF ADAPTATION PROJECTS: STATE OF THE ART

Survey of Indicators and M&E Systems of GEF Adaptation Projects

87. Only projects for Stage III of adaptation⁸ were chosen for the purposes of this survey. The enabling activities funded under the GEF to produce the National Adaptation Programs of Action (NAPAs) for Least Developed Countries or the National Communications for the UNFCCC were not taken into account, as these projects rarely incorporate an implementation phase of adaptation measures and focus primarily on vulnerability assessments.

88. The range of projects reviewed extends across the world, from small island states in the Pacific and Caribbean, to East and West Africa, China, Eastern Europe and South America. Many projects address adaptation for water resource management, either for expected drought or increased variability in freshwater availability for domestic and agricultural uses. The threats of sea level rise, saltwater intrusion, coral bleaching and increased probability of storms and storm surges are addressed by several projects in coastal areas. Other areas of adaptation work include land degradation, biodiversity, public health and infrastructure. A descriptive table of the projects is given in Appendix 1.

89. This review includes 17 projects that had been approved by the GEF CEO or Council (under implementation or closed) and projects proposals that were sufficiently advanced to have an indicator framework. These projects are implemented by the World Bank, UNDP, UNEP and IFAD. The small number is a reflection of both the limited funding available for disbursement, in particular through the SPA and the SCCF, as well as the recent implementation of these funding windows, which became operational in recent years. A few older projects belonging to the main GEF Trust Fund were also included because they had components of adaptation measures on the ground. Although other adaptation projects have been carried out outside of the GEF, the scope of this review was limited to the GEF portfolio.

⁸ Actual adaptation measures on the ground

90. The methodology to review these projects was straightforward. Each project document was reviewed to extract the indicators used, which were, for the most part, extracted from the logical framework. Notes were also taken on the monitoring and evaluation provisions of each project. The baselines of the project were also annotated, as well as the different context to which the indicators referred.

91. The indicators for each project were grouped into categories, following the Generic and Thematic templates provided by the draft UNDP Monitoring and Evaluation framework for Adaptation to Climate Change (UNDP, 2007). For those indicators that did not have a corresponding category in the UNDP Framework, new categories were created. The compiled inventory is found in Appendix 2.

Project Indicators – Findings

1. Robustness of indicators by thematic area

92. The 17 projects reviewed covered only a small sample of possible adaptation investments so their indicators cover only a sample of the possible array of indicators for adaptation.

93. Relative to other project areas, those dealing with Disaster Risk Management and Water Resources have generally more robust and SMART indicators for assessing adaptation to climate change. This may be expected given that these sectors are closely related to climate conditions and variability, and therefore the extension of indicators to assess adaptation to additional long-term climate changes is relatively straightforward. For instance, the same indicators for efficient use of water use can be applied to adaptation, perhaps focusing more on the *improvement* in efficiency to be able to cope with a more unreliable supply of water.

94. On the other hand, indicators for adaptation to climate change for agriculture, public health, land management and biodiversity are less straightforward. These fields, although affected by climate change, are greatly impacted by other phenomena as well, so it is difficult to isolate the climate effect and hence gauge whether the sectors are adapting successfully to a new climate. The time lag of reaction to climate is longer in many cases too. Therefore, measuring adaptation has to be done indirectly, using proxies.

95. For instance, in the case of biodiversity, the extension of protected areas is thought to be a good adaptation measure because if non-climate stresses are reduced on the ecosystem, it is in theory more resilient and can more easily withstand climate changes. Larger protected areas would also allow for expected shifts in habitats and ranges of species. However, the real success of a protected area as an adaptation measure cannot be examined directly until an extreme weather event occurs and tests the resiliency of the ecosystem, or a range extension or habitat shift are documented.

2. Generic indicators of adaptation

96. In spite of the multitude of sectors that adaptation projects involve, there are many generic adaptation indicators that have yet to be aggregated across multiple projects and make possible the evaluation of the total impact of the GEF at a program level (See Appendix 2). Many of these indicators were present in the projects reviewed, and they refer for the most part to cross-sectoral issues like vulnerability assessments, policy mainstreaming, adaptation planning, funding for adaptation, public awareness, capacity building and education. Indicators related to climate monitoring and projections –for instance, development of local climate change scenarios, improvement of meteorological networks– can be placed under specific and generic categories, given that they are indicators of information availability useful across different sectors. The same can be argued for economic diversification indicators, a topic that encompasses multiple thematic areas.

97. Generic indicators can be overly coarse to be useful for project managers, but when aggregated they are important as a reporting instrument to assess and document the effectiveness and progress of the GEF adaptation portfolio.

3. Measures of reduction of vulnerability and increase in adaptive capacity

98. Surprisingly, none of the projects employed direct indicators of “reduction in vulnerability” or “increase in adaptive capacity” as measures of their success. These have been suggested by UNDP in its framework (UNDP, 2007) and can indeed be used across projects in an Adaptation Assessment Tool if the proposal is eventually adopted (see Section 6 on recommendations). Given that the reduction of vulnerability and the increase in adaptive capacity are ultimate objectives of adaptation, it is important that all projects have simple measures of these, even if stakeholders and experts base them on educated guesses and perceptions rather than on quantitative data.

4. Vagueness and ambiguity in indicators

99. There is a tendency to define indicators in a vague or very broad way, rather than in a specific and unambiguous way. This makes aggregation all the more difficult.

100. The following are some examples of vague indicators from various projects, even when considered within context:

1. The indicator “*Number of reports of coastal and marine ecosystem monitoring*”⁹ has clarity in the way that is going to be measured, by number of reports, but not in regards to the quality of actions or the type of monitoring (ie, coral bleach monitoring to water quality).
2. The indicator “*Positive impacts on biodiversity and land degradation*”

⁹ Kiribati Adaptation Program - Pilot Implementation Phase (KAP-II)

*documented*¹⁰ is vague because it does not define what it will consider as positive impacts.

3. The indicator “*Reduced time lapsed between reported drought stress and response (Percentage change in decrease of time)*”¹¹, does not define what would qualify as a response.

101. The problem of vagueness is more apparent when measuring degrees of improvement in the quality of an action, many of which are necessarily subjective. For the generic indicators, this could be resolved by including questions in the proposed “Adaptation Assessment Tool.” These could be assessed with a standard scoring scale, and quantitative values reflecting different degrees of quality. Even so, the sector or activity that changes has to be unambiguously defined; the AAT would simply provide a method to measure the degree of change during the course of the project.

5. Indicators of chain of results and evaluative criteria

102. A positive finding is that projects are balancing indicators of process, outputs, outcomes and impact; as well as indicators that cover the evaluative criteria of coverage, effectiveness, sustainability and replication. Efficiency indicators were altogether absent from the sample of projects surveyed.

103. With respect to impact and outcome indicators, their incidence was fairly widespread throughout the projects. However, for some of them time lag issues will be apparent because the impacts may take longer to manifest themselves than the project lifetime. For instance, indicators of presence of endangered species¹², area of ecosystems effectively restored¹³, or continuous river flow guaranteed for hydropower generation¹⁴ are effects that might take much longer than the project lifetime. It is important that projects have an understanding of these time lag problems and have additional indicators of activities that show progress in these directions.

