



GEF/A.2/Inf.2  
September 20, 2002

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Second GEF Assembly  
Beijing, China  
October 16-18, 2002

**QUADRENNIAL REPORT OF STAP ON THE BROAD  
SCIENTIFIC AND TECHNICAL ISSUES THAT EMERGED DURING  
THE SECOND PHASE OF THE GEF**

(Prepared by the Scientific and Technical Advisory Panel)

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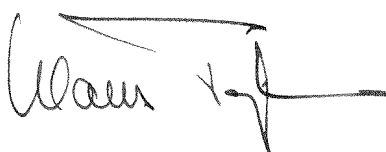
## Preface

In my capacity as the head of the organization providing the secretariat of the Scientific and Technical Advisory Panel (STAP) of the Global Environment Facility (GEF), and in accordance with the Instrument for the Establishment of the Restructured Global Environment Facility, I am pleased to forward to you the quadrennial report of STAP on the broad scientific and technical issues that emerged during the second phase of GEF (GEF II), covering the period 1998-2002.

The quadrennial report of STAP reflects the scientific and technical issues that influenced new directions in GEF and on which STAP provided input and advice. It also demonstrates the outstanding contributions of STAP, under the able leadership of the GEF Chair, Mr. Madhav Gadgil, which assisted the GEF family in meeting the challenges that marked GEF II.

I hope the report will stimulate the debate on the role of science in GEF and on the different mechanisms to integrate science into GEF's work. I also hope that the report will form a basis for the new STAP to build on, and to identify ways to further enhance the efficiency of STAP in the delivery of advice and inputs to GEF in the face of new challenges in its third phase, particularly those arising from the expansion of its mandate with the incorporation of persistent organic pollutants and land degradation as new areas of focus.

This report was prepared by the STAP secretariat, in close consultation with the STAP Chair, Ms. Julia Carabias, and with the active contribution of STAP II members.

A handwritten signature in black ink, appearing to read 'Klaus Topfer', with a long horizontal stroke extending to the right.

Dr. Klaus Topfer

Executive Director of UNEP

## Introduction

1. The advisory responsibilities of the Scientific and Technical Advisory Panel (STAP), as set out in its mandate, span from enlightening the Global Environment Facility (GEF) on global trends and scientific progress in the understanding of global environmental change, over shaping the GEF policy frameworks, to providing guidance on how to implement solutions at the local level.
2. The breadth of its task has compelled STAP to take a multifaceted approach in its response to specific demands from GEF, to provide scientific and/or technical input on certain issues emanating from the conventions and from GEF's own reviews and project experience. Besides responding to demands, STAP is also engaged in bringing to GEF's attention new findings, developments and thinking in global environmental protection.
3. As science and technology continually evolve with new findings and research, GEF is required to adapt its responses, and to keep under constant review its programmatic frameworks. In helping GEF to address the global environmental challenges it faces, STAP has attempted to integrate and unify concepts from the domains of both the natural and social sciences and to encourage the use of technological innovations and experimental science-based approaches. Because of its multidisciplinary nature, STAP has discharged this task particularly well, and has made recommendations to STAP III on how to further develop and test the concepts of integrated approaches within the context of sustainable development.
4. In STAP's experience, addressing global environmental problems demands not only scientific understanding of environmental change at different levels, and assessments of trends and vulnerability upon which to base interventions, but also continuous feedback from ground-level interventions. The latter is linked to the realization that much of the scientific research needed to generate the reliable information that would enhance the efficiency of GEF interventions must be performed at the local and regional levels where the projects are being implemented. STAP II, throughout its tenure, has therefore put much emphasis on the importance of interdisciplinary input of scientists, social scientists and technologists specifically at the level of GEF's interventions. In the formulation of its advice, STAP relied on the best available expertise, thereby acting as a forum for integrating science and technology in GEF.
5. Based on four years of experience, STAP maintains that a broad appreciation of global environmental concerns is central to its functioning. From there, it follows that STAP must comprehend GEF operations in their totality, from the way GEF strategies are formulated and translated into programmes and projects, to how they lead to effective action on the ground. During its tenure, STAP strived towards an appreciation of the broader picture, building on its significant strength as an interdisciplinary group. This will be even more vital in coming years as GEF comes under ever greater pressure while (a) serving an increasing number of conventions, (b) adding new focal areas, (c) expanding the range of activities under older conventions, and (d) setting strategic programming objectives in managing a growing portfolio in a resource-constrained environment. Under these circumstances, STAP must help in identifying priorities on the basis of a broad understanding of global environmental issues. To accomplish this, STAP will have to engage the wider scientific and technical networks ever more effectively. STAP would therefore like to recommend that in the coming years it should be encouraged to develop a forward looking agenda, while doing justice to the corporate demands presented by the implementing agencies, environmental agreements and the GEF secretariat.
6. As many GEF interventions are experimental and innovative, and bearing in mind their country-driven and action-oriented nature, an important part of STAP's advice has focused on defining the scope and applicability of new paradigms and concepts to project-based interventions, whilst also advocating their testing and evaluation. Selective reviews, in particular, have given STAP the insight into operational aspects of GEF activities necessary to make recommendations on scientific and technical issues at the operational level. Similarly, STAP's membership in steering committees of

