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A PROPOSED GEF APPROACH TO ADAPTATION TO CLIMATE CHANGE

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EXECUTIVE SUMMARY

1. The objective of this paper is to outline the *initial elements* of a GEF approach to support for additional efforts by recipient countries to address the adverse impacts of climate change. This includes both the assessment of vulnerability and the identification and implementation of adaptation measures to reduce the risks.

2. This paper is being prepared in response to the increasing recognition in a wide range of international forums [1]that adaptation to climate change is a matter of increasing urgency for many developing nations, with important linkages to the attainment of many local and global environmental objectives. The importance of greater efforts to respond to the risks of climate change was most recently highlighted by the Delhi Ministerial Declaration on Climate Change and Sustainable Development which states (par. (e)):

> "Adaptation to the adverse effects of climate change is of high priority for all countries. Developing countries are particularly vulnerable, especially the least developed countries and small island developing States. Adaptation requires urgent attention and action on the part of all countries. Effective and result-based measures should be supported for the development of approaches at all levels on vulnerability and adaptation, as well as capacity-building for the integration of adaptation concerns into sustainable development strategies."

3. The paper builds on Convention guidance and GEF projects supporting climate change adaptation presented to the May 2002 Council meeting. See GEF/C.19/Inf.10. The approach was developed taking into account the results of a STAP workshop held in Nairobi, Kenya, February 18-20, 2002, and inputs from the Secretariats of the UNFCCC, CBD, as well as the Implementing Agencies.

4. The approach proposed has three key components. The first is the continuation of and the expected expanded role for the support of those adaptation activities which fall within the context of national communications. This support would continue to be provided under the GEF Climate Change focal area. At the UNFCCC COP 8 in Delhi in November 2002, the Parties agreed on improved guidelines for the preparation of second national communications. These guidelines provide expanded scope for support of vulnerability assessments and consideration of measures to prepare for adaptation. See 17/CP.8. As discussed in the *Relations with Conventions* paper (GEF/C.21/4), the Council is being requested to delegate authority to the CEO for expedited approval of proposals for funding the preparation of second national communications.

5. The second component will be to support projects, including pilots and demonstrations, based on linkages between climate adaptation strategies and those measures that achieve other GEF-supported global environmental benefits. This approach is expected to expand the potential

[1] For example, the Statement on Water and Climate Change to the Ministerial Conference, the Third World Water Forum, March 16-23, 2003, Kyoto, Shiga and Osaka, Japan.

range of GEF funding for adaptation to non-climate operational programs of the GEF and builds on the internal assessment which finds that *many important adaptation response measures are being supported by the GEF under its other focal areas*. Examples include projects that support integrated coastal zone management, forestry conservation and watershed management, and sustainable agricultural practices. See Annex III. Countries seeking support for climate change adaptation will be encouraged to explore these linkages within the context of their needs and circumstances as the basis for GEF projects.[2]

6. A third component of the proposed approach is to require greater consideration of the impacts of climate change as a long-term risk to the sustainability of some GEF projects, particularly those related to ecosystem conservation. In collaboration with STAP and the Implementing Agencies, the GEF will review a sample of current projects to identify those potentially most vulnerable to climate change and to consider possible design changes to avoid or ameliorate them. This process would be the basis for possible best practices in the design and review of future projects. The World Bank and other development agencies have already initiated similar assessments and will be consulted in the design of this initiative.[3]

7. Two initiatives included in documents for this Council meeting are of direct relevance to climate adaptation, and decisions concerning them may also contribute to the objectives outlined in this paper. The first is the new Operational Program on Sustainable Land Management (GEF/C.21/6), which emphasizes an integrated, cross-sectoral approach consistent with the proposed approach to adaptation. The second is the expanded role for capacity building outlined in the Corporate Business Plan (GEF/C.21/9), particularly with respect to cross-cutting capacity building projects. While the scope and details of this proposal are not expected to be defined for Council review and decision until November 2003, the intent parallels and is likely to reinforce the adaptation approach. The addition of more focused capacity building would allow a range of GEF support for adaptation measures consistent with the diverse needs and circumstances of developing countries – from the assessment of vulnerability and building of scientific capacity to the identification and implementation of response measures consistent with global environmental benefits.

8. In line with evolving scientific knowledge and political guidance, GEF expects to address adaptation within the framework of an integrated, flexible and phased process based on country needs and circumstances. This range of options would be used flexibly, emphasizing learning by doing and building on the results of best practices.

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[2] The recognition of these linkages is consistent with recent efforts to explore synergies between global environmental conventions. See Draft Report for Experts and Government Review, "Interlinkages between Biological Diversity and Climate Change and Advice on the Integration of Biodiversity Considerations into the Implementation of the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol," Prepared by the CBD Ad Hoc Technical Expert Group on Biodiversity and Climate Change, February 17, 2003.

[3] Burton, I. and M. van Aalst. 1999. *Come Hell or High Water – Integrating Climate Change Vulnerability and Adaptation into Bank Work*, Washington, DC., World Bank.

9. The proposed approach is further designed to allow for the likelihood of further Convention guidance and the potential availability of additional resources. The implications of further decisions with respect to the LDC Fund, Special Climate Fund, and Adaptation Fund are particularly relevant. When such decisions are made and/or resources become available, the Secretariat will respond expeditiously building on the efforts already taken to implement the guidance for NAPAs and the LDC Fund. See GEF/C.21/5.

10. The GEF intends to prepare a more extensive review of adaptation issues and options as a report in the GEF working paper series for publication later this year.

ADVERSE IMPACTS OF CLIMATE CHANGE AND IMPLICATIONS FOR DEVELOPING COUNTRIES

11. According to the IPCC[4], the globally averaged surface temperatures have increased by 0.6 ± 0.2 °C over the 20th century, globally averaged surface air temperature is projected by models to warm 1.4 to 5.8 °C by 2100 relative to 1990, and the globally averaged sea level is projected to rise 0.09 to 0.88 meters by 2100. In addition to changes in mean climate condition , the IPCC has identified the possibility that climate change may be influencing changes in climate variability and extreme events, including more frequent heat waves, less frequent cold spells, greater intensity of heavy rainfall events, more frequent mid-continental summer drought, greater intensity of tropical cyclones, and more intense El Niño-Southern Oscillation (ENSO) events. These changes are likely to be at least as important as changes in mean climate conditions in determining climate change impacts.

12. According to the IPCC[5], there is high confidence that recent regional changes in climate, particularly increases in temperature, have already affected many physical and biological systems around the world. Examples of observed changes include shrinkage of glaciers, thawing of permafrost, later freezing and earlier break-up of ice on rivers and lakes, lengthening of mid to high latitude of growing seasons, declines of some animal and plant populations, and earlier flowering of trees, emergence of insects and egg-laying in birds. Moreover, there are preliminary indications of socio-economic impacts due to recent changes in climate that have resulted in increased frequency of floods and droughts as well as deterioration of ecosystems on which people depend for their livelihood.

13. Projected adverse impacts of climate change may include reduced crop yields, a decrease in water availability in already water scarce regions, particularly in the sub-tropics, an increase in the number of people exposed to vector-borne diseases (e.g. malaria) and water-borne diseases (e.g. cholera), an increase in the risk of flooding and other natural disasters from both heavy precipitation events and sea-level rise, and an increase energy demand for space cooling due to higher summer temperatures. Moreover, the rate of climatic warming may exceed the rate of shifts in certain species ranges, resulting in irreversible damage to or loss of these species if they are unable to adapt.[6]

14. Vulnerability to climate change is in general a function of a system's exposure to climate change, its sensitivity to such changes[7], and its ability to respond and mitigate such changes (i.e., its adaptive capacity)[8]. While the magnitude of adverse effects from climate change remain

[4] IPCC. 2001. *Climate Change 2001: The Scientific Basis- Report of the IPCC Working Group I*. Cambridge, UK. Cambridge University Press.
[5] IPCC. 2001. *Climate Change 2001: Impacts, Adaptation and Vulnerability- Report of the IPCC Working Group II*, Cambridge, UK. Cambridge University Press.
[6] Climate change is expected to have beneficial as well as adverse impacts; but as noted below, developing countries would be particularly exposed to its adverse impacts.
[7] Sensitivity is defined by IPCC as the degree to which a system will respond to a given change in climate.
[8] For human societies, adaptive capacity can be defined as the ability to plan, facilitate, and implement measures to adapt to climate change. Factors that determine adaptive capacity may include level of economic wealth and well-

uncertain, developing countries are generally perceived to be at greater risk. The adverse impacts of climate change are moreover expected to fall disproportionately on poor societies, especially those who live in arid or semi-arid lands, water-limited or flood-prone areas, low-lying coastal areas or small islands. These impacts would add to the many other stresses that are already being faced by these societies. Consistent with their limited resources and human capacity, poorer societies already face greater stress and accordingly lesser ability to develop and implement adaptation strategies.

ADAPTATION RESPONSE MEASURES

15. Adaptation comprises "adjustments in practices, processes, or structures to take account of changing climate conditions[9]" with an effort to reduce a system's vulnerability and to ease the adverse impacts of climate change. While ecosystems can, to a certain extent, adapt naturally to changing conditions, in human systems, adaptation requires an awareness of potential impacts of climate change, the need for taking action, an understanding of available strategies, measures and means to assess adaptive responses and the capacity to implement effective options.

16. Adaptation can be a major part of a country's climate change response strategy, complementing climate change mitigation efforts. It can include policies and programs to:

(a) Increase robustness of infrastructure and investments to climate change impacts (e.g., expanding buffer zones against sea level rise);

(b) Discourage investments that would increase vulnerability in sensitive areas;

(c) Increase flexibility of managed systems to accommodate and adapt to climate change;

(d) Learn from and enhance resilience and adaptability of natural systems;

(e) Reverse maladaptive trends in development and resource management and use (e.g., reducing subsidies associated with inefficient use of energy and water).