104. On the other hand, other outcomes are more immediate and sound to have as indicators of project performance: percentage reduction in water leakage¹⁵, demarcation of marine protected area completed and disseminated among users¹⁶, and contingency plans for flood events in place¹⁷. Another important issue regarding outcome indicators is the way to measure their sustainability beyond the project lifetime.

¹⁰ Integrated National Adaptation Plan: High Mountain Ecosystems, Colombia's Caribbean Insular Areas and Human Health (INAP)

¹¹ Adaptation to Climate Change in Arid Lands (KACCAL)

¹² Implementation of Pilot Adaptation Measures in coastal areas of Dominica, St. Lucia and St. Vincent & the Grenadines

¹³ Participatory Coastal Zone Restoration and Sustainable Management in the Eastern Province of Post-Tsunami Sri Lanka

¹⁴ Adaptation to Climate Change through Effective Water Governance

¹⁵ Kiribati Adaptation Program - Pilot Implementation Phase (KAP-II)

¹⁶ Integrated National Adaptation Plan: High Mountain Ecosystems, Colombia's Caribbean Insular Areas and Human Health (INAP)

¹⁷ Conservancy Adaptation Project

6. Disconnection between adaptation actions and indicators

105. In several projects there was a disconnection between the adaptation activities to be implemented and the actual indicators proposed.

106. For instance, in the “Coping with Drought and Climate Change” project from Mozambique, the “Food production” indicator relies on multiple activities¹⁸, which if successful, would effectively contribute to an increased food production. However, at present, there is only one measure of outcome. It would be better to have sub indicators for the most important activities so that they could be tracked individually and their sum contribution to an increased food production be assessed more comprehensively.

107. In many projects, the actual adaptation measures to be implemented are not included in the log frame. Some projects explained that the adaptation measures would be identified and designed during the course of the project. In other cases, the objective of the measure was mentioned (i.e., water saving measures), but the specific measures were not. There were very few projects with indicators tallying the implementation of a concrete activity. Two examples are “*Rainwater collection facilities added*”¹⁹, or “*retrofitting of infrastructure for withstanding storms*”²⁰. Given the problems existing with measuring success in adaptation, it is desirable for projects to use more indicators of activities, not only because they narrate a story, but also because they complement measures of outcomes and impact that might be fuzzier and less difficult to measure within a project lifetime.

7. Yes/No indicators

108. The indicators of a Yes/No category, simply indicating whether an objective has been achieved or not, are very straightforward and useful in several cases. They are employed consistently across different projects, and have a lot of potential for standardization into an Adaptation Assessment Tool. For example, some of these indicators refer to particular documents that are planned or issued (i.e., Vulnerability Assessment, Management Plan, Disaster Response Plan), where the existence of a plan is the indicator itself; to the inclusion of climate change considerations in different policies and plans (mainstreaming); or to release of publications or products (adaptation tool kit, public awareness campaign).

¹⁸ “Increase quality and improve control of seeds distributed at fairs; provide access to a wider range of certified seeds and other agriculture inputs, Provide agriculture technical assistance, encouragement of fish farming; intensification of control/treatment of *Oidium* in cashew, and of the post-harvest plague *Prostephanus truncates*; encouragement to communities to grow drought resistance crops as a strategy to reduce hunger and mal-nutrition in the future; application of new agriculture technique for soil conservation including mulching.”

¹⁹ Kiribati Adaptation Program - Pilot Implementation Phase (KAP-II) and Integrated National Adaptation Plan:

²⁰ Implementation of Pilot Adaptation Measures in coastal areas of Dominica, St. Lucia and St. Vincent & the Grenadines

109. For the most part these indicators can be aggregated successfully across projects, generating simple statistics for the GEF adaptation activities as a whole.

8. Use of numerical indicators

110. Several projects included quantitative indicators. Examples of them included the number of policies implemented, stakeholders implementing adaptation actions, strategies employed to reduce vulnerability, lessons learnt, and households implementing water saving measures, among others. Although these indicators are fairly easy to collect, the information they provide is limited if not given in the appropriate context.

111. In some cases, it is obvious whether an increase or decrease in the number marks progress for adaptation, such as a decrease in the number of people affected by floods, or the number of households with rain collection facilities. But in other cases, there is no explicit benchmark established, such as for the number of policies established, people trained or lessons learnt. Despite these distinct differences, the common assumption is that more is necessarily better. Therefore, it is sensible to couple quantitative indicators with measures of proportion, such as proportion of ministries with climate change considerations in their plans, or proportion of teachers trained with respect to the whole population of teachers. GEF projects have not used proportion indicators extensively, presumably because in many cases it is difficult to define the universe of the population.

112. Another problem with these quantity indicators is the difficulty of providing meaningful information when aggregating them across projects. For instance, adding the number of policies that include climate change across projects may indeed give a number, but may not indicate whether the programs are effective.

113. Quantitative indicators could be more meaningful if combined with qualitative indicators. Albeit subjective in many cases, quality can be examined against recommended standards, expert opinion or stakeholder perceptions.

9. Indicators overall not SMART

114. Overall, the indicators used by GEF adaptation projects do not comply fully with the SMART criteria (specific, measurable, achievable and attributable, relevant and realistic, time-bound, timely, trackable and targeted). However, most of the problems with these indicators are inherent difficulties of measuring adaptation. In some instances, for example, the solution might be to simply split indicators whenever they attempt to measure two things simultaneously.

115. Other than scrapping indicators, a more viable solution is to enhance the information they provide by setting the context right, or establishing clear linkages from objectives to indicators in the log frames. By providing nested indicators and combining process, output, outcome and also impact indicators, direct and proxies, quantitative and qualitative, their individual limitations can be tempered by the sum of the whole.

10. Weak connections among indicators

116. One pervasive problem found throughout the projects is weak connections between indicators within a single project and the haphazard way that many of them are presented. Given that the process of adaptation to climate change has several components or steps, as exemplified by UNDP's APF, it would make sense to have indicators for them, even if not all steps are addressed by a particular project.

117. Understanding and addressing context is critical to adaptation, as has been mentioned in the discussion of moving baselines. For instance, indicators such as "*rainwater collection facilities installed*" provide much more information when put into context with additional indicators such as water availability per capita. Moreover, the indicators become even more meaningful when beginning with a baseline of relevant information, such as the amount of precipitation, number of days of rainfall and number of households in the area.

118. As another example, in the case of an indicator measuring how many public awareness campaigns have been implemented about climate change²¹, a complementary indicator evaluating the effectiveness of such campaigns by measuring public attitudes or behavior would be very informative.

Context Indicators – Findings

119. In the background information of the project documents, where the rationale and context for the project is given, numerous indicators are cited to describe the baseline and current situation the project is addressing. However, these are rarely presented in a structured way. For the most part, these indicators are not useful to measure the contributions of a single project because they are generic environmental or development, national or regional level indicators. And yet, they provide an invaluable context. Baselines that look at trends over time are often even more informative.