GEF assessment and research-oriented projects has allowed STAP to influence project direction and to provide concrete suggestions on methodologies, approaches and indicators. Although STAP's advisory role is most strongly defined and articulated at the policy level, the need for more scientifically founded practices has called for more guidance to "operationalize" concepts and strategies. STAP II pointed out that selective reviews could play a very useful role in ensuring that STAP's advice is based on operational realities by exposing STAP members

to GEF operations on the ground. The focus of such selective reviews involving STAP members would be on science and technology issues and on drawing lessons from experience in concrete implementation of scientific concepts.

7. As a result of the evolving and expanded mandate of GEF - with new focal areas being added and it becoming the financial mechanism for new conventions and an expanded range of activities under the biodiversity and climate change conventions - STAP II has also had the opportunity to influence and shape GEF's new operational programmes, by making recommendations on key elements to ensure their scientific coherence, and to advise GEF on the development of strategies on new directions in its programmes. In these specific endeavours, STAP sought to work in a complementary manner with the scientific bodies of the conventions.

8. Building on the work of STAP I and through continuous interaction with the implementing agencies, STAP II reached a maturity and better understanding of where its advice was most needed and what form it should take.

9. This report illustrates how STAP II has advised GEF on the state of scientific, technical and technological knowledge related to each focal area, highlighting their policy and operational implications to GEF, how it has responded to GEF demands, and how its forward-looking agenda has shaped GEF's work. An attempt was made to organize the extensive information related to STAP II's advice and achievements in a way that reveals its multifaceted nature. It should be noted that, when the term STAP is used it refers to STAP II, unless it pertains to STAP as an entity of the GEF, regardless of the time period.

10. The next two sections summarize the broad scientific and technical issues that marked the second phase of GEF. It is preceded by an analysis of the sources of emerging issues, as well as analysis of the different levels at which STAP advice was given. The summary is twofold: a first part (chapter II) reports on issues that were cross-cutting to all or more than one focal area; the second part (chapter III) is an overview of all issues specific to one focal area, which emerged during the second phase of GEF. Both chapters reflect STAP's thinking and advice on the described issues, and refer to the activities that formed the basis for the advice that STAP formulated. Chapter IV contains the priorities identified by STAP II that STAP III should consider in the third phase of GEF. Broad conclusions from chapters II and III are drawn in chapter V. Tables with STAP's activities, outputs and reports are contained in the annex to the report.

## I. BROAD SCIENTIFIC AND TECHNICAL ISSUES THAT EMERGED DURING STAP II

11. The scientific and technical issues that emerged during STAP II and were taken up by the Panel (categorized according to their origin) arose from:

New findings and understanding based on *scientific research*;

Assessments of *trends* and their impact on GEF operations;

Feedback and experience from interventions and portfolio analysis;

The need to operationalize *guidance from* the global environmental *conventions*;

The addition of new focal areas and conventions.