17. Such measures can also produce "secondary benefits" including:

(a) Improved protection against current climate variability, extreme weather events, and climate-related disasters;

(b) Improved management of weather-dependent sectors (e.g. agriculture, water, etc.);

(c) Reduction of pollution, land degradation and erosion;

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being, availability of appropriate technology, extent of information and skills, provision of sufficient infrastructure, effectiveness of institutions, political stability, cultural cohesiveness and social equity.

[9] IPCC. 2001. *Climate 2001: Impacts, Adaptation and Vulnerability- IPCC Working Group II Report*. Cambridge, UK. Cambridge University Press.

(d) Conservation of economically important habitats and biological diversity.

18. Adaptation, sustainable development and global environmental goals can be jointly advanced through integrated cross-sectoral policies and programs that lessen pressure on resources, improve management of long and short term environmental risks, and enhance adaptive capacity. For example, measures such as establishment of refuges, protected areas, and reserves with corridors to allow migration of species can help reduce long term climate change risks to biodiversity and the local communities while achieving global biodiversity conservation goals. Similarly, in combating desertification, preventive measures such as early warning systems, drought preparedness and management, and sustainable livelihood programs can also have adaptation benefits if their design takes into consideration projections of climate change and its impacts on precipitation, run off, soil moisture and other relevant factors.

19. Implementation of adaptation measures should be part of a broader sustainable development process which includes consideration of numerous non-climate issues. Adaptation methods and technologies are already available in many sectors such as health, agriculture, urban planning and resource management, and are currently being applied to adapt to climate variability. The failure to adopt such methods is often associated with standard developmental problems including lack of information, financial and legal barriers, and lack of access to expertise or technology.

THE GEF'S ROLE AND APPROACH TO ADAPTATION

20. Consistent with UNFCCC guidance, the GEF, through its climate change focal area, has been funding adaptation related capacity building and targeted research activities within the context of national communications and in accordance with the staged process[10] put forth by the UNFCCC. The scope of this guidance and GEF implementation was summarized in a paper to Council last May (see GEF/C.19/Inf.10) and has been expanded by the COP 8 decision providing guidelines for second national communications (see GEF/C.21/4 summarizing developments at COP 8).

21. GEF support for adaptation can benefit from the extensive linkages to biodiversity, land degradation, and other environmental objectives. As a source of multilateral financing to achieve global environmental benefits in six focal areas, the GEF can support cross-cutting adaptation activities that produce global environmental benefits within the context of biodiversity, international waters, land degradation and persistent organic pollutants. Several GEF projects in these focal areas are already indirectly contributing to adaptation by reducing non-climatic stresses as well as maladaptive trends in resource management and thereby enhancing the

[10] **Decision 11/CP.1** lays out three stages of adaptation as follows:

- Stage I: Planning, which includes studies of possible impacts of climate change, to identify particularly vulnerable countries or regions and policy options for adaptation and appropriate capacity-building;
- Stage II: Measures, including further capacity-building, which may be taken to prepare for adaptation, as envisaged by Article 4.1(e) ;
- Stage III: Measures to facilitate adequate adaptation, including insurance, and other adaptation measures as envisaged by Article 4.1(b) and Article 4.4 ;

resilience of vulnerable ecosystems. (See Annex IV) As evidenced by these projects, the GEF's extensive experience in implementing cross-sectoral management strategies (such as integrated coastal zone management) to achieve global benefits while supporting sustainable development goals gives it invaluable experience to assist countries adapt to climate change.

22. In addition, many GEF projects are located in countries that are vulnerable to climate change and hence are potentially at risk. Therefore, it is necessary for the GEF to address climate change as a potential risk to its portfolio, and incorporate appropriate measures to reduce this risk in project design and implementation in order to ensure the long term sustainability of its efforts. By integrating and mainstreaming climate change concerns into its biodiversity conservation and integrated resource management efforts, the GEF can reduce the vulnerability of its own portfolio while helping vulnerable countries build adaptive capacity and implement adaptation measures in line with both local and global priorities.

23. This approach is consistent with the recent efforts initiated by the Secretariats of the CBD and UNFCCC to promote and operationalize the synergy between the two conventions, recognizing adaptation as a key link and emphasizing the efficacy of the ecosystem approach in addressing climate change and adaptation issues.

24. The GEF approach consists of the following elements building on established policies.

Strengthening the Enabling Environment

25. GEF support for facilitating adaptation will be enhanced if there is an effective policy and enabling environment within recipient countries to carry out strategic adaptation plans and programs. Consistent with UNFCCC guidance to date, the GEF has already provided substantial enabling activity support to countries for Stage I and II adaptation, including V&A assessments as well as institutional and scientific capacity building within the context of national communications. Consistent with earlier Convention decisions and the new guidelines for second national communications, the GEF will expand support for such activities to improve scientific knowledge and the enabling environment in developing countries for addressing climate change impacts, and will encourage closer integration with mainstream sector planning.

Operationalizing the Linkages Between Focal Areas

26. The GEF will assist countries to mainstream climate change into their development programs and policies by funding adaptation projects that operationalize linkages between focal areas through on-the-ground activities, including promotion of integrated and cross-sectoral approaches to natural resources management. This will require an integrated approach that takes climate change concerns into account from the outset, and that includes partnerships with key stakeholders.

27. Given its mandate, mission and comparative advantage, the GEF will provide funding only to those adaptation measures that produce and promote global environmental benefits in

addition to local benefits[11]. Within this context, the GEF can focus on barrier removal, capacity building, and policy development to incorporate climate change into local development efforts in vulnerable sectors, leading to sustainable outcomes. Such activities may be formulated as "stand-alone" projects, including small grants and medium-sized projects, as well as components of larger projects in all operational programs as appropriate. They can also be both single country or regional projects based on the area of intervention, needs and priorities of the countries.

28. Consistent with Convention mandates, GEF support for adaptation activities will seek to build on vulnerability assessments carried out as part of national communications or national studies, as well as NAPAs in the case of LDCs, identifying vulnerable sectors and regions as well as baseline conditions in these sectors and regions.

Improving the GEF Project Review Process

29. Given that most GEF funded projects are located in countries with some vulnerability to climate change, in the long term GEF investments in climate mitigation, biodiversity conservation and ecosystem management could also become vulnerable to climate change impacts. In order to ensure long-term sustainability, it is necessary that GEF projects take climate change into consideration from the start, treat it as a long term risk, assess their potential vulnerability and incorporate climate change adaptation measures into project design and implementation.

30. Given that the current GEF pipeline represents the GEF's future portfolio, the first step towards reducing GEF's vulnerability to climate change would involve conducting a climate risk assessment of a representative sample of projects in the current pipeline and identifying potentially vulnerable projects so that they can be redesigned to address climate change concerns. This exercise would be conducted in collaboration with the implementing agencies and would help the GEF better understand (i) the types of risks that each project type brings vis-a-vis adaptation, and (ii) the design features that would have to change as a response to adaptation challenges. Based on this analysis, the GEF would develop a risk scale and a guide of good practice that details the types of issues that need to be considered when designing new projects. This guide could be in the form of a "check list" and would become a part of the project review criteria for pipeline and work program entry, emphasizing long-term sustainability. Ultimately, all future GEF projects would be required to use this check list to demonstrate that they are taking climate change into consideration as a potential risk in their design and overall approach.

Engaging Stakeholders

[11] In this case, activities that focus on climate variability would be eligible for funding as long as they also take climate change into consideration. The scope and application of this requirement is addressed by Convention decisions (e.g. the need for capacity to support observation networks) as well as GEF operational strategy and guidelines (e.g. provision in OP 2 or OP 9 projects for inclusion of sea level rise assessments to support integrated coastal zone management programs).

31. An important element of GEF's approach to adaptation is to strengthen participation of key stakeholders, at local, regional and international levels, and to facilitate mobilization of resources to address impacts of climate change. Engaging local stakeholders such as governments and civil society groups, including the private sector and local communities, would ensure that country needs and priorities are properly addressed while engaging international stakeholders would secure parallel support for GEF efforts to address adaptation. Moreover, regional consultations could lead to formulation of regional projects that address certain adaptation objectives more effectively than single country projects.

32. Information exchange among key stakeholders would be supported, building upon Country Dialogue Workshops as well as targeted research and previous STAP work to help clarify the linkages between adaptation and global environment[12]. The participation of vulnerable groups of people, such as women, indigenous populations, displaced households, is critical to reducing vulnerability to adverse impacts and ensuring sustainable outcomes with global environmental benefits.[13]

MATCHING GEF SUPPORT TO COUNTRY NEEDS

33. GEF project activities that fall under each of these key elements would be selected on a country and/or regional basis consistent with local capacity, needs, and priorities, scientific and technical knowledge regarding impacts of climate change and adaptation as well as GEF's strategic priorities, sources of funding and evolving guidance from the Conventions.

34. As an initial emphasis, GEF support for adaptation would focus on capacity building activities and exploratory targeted research projects[14] in order to enhance the enabling environment and the state of scientific knowledge on adaptation in most vulnerable sectors and regions.[15] As an additional short-term measure, the GEF also proposes to initiate an examination of its project review criteria to more effectively incorporate climate change risks as an influence on project sustainability.

35. Countries which have made substantial progress on their V&A assessments and capacity building efforts would be considered for additional support as appropriate. This could come in the form of GEF support for a limited number of small-scale, innovative demonstration or pilot projects, testing different approaches to the implementation of adaptation measures. LDC parties

[12] GEF/C.19/Inf.12 Report of the STAP Expert Group Workshop on Adaptation and Vulnerability

[13] This objective may also benefit from the ongoing review of the local benefits of GEF projects

[14] Two examples are: Assessment of Impacts of and Adaptation to Climate Change in Multiple Regions and Sectors (AIACC) project, implemented by UNEP and the *Climate, Water and Agriculture: Impacts on and Adaptation of Agro-Ecological Systems in Africa* project, implemented by the World Bank.