120. Examples of context indicators are the following:

1. Agricultural statistics: % of rainfed and irrigated agriculture
2. Environmental indicators: species diversity, land cover, land subject to desertification, coral bleaching, soil salinisation, bird populations
3. Climate information: departure of rainfall from normal monthly value, El Niño incidence
4. Basic development indicators: demographic growth, GDP growth, literacy rates, malnutrition of children under 5, population involved in agriculture
5. Disaster risk indicators: extent and damages of natural disasters, % of land below 3 m over sea level
6. Water resources: water balance in a watershed, water stress, irrigation efficiency, water leakage from infrastructure, water quality, river flow allocation for human use
7. Public health: incidence of malaria and dengue

²¹ Adaptation to Climate Change through Effective Water Governance

121. At present, the only purpose of these indicators is to provide a narrative for the project. However, they could be used more strategically to help in the M&E process. For this purpose, it would be ideal if projects had a more structured way to present these indicators as part of the baseline information, and be required to look again at the information at the end of the project to evaluate if changes in these contextual indicators have affected the results of the project. Of course, this should be required to the extent that it does not pose an undue burden on projects in terms of data collection.

M&E Systems – Findings

122. The monitoring and evaluation systems of the GEF adaptation projects reviewed are directly influenced by the M&E requirements of the GEF and the GEF Agencies implementing projects, for the most part UNDP and the World Bank. All of them require a log frame approach, although lately the World Bank has instituted a Results Based Management system. There has been a lot of attention devoted to M&E procedures in recent years, and therefore, the procedures devised are highly standardized and elaborate, focusing heavily on performance measurement, adaptive management of projects, learning and sharing of lessons, participatory monitoring and independent evaluations. M&E procedures can be thought as having two distinct components. One is the monitoring and evaluation of project implementation, which makes sure the project is running well according to plan; and the M&E of project achievements, which looks at how much impact the project is having.

123. In the case of UNDP projects, projects commonly involve the following monitoring and evaluation requirements: Inception Report, Annual Project Report, Project Implementation Review (a GEF requirement), the Terminal Tripartite Review and Mid-Term and Final Evaluations prior to termination of the project. The project executors write the reports, while the terminal tripartite review is the highest policy level meeting of parties involved, and has the authority to stop disbursements if benchmarks are not met. The mid-term and final evaluations are external and independent.

124. In the case of World Bank projects, the M&E procedures regularly involve bank supervision missions, mid-term reviews with internal and external evaluators, as well as final evaluations.

125. So far, only one GEF adaptation project, apart from the enabling activities of NAPAs and National Communications to the UNFCCC, has reached the stage where it has had a Terminal Evaluation. That is the “*Caribbean Planning for Adaptation to Global Climate Change*” (CPACC). However, given that the project was heavily focused on vulnerability assessments, improvement in technical and monitoring capabilities and capacity building, rather than implementation of adaptation measures themselves; the M&E component didn’t have particular features of targeting the evaluation of success of adaptation measures. The terminal evaluation methods were beneficiary surveys, a stakeholder workshop and rating of achievement of outputs.

126. With respect to the means of verification employed by projects for their monitoring, the methods are fairly standard. Many of the means of verification listed are

information found on documents: policy statements, management plans, minutes of meetings, signed agreements and progress reports. Household surveys, interviews and questionnaires were also listed. A comparison with the baseline as a method of verification was explicit in a few projects, although it is implicit for all projects in the log frame approach. Field surveys and field verification were mentioned too, albeit with little information as to the exact nature of measurements. This reflects both uncertainty in what to measure to evaluate the success of adaptation measures, as well as the fact that many of the projects still focus largely on advancing adaptation in the policy and planning agenda. Unfortunately in some cases, ambiguity and vagueness is a safety tactic to reduce the burden of accountability during the evaluation phase in the event that the project isn't as successful as planned.

127. The following paragraphs present lessons from the review of M&E systems.

1. Using the Vulnerability Reduction Assessment

128. Two projects: “Community-based Adaptation Programme” (CBA) and “Adaptation to Climate Change - Responding to Coastline Change and Its Human Dimensions in West Africa through Integrated Coastal Area Management” employed the Vulnerability Reduction Assessment, a simple tracking tool with seven areas of inquiry covering the different steps in the Adaptation Policy Framework. The VRA follows the approach of the Tracking Tool for Management Effectiveness of Protected Areas mandated for GEF projects in protected areas.

129. The Vulnerability Reduction Assessment is a very promising tool than can be developed further to standardize a generic evaluation of adaptation success in different projects by establishing a baseline that then can be reassessed once the project is completed, as well as to translate stakeholders' opinions and perceptions into quantifiable scores (See Appendix 3).

2. Technical M&E Provisions

130. The “Conservancy Adaptation Project” in Guyana, an engineering project of flood control infrastructures has an important component of the M&E to ensure a quality control of the engineering works. Therefore, the project specifies that an independent engineering company is going to be hired to monitor the execution of the project works.

131. Many projects in adaptation involve infrastructural improvements, in housing, public buildings, public services and others. These projects demand more technical M&E provisions assuring the standards set by professions such as engineering.

3. Monitoring of baselines

132. A few projects paid significant attention to the monitoring of baselines, something that is definitely critical with adaptation. The project “Mainstreaming Climate Change in Integrated Water Resources Management in Pangani River Basin,” from Tanzania, includes the monitoring not only of baseline conditions, but also of the risks and

assumptions included in the log frame. The project “Adaptation to Climate Change in Arid Lands” (KACCAL) from Kenya established a baseline survey to be repeated yearly as a monitoring procedure.

133. Given the fact that in adaptation projects there is not only the current baseline but also the climate change scenario applied over the business as usual scenario, monitoring changes in baseline conditions is key, particularly to evaluate the effectiveness of the project. The science of climate change is also evolving rapidly, and climate scenarios are constantly being refined both in the temporal and spatial scale. As a consequence, the climate change scenario may easily change during the course of the project.

4. Adaptive management

134. The vast majority of projects had provisions for adaptive management (i.e., receiving feedback from M&E activities, providing input for replication, scaling up of activities or course correction, and even review of the indicators and monitoring system themselves). Projects that were global or regional in nature emphasized the learning component and sharing of lessons learnt as a central element of the M&E strategy (CBA, “Coastal Resilience to Climate Change: Developing a Generalizable Method for Assessing Vulnerability and Adaptation of Mangroves and Associated Ecosystems”). In fact, the latter project belongs to IUCN’s Water and Nature Initiative, which has a “learning strategy” common to all its projects, which provides active exchanges between them. Several projects also mentioned their expected contributions to UNDP’s Adaptation Learning Mechanism (UNDP, 2007b).

135. Adaptive management, a core function of general M&E, is even more crucial a principle in adaptation projects. The lessons-sharing component of M&E systems is critical for adaptation projects if we want to emphasize the catalytic role of the GEF and capacity for replication.

5. Participatory M&E

136. Several projects, in particular KACCAL from Kenya, emphasized a participatory M&E strategy, whereby not only project beneficiaries are the main people who monitor results and self-evaluate performance, but also receive significant training looking forward to an institutionalization of monitoring in the region/sector or community.

137. Developing local monitoring capabilities is essential for adaptation projects. One compelling reason for this is that the first variable that needs to be monitored adequately for successful adaptation is the climate itself, to gauge the magnitude of changes, have forecasting capabilities and thus be able to react effectively.

6. Experimental design for M&E

138. The Kenya KCCAL project is the only project of those reviewed which provided an experimental design for monitoring impacts. The project will compare the results of

semiarid land management in districts with project interventions to conditions in districts without project interventions, which serve as a control.

139. This kind of experimental design is complex to carry out in practice due to the difficulty of isolating the impact of the project from other external factors that also differentiate the control and project sites. Furthermore, it is difficult to identify areas that remain comparable throughout the project life. Nonetheless, it is as a potentially effective approach because it may provide compelling evidence of the success of an adaptation measure, or of its lack of impact for that matter.