All of the emerging issues on which STAP II advised GEF can be traced back to one or more of these categories.

12. The first two, *new findings* and *trends*, were not necessarily identified by GEF, but rather brought to GEF's attention by STAP, whose role it is to synthesize and galvanize state of the art contributions of the scientific and technical community. Although most of STAP's work is demand-driven, STAP has found that one of its strategic functions should be to alert GEF to the latest findings and developments in the continuously evolving cross-disciplinary fields of environmental science and sustainable development, at the levels of both policy and operations. STAP has also drawn to GEF's attention trends in society that affect GEF operations, such as the ongoing power sector reforms, assessing implications for GEF operations and advising on the development of responses at the programme and project levels.

13. A source of emerging issues that has grown in importance is the experience and feedback from interventions and projects that have demonstrated, tested and evaluated new and innovative approaches and technologies in the focal areas of GEF, including many of the GEF projects that have matured and reached completion. These experiences are enlarging the knowledge pool of how theoretical concepts and methods can be applied and adapted to different conditions. STAP II was able to tap into and review that knowledge and to make recommendations to GEF on how better to achieve the goals of projects by taking into account key factors and conditions that have transpired from analyses and assessments of these experiences. Obviously, these recommendations were limited to scientific and technical aspects, including those that were "technical" social and institutional. It is at this implementation level that STAP's advice was concentrated in the "older", mature areas represented by the first generation of operational programmes. An example illustrating STAP's contribution at the practical application level is the review of the scientific and technical related issues arising from the implementation of GEF projects in East African lakes. Another is the analysis of best practices in community-based integrated land and water management. These and other experiences led STAP to advocate the use of a framework at the project level to evaluate scientific and technical issues.

14. Because of the condition-specific and in-depth nature of the issues at this level, STAP selective reviews have proven to be potentially the most appropriate mode to obtain the necessary feedback and information. Selective reviews were the main modality used by STAP to provide inputs in the monitoring and evaluation programme studies, in which STAP's role was to review how science and technology had been integrated into GEF projects. In this regard, the STAP reviews by roster experts of GEF project proposals have been instrumental in raising key scientific and technical issues at an early stage at the operations level to GEF by analysing the strengths and weaknesses of GEF project proposals from a scientific and technical viewpoint, and by making concrete suggestions to strengthen the proposals. The importance of an early input was realized by STAP II and led it to recommend an earlier "concept" phase review that would allow a less challenging redirection of a project approach.

15. During STAP II, the body's work programme was largely defined by the demand expressed by the GEF partners through presentation and discussion of issues emerging from the annual programme status reviews and from the need to develop additional operational programmes. The larger part of STAP's activities was in response to a request for input and advice on specific strategic matters of a scientific and/or technical nature. Portfolio analysis by the GEF partners provided an overview and insight to STAP on gaps and coverage allowing the panel to advise, for example, on increasing the range of technologies supported, on ways of strengthening the portfolios and making them more scientifically coherent, and in general to infuse them with strategic long-term thinking. STAP has made a number of portfolio-specific recommendations in its meeting and workshop reports that assisted GEF in refining the strategic priorities in each of the focal areas. Good examples of this type of advice can be found in the technology related recommendations in the climate change focal area.

Most of STAP's inputs and advice therefore fed into a process, or have shaped GEF policies and programmes.

16. One of the challenges GEF faced in its second phase was the interlinkages existing between focal areas and the implications for developing interventions aiming at achieving benefits across focal areas. The fact that STAP is a multidisciplinary body made it particularly well suited to the task of the development of a science-based and integrated understanding and perspective of the causes and consequences of environmental degradation and how they are best addressed. This is well illustrated by its achievements in helping GEF to define the interlinkages existing between land degradation and the GEF focal areas. Similarly, adaptation presented another challenge touching on all sectors and focal areas, demanding a cross-disciplinary approach.