[15] According to the IPCC, methodological gaps remain concerning scales, data, validation, and integration of adaptation and the human dimensions of climate change. Greater emphasis on the development of methods for assessing vulnerability is required, especially at national and sub-national scales where impacts of climate change are felt and responses are implemented. Methods designed to include climate change risk, adaptation and adaptive capacity explicitly in sectoral applications must be developed. Costing and valuation methodology also require further development.

that have completed their NAPAs would also be eligible for consideration at this phase of the process.[16]

36. Currently, the main source of GEF funding for adaptation projects that produce global environmental benefits is the GEF Trust Fund. However, COP 7 has created three new funds under which additional adaptation activities can be funded and has requested the GEF to operate and manage these funds[17]. In principle, the GEF would be able to provide support for adaptation through all of these funds. Annexes I and II summarize these sources and modes of funding.

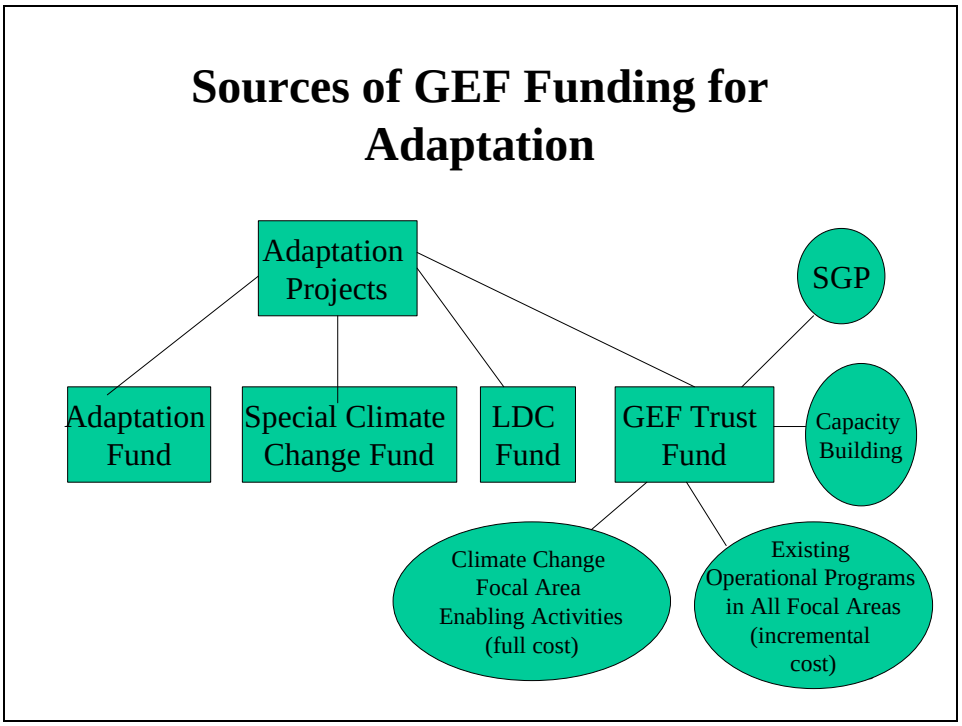
[16] The availability of additional resources from the LDC Fund for post-NAPA activities may be considered by the Parties at COP 9.

[17] GEF/C.19/Inf.10

ANNEX I. PROPOSED FRAMEWORK FOR GEF FUNDING FOR ADAPTATION

Activities to be Funded	**Project Examples**	**GEF Trust Fund**	**LDC Fund**	**Special CC Fund**	**Adaptation Fund**
Stage I Adaptation within the context of national communications	V&A analysis	Enabling Activity (Full Cost)	N/A	N/A	N/A
Stage II Adaptation within the context of national communications	Prioritization, National policy/strategy development, Planning, Targeted research, etc.	Enabling Activity (Full Cost)	N/A	N/A	N/A
Stage II Adaptation beyond the context of national communications	Sector specific action plans, Barrier removal, Cost/benefit calculations, Regional climate models, Targeted research, etc.	Operational Programs (Incremental Cost)	N/A	UNFCCC to provide guidance	N/A
NAPAs	Preparation of NAPAs	N/A	Enabling Activity (Full Cost)	N/A	N/A
Pilot and Demo Projects	Implementation and testing of sector specific adaptation measures	Operational Programs (Incremental Cost)	UNFCCC to provide guidance	UNFCCC to provide guidance	N/A
Capacity Building	Observation systems, Monitoring of diseases and vectors, Disaster preparedness, Technology transfer, Public awareness, Improving climate information, etc.	Enabling Activity (Full Cost) Proposed Expanded GEF Support for Capacity Building Operational Programs (Incremental Cost)	UNFCCC to provide guidance	UNFCCC to provide guidance	Dependent on Kyoto
Concrete Adaptation Projects		UNFCCC to provide guidance	UNFCCC to provide guidance	UNFCCC to provide guidance	Dependent on Kyoto/ UNFCCC to provide guidance

ANNEX II. SOURCES OF GEF FUNDING FOR ADAPTATION



37. Currently, the main source of GEF funding for adaptation projects that produce global environmental benefits is the GEF Trust Fund. However, at COP 7 the parties agreed to the creation of three new funds under which adaptation activities can potentially be funded. The GEF was requested and agreed to administer these funds[18]. Annex I and II summarize these potential sources and modes of funding.

A. GEF TRUST FUND

38. To date, direct and indirect GEF funding for adaptation has been provided under the GEF Trust Fund. Currently, the GEF Trust Fund uses six forms of funding that could be applicable to eligible adaptation activities: Medium-Sized Projects, Full-Sized Projects, Small Grants Program (SGP), Enabling Activities, Targeted Research, and Project Preparation and Development Facility Grants (PDF-A, B and C). It is also expected that the proposed expanded GEF support for capacity building would emerge as an additional window under the GEF Trust Fund. (See Corporate Business Plan GEF/C.21/9.)

39. The GEF Trust Fund provides funding to projects in developing countries based on either agreed full cost or on agreed incremental costs, depending on the mode of funding and related COP guidance. Under the operational programs, all projects are funded based on the incremental

[18] GEF/C.19/Inf.10

cost principle. On the other hand, support for Enabling Activity projects are provided on a full cost basis.

40. So far, within its climate change focal area, the GEF has funded Stage I and II adaptation measures as part of enabling activities to prepare first national communications on the basis of agreed full costs (**UNFCCC Decision 11/CP.1**). Such funding for adaptation is proposed to be continued for countries preparing their first or subsequent national communications, but this will be done consistent with new guidelines approved at COP 8.

41. Adaptation activities outside the context of national communications would be funded through GEF operational programs. This would be done by supporting projects with adaptation components through existing operational programs such as integrated ecosystem management (OP12), coastal, marine and freshwater ecosystems (OP 2), mountain ecosystems (OP 4), integrated land and water (OP 9) and agro-biodiversity (OP 13). The new operational program on land degradation (OP 15) would also serve as a window for adaptation projects related to land degradation.

B. NEW FUNDS

42. At COP 7 of the UNFCCC, three new funds were created:

(a) Least Developed Countries Fund (**UNFCCC Decision 7/CP.7**), to support a work program for least developed countries (LDCs), including the preparation and implementation of National Adaptation Programmes of Action (NAPAs) as well as other activities listed in section II of **Decision 5/CP.7**;

(b) Special Climate Change Fund (**UNFCCC Decision 7/CP.7**), to support (a)adaptation, (b)technology transfer, (c)energy, transport, industry, forestry and waste management, and (d)activities to assist developing country Parties in diversifying their economies;

(c) Adaptation Fund (**UNFCCC Decision 10/CP.7**), to support concrete adaptation projects and programs in developing country Parties to the Kyoto Protocol.[19]

43. The COP has asked the GEF to operate and manage these funds all of which have provisions to provide support to adaptation activities. GEF Council paper GEF/C.19/6[20] outlines the principles for operating these funds. Specifically, the operational policies, procedures, and

[19] The Kyoto Protocol, if ratified, would strengthen all provisions of UNFCCC related to the implementation and financing of adaptation. Articles 10 and 11 of the Protocol contain provisions to advance the implementation of the commitments of all Parties found in Article 4.1 of the Convention, on the same financial footing as provided by the Convention. Article 12 of the Protocol establishes the Clean Development Mechanism as a source of funding for adaptation, and envisages the creation of an Adaptation Fund based on proceeds from certified project activities. Article 12.8 provides that: "a share of the proceeds from certified project activities [will be] used to cover administrative expenses as well as to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation."

[20] GEF/C.19/6 Arrangements for the Establishment of the New Climate Change Funds

governance structure of the GEF will apply to the operation of all the funds, unless the COP determines through guidance concerning the modalities for operating the funds that other arrangements should be made[21]. One example of such guidance is a provision in the Least Developed Countries Fund, specifying that funding is to be provided to meet the agreed full cost of preparing national adaptation programs of action (NAPAs) [22]. It is expected that the UNFCCC will provide guidance to identify program priorities for financing within the broad scope of the mandate of each Fund.

44. **Least Developed Countries (LDC) Fund**: In accordance with **UNFCCC Decision 7/CP.7**, this Fund is to support a work program for the LDCs. The COP has also approved initial guidance (**UNFCCC Decision 27/CP.7**) which requests the GEF, as a first step, to provide funding from the LDC Fund to meet the agreed full cost of preparing NAPAs, given that the preparation of NAPAs will help to build capacity for the preparation of national communications in LDCs. According to this decision, the LDC fund will be complementary to separate from the other funds. The GEF is requested to adopt simplified and streamlined procedures for expedited access to the LDC Fund.

45. The GEF has already begun providing expedited funding to the LDCs through the LDC fund. Future activities to be supported by this fund will be determined by decisions of the UNFCCC. A report on operations of the LDC fund has been presented for the Council's consideration separately (GEF/C.21/5/Rev.1).