SUGGESTIONS FOR AN M&E FRAMEWORK FOR GEF ADAPTATION PROJECTS

140. As discussed in the conceptual level and analyzed in the inventory of GEF adaptation projects, adaptation to climate change presents some challenges for monitoring and evaluation at the project level. Poor quality of monitoring and evaluation at the project level will cause problems with the evaluation at the aggregated, program level.

141. This, plus the increased importance of the GEF in funding adaptation to climate change, warrants the establishment of a comprehensive monitoring and evaluation framework for GEF adaptation projects in the SCCF and LDCF. The following recommendations outline a series of elements to be considered when designing and adopting such a framework.

142. A sound M&E Framework should allow for accurate and informative project evaluations to help understand why a project had successful and unsuccessful outcomes, comparing baseline with final outcomes, vulnerability and adaptive capacity indicators at the beginning and end of project, and taking into account the climate and development context to see how these have influenced the outcomes of the project.

Given that the GEF adaptation programs do not have targets the GEF could use other proxies as measurements of its achievements

143. At present, the GEF does not have targets for the GEF adaptation programs in any priority area or sector. This makes it difficult to report on achievements. There are alternative measurements of achievements:

- Using the targets and goals proposed by countries in their NAPAs and National Communications and aggregating them at the program level. Examples include: “coverage of early warning systems for cyclones for all developing countries” or “crop insurance coverage of X % by year Y in all LDCs”.
- Reporting achievements against targets defined and agreed within the work programs of specialized agencies and international conventions relevant to appropriate thematic areas at the global level. For example, employing the Hyogo Framework for Action for Disaster Risk Reduction of the UN-ISDR (ISDR, 2005), whose indicators are being developed with adaptation-explicit targets.
- Aggregating contributions of projects in certain areas, if they have common or

similar indicators. For instance, two of the GEF projects reviewed had an indicator of “Rainwater collection facilities added.” The addition of figures for both projects would give an indicator of GEF contributions to this particular adaptation strategy, applicable in many areas of the world.

144. Furthermore, another alternative is to use existing **vulnerability indexes**. Relevance and coverage are two evaluative criteria for the GEF adaptation funds. To assess the impact of the GEF and its cost-effectiveness, the GEF should evaluate how it allocates its scarce resources vis-à-vis the global priorities for adaptation. So far, the priorities have been established at a broad level: addressing the urgent and immediate adaptation needs of least-developed countries, work on the priority thematic areas and secure development achievements by making them resilient to climate change. However, this is likely to change as several climate change vulnerability indices have been proposed that could be used in establishing priorities for funding allocations under the SCCF and LDCF. A country vulnerability index would rank countries by their risk of negative impacts from climate change, thereby signaling which are the countries at most need of adaptation investments, particularly since the needs of countries are substantially exceeding the available funding. This could also apply for the recently established Adaptation Fund.

145. There have been several approaches to vulnerability indices to which the GEF should look into as examples:

- the Disaster Risk Index -DRI (UNDP, 2005) incorporates the level of exposure plus hazard probabilities for drought, floods, cyclones and earthquakes, and disaster induced mortality with disaster deaths statistics from the EM-DAT disaster database at the University of Louvain.
- the vulnerability indicators of Brooks et al. (2005) couple the same disaster mortality statistics with socioeconomic measures of vulnerability, establishing the variables that best account for disaster deaths; which turn out to be public health in the short term, governance in the medium term and education in the long term.
- the impact vulnerability index of Buys et al (2007) puts together a weather disaster index – similar to the DRI, with a sea level rise risk index, assessed by the extent of territory prone to sea level rise and the amount of GDP likely to be affected.
- the Disaster Deficit Index (Cardona, 2004) is a measure of the economic capacity of a country to absorb the financial costs of catastrophic events

Development of an Adaptation Assessment Tracking Tool

146. In order to facilitate evaluation at the project but more so at the program level, the use of a standard Adaptation Assessment Tracking Tool in all GEF LDCF/SCCF

adaptation projects would be very helpful to systematically collect data and assess progress in adaptation across all sectors.²²

147. The Vulnerability Reduction Assessment (VRA) scorecard (Appendix 3), which has already been used in some UNDP GEF projects, could be a starting point for the development of an Adaptation Assessment Tool across all sectors, more at the adaptation program level. The VRA is a tool that aims to capture the dimensions of change in adaptation through comparisons of scores at the beginning of a project, midway through implementation, and again at the end, including simple indicators of vulnerability and adaptive capacity. The measures of the seven indicators are gauged and averaged through corresponding perception-based questions formulated to project stakeholders²³, who answer on a scale from 1 to 10. Given the perils of relying on perceptual data alone, scores are meaningless until they are compared to a second round of the VRA with the same stakeholders, after which relative improvements in adaptive capacity and reductions in vulnerability can be estimated. Even better results occur when there are three snapshots of the situation with the VRA. The VRA thus provides a measure of the relative change due to a project intervention from the point of view of stakeholders.

148. The VRA follows the adaptation cycle as outlined in the UNDP's APF and uses seven indicators for different steps of the framework (Table 1). The AAT, however, would need to expand and tackle all the process of adaptation and not only the vulnerability assessment. The AAT could similarly be employed at the beginning, midpoint and end of project. A fourth ex-post assessment might be deemed useful as well to evaluate long-term sustainability of project results for a selection of projects.

²² The GEF already has experience with such tools, in particular the Tracking Tool for Management Effectiveness of Protected Areas (GEF, 2003). Another interesting and relevant experience comes from the Disaster Risk Reduction discipline which is also developing its own tools (Benson and Twigg, 2007). These could be useful in providing insights for the Adaptation Assessment Tool.

²³ A balanced composition of stakeholders is needed to avoid bias, including those involved directly in project and those that are not.

Table 1 – Possible indicators for different types of adaptation measures (based on UNDP’s Vulnerability Reduction Assessment)²⁴

Step in the Adaptation Policy Framework	Indicator
Assessing current vulnerability	1. Vulnerability of livelihood/welfare to existing climate change and/or climate variability.
	2. Efficacy of coping mechanisms in the face of current climate change/climate variability risks.
Assessing future climate risks	3. Vulnerability of livelihood/welfare to developing climate change risks.
	4. Ability of the community to respond to developing climate change risks.
Formulating an adaptation strategy	5. Magnitude of barriers (institutional, policy, technological, financial, etc) barriers to adaptation.
Continuing the adaptation process	6. Ability and willingness of the community to sustain the project intervention
	7. Ability and capacity of community to continue the adaptation process, and to carry it beyond the specific project focus

Source: “Adaptation to Climate Change - Responding to Coastline Change and Its Human Dimensions in West Africa through Integrated Coastal Area Management” – Project Document.

149. A GEF *Adaptation Assessment Tool* could be able to produce generic indicators of change for all adaptation projects, regardless of the sector. Obviously, most projects would only address a few areas of the adaptation realm. However, measures of change in all areas would still be useful to establish baselines and put the project into context. The AAT would act as the generic component of the monitoring process, to be supplemented with indicators specific to each project.