17. In some instances, the need to expand the range of activities in a portfolio arises from new guidance from the conventions. STAP's advice at this level has been particularly pertinent and valuable in the second phase of GEF. Examples of the substantive areas in which STAP articulated its strategic scientific advice in response to new convention guidance are taxonomy, sustainable use of forests, and adaptation. The details of their nature and content are reflected in the chapter on focal area specific issues below.

18. Lastly, STAP II helped to shape and strengthen the development of three new operational programmes, namely Integrated ecosystem management, Agrobiodiversity and Persistent organic pollutants, drafts of which were prepared during GEF II. The specific recommendations towards their development are summarized in chapter III below.

#### A. Specific scientific and technical issues related to strategic non-focal areas

19. Specific scientific and technical issues related to the non-focal areas are cross-cutting to two or all focal areas, although some are relevant only to natural systems. They were distilled from four years of analysis of cross-cutting issues of a scientific nature that have an impact on GEF operations and reflect the contribution of STAP II to corporate programmes and initiatives. STAP has tried to summarize them under eight headings. A ninth deals with small island developing States, which was treated separately because of its cross-sectoral but specific nature.

##### 1. Interlinkages and integrated approaches

20. On many occasions, STAP has emphasized that the complexity of, and interlinkages between, the processes of global environmental change demand an integrated approach at the level of interventions and policies. The interlinkages between, for example, land degradation, water, climate change and biodiversity are well-illustrated in the STAP report on interlinkages.

21. Integrated approaches also raise questions of causal linkages and driving forces across scales, and their implications for interventions. The scale question became very apparent in STAP's analysis of community-based integrated land and water management, but also permeated other debates on interventions in changing natural systems. Environmental problems manifest themselves on many different scales of space and time, and the choice of appropriate scale is critical to their proper understanding and resolution. A proper synthesis of local and global element is relevant, for instance, to working out strategies for adaptation to climate change. STAP also looked at the other side of the coin, in that local scientists and communities have access to vital locality-specific information that needs to be integrated with more global understanding.

22. As this integrated perspective is relatively new, scientific tools available for the holistic understanding of environmental processes are still scarce. Moreover, the barriers to be overcome for the successful implementation of integrated management approaches are not only of a technological and scientific nature, but are also deeply embedded in the conventional ways of thinking and of assessing the impact of human life on the natural ecosystem, and of the impact of changing natural



systems on human systems. STAP is therefore recommending the development and testing of scientific tools for the design and implementation of integrated approaches that generate multiple benefits.

## 2. Complexity and adaptive management

23. Some of the most important lessons that have emerged recently from endeavours to conserve biodiversity pertain to an appreciation of the limits to the scientific understanding of the behaviour of complex systems; limits that are a consequence of highly non-linear interactions amongst a large number of variables governing the systems. In reality there are many surprises in the behaviour of, say, forest ecosystems, and it is necessary to accept a degree of inevitable and inherent unpredictability in their reaction to human interventions. This complexity applies to all natural systems. In this context, STAP II made a case for adaptive management.

24. Adaptive management embodies an approach whereby stakeholders arrive at a consensus on management objectives, such as what resources are to be sustained, and within which space and time scales. Management practices that may achieve the agreed upon objectives are then selected from a range of options based on the necessarily limited understanding of the system behaviour. Whether these practices are fulfilling the agreed upon objectives of sustainability is then assessed through a process of monitoring which is included as an integral component of management practices. This facilitates an enhanced understanding of the working of the system that allows for appropriate adjustments of the management practices with accumulating understanding and experience. Our current scientific understanding suggests that this would be the most appropriate approach to promote in the context of biodiversity friendly and sustainable use of forest and other natural living resources.

25. Consequently, STAP advised that flexibility should be built into the process of project implementation in order to respond adaptively to the lessons thrown up by the monitoring process, and to adopt monitoring processes which are an integral part of project management.