46. **Special Climate Change (SCC) Fund:** In accordance with **UNFCCC Decision 7/CP.7**, this fund is to finance activities, programs and measures relating to climate change, that are complementary to those funded by the resources allocated to the GEF's climate change focal area and by bilateral and multilateral funding. Adaptation is one of the areas which the fund would support. Paragraph 8 of **UNFCCC Decision 5/CP.7** provides that the following adaptation activities are to be supported through this fund and the Adaptation Fund:

(a) implementing adaptation activities where sufficient information is available, inter alia, in water resources management, land management, agriculture, health, infrastructure development, fragile ecosystems, including mountainous ecosystems, and integrated coastal zone management; monitoring diseases and vectors affected by climate change, related forecasting and early-warning systems, and in this context, improving disease control and prevention;

(b) capacity building, including institutional capacity, for preventive measures, planning, preparedness and management of disasters relating to climate change, including contingency planning, in particular, for droughts and floods in areas prone to extreme weather events;

[21] Decision7/CP.7, which establishes the special climate change fund and the LDC Fund, provides that the COP is to provide guidance to the GEF on modalities for operating the funds, including expedited access.

[22] COP 7, by its Decision 27/CP.7, adopted initial guidance for the operation of the LDC Fund, including the preparation of NAPAs as a program priority.

(c) strengthening existing and, where needed, establishing national and regional centers and information networks for rapid response to extreme weather events, utilizing information technology as much as possible.

47. According to **UNFCCC Decision 7/CP.7**, SCC Fund support will be provided to developing country Parties (all non-Annex I Parties). The COP is to provide guidance to the GEF on modalities for operating this fund, including expedited access. It is expected that such guidance will also serve to identify program priorities for financing by the Fund within the broad scope of its mandate. Parties included in Annex II, and other Parties included in Annex I that are in a position to do so, have been invited to contribute to the fund.

48. **Kyoto Protocol Adaptation Fund**: In accordance with **UNFCCC Decision 10/CP.7**, this fund is to finance concrete adaptation projects and programs in addition to the above mentioned activities listed in paragraph 8 of **UNFCCC Decision 5/CP.7**.

49. Guidance on the operation of the fund is to be provided by the UNFCCC COP serving as the meeting of the Parties to the Kyoto Protocol, with guidance to be provided by the COP in the period prior to the entry into force of the Kyoto Protocol. It is expected that such guidance will serve to identify program priorities for financing by the Fund within the broad scope of its mandate. The fund is to be financed from two percent of proceeds from the clean development mechanism projects.[23] Parties included in Annex I that intend to ratify the Kyoto Protocol are invited to provide funding, which will be additional to the share of proceeds on clean development mechanism project activities. Developing country Parties that are Parties to the Protocol will be eligible to receive funding from this fund.

[23] In Decision 17/CP.7, paragraph 15(a), the Conference of the Parties decided, "that the share of proceeds to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation, as referred to in Article 12, paragraph 8, of the Kyoto Protocol, shall be two per cent of the certified emission reductions issued for a clean development mechanism project activity." Modalities and procedures will need to be considered and agreed by the Conference of the Parties for the collection and transfer of these funds.

ANNEX III. EXISTING LINKAGES BETWEEN ADAPTATION AND GEF FOCAL AREAS

50. Current GEF support for adaptation is not limited to projects under the climate change focal area. The GEF's extensive experience in land degradation, biodiversity, international waters and integrated ecosystem management gives it invaluable experience to assist countries in adaptation to climate change. In fact, GEF projects in these areas have been "indirectly" contributing to the enhancement of the adaptability and resilience of vulnerable ecosystems by

(a) minimizing short term (non-climate) stresses;

(b) reducing maladaptation by improving enabling environments (e.g. capacity building); and

(c) implementing cross-sectoral management strategies (i.e. integrated coastal zone management – ICZM) to achieve sustainable development.

51. These can be characterized as "no regrets"[24] or "indirect" adaptation activities that are undertaken independently of climate change consideration, but which improve adaptive capacity to cope with impacts of climate change.

52. The following sections will briefly outline characteristics of GEF interventions in Biodiversity, International Waters, Land Degradation and Integrated Ecosystem Management, which directly and/or indirectly provide adaptation benefits[25]. These projects illustrate the multi-disciplinary and cross-cutting nature of efforts needed to address the impacts of climate change. They also demonstrate how the GEF can use a multi-focal area approach to provide funds for adaptation activities that provide global environmental benefits.

A. ADAPTATION AND BIODIVERSITY CONSERVATION

53. The GEF serves as the interim financial mechanism for the Convention on Biological Diversity (CBD) and provides funding to meet the agreed incremental costs of measures that achieve global environmental benefits in biological diversity. Global environmental benefits as they pertain to the CBD include reduced risks of global biodiversity loss, enhanced protection of ecosystems and sustainable use of biodiversity.

54. Within the biodiversity focal area, the GEF operates five operational programs (OPs): Arid and Semi-Arid Zone Ecosystems (OP1 – discussed under land degradation), Coastal, Marine and Freshwater Ecosystems (OP2), Forest Ecosystems (OP3), Mountain Ecosystems (OP4) and Agro-ecosystems (OP13). All projects under these operation programs adopt the

[24] See Klein, R.J.T, and R.S.J. Tol. 1997. *Adaptation to Climate Change: Options and Technologies*. An Overview Paper. Amsterdam, the Netherlands. IVM/Vrije Universiteit, for UNFCCC; and Orlando, B.M. and R.J.T. Klein, 2000: *Taking an Ecosystem Approach to Climate Change Adaptation in Small Island States.* Second Workshop on Climate Change Negotiations, Strategy and Management, Alliance of Small Island States, Apia, Samoa, 31 July – 3 August 2000.

[25] The review of projects presented here was undertaken during July-August 2002 and therefore covers projects that have been admitted to the GEF work program up until May 2002.

'ecosystem approach' for the integrated management of land, water and living resources. The ecosystem approach encourages the integration of scientific, social and economic information to provide a more holistic and 'adaptive' understanding of ecosystems for policy development and management with an emphasis on ecological change, uncertainty and fluctuation. Concomitant to this is the appreciation of climatic variability and change. Accordingly, the CBD COP5/6 states[26]:

> *" The ecosystem approach must utilize adaptive management in order to anticipate and cater for…changes and events and should be cautious in making any decision that may foreclose options, but, at the same time, consider making mitigating actions to cope with long-term changes such as climate change."*

55. The ecosystem approach recognizes that ecosystems are intimately linked and integrates scientific knowledge of ecological relations with sociopolitical considerations and values to achieve biodiversity conservation and sustainable development. The underlying assumption of the ecosystem approach is that maintaining biodiversity provides services that will assist adaptation and mitigation of climate change. Examples are water storage, groundwater recharge, watershed, flood and soil erosion protection provided by forests, storm protection provided by coral reefs and/or mangroves, shoreline stabilization and sequestration of carbon dioxide in forests and rangeland ecosystems. The approach encourages policy makers and managers to think in terms of ecosystem and social change, and thus it enables the design of strategies to anticipate and respond to change which has relevance to adaptation to climate change. Key project examples of the ecosystem approach are ICZM, integrated forest and watershed management, protection, rehabilitation and restoration of forest ecosystems for carbon sequestration and biodiversity conservation, establishment of participatory and decentralized systems for resource management and sustainable use which are able to internalize and react to change.

Coastal, Marine and Freshwater Ecosystems

56. OP 2 addresses conservation and sustainable use of biodiversity in wetland, mangrove, coastal, estuarine, marine and freshwater ecosystems. All of these ecosystems offer adaptation services within the context of predicted sea level and climate changes. OP2 projects involve integrated approaches to coastal area development and management, including the creation and strengthening of PA systems and sectoral linkages (e.g. between land and coastal management) and planning with other social and economic activities to meet national conservation requirements.

57. Under this operational program, the needs of tropical and Small Island Developing States (SIDS) ecosystems, particularly coral reefs, have received specific attention given their inherent vulnerability to both immediate human stresses and climate change. Although no OP2 projects have directly addressed adaptation to climate change as an explicit project activity, all projects provide "no regrets" adaptation benefits in terms of improving adaptive capacity and increasing ecosystem resilience. The types of activities funded under OP2 include:

[26] Decision V/6, Principle 9

(a) Creating enabling environments by developing appropriate legislation, policy, management and planning frameworks and strategies (e.g. ICZM) to prevent and mitigate human stress factors and to increase resilience of coastal, marine and freshwater ecosystems;

(b) Promoting institutional capacity building for management of resources within and outside marine PAs;

(c) Piloting projects that improve livelihoods and conservation through the implementation of sustainable use, aquaculture/mariculture, eco-tourism and benefit sharing;

(d) Demarcating, gazetting, expanding and consolidating of PA systems with particular focus on vulnerable or key representative systems of coastal, marine and freshwater conservation areas;

(e) Targeted research to identify and assess impacts of natural ecological disturbances and effects of human stresses;

(f) Instituting systems, methods and tools for the establishment of monitoring and evaluation baselines for ecological and social impacts (e.g. ecological surveys of key indicator species, surveys of impacts on livelihoods and participation).

58. From 1991 to 2002, the GEF has provided $285 million alongside $811 million in co-financing for 100 OP2 projects which have contributed to the conservation of coastal, marine and freshwater biodiversity, sustainable development and provided no regrets adaptation benefits.

59. Examples of OP2 projects that produce adaptation benefits include; integrating of conservation and sustainable use of water resources, integrated land-use and coastal management plans and there are currently OP2 projects which are implementing or planning ICZM[27]; pilot projects to provide livelihood and conservation benefits adjacent to globally important coastal, marine and freshwater ecosystems through buffer zones particularly in relation to coral reef conservation[28]; policy reform of land tenure and resource rights in the coastal, marine and freshwater ecosystems to encourage sustainable use; reduction of habitat fragmentation and the

[27] For example; Argentina: Consolidation and Implementation of the Patagonia Coastal Zone management Program for Biodiversity Conservation; Georgia: Integrated Coastal Management Project; Belize: Conservation And Sustainable Use of the Barrier Reef Complex; Yemen: Coastal Zone Management along the Gulf of Aden; Seychelles: Marine Ecosystem Management Project; Cuba: Priority Actions to Consolidate Biodiversity Protection in the Sabana-Camaguey Ecosystem; Indonesia: The Greater Berbak-Sembilang Integrated Coastal Wetlands Conservation Project; Dominican Republic: Biodiversity Conservation and Management in the Coastal Zone of the Dominican Republic; Colombia: Caribbean Archipelago Biosphere Reserve: Regional Marine Protected Area System.