150. Areas the AAT can cover applicable to most projects are vulnerability assessments, climate and weather monitoring, observation, communication and data management systems, policy mainstreaming, adaptation planning, integrated resource management, funding for adaptation, public awareness, risk management, capacity building and education. An AAT ideal for GEF projects should:

- Strike a balance between comprehensiveness and ease of use, trying to avoid an “indicator overload” or a complex scoring system²⁵;
- address the various steps of the adaptation process²⁶;
- address the different evaluative criteria established by the GEF M&E policy: Relevance, Efficiency, Effectiveness, Results and Sustainability;
- include questions about cross-sectoral and multi-sectoral adaptation measures, appropriate to any thematic area;
- have three direct questions that measure the overall success of the project in light of the GEF goals: *1) Has there been a reduction in vulnerability/increase in*

²⁴ The indicators of the VRA are mostly geared towards community-level projects. The AAT would need a suite of indicators appropriate for other kinds of projects as well.

²⁵ Qualitative scores of 0 to 3 are usually appropriate

²⁶ As proposed by the APF (Lim et al., 2004) or a similar categorization (*Scoping and designing an adaptation project, assessing current vulnerability, assessing future climate risks, formulating an adaptation strategy, and continuing the adaptation process*).

resilience to the impacts of climate change? 2) Has there been an increase in adaptive capacity? 3) Have the adaptation actions implemented by the project been effective in forestalling climate impacts?;

- assess the relevance of projects in the context of environmental and developmental goals via indicators that link project outcomes with national or regional priorities²⁷
- include questions about trade-offs of adaptation actions.
- be compatible enough to be used in adaptation projects funded by other agencies, not only by the GEF.

At the project level, the GEF should require structured monitoring and reporting of baselines and scenarios, when appropriate.

151. Project should have a presentation of the baseline in which the adaptation measure will be applied. This baseline should include not only socio-economic and biophysical but also climate indicators. Furthermore, the projects should include appropriate adaptation targets corresponding to different climate change scenarios.

1. Climate baseline and climate scenarios

152. In adaptation projects, the climate reference is indispensable to set the context for the project. Therefore, the establishment of a climate baseline should be done in a standardized way, so that each project documents the current climate, the current hazards and current levels of risk. Within the structure of the M&E framework, projects should also be explicit about the climate scenario and specific hazards to which they are targeting the adaptation measures. Measures of uncertainty and all scenario assumptions should be explicit. Climate scenarios should be based on those accepted by the scientific community.

2. Development and sectoral baseline, scenarios and adaptation targets

153. Since LDCF and SCCF projects are both related to development, the “development baseline” from where the projects start also needs to be documented, with relevant descriptions and indicators of the current socioeconomic and sectoral situation. Ideally, projects should also present a “business as usual development scenario” related to the project topic, matching the time of the climate scenario and narrating both the aspirations of development for that time, but also the likely paths given the present conditions and trends. The scenario should mention realistic targets for adaptation in the specific sector by the time of the scenario. For instance, given an expected 50 cm rise in sea level by 2050, one adaptation target would be to carry out a phased retreat of housing standing below 2 m over sea level from 2020 to 2050. The purpose of this development scenario is to give an appropriate context to the adaptation targets.

²⁷ As indicated in the NAPAs, National Communications to the UNFCCC as well as Poverty Reduction Strategies and MDGs. Relationships with other Multilateral Environmental Agreement (MEA) objectives could also be delineated

3. Document current vulnerability and adaptive capacity to climate change

154. SCCF and LDCF projects presuppose that a vulnerability assessment has already been carried out. The current levels of vulnerability and adaptive capacity would be the starting point for projects and in that sense would be the “adaptation baseline”. There should be appropriate SMART indicators assessing these at the onset of the project. The Adaptation Assessment Tool would provide a qualitative snapshot of current vulnerability and adaptive capacity, but should be complemented with other indicators specific to each project.

4. Monitoring during the project against climate variability

155. Monitoring activities during the execution of the project should not only document progress towards the objectives, but also document weather conditions and events that may influence the results of the project, in particular extreme events, as well as important shifts in socio-economic conditions (e.g. a sudden economic crisis). Furthermore, if climate conditions approach scenario-like conditions during the course of the project (e.g. a 1/100 year flood event), the adaptation measures executed by the project may be tested and their performance evaluated with direct measurements.

Establish guidelines, identify best practices and compile references for adaptation indicators

156. *Monitoring during the project against climate variability.* The inventory of indicators of 17 GEF Adaptation projects showed that there are numerous problems in the use of indicators and shortcomings of the ones chosen. On the other hand, the survey detailed some best practices that are beginning to emerge. The GEF should elaborate on these lessons and establish guidelines for the use of indicators in adaptation projects.

1. Inventory adaptation indicators

157. There are different options to develop a menu of adaptation indicators that should be made available to project developers. This menu would be mostly applicable at a high level, and not necessarily applicable for each sector in which the GEF works in. These indicators should comply with the SMART criteria. In particular, indicators should be as specific as possible, avoiding purposeful vagueness, ambiguity, or trying to measure two things simultaneously. In order to facilitate the process of project development for the SCCF and LDCF, the creation of a database of recommended adaptation indicators both at the generic and the sectoral level would be very useful. The “Adaptation Learning Mechanism” project, implemented by UNDP and funded by GEF, could provide a vehicle for this effort.²⁸ An inventory would enable consistency of use of indicators across different projects and enhance their quality. Ideally, indicators could be searched in the database by thematic area or type of adaptation action.

²⁸ The indicators on Appendix 2 of this document could be vetted for inclusion in such an inventory.

2. Encourage combination and nesting of indicators

158. Adaptation is a process and a web of interconnected outcomes, which in turn should be evaluated against an evolving context of climate and development. Many individual indicators will have flaws when assessed by the SMART criteria when trying to pinpoint success in adaptation. A better picture emerges when there are sets of assembling indicators to document the adaptation activities, as well as the baseline and reference scenarios. Combined indicators indeed compensate for the flaws of individual indicators.

159. Examples of combinations are as follows:

- *Sequence of project implementation:* input (budget) - process (stakeholder meetings) –output- (change in building codes) outcome (new public buildings with new building standards) –impact (building withstanding a hurricane).
- *Indicators of quantity and indicators of proportion:* number of households with water saving features - % of houses with water saving features.
- *Evolution of a baseline:* current climate – climate during project– reference climate change scenario.
- *Nested indicators:* evidence of trickling down or expansion of policy mainstreaming of climate change at different levels (local to national, sectoral to national, national to local).
- *Sequence of the adaptation process:* the Adaptation Assessment Tool, following the example of the Vulnerability Reduction Assessment, can document progress along the adaptation path while setting the context. The evaluation of success becomes more apparent, even if there are gaps a specific project is not addressing

160. On a practical basis, it is also recommendable to combine easily attainable indicators, such as markers of progress (meetings carried out, local public awareness campaign), with objectives that are harder to achieve (increase in crop yields). The accomplishment of small victories is an incentive for project executors to persist in pursuing the more difficult objectives.

161. Another important combination of indicators is one looking at the different evaluative criteria of coverage, effectiveness, sustainability and replication.

Evaluators of adaptation projects should evaluate trade-offs and consider indicators outside the main thematic areas

1. Trade-offs

162. One risk of working in sectoral adaptation projects is to begin to work in silos and avoid looking at the impact of the adaptation actions beyond the sector involved. For this reason, adaptation projects should explicitly evaluate the possible trade-offs involved: maladaptation measures, sustainability at the local and regional scales, environmental and social impacts of adaptation measures; alternative adaptation options –to evaluate cost-

effectiveness. Synergies and win-win situations should also be contemplated in project evaluation.