## 3. Social dimensions

26. Throughout its tenure, STAP has argued for a general strengthening of the social dimensions of GEF interventions. In STAP's experience, many project proposals indicate a less than optimal grasp of social organization, tenure systems, local technical knowledge, local leadership on conservation measures and land and water management, local organization for conservation enforcement and monitoring, etc., on the part of the project proponents. For many if not most biodiversity projects that now must include significant community participation, the "non-biological" issues are obviously among the most crucial. From the review of experience on the ground, including selective reviews by STAP, it has emerged that many project difficulties and failures are rooted in a lack of attention to issues of sustainable livelihood and tenure.

27. STAP believes that incentives for the preservation and sustainable use and management of natural resources are a precondition for the success and sustainability of GEF projects. In the absence of market incentives, it may be necessary for society to agree to pay some service charges to communities who take it upon themselves to preserve natural resources that are for the benefit of society.

28. In order to ensure that social aspects are adequately addressed in project implementation and that "technical" issues of social science are included, STAP advocates the establishment of strong links amongst science and technology, social science and traditional ecological knowledge streams, links that are largely absent today.

29. Through its selective reviews, STAP has in fact helped forge such links, as well as with the resource management agencies.

#### 4. Capacity-building

30. Scientific and technical knowledge is not only required for the development of national strategies and plans in countries that are signatory to environmental conventions but also for the improved identification, design and implementation of GEF projects. Neither can options for measures and responses be truly evaluated at the national level without the requisite institutional capacity.

Throughout its tenure, STAP II has placed great emphasis on capacity-building of the science and technology communities in recipient countries as an essential component of GEF projects and strategies. STAP has furthermore underscored that building the capacity of national and regional scientific communities promotes sustainability and ownership of GEF projects, in particular if the capacity-building support is provided in a project context or if directly linked to a project or programme. STAP was very emphatic for example, that the Capacity Development Initiative should include an assessment and analysis of the scientific and technical capacity-building needs. In order to ensure STAP's input in the process, the chair was made a member of the steering committee for that Initiative.

31. Without doubt, many of the knowledge and information related impediments cannot be resolved without developing human and institutional capacities in developing countries. Various mechanisms for capacity-building at the national and regional level were examined by STAP, and are reflected in its selective reviews and workshop recommendations. Capacity-building in technology transfer projects for example is a key component because the success of technology transfer depends on the domestic adoption capacity in the target country, in addition to the hardware and software components of technology transfer.

32. STAP is of the opinion that for capacity-building to be effective it must be targeted (for example, building capacity for the use of taxonomic information). Once the specific area is clearly identified, capacity could be built to address the issue under consideration. The Panel considered this to be the most effective means of building capacity to address global environmental issues.

#### 5. Mobilization of the wider scientific and technical community in GEF work

33. STAP's activities and efforts to mobilize the wider scientific community were a direct response to the New Delhi Statement of the first GEF Assembly, which mandated GEF to build strong relationships and networks with the global scientific community, especially with national scientists and scientific institutions in recipient countries.

34. The mobilization of the wider scientific and technical community in GEF's work serves a number of important functions, including:

(a) Contributing to the strategic advice which STAP presents on GEF operations and programmes and development of methods of assessing the efficacy of ongoing GEF programmes;

(b) Assisting in building capacity and enabling the developing countries to design and implement programmes and projects that would further GEF objectives;

(c) Strengthening the scientific underpinning of GEF projects mainly through the inclusion of research and monitoring components in the projects as well as in priority setting and project conceptualization, formulation, implementation and evaluation.

35. At the project level, STAP emphasized the importance of bringing to bear on project design the knowledge and experience of various stakeholders involved.

36. Constraints to an increased involvement relate mainly to the lack of adequate mechanisms at the national, regional and international levels to facilitate the systematic participation of the scientific and

technical community in GEF operations, on the one hand, and the lack of outreach on the part of GEF towards the scientific and technical community, on the other.

37. In 1999, STAP convened a workshop on the theme “Integrating science and technology into GEF work” in Chennai, India, with a view towards establishing a dialogue with global and regional scientific and technical networks, and providing suggestions for mechanisms to facilitate greater participation of the scientific and technical community in GEF’s work.