[28] For example, Egypt: Red Sea Coastal and Marine Resource Management; Eritrea: Conservation Management of Coastal, Marine and Island Biodiversity; India: Conservation and Sustainable Use of the Gulf of Mannar Biosphere Reserves; Indonesia: Coral Reef Rehabilitation and Management Project; Mozambique: Coastal and Marine Biodiversity Management Project; Philippines: Coastal and Marine Biodiversity Conservation in Mindanao.

establishment of eco-corridors allowing for migration of species and targeted monitoring and evaluation and research. Of particular relevance is the project addressing regional monitoring of coral reefs in the Indian Ocean[29] which includes monitoring for climate induced bleaching. The information from this project will be used by country's to improve ICZM and sustainable management of coral reefs.

60. Box 1.1 provides an example of GEF project addressing the interface between adaptation and conservation and sustainable use of coastal, marine and freshwater ecosystems.

Box 1.1 Regional: Conservation and Sustainable Use of the Mesoamerican Barrier Reef System (MBRS)

The objective of the Mesoamerican Barrier Reef Project is to enhance protection of the ecologically unique and vulnerable marine ecosystems comprising the MBRS, by assisting the recipient countries to strengthen and coordinate national policies, regulations and institutional arrangements for conservation and sustainable use. The Project assists Belize, Guatemala, Honduras and Mexico to: (1) strengthen existing marine PAs and establish new PAs in transboundary conservation areas; (2) develop and implement standardized regional monitoring and environmental information systems (including for coral bleaching/climate impacts); (3) promote measures to reduce non-sustainable patterns of resource use, focusing initially on the fisheries and tourism sectors; (4) increase local and national capacity for environmental management through education and information sharing and training; and (5) strengthen and coordinate national policies, regulations and institutional arrangements for marine conservation and sustainable use including Integrated Coastal Zone Management (ICZM) and planning. Total financing is $17.78million with a GEF contribution of $10.62million.

61. The current OP2 project pipeline contains 63 full and medium size projects. Although none of these projects have activities which directly address adaptation to climate change, many of the planned activities address ICZM, management of wetlands, coral reefs including monitoring for climate induced bleaching, and flood management which offer considerable indirect adaptation benefits. For example, six projects have a strong emphasis on the development of ICZM[30]; 20 projects address wetlands and freshwater management including one project in China with strong emphasis on integrated flood and wetland management and modeling[31]; nine projects have SIDS emphasis and 11 projects focus on coral reef management and sustainable use.

Forest Ecosystems

62. OP3 concentrates on the establishment and strengthening of systems of conservation areas (including PAs) and demonstration and development of sustainable use of forest products as part of integrated land management. It focuses primarily on tropical and temperate forests

[29] Regional: Coral Reef Monitoring Network in Member States of the Indian Ocean Commission within the Global Coral Reef Monitoring Network.
[30] Benin, Guinea, Jamaica, Philippines, Senegal and Tunisia.
[31] China: Songhua River Flood and Wetland Management Project.

which are vulnerable to immediate human stresses and longer term climate stress[32]. Particular attention is given to the conservation of wild relatives of domestic plants and animals for the sustainable use of biodiversity, conservation of areas of importance to migratory species and eco-corridors[33], institutional strengthening of conservation systems as well as capacity building to support preservation and maintenance of the knowledge of indigenous peoples.

63. The types of OP3 activities that contribute to improving adaptive capacity and ecosystem resilience include:

(a) Creating enabling environments by developing appropriate legislation, policy, planning and management tools to reduce human stress factors and invasive species, and to increase resilience of forest ecosystems;

(b) Promoting institutional capacity building for management of forest resources within and outside PAs, including sectoral integration, sustainable logging and carbon sequestration;

(c) Piloting projects that improve conservation as well as livelihoods, particularly of indigenous people's, through the implementation of sustainable use of forest products;

(d) Demarcating, gazetting, expanding and consolidating of PA systems with particular focus on vulnerable forest areas; maintaining and creating forest corridors within productive landscapes, particularly in critical habitats or areas of importance for migratory species;

(e) Targeted research to identify and assess impacts of natural ecological disturbances and effects of human stresses;

(f) Instituting systems, methods and tools for the establishment of monitoring and evaluation baselines for ecological and social impacts (e.g. ecological surveys of key indicator species, surveys of impacts on livelihoods and participation).

64. The Forest Ecosystem program links with other OPs and indirectly provides adaptation benefits. For example, arresting deforestation reduces soil erosion and provides watershed protection to reduce downstream flooding and improve river basin management, reducing deforestation of in arid and semi-arid and mountain ecosystems also has clear benefits for improving livelihoods in vulnerable areas and maintaining integrity of watersheds. The GEF has funded many OP3 projects that are multi-focal and overlap with OP1, OP2, OP4, OP9 and OP12 and take an integrated ecosystem approach to biodiversity conservation.

[32] IPCC. 2001. *Climate 2001: Impacts, Adaptation and Vulnerability- IPCC Working Group II Report*. Cambridge, UK. Cambridge University Press.

[33] Mexico: Mesoamerican Biological Corridor; Nicaragua: Atlantic Biological Corridor; Panama: Atlantic Mesoamerican Biological Corridor

65. To date, GEF has provided $579 million for 142 OP3 projects alongside $1322 million in co-financing, which has contributed to the conservation of forest biodiversity and sustainable development. The current OP3 project pipeline contains 41 full and medium sized projects which have been allocated GEF funds for preparation. Although none of the projects include activities which directly address adaptation to climate change, they do plan activities such as integrated ecosystem management approaches that link forest conservation with sustainable use and livelihoods, fire and watershed/river basin management, creation of trans-boundary migratory corridors, carbon sequestration, as well as land and coastal management. For example, two projects in Gabon and South Africa[34] recognize that climate change is very likely to impact forest ecosystems. The South Africa project will attempt to improve adaptive management through integrated regional planning and management within PAs and in productive landscapes including both forest and coastal elements. Box 1.2 provides a example of a project linking adaptation to forest ecosystems.

Box 1.2 Atlantic Biological Corridor

The Atlantic slope of Nicaragua accounts for over half of the country's 12 million ha. The outstanding biological value of the Atlantic region's natural habitats is recognized nationally and globally. The Atlantic slope is endowed with important habitats ranging from mangroves and coastal wetlands to lowland humid forests, pine savannas and bamboo forest. The area is under threat from human activity. The overall objective of the project is to promote the integrity of the biological corridor along the Atlantic slope by ensuring conservation and sustainable use in line with the Rural Municipalities Project. The project has four components: (1) public communication and education; (2) corridor monitoring and planning based on proposed land use patterns which are contiguous with sustainable development and biodiversity conservation and objectives; (3) creation of a series of protected areas would target areas of high biodiversity importance, that are currently threatened now and in the future and lacking adequate support from donors; strengthen their management and enhance conservation outside protected areas; (4) indigenous community development by strengthening and enforcing their rights to manage resources sustainably through (a) strengthening of indigenous organizations (b) support to the regional governments and to national demarcation of indigenous lands (c) land demarcation activities. Total financing $19.8million. GEF contribution of $7.1million

Mountain Ecosystems

66. OP 4 addresses conservation and sustainable use of biodiversity areas under increasing human stress and imminent threat of degradation. It has synergy with forest ecosystem program (OP3), and many OP4 projects are multi-focal. The portfolio is focused in Mesoamerica, Andean, East African, Himalayan, Indochina Peninsula and SIDS which are recognized as vulnerable to climate change[35]. The GEF projects focus on instituting sustainable land use practices through integrated ecosystem management on mountain slopes in order to protect representative habitats,

[34] Gabon: South Africa: Cape Action Plan for the Environment (CAPE): Implementation Program.

[35] IPCC. 2001. *Climate 2001: Impacts, Adaptation and Vulnerability- IPCC Working Group II Report*. Cambridge, UK. Cambridge University Press.

particularly forests. They also seek to strengthen the network of representative conservation areas in alpine, mountain grassland, mountain forest and freshwater systems.

67. Activities that best illustrate how this program indirectly leads to adaptation benefits are those that link management of mountain and lowland ecosystems through corridors that allow for species migration as well as adaptation to both human and climatic stress. For example, in 2002 GEF funded a medium sized targeted research project on integrated management of mountain ecosystems in order to establish and disseminate best practices, including identifying ecosystems and human societies at risk from adverse change and those likely to be vulnerable to climate change in the future. Box 1.3 provides an example of a project linking adaptation to mountain eco-systems.

Box 1.3 Ecuador: Choco-Andean Corridor

The project aims to create the Choco-Andean rainforest corridor between 1000 – 3000m. The corridor is treated as matrix of land uses, rather than as a rigid piece of land. It is currently threatened by unsustainable human activities (e.g., logging causing deforestation) The project will establish priorities and guidelines for the Choco-Andean region taking into account spatial patterns of distribution of biodiversity and using a multi-stakeholder approach; establish a pilot corridor in the southern ecosystems of this bioregion by increasing the extent of the area under conservation and sustainable management between protected areas; increase the quality, quantity and availability of environmental information, facilitating decision making related to conservation and sustainable management in the region; design and establish a system of incentives for the conservation and sustainable management in the region. Total financing $3.3million. GEF contribution of $1million.

68. Since 1991 to 2002 GEF has provided $126 million for 51 OP4 projects alongside $112 million in co-financing, which has contributed to the conservation of forest biodiversity and sustainable development. Currently, the GEF OP4 pipeline contains 24 projects. Again, no project proposes direct measures in relation to adaptation to climate change, however, there are indirect benefits through planned activities such as establishment of migratory corridors[36], building capacity for the conservation of agro-biodiversity in mountain regions[37] as a genetic pool for possible crop development. One project proposed for China recognizes the long term climate change risks to mountain areas[38] and proposes establishment of a series of integrated PAs and corridors linked to productive landscapes and the conservation of agro-biodiversity.