2. Going beyond adaptation issues.

163. Although SCCF and LDCF projects target priority areas, it is common for projects to have activities covering non-priority areas such as economic diversification. Thematic evaluations of GEF projects should make room for indicators outside the main thematic areas.

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1. APPENDIX 1 – LIST OF GEF ADAPTATION PROJECTS SURVEYED

GEF ID	Country	OP	Project Status	Project Title	Agency	GEF Funding (millions US \$)	Fiscal Year approved	Description
105	Regional (Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, Trinidad and Tobago)	Enabling Activity - Climate Change	Completed	Caribbean Planning for Adaptation to Global Climate Change (CARICOM)	World Bank	6.825	1995	Strengthening of regional capacity to monitor and analyze sea-level dynamics and trends; identification of areas particularly vulnerable to the adverse effects of climate change; integrated management and planning framework; capacity building and assessment of adaptation policy options.
2019	Colombia	SPA	Endorsed by CEO	Integrated National Adaptation Plan: High Mountain Ecosystems, Colombia's Caribbean Insular Areas and Human Health (INAP)	World Bank	5.570	2006	Adaptation measures in water regulation in high mountain ecosystems; insular areas in Caribbean; and malaria and dengue prevention measures.
2092	Global (Cameroon, Tanzania, Fiji, India)	Coastal, marine, freshwater ecosystems - Biodiversity	Approved	Coastal Resilience to Climate Change: Developing a Generalizable Method for Assessing Vulnerability and Adaptation of Mangroves and Associated Ecosystems	UNEP	1.000	2006	Development of an effective adaptation strategy that could be replicated. The project will focus on mangroves with near shore coral reefs to increase their resilience.
2543	Kiribati	SPA	Endorsed by CEO	Kiribati Adaptation Program - Pilot Implementation Phase (KAP-II)	World Bank	1.899	2006	Mainstreaming of climate change into policies, protection of select public assets and coastal areas, improvements in freshwater supply, awareness raising, management of coastal areas and coral reefs, and improved conservation and sustainable use of biodiversity.
2552	Regional (Dominica, St. Lucia, St. Vincent and Grenadines)	SPA	Endorsed by CEO	Implementation of Pilot Adaptation Measures in coastal areas of Dominica, St. Lucia and St. Vincent & the Grenadines	World Bank	2.400	2006	Pilot adaptation measures along coastal and near-coastal areas to address the impacts of climate change on biodiversity and land degradation, following previous mainstreaming and capacity building projects (MACC and CPACC).

GEF ID	Country	OP	Project Status	Project Title	Agency	GEF Funding (millions US \$)	Fiscal Year approved	Description
2614	Regional (Senegal, Gambia, Guinea-Bissau, Mauritania, Cape Verde)	SPA	Approved	Adaptation to Climate Change - Responding to Coastline Change and Its Human Dimensions in West Africa through Integrated Coastal Area Management	UNDP	4.000	2007	Mainstreaming of adaptation into policies and programs, integrated coastal area management and demonstration projects to adapt to and reduce coastal erosion and shoreline retreat; training of stakeholders and establishment of a clearinghouse to disseminate lessons and best practices.
2630	Hungary	SPA	Approved	Lake Balaton Integrated Vulnerability Assessment, Early Warning and Adaptation Strategies	UNDP	0.985	2005	Addressing increased water level fluctuations in Lake Balaton through formulation of adaptive measures and facilitation of adaptive strategies.
2752	Regional (Kenya, Madagascar, Mozambique, Rwanda, Tanzania)	SPA	Approved	Integrating Vulnerability and Adaptation to Climate Change into Sustainable Development Policy Planning and Implementation in Southern and Eastern Africa	UNEP	1.000	2006	Reduction of vulnerability to climate change as well as mitigation of land degradation and climate change. Better management of micro-hydro potential in Rwanda against decreasing availability of freshwater; projects to mitigate land degradation and desertification and forest fire management in Mozambique and Kenya.
2753	Sri-Lanka	SPA	Approved	Participatory Coastal Zone Restoration and Sustainable Management in the Eastern Province of Post-Tsunami Sri Lanka	IFAD	7.270	2006	Mainstreaming of climate change risk considerations in the reconstruction process of post-tsunami Sri Lanka with emphasis on participatory and community restoration of lagoons and sand dunes.
2774	Global (Bangladesh, Bolivia, Niger, Samoa, Guatemala, Jamaica, Kazakhstan, Morocco, Namibia, Vietnam)	SPA	Approved	Community-based Adaptation (CBA) Programme	UNDP	5.010	2007	Development of a framework that spans the local to the intergovernmental levels to respond to unique community-based adaptation needs; implementation of diverse community-based adaptation projects in a number of selected countries; and capture and dissemination of lessons learned.

GEF ID	Country	OP	Project Status	Project Title	Agency	GEF Funding (millions US \$)	Fiscal Year approved	Description
2832	Tanzania	SCCF	Approved	Mainstreaming Climate Change in Integrated Water Resources Management in Pangani River Basin	UNDP	1.000	2006	Integrated Water Resource Management in the Pangani River Basin, with strong links to basin and national planning and policy, building of national and regional capacity, and serve as a national and regional demonstration site.
2902	Regional (Bolivia, Peru, Ecuador)	SCCF	Approved	Design and Implementation of Pilot Climate Change Adaptation Measures in the Andean Region	World Bank	7.490	2007	Adaptation activities of water resource management in the highly vulnerable highland and in glacier dependent watersheds of participating countries.
2931	Ecuador	SCCF	Approved	Adaptation to Climate Change through Effective Water Governance	UNDP	3.350	2007	Implementation of efficient water management through water governance arrangements; decentralization of climate-resilient water management; information management and dissemination, and flexible financial mechanisms to promote local innovation.
3155	Mozambique	SCCF	Approved	Coping with Drought and Climate Change	UNDP	0.960	2007	Pilot coping mechanisms for reducing the vulnerability of farmers and pastoralists to drought, including early warning systems, drought preparedness and drought mitigation policies.
3227	Guyana	SCCF	Approved	Conservancy Adaptation Project	World Bank	3.800	2007	Protection of the coastal population currently vulnerable to annual flooding by increasing the drainage capacity of the EDWC draining system, and by strengthening the Government's capacity to manage it.
3249	Kenya	SCCF	Approved	Adaptation to Climate Change in Arid Lands (KACCAL)	World Bank/UN DP	6.790	2007	Design, implement and monitor cost-effective adaptation measures related to food security and rural livelihoods in Kenya's Arid and Semi-Arid Lands.
3265	China	SCCF	Project Preparation Grant	Mainstreaming Adaptation to Climate Change Into Water Resources Management and Rural Development	World Bank	5.316	N/A	Strengthening of the resilience of agriculture by implementing selected adaptation measures at demonstration sites in the 3 H Basin and mainstreaming climate change adaptation into irrigation, water resource management and rural development.

2. APPENDIX 2 - INVENTORY OF INDICATORS IN GEF ADAPTATION PROJECTS

The categories in the inventory were adopted from UNDP's M&E Framework for Adaptation (Draft version May 2007). Indicators in bold are those that were used by two or more projects (number in brackets). Also listed are the indicators present in UNDP's framework but not found in any of the projects, and a few suggestions for additional indicators.