38. The recommendations that came out of the workshop were targeted at different levels, namely the policy, regional, and national level, and aimed at GEF, GEF focal points, and regional and global networks. The main recommendations can be summarized as follows:

(d) The partnership between GEF and the scientific and technical community should be strengthened, with the aim of boosting the substantive input into GEF operations by that community. To facilitate this process the extension of the consultation with non-governmental organizations to include the involvement of the scientific and technical community and/or the establishment of a similar mechanism comprising scientists and technologists is being recommended. This would be an effective starting point to building a substantive partnership between GEF and the scientific and technical community;

(e) An annex outlining the scientific and technical stakeholder participation should be included in project documents showing how the scientific and technical community in the country/region where the project is being implemented has been engaged in the project preparation process;

(f) The establishment of project scientific and technical committees for complex and/or innovative GEF projects. These projects would be the same ones targeted by STAP for selective reviews. This would enable STAP to develop a linkage with the local scientific and technical community as well as keep an overview of the scientific and technical dimension of the project;

(g) The GEF targeted research policy should be used as a mechanism to facilitate the involvement of the wider scientific and technical community in GEF’s work.

39. In addition, STAP recommended that for the implementation of the country dialogue workshops and the Capacity Development Initiative, scientific and technical nodal points should be established in each country to facilitate the interface between the scientific and technical community and the operational focal points and to enhance interaction between STAP and the country-level networks.

## 6. Indigenous knowledge

40. With the GEF portfolio moving away from efforts that focus purely on protected areas towards projects that work more closely with rural communities, a need has arisen to examine approaches and models of sustainable use and management of natural resources that are site-specific. This raises a question of where such models or examples are to come from. One of the few existing sources, and one that is often overlooked, is local or indigenous knowledge and practice: the many examples of resource management practices that exist in indigenous and local communities throughout the biodiversity-rich regions of the world.

41. Contrary to common belief, local practice and knowledge is not confined to knowledge about uses and products but also about processes (how ecosystems and landscapes are transformed). Equally significant is that local knowledge is dynamic and therefore can offer solutions to modern, changing problems. Furthermore, local practices are often very complex and cyclic, and any part of these production cycles seen in isolation can be misinterpreted as destructive or unproductive behavior. They are also distributed unevenly throughout the communities. While “common resources” are often important, there is always difference in expertise. The “alternatives” to what has been determined to be destructive resource management are often found within the same community.

42. The reassessment of local and indigenous practice and knowledge is the result of much recent, insightful scientific research and thought. If GEF projects are to succeed in the central task of helping communities adopt conservationist and sustainable practices, project personnel must better appreciate and apply existing research results and analyses and consider far more seriously the need to carry out directed research in specific sites and situations. Care should be taken however, not to make a replicable “package” that can fit neatly into any project document, since they are insights born in and adapted to local, specific contexts.

43. STAP II recognized the value of indigenous technical knowledge and of the benefits to be gained from effective community-based natural resources management. The Panel made recommendations in the biodiversity and international waters focal areas to link formal and ethno-science and argued that some projects could greatly profit from more detailed and careful documentation of, for example, farmers' knowledge and technologies in ways that could promote its use side-by-side with scientific knowledge and technologies. Farmers, herders, fishers and herbal medicine men and women have important knowledge and insights that complement the areas of competence of scientifically trained experts. One experiment, for example, showed that working with farmers through an alliance of scientists and farmers led to the development of a crop model incorporating pest disease. This cooperation can simulate the behaviour of the crops far better than the earlier scientists working alone. GEF projects should therefore record and deploy the knowledge and techniques of farmers and other traditional natural resource managers.

## 7. Monitoring and indicators

44. A consistent finding in project performance reviews is the need for the adoption of better monitoring and evaluation indicators, including establishment of benchmarks. Monitoring and evaluation issues featured high on GEF's agenda during STAP II, with STAP's contributions concentrated in two areas: the development of indicators and impact studies. Due to a growing attention to and further refining of monitoring and evaluation in GEF III, it is expected that the complementarity between STAP activities and the monitoring and evaluation work programme will be further enhanced in the