Conservation and Sustainable Use of Biological Diversity Important to Agriculture

69. Although related to OP1, OP13 activities provide a more specific focus on the conservation of agricultural biodiversity. OP13 supports the following activities:

[36] Kazakhstan: In situ Conservation of Kazakhstan's Mountain Agrobiodiversity; Mongolia: Conservation and Sustainable Use of Biodiversity in the Atlai-Sayan Ecoregion of Mongolia. Regional: Bioregional Biodiversity Conservation in the Altai-Sayan Mountain Eco-region Phase I.

[37] Regional: In-situ Conservation of Crop Wild Relatives through Enhanced Information Management and Field Application (Armenia, Bolivia, Madagascar, Sri Lanka, Uzbekistan)

[38] China: Yunnan Comprehensive Agricultural Development and Biodiversity Conservation Project.

(a) Integrated rural development on a sustainable basis (e.g farmer seed supply and exchange, participatory plant breeding, range management);

(b) Integrated management of crops and animals to reduce the use of pesticides and fertilizers which cause pollution of lakes and river systems;

(c) Soil conservation and restoration of degraded areas;

(d) Water management that eases grazing pressure and prevents vegetation deterioration;

(e) Designation of PAs that contain wild relatives of crops and animal breeds;

(f) Energy conservation projects that emphasize alternative sources of energy (e.g. solar and biomass) that conserve vegetation and biological diversity;

(g) Establishment of financial incentives for sustainable use and cost recovery mechanisms;

(h) Community based farming and pastoral systems that foster and preserve indigenous knowledge.

70. Since OP13 has been created only recently, only two projects have been funded so far, neither of which directly addresses adaptation. The first project focuses on below-ground biodiversity critical to productive landscapes with a focus on sub-Saharan Africa and southeast Asia. It aims to establish specific indicators and recommends critical sites for conservation as well as establishing sustainable or 'best' practices for biodiversity conservation with productive benefits as well as indirect adaptation benefits. The second project focuses on the establishment of sustainable community-based Gene Management Zones (GMZ) with agricultural landscapes for the conservation of wild relatives of domesticated plants in Vietnam. Specific attention is paid to key global crops of rice, taro, tea, rice bean, citrus and litchi-longan.

71. To date, GEF has provided $7.2 million alongside $15.57 million in co-financing for two OP13 projects. There are currently 10 OP13 projects under preparation of which two focus predominantly on the conservation of globally important wild rice species in Cambodia and China. The China project has great adaptation benefits given that the country is the source of over half the worlds agricultural biodiversity and some rice species found there are resistant to both poor soils and drought conditions. Hence, the biodiversity and adaptive value is high. One project considers the conservation of wild relatives within the context of future livelihood and climate demands and is focused on improving and disseminating knowledge of wild relatives and building capacity within local communities to preserve agro-biodiversity and cultural mechanisms that support them to mitigate immediate stress factors, thus building adaptive

capacity, ecological and social resilience[39]. Box 1.4 provides an example of OP13 projects that are consistent with adaptation.

Box 1.4 Conservation and Sustainable Use of Dryland Agro-biodiversity in the Fertile Crescent

The fertile crescent is an area of mega-diversity of important food crop and pasture species. It is one of the few centers where numerous species (notably wheat, barley, lentil, pea and vetch) of temperate zone agriculture originated 10,000 years ago and where their wild relatives are still found. The project is aims to conserve agro-biodiversity which is seriously threatened through degradation, intensification of rangelands and expansion of cultivation. The long term objective of this project is to ensure continuous availability of agro-biodiversity in the Fertile Crescent that is essential for the sustainable development of agriculture in that region as well as for global food security and production. The specific project objectives are (1) development of an information base for the research, monitoring and evaluation of the genetic diversity of ten target crops in the fertile crescent, and social, economic, land use and agricultural policies and practices which affect them; (2) a replicable, transferable and integrated approach for the conservation and sustainable use of agro-biodiversity within agro-ecosystems, adopted by participating countries and authorities and driven by local communities, in selected target areas of representative ecosystems; (3) national land use social and economic policy measures (involving incentives, compensation and alternative livelihoods) to support and ensure the sustainability of the agro-biodiversity conservation activities; (4) strengthened national capacity for the conservation and sustainable use of agro-biodiversity (including technical and management capability), through training, regional collaboration, networking and exchange in experience. Total financing of $18.78million with GEF contribution of $8.18million.

B. ADAPTATION AND INTERNATIONAL WATERS

72. The international waters[40] focal area addresses issues related to trans-boundary waters and consists of two operational programs which relate indirectly to adaptation to climate change: waterbody-based program (OP 8) and integrated land and water program (OP 9).

Waterbody-based Operational Program

73. OP 8 addresses trans-boundary environmental concerns that exist in a specific waterbody to provide a comprehensive approach to its sustainable management. The objectives of the program is to undertake series of projects that assist countries in working collaboratively to achieve remedial changes and to arrest the degradation of international waters through the development of Strategic Action Programs (SAPs) to address priority trans-boundary concerns including the identification of non-climatic threats and problems such as depletion of fish stocks and/or marine pollution as the relate to ecosystem dynamics such as ocean currents and comprehensive environmental analysis and setting of baselines for actions needed. The types of activities funded include:

[39] Cambodia: Conservation of Traditional Varieties of Deepwater Rice and Associated Biodiversity in Kampong Thom Province, Cambodia; China: Conservation and Sustainable Utilisation of Wild Relatives of Crops.

[40] The term 'international waters' as used for the purposes of the GEF Operational Strategy, includes oceans, large marine ecosystems (LMEs), enclosed or semi-enclosed seas and estuaries as well as rivers, lakes, groundwater systems and wetlands with transboundary drainage basins or common borders. A common hydrological cycle dynamically links many watersheds, airsheds and estuaries and coastal and marine waters through transboundary movement of water, pollutants and living resources (e.g. fish stocks). In this respect international waters issues are intimately linked to climate change and variability through hydrological processes.

(a) Creating an enabling environment by developing harmonization and cooperation between country's legislative and policy frameworks and preparation of management plans for joint resources;

(b) Capacity building and/or formulation of management institutions to sustain actions, paying particular attention to stakeholder participation, design and conducting social and ecological assessments;

(c) Piloting demonstration projects that test new interventions such as permit process, water minimization/pollution requirements and fishing regulations for sustainable use of resources (e.g. implementation of the UNCLOS Code of Conduct for Responsible Fishing);

(d) Formulation of SAPs based on comprehensive trans-boundary diagnostic environmental analysis that establishes key threats and linkages to be addressed.

74. OP8 projects that have addressed trans-boundary diagnostic analysis and the preparation of SAPs have produced indirect adaptation benefits in relation to water scarcity and flood risks in trans-boundary river basins, fluctuations in fisheries of lakes[41] and large marine ecosystems (LMEs) in terms of establishing and planning mitigation of immediate human threats, particularly pollution[42]. They have also identified fluctuating climate as a key trans-boundary issue to be addressed through multi-country cooperation and management particularly in connection with ocean current circulation.

75. To date, GEF has provided $239 million in funding for 32 OP8 projects alongside $403 million in co-financing, which has contributed to the conservation of international waters and sustainable development. The current OP8 pipeline contains 16 projects under preparation of which seven employ an integrated ecosystem approach to freshwater, LME and fisheries management[43] and nine outline measure diagnostic analysis and SAPs to address regional pollution of ecosystems. Box 2.1 describes an OP8 project with indirect adaptation benefits.

[41] Regional: Lake Victoria Environmental Management Project; Regional: Environmental Protection and Sustainable Integrated Management of the Guarani Aquifer; Regional: Lake Ohrid Management; Egypt: Lake Manzala Engineered Wetlands; Regional: Mekong River Basin Water Utilization Project.

[42] Regional: Developing the Implementation of the Black Sea Strategic Action Plan; Regional: Developing the Danube River Basin Pollution Reduction Program; Regional: Water Pollution Control and Biodiversity Conservation in the Gulf of Guinea Large Marine Ecosystem; Regional: Danube/Black Sea Basin Strategic Partnership on Nutrient Reduction, Phase I

[43] Albania: Integrated Water and Ecosystems Management Project; Regional: Addressing Land-based Activities in the Western Indian Ocean; Regional: Regional Partnership for Prevention of Trans-boundary Degradation of the Kura-Aras River; Regional: Integrated Ecosystem Management in the Trans-boundary Prespa Park Region; Regional: An Ecosystem Approach to the Sustainable Use of the Resources of the Agulhas and Somali Current Large Marine Ecosystem; Regional: Sustainable Management of the Shared Marine Resources of the Caribbean Large Marine Ecosystem and Adjacent Regions; Regional: Southwest Indian Ocean Fisheries Project; Regional: Towards a Convention and Action Programme for the Protection of the Caspian Sea Environment.

Box 2.1 Integrated Management of the Benguela Current Large Marine Ecosystem (BCLME)

The Benguela system is at a critical location in terms of the global climate system, as it forms a connection between the Indo-Pacific and North Atlantic Oceans and it is influenced by El Nino events which impact fish stocks. As a consequence, the current system is potentially vulnerable to any future climate change or increasing variability in climate. The BCLME has been placed under severe stress caused by over-fishing, coastal pollution and inshore modification (e.g. diamond mining) against a background of climate variability and change. The overall objective of the project is to create mechanisms for the sustainable management of the BCLME; assess climate variability (El Nino) and ecosystem impacts (non-climatic – e.g. over-fishing, water quality and coastal pollution, loss of biodiversity, algal blooms); improve predictability through research and monitoring as preliminary steps to maintain BCLME ecosystem health; and prevent pollution. The goals of the project will be: (1) to create a Benguela Current Commission (BCC) to coordinate management of the BCLME; (2) to develop management capability to better sustain and utilize resources of the BCLME; (3) to develop plans and implement actions for optimal sustainable utilization of marine resources; (4) to assess the impacts of resource extraction, mining and drilling, and promote rational harmonization of activities between countries; (5) country agreement on measures necessary to ensure development of mariculture; (6) to protect vulnerable habitats and species, and reverse habitat destructio;n (7) to improve understanding of ecological and climate variability to improve predictability and management of fish stocks to sustain human livelihoods (8) to reduce uncertainty and improve predictability of regional resources; (9) to strengthen training capacity for improved management of shared resources; (10) to develop programs and measures to address coastal pollution. In 2001, GEF provided $15m funding over 5 years.