A. Generic indicators

Coverage:

- **Number of policies mainstreaming adaptation to climate change (8)**
- Number of beneficiaries of climate information systems
- **Number of stakeholders implementing adaptation actions (2)**
- **Number of public awareness campaigns implemented (2)**
- Level of coverage of climate change adaptation in the media
- Dissemination of project information (report, website, database, products)
- Frequency of meetings of adaptation committee/institutional body
- Number of senior officials involved in adaptation policy coordination
- **Level of participation in adaptation planning /decisions (2)**
- Proportion of population adopting sustainable development measures
- Identification of demonstration areas for adaptation measures
- Extent of public awareness
- Inclusion of climate change in school curricula
- Establishment of capacity building strategies

In UNDP framework but absent in projects:

- Number of investment decisions altered or made incorporating climate change risks.

Efficacy:

- **Completion of baseline study for vulnerability assessment (2)**
- **Completion of vulnerability assessment (2)**
- **Change in capacity to manage/administer/disseminate climate change information (3)**
- **Identification and design of adaptation measures (3)**
- **Implementation of adaptation measures (4)**
- Increased public awareness of vulnerability to climate change
- Usage of project information (references, website, databases)
- Financing of adaptation projects
- **Number of strategies adopted to reduce vulnerability (2)**
- Number of adaptation projects approved / proposals received.
- Inclusion of climate change considerations into policy
- Inclusion of climate adaptation considerations into funding requirements
- **Creation of institutional body coordinating climate change adaptation (2)**
- Creation of adaptation policy frameworks
- Completion of policy analysis with recommendations for adaptation
- **Coordination among institutions (2)**
- **Completion of adaptation master plan (2)**
- Empowerment of environmental agency

- Magnitude of Global Environmental Benefits secured
- **Adaptation training tool kits created (3)**
- Donor meetings
- Donor pledges
- Disbursement of funds for adaptation

In UNDP framework but absent in projects:

- Perceived improvements in vulnerability
- Perceived improvements in adaptive capacity
- Percent change in stakeholders' behavior
- Perceived effectiveness of project
- Successful deployment of indicators

Replication

- **Number of lessons learnt (4)**
- **Incorporation of outcomes into other programs or policies (5)**

Sustainability

- **Establishment of monitoring system of adaptation measures (2)**
- **Training of stakeholders in adaptation measures, vulnerability assessment and climate information (2)**
- **Availability of capacity to continue adaptation measures (2)**
- Inexistence of technical constraints for adaptation measures
- Cost-effectiveness analysis used for adaptation measures implementation
- A harmonized Multilateral Environmental Agreement reporting framework developed

In UNDP framework but absent in projects:

- Support for project activities among participating communities as assessed by QBS.

B. Sectoral indicators

Agriculture / Food Security

- **Increases in yields/productivity (2)**
- Irrigation efficiency
- Access to climate information
- People in food insecurity
- Mainstreaming adaptation into agricultural policy
- Increased access to land

In UNDP framework but absent in projects:

- Success in new crop strains
- Increase in income of project beneficiaries
- Availability of climate data relevant to agriculture
- Relations between agriculturalists and pastoralists (conflict indicator?)
- Food deficits during extreme events

Natural resources/Biodiversity/Fragile Ecosystems:

- **Continued presence of species (3)**
- Bird populations
- Implementation of management plan
- Demarcation of new protected areas
- Persistence of vegetation coverage
- Coral reef diversity
- Area of coastal ecosystems restored
- Health of ecosystems (eg. Mangrove density and productivity)
- Number of people trained in sustainable resource management
- Agreements signed on sustainable resource management
- Frequency of ecosystem monitoring
- Testing of restoration methods
- Natural resource management plans finalized

In UNDP framework but absent in projects:

- Rate of loss of natural resource base for livelihoods determined to be negatively impacted by climate change.
- Livelihoods options better suited to climate change available to target community.

Coastal zone development:

- Mainstreaming of climate change adaptation in coastal zone development

Disaster Risk Management:

- People affected by disasters (flood, drought)
- **Existence of disaster response plans, committees (2)**
- **Development of local climate risk assessments (2)**
- Improvement in storm drainage capacity
- Local flood models completed
- Coverage of early warning systems
- Forest fire frequency trends
- Assessment of drainage infrastructure for repairs and maintenance
- Time for response to drought events
- Integration of climate and weather information in disaster plans

In UNDP framework but absent in projects:

- Change in population living in high risk areas
- Number of households with “disaster preparedness kits” and safety improvements

Infrastructure:

- **Inclusion of climate change and risk considerations into infrastructure design (5)**
- Changes to the building codes for water savings
- Retrofitting of infrastructure for withstanding storms

Water resources:

- **Continuous river flow for hydropower generation (2)**
- Implementation of water demand management measures

- **Number of households implementing water saving measures (3)**
- Water supply increases due to adaptation measures
- **Rainwater collection facilities added (2)**
- Allocation of water by environmental flows criteria
- Improved irrigation efficiency
- Improved water infrastructure efficiency (leakage)
- Establishment of mechanism to resolve water use conflicts
- Training in water management
- Prioritization of water resource management
- Establishment of water users associations
- Increased capacity of water users to implement water use policies

In UNDP framework but absent in projects:

- Water saved as a result of adaptation measures
- Proportion of population classed as water stressed relative to projected baseline without adaptation interventions.
- Water saving capacity for managing supply during times of stress.

Public health:

- Reduction in morbidity due to malaria or dengue
- Early warning systems in place for epidemics
- Nutritional status of children under age of 5
- Strengthened public health program against dengue and malaria

In UNDP framework but absent in projects:

- Preventive measures employed for controlling climate-sensitive disease at household/community level.
- Policies identified as maladaptive from health perspective
- Number of exposure/risk reduction measures piloted; households, communities participating.

Land degradation

- Positive trends

Other: Economic development (can be placed under Generic indicators):

- Generation of new income alternatives
- Income variability

Other: Climate research (can be placed under Generic indicators)

- **Development of local climate change scenarios (3)**
- Improvement of meteorological offices capabilities, observation and information networks

3. APPENDIX 3 – A USERS GUIDE TO THE VULNERABILITY REDUCTION ASSESSMENT

Source: Community Based Adaptation (CBA) (UNDP, 2007c). UNDP GEF Project

The Vulnerability Reduction Assessment (VRA) forms a cornerstone of the CBA programme’s monitoring and evaluation activities. It is designed to measure the changing vulnerabilities of communities to climate change, including variability, and to be comparable across vastly different projects, regions, and contexts, making it possible to determine if the programme is successful or unsuccessful. The VRA is complimented by the SGP IAS, which measures global environmental benefits as well as livelihood and empowerment indicators. Together they provide a complete picture of the progress of the CBA programme in achieving its goals of enhancing adaptive capacity, and improving the resilience of ecosystems providing global environmental benefits in GEF focal areas.

