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BACKGROUND AND ELEMENTS FOR A GEF MONITORING AND EVALUATION FRAMEWORK ON ADAPTATION

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

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.

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.

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.

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.

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 — the subject of this paper, from vulnerability or climate change impact assessments — ex-ante evaluation.

Approaches for evaluating GEF interventions for adaptation

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.

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

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.

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

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

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.

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

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)

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.

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

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

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 adaptation*

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.

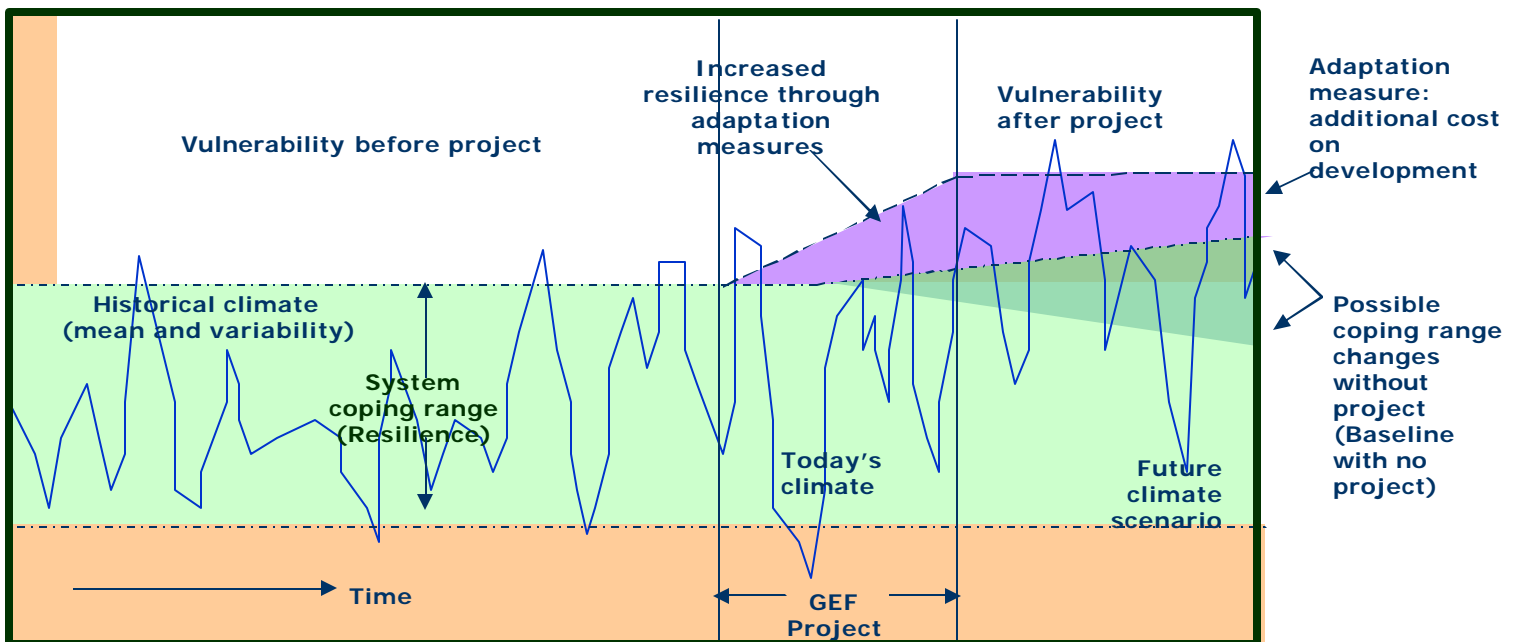
28. In a changing climate, the climate is moving incrementally towards new *scenarios* as projected by models, with subsequent modifications in the means and variability of climatic variables. Some of these changes are manifesting now, and as a result, the normal resilience of the system is under stress and less able to cope with some events. Under the new climate scenario, the existing coping range is no longer as suitable. There is therefore a need to *adapt* to changing conditions.

* 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.

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 socio-economic, 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 LDCE 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 LDCE/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 LDCE/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 disasters[†]; therefore, the study of disasters is an appropriate analogy. However, there are important differences to note.

40. *Disaster Risk Reduction*[‡] 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:

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

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

*Risk of disasters = Hazards * Physical exposure * 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:

*Risk of disaster in a changed climate (at time T_n) = Hazards at time T_n * physical exposure at T_n * 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 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.