Integrated Land and Water Operational Program

76. OP9 also addresses the degradation of international waters, but within a multi-focal framework. It also stresses prevention of degradation as opposed to remedial changes emphasized in OP8. The focus is on integrated approaches to the use of better land and water resource management practice (e.g. flood and drought management taking into account climatic variability, ICZM, etc.) with a long term objective of promoting sustainable development. In doing so it has close synergies with other GEF focal areas such as climate change, land degradation and biodiversity. These cross-sectoral linkages are most acutely focused in the OP's specific provision to address the needs of SIDS and Africa which are areas that highly vulnerable to climate change, land degradation and biodiversity loss.

77. Types of activities funded include:

(a) Enabling and developing harmonization and cooperation between country's legislative and policy frameworks and preparation of SAPs to address improved watershed and catchment management, sustainable land-use and conservation systems. Promoting the harmonization of economic and social policies as they relate to trans-boundary water management and land degradation (e.g. especially in drylands where land degradation is linked to changes in climate and river flow management such as dams);

(b) Capacity building and/or formulation of management institutions to sustain actions and implement SAPs, paying particular attention to stakeholder participation, design and conducting social and ecological assessments;

(c) Piloting demonstration projects that test new interventions such as permit processes, water conservation, coastal zone planning and management (ICZM), sustainable management of fish stocks, tourism development, land and marine based sources of pollution and vulnerability to climate change in SIDS;

(d) Formulation SAPs based on comprehensive trans-boundary environmental analysis that establishes key threats;

(e) Targeted research to establish information systems, simulation and modeling to build up predictive capability to improve environmental management (e.g. using climate change models to improve value-added benefits of coastal zone planning in SIDS).

78. The integrated character of OP9 projects has produced projects that have significant indirect adaptation benefits as they focus on groundwater, watershed and coastal management and strategic planning to address immediate human stress in areas which are very likely to be impacted by climate change. For example, the Pacific SIDS project[44] addresses oceanic fisheries as well as conservation of island water resources. A similar project is under preparation for the Caribbean SIDS and contains design features to allow linkages with the Mainstreaming Adaptation to Climate Change Project in the Caribbean project which is a climate change enabling activity.[45] Moreover, although adaptation is not directly specified as an objective, several projects in Africa contain elements that enhance the ability of countries to adapt to climate change. These projects include the Lake Chad Basin project as well as two projects in preparation, which address land degradation, water conservation and river flow depletion to assist communities adapt to fluctuating lake and river levels on the Niger Basin and Volta Basin. There are similar projects in the Nile Basin, Aral Sea, Egypt, Lake Tanganyika as well[46].

[44] Regional: Implementation of the Strategic Action Programme (SAP) of the Pacific Small Island Developing States

[45] Global: Effects of Localized Anthropogenic Stress and Compounding Impacts of Climate Change on the Sustainability of Coral Reef Ecosystems and the Implications for Management has recently entered the GEF pipeline and the funding for this project will also be provided based on the agreed incremental cost principle.

[46] Regional: Reversal of Land and Water Degradation Trends in the Lake Chad Basin Ecosystem; Regional: Water and Environmental Management in the Aral Sea Basin; Regional: Nile Transboundary Environmental Action Project, Phase I; Regional: Pollution Control and Other Measures to Protect Biodiversity in Lake Tanganyika; Egypt: Developing Renewable Ground Water Resources in Arid Lands: a Pilot Case - the Eastern Desert of Egypt.

79. Boxes 2.2 and 2.3 provide examples of projects which consider climate as a variable.

Box 2.2 A Regional Framework for the Sustainable Development and Management of Water Resources in the Plata River Basin.

The Plata Basin extends over three million square kilometers and is second largest river basin in South America and shared by Argentina, Bolivia, Brazil, Paraguay and Uruguay. During recent years, the Plata River Basin has been affected by alternating series of floods and droughts with devastating impacts on local communities and the national economies. Rapid urban development, changes in land use, the increase of lands dedicated to agriculture, and the change in the uses of the water resources, have compounded these effects. All these problems have been analyzed in each country but not integrated into an assessment of the overall basin. This project seeks to develop a framework for the co-ordinated management of the entire basin in a sustainable manner, based upon the development of an appropriate institutional framework. The project will specifically support a process designed to initiate a process to develop agreement to enhance cooperation between the five countries in the management of shared water resources. Development of technical basis upon which to define joint priorities and define a timetable necessary for a management framework to adapt to increasing risk of major floods and droughts (El Nino events).

Box 2.3 Opportunities for Using Groundwater in Drought Prone Areas of the SADC Region

Groundwater is a key element to alleviate the effects of drought in the SADC region. Policy responses in the past have been based on short-term crisis management, and insufficient attention has been paid to the sustainable management of groundwater resources. To address this situation predictive and mitigation measures are required both for groundwater and surface resources to secure proactive and sustainable management of water resources. The GEF project will develop a strategic regional approach to support and enhance the capacity of member states in their drought management policies, in relation to the regional significance of the role, availability (magnitude and recharge) and supply potential of groundwater sources. At a regional level the project will identify transboundary impacts of groundwater development in various river basins, and identify priority drought prone areas and provide regional management tools such as drought vulnerability and water scarcity maps, and regional groundwater monitoring networks and regional groundwater information systems. The developed tools will be sustained through SADC institutions, which are financed by member countries. Total project cost is $12.0million with GEF contribution of $8million.

80. In summary, between 1991 and 2002 GEF has provided $163 million alongside $293 million in co-financing for the 22 OP9 projects. There are 16 OP9 projects currently under preparation. Two projects focus on the Niger Basin and Volta Basin which address land degradation and water conservation measures and river flow depletion in terms of assisting communities to adapt to fluctuating lake and river levels[47]. Encouragingly, seven projects focusing on integrated approaches to LME, SIDS, coastal, and river basin management in drylands either address or consider climate change in the project design[48].

[47] Regional: Integrated Management of the Volta River Basin;

[48] For example; Global: Effects of Localized Anthropogenic Stress and Compounding Impacts of Climate Change on the Sustainability of Coral Reef Ecosystems and the Implications for Management; Regional: A Transboundary Diagnostic Analysis and Strategic Action Programme for the Gulf of Mexico Large Marine Ecosystem; Regional: Integrated Management of the Humboldt Current Large Marine Ecosystem (HCLME); Regional: Integrating Watershed and Coastal Area Management in Small Island Developing States of the Caribbean; Regional: Integrated Ecosystem Management in Shared Watersheds between Niger and Nigeria; Regional: A Regional Framework for the Sustainable Development and Management of Water Resources in the Plata River Basin; Regional: Opportunities for Using Groundwater in Drought Prone Areas of the SADC Region.

C. ADAPTATION AND LAND DEGRADATION

81. GEF activities in land degradation relate to biodiversity issues that protect biodiversity and promote sustainable use in arid, semi-arid and Mediterranean ecosystems. The goal of OP1 on arid and semi arid ecosystems is to prevent deforestation, promote sustainable use and sustainable management of forest or forested areas in order to conserve biodiversity . The goal of OP 13 on agro-biodiversity is to sustain the functions of biological diversity in agricultural ecosystems in order to maintain or enhance the goods and services provided by such biological diversity which support agricultural production, provision of clean water, control of erosion and moderation of climatic effects. Both OP1 and OP13 contribute to the objectives of the CBD and the UNCCD, and have a strong regional focus on Africa where ecosystems are most vulnerable to human and climatic stresses (e.g. drought and floods).

Arid and Semi Arid Ecosystems

82. OP1 focuses on the conservation and sustainable use of endemic biodiversity in dryland ecosystems, including grasslands and savanna primarily in Africa, and Mediterranean-type ecosystems, where biodiversity is threatened by intensified land-use, drought, and desertification, often leading to land degradation. GEF projects emphasize both prevention and remedial activities through sustainable use methods, including the management of freshwater systems in countries experiencing serious land degradation. Activities demonstrate integrated ecosystem approaches through establishment of conservation systems including PAs, sustainable land use systems, and enabling environment activities to improve the management and rehabilitation of degraded lands. Particular attention is given to the demonstration of technologies, methods and tools to conserve traditional crops and animals species in their original habitats, because it is these genetic resources that are known for their resistance to disease, stress and for their adaptability and as sources for plant breeding.

83. GEF activities within the OP1 portfolio include:

(a) Creating an enabling environment by developing legislation, policy, management and planning frameworks and strategies to prevent and mitigate human stress factors that cause land degradation (e.g. ecosystem approaches, drought preparedness and management, measures to address soil erosion, watershed and rangeland management, land tenure and agricultural reform);

(b) Promoting institutional capacity building for management of dryland areas;

(c) Piloting projects that improve livelihoods and conservation through sustainable use (e.g. promotion of diversification of livelihoods in drought prone areas, strengthening food security through agricultural extension and livestock improvement, conservation of agro-biodiversity and control of invasive species);

(d) Demarcating, gazetting, expanding and consolidating PA systems with particular focus on vulnerable or key representative dryland systems including a focus on wild relatives of domesticated plants and animals;

(e) Targeted research to identify and assess impacts of natural ecological disturbances and effects of human stresses;

(f) Instituting systems, methods and tools for the establishment of monitoring and evaluation baselines for ecological and social impacts (e.g. ecological surveys of key indicator species, surveys of impacts on livelihoods and participation).