1. Community-level Awareness Raising

VRA meetings will be preceded by awareness raising activities for the project’s target stakeholder community, establishing a scientifically grounded consensus as to the character of established and ongoing climate variability, as well as developing climate trends. These activities should also focus on impacts from climate variability and change. This will serve as the basis for VRA discussions, establishing an objective baseline of vulnerability, giving context to the VRA, and establishing the context necessary for the VRA discussions. These activities will normally take place as the first part of the first VRA stakeholder meeting, and smoothly transition into measurement of the VRA indicators. These activities should be highly context dependent, taking into account differing levels of education, literacy, pre-existing climate knowledge, and history of climate impacts. However, the outcome in all cases will be a stakeholder body with a clear and common understanding of the climate risks that the project will seek to address.

2. The Structure of the VRA

The VRA is comprised of seven indicators, based on corresponding open-ended, perception-based questions, which in turn aggregate to serve as indicators of adaptive capacity. (The composition of the seven indicators is informed by scientific assessments of climate risk.) Local stakeholders will answer all questions on a 1 to 10 scale, generating qualitative data to be recorded on the sides of the H-form, in addition to the simple numerical score. A simple average is used to convert participant’s answers into a VRA score that will be comparable across CBA projects. However, a single VRA score is not meaningful; it becomes meaningful as it is measured at the pre and post-project stages. **The key quantitative output of the VRA is the percentage change from the baseline score.** The seven VRA indicators and corresponding questions are outlined below.

The VRA will be measured at least three times over the course of the project cycle – before project activities begin, at project conclusion, and at least once in the intervening period, as part of the required interim progress reporting (see attached “CBA Progress Report”). This allows multiple VRA scores to be taken, making it possible to measure the percentage change in their values.

APF Step	Indicator	Sample Question	Logic
Assessing current vulnerability	1. Vulnerability of livelihood/welfare to existing climate change and/or climate variability.	How severe is the present impact of (climate risk) on your (climate-sensitive livelihood or welfare)? <i>Example: How severe is the present impact of drought on farming in your community?</i>	<input type="checkbox"/> Addresses present climate-related development issues – often the main climate concern of the community. <input type="checkbox"/> Applicable to climate variability and/or climate change (depending on specific risk and community context). <input type="checkbox"/> Prepares community for following

		<i>(The choice of “drought” and “farming” would have already been dictated by the development of the project concept in this example).</i>	questions that are specific to anthropogenic climate change by grounding that discussion in a framework that relates it to present impacts.
Assessing current vulnerability	2. Efficacy of coping mechanisms in the face of current climate change/climate variability risks.	How effective are your mechanisms for dealing with (climate risk) presently? <i>Example: What does the community currently do to limit the damage caused by cyclones, and how effective are these measures offsetting damage and reducing mortality?</i>	<input type="checkbox"/> During the first VRA meeting, this question will describe baseline adaptation to climate variability. During subsequent meetings, it will assess progress against that baseline. <input type="checkbox"/> Applicable to climate variability and/or climate change (depending on specific risk and community context). <input type="checkbox"/> As above, grounds community in present practices, preparing them to think about how changing conditions might impact those practices.
Assessing future climate risks	3. Vulnerability of livelihood/welfare to developing climate change risks.* <i>*Climate risks as based on country strategies, which in turn are based on National Communications and NAPAs</i>	How severe would the impacts of (climate change risk be on (climate-sensitive livelihood or welfare)? <i>Example: How severe would the impact of doubled frequency of meningitis epidemic years be on the health of your community?</i>	<input type="checkbox"/> Once present context of variability has been discussed, this question focuses the community on their perceptions of likely impacts of climate change. <input type="checkbox"/> This question is based on “likely” impacts on sectors identified in project target, which in turn are based on CCPS. <input type="checkbox"/> Allows the community to begin to consider long-term viability of livelihood practices in the face of climate change, leading to the following question.
Assessing future climate risks	4. Ability of the community to respond to developing climate change risks.	To what degree is the community prepared to address (climate change risk), through (project intervention and current coping mechanisms) without a diminution in livelihood or wellbeing? <i>Example: Will the community be able to address doubled soil salinity without a decrease in livelihoods or wellbeing?</i>	<input type="checkbox"/> This question compliments the previous one by focusing the community on potential actions to respond to CC. <input type="checkbox"/> During the first VRA meeting, this question will measure baseline adaptive capacity. During subsequent VRA meetings, as answers to this question improve, this question measures progress against that baseline, influenced by the project intervention.
Formulating an adaptation strategy	5. Magnitude of barriers (institutional, policy, technological, financial, etc) barriers to adaptation.	What are the barriers to adaptation, and how surmountable are they? <i>Example: What stands in the way of more widespread use of drip irrigation, and how difficult will it be to overcome these barriers?</i>	<input type="checkbox"/> This question will qualify the above question, and focus it onto the needs of the community in successfully achieving adaptation. <input type="checkbox"/> This question will identify policy barriers, forming useful lessons for the country and global programmes. <input type="checkbox"/> This question will also measure unintended consequences, unexpected setbacks, and other barriers that were not identified during the project scoping phase.
Continuing the adaptation process	6. Ability and willingness of the community to sustain	To what degree do you think that (project intervention) will continue after the project	<input type="checkbox"/> This question measures project sustainability and ownership, essential if adaptation to long-term climate change is to be successful.

	the project intervention	concludes? <i>Example: Will the community be able to continue stabilizing erosive hillsides with improved grasses after the conclusion of the project?</i>	
Continuing the adaptation process	7. Ability and capacity of community to continue the adaptation process, and to carry it beyond the specific project focus	To what degree will the community be able to go further in decreasing their vulnerability to (climate change risk)? <i>Example: To what degree is the community able and willing to take other measures to adapt to sea-level rise beyond the measures taken by this project?</i>	<input type="checkbox"/> This question measures adaptive capacity more directly than other questions, as it seeks to determine to what extent communities will continue to adapt, and to what extent they feel that they are able to do so.

The VRA will be measured in stakeholder meetings required by all projects. The meeting participants will guide the VRA as well as project design, so it is crucial that they be inclusive of all project beneficiaries, and that the composition of the meetings be explicitly identified during each exercise on the relevant reporting form (i.e., *Project Proposal, Progress Report, Final Report*). Grantees should have the capacity to successfully engage communities in the VRA, which is a highly participatory process, and should show sensitivity to gender, ethnicity, livelihood, and other social dynamics among the grantees. This is crucial, because the product of the VRA – both in terms of the quantitative index described below and in terms of the qualitative data elicited in the process – is a large amount of data, which will guide project design, implementation, and eventual lessons learned.

It is crucial that all VRA materials be filed and submitted to the NC at project conclusion or at any interval during implementation, for use in consolidation of lessons learned at the conclusion of the project.

3. The H-form

The main tool to be used in conducting the VRA is the “H-form.” The H-form is a tool for participatory evaluation, designed to develop a numerical score for a given question, as well as qualitative information giving the reasoning behind the resultant score.

4. Calculating the Final VRA Score, Measuring Percentage Change

The final VRA score from any one VRA meeting is simply the average of the scores of the seven questions. In itself, the score is meaningless, as two different communities with objectively identical adaptive capacities might arrive at different scores based on the numbers chosen. Therefore, the final VRA scores – upon which programme-wide M&E will rely – will be comprised of a percentage change from an initial VRA score with a subsequent measurement. This quantity will be automatically calculated by the CBA database.

9. Thus, as adaptive capacity increases through project interventions, VRA index scores are expected to increase. By converting the difference between baseline and subsequent scores into a percentage, a VRA percentage score is arrived upon.