84. At present no OP1 project directly addresses adaptation. However, projects do offer indirect benefits as many implicitly consider climate variability and 'drought' within the context of measures to address immediate human stresses that cause land degradation. Axiomatically, projects also take integrated ecosystem approaches to land degradation often with equal focus on watershed, lake and forest management and wild plant relatives. Therefore, many are multi-focal in nature with links to OP2, OP4, OP9, OP12, and OP13. GEF funded projects emphasize both prevention and remedial activities through sustainable use methods, including the management of freshwater systems in regions experiencing serious land degradation such as sub-Saharan Africa. Activities demonstrate integrated ecosystem approaches through establishment of conservation systems including PAs, sustainable land, watershed and wetland systems, and enabling environment activities[49]. Particular attention has been given to the demonstration of locally or indigenous appropriate technologies and methods to restore or prevent land degradation and conserve biodiversity[50], and tools to conserve traditional crops and animal species in their original habitats, because it is these genetic resources that are the sources for plant breeding and are known for their resistance to disease, stress and for their adaptability to changing climate[51].

85. In summary, between 1991 and 2002 GEF has provided $35o million alongside $607 million in co-financing for 73 OP1 projects. There are currently 40 OP1 projects under preparation many of which are multi-focal with significant biodiversity conservation and sustainable use components. 24 of the project focus on Africa which is encouraging given the

[49] For example; Algeria: Conservation and Sustainable Use of Globally Significant Biodiversity in the Tassili and Ahaggar National Parks; Chile: Water Resources and Biodiversity Management; Georgia: Arid and Semi-Arid Ecosystem Conservation in the Caucasus; Kenya: Lake Baringo Community-based Integrated Land and Water Management Project; Mali: Arid Rangeland Biodiversity Conservation; Nigeria: Micro Watershed and Environmental Management Project;

[50] For example, Ecuador: Albarradas in Coastal Ecuador: Rescuing Ancient Knowledge on Sustainable Use of Biodiversity; Global: Harnessing Multi-Stakeholder Mechanisms to Promote Global Environmental Priorities; Global: Promoting Best Practices for Conservation and Sustainable Use of Biodiversity of Global Significance in Arid and Semi-arid Zones.

[51] For example; Egypt: Conservation and Sustainable Use of Medicinal Plants in Arid and Semi-arid Ecosystems; Ethiopia: A Dynamic Farmer-Based Approach to the Conservation of African Plant Genetic Resources; Peru: In-Situ Conservation of Native Cultivars and Their Wild Relatives.

continent's limited adaptation capacity and high risk exposure to climate change. Two projects specifically consider climate variability, change and adaptation in their design[52].

86. Box 3.1 provides an example of OP1 projects that are consistent with adaptation.

> *Box 3.1 Participatory Management of Plant Genetic Resources in Oases of the Maghreb*
>
> The Project removes barriers to the genetic erosion of date palm in the Maghreb region; namely (1) the replacement threat from national programs on in situ genetic resources, that are multiplying and distributing only a few varieties of trees and (2) market forces that are encouraging a preference by farmers to grow only a few high value varieties of date palm to the exclusion of a wide range of other varieties. Together with the number of baseline programs described, the project will form an integrated ecosystem approach to the management of the oases sites. The project focuses on activities that will serve to broaden the number of date palm varieties that will be grown in situ by comparison to baseline predictions rather than promote higher yields or an expansion of market demand, which are not incremental activities. Project activities are summarized as follows: (1) in situ pre-screening to make more efficient process of varietal selection for multiplication; (2) adapting techniques to multiply a greater range of date palm varieties; (3) develop a range of markets for date palm products and create value for a wide range of phenotypic characteristics and the incentive to grow more varieties in situ; (4) develop national capacity to negotiate genetic property rights concerning win / win partnerships and (5) replicate project best practices to other sites. Total financing of $6.578million with GEF contribution of $3,087million

D. ADAPTATION AND INTEGRATED ECOSYSTEM MANAGEMENT

87. GEF's Integrated Ecosystem Management operational program (OP12) provides a framework to manage ecosystems across sectors, and political or administrative boundaries within the context of sustainable development. Therefore, the objective is not to address natural resource management in a single focal area, but to promote synergies between two or more focal areas (Biodiversity, Climate Change, International Waters and Land Degradation) to optimize multiple benefits.

88. OP12 responds to guidance from the CBD[53], UNFCCC[54] and UNCCD[55] and the interests of country stakeholders for holistic environmental management and the promotion of the ecosystem approach. Therefore, it builds on and complements existing GEF operational programs such as OP9. It facilitates cross-sectoral and participatory approaches to natural resource management planning and implementation on an ecosystem scale and enables the prioritization and strategic sequencing of legislative, policy reforms and investments. The types of activities funded within the context of sustainable development include:

(a) Enabling, developing and modifying of appropriate policies, regulations, incentives and markets to support integrated ecosystem approaches, including those addressing human societies in fragile or vulnerable areas such as drylands or SIDS;

[52] Global: Land Degradation Assessment in Drylands (LADA); Kazakhstan: Drylands Management Project.
[53] CBD Decision II/8
[54] UNFCCC Article 4 para.3.
[55] UNCCD Article 2 para.1.

(b) Capacity building for development and management of integrated ecosystem approaches;

(c) Targeted research on ecological, economic and social surveys to provide information for managers, including incorporation of indigenous knowledge to guide integrated ecosystem planning and implementation;

(d) Development of mechanisms for conflict resolution, stakeholder participation among resource users for joint planning and implementation of ecosystem approaches;

(e) Enabling public/community/private sector partnerships for integrated ecosystem management planning and implementation.

89. Adaptation related investments under OP12 include rehabilitation and/or restoration of indigenous vegetation and watersheds; improved rangeland management; sustainable forest management to achieve multiple benefits such as flood control, minimization of sedimentation in coastal areas; carbon sequestration; integrated coastal zone management and planning (ICZM); and development of measures to control land and marine pollution from point to non-point sources to prevent ecosystem and public health impacts. Nine projects currently under implementation have formulated activities that aim to minimize and/or adapt to climate change impacts alongside primary objectives of carbon sequestration, mitigation of land degradation and improvements in sustainable management/livelihoods as well as technology transfer[56]. The majority of these projects focus on sub-Saharan Africa. One example is the *Climate, Water and Agriculture: Impacts on and Adaptation of Agro-Ecological Systems in Africa* project. This regional targeted research MSP aims to develop multipliable analytical methods and procedures for assessing the impact of climate change on agriculture in Africa, to estimate how climate affects the current agricultural system, and to project how climate change might affect this system in the future. It also intends to address methodological issues and to develop suitable plans for adaptation, working closely with policy makers. GEF allocation to this project was $0.7 million and was provided on the basis of agreed incremental costs. Box 4.1 provides a case study from OP12:

[56] Egypt: Second Matrouh Resource Management Project; Global: Technology Transfer Networks; Global: Capacity Building for Small Island Developing States through SIDSNet; Mexico: Integrated Ecosystem Management in 3 Priority Ecoregions; Nambia: Integrated Ecosystem Management in Namibia
through the National Conservancy Network; Niger: Community-based Integrated Ecosytem Management Program under the Community Action Program; Regional: Integrated Silvo-Pastoral Approaches to Ecosystem Management; Regional: Institutional Strengthening and Resource Mobilization for Mainstreaming Integrated Land and Water Management Approaches into Development Programs in Africa; Regional: Desert Margin Programme, Phase 1; Regional: Climate, Water and Agriculture: Impacts on and Adaptation of Agro-Ecological Systems in Africa; Zambia: Sustainable Land Management in the Zambian Miombo Woodland Ecosystem.

Box 4.1 Rwanda: Integrated Management of Critical Ecosystems

This project is blended with a IDA funded Rural Sector Support Program (RSSP). Its objective is to help ensure integrated management of the country's ecosystems that play critical economic, ecological and environmental functions. They include mountain, savannah and wetland ecosystems, many of which contribute to rural livelihoods. Project will (1) assist in strengthening government human resources and institutional capacity to develop sound policies, programs and science based guidelines for integrated ecosystem management of the country's wetlands; (2) help decentralized governments and local communities develop integrated ecosystem management plans that ensure the sustainable use and protection of critical wetlands. The integrated management of critical ecosystems consists development of regulatory framework for sustainable ecosystem management and capacity building and institutional strengthening at central, district and local levels and includes (a) development of policy and institutional arrangements (b) technical capacity building to manage marshlands, watersheds and associated natural resources (c) the creation of biodiversity information system that will be linked to a monitoring and evaluation system (d) development and implementation of community-based integrated ecosystem management of Rwanda's four critical wetland systems. Total project funding is $49.06million with GEF contributing $4.65million.

90. To date, GEF has provided $67 million for 18 OP12 projects alongside $256 million in co-financing. Most of the growth in the OP12 portfolio has taken place between 2000 and 2002, and given the increasing emphasis on the ecosystem approach, carbon sequestration and adaptation, the portfolio is likely to expand rapidly. There are currently 43 OP12 projects in preparation of which 13 explicitly link measures to improve integrated ecosystem management to adaptation[57], of which five address key vulnerable regions of sub-Saharan Africa and SIDS. The remainder focus on carbon sequestration and the ecosystem approach and have not yet elaborated clear synergies between sustainable and integrated ecosystem management, resilience and adaptive capacity.

[57] Argentina: Small Farmer Integrated Ecosystem Management Project; Brazil: Caatinga Biome Conservation and Sustainable Management Project; Brazil: Demonstrations of Integrated Ecosystem and Watershed Management in the Caatinga; Burkina Faso: Sahel Integrated Lowland Ecosystem Management (SILEM); China: Nature Conservation and Flood Control in the Yangtze River Basin; Guatemala: Rural Indigenous Communities and Mitigation Disaster: The Micro-basin Approach in the Polochic Valley; Kazakhstan: Drylands Management Project ; Kenya: Western Kenya Integrated Ecosystem Management Project; Regional: Coping with Drought and Climate Change: Best Use of Climate Information for Reducing Land Degradation and Conserving Biodiversity: Regional: Integrated Ecosystem Management in the Transboundary Prespa Park Region; Regional: Sustainable Land Use Planning for Integrated Land and Water Management for Disaster Preparedness and Vulnerability Reduction in the Lower Limpopo Basin; Russia: Impacts of Climate Change on Terrestrial and Aquatic Ecosystems and their Management in Permafrost Regions of Russia (ICAR); St Lucia: Coastal/Wetland Ecosystem Conservation and Sustainable Livelihoods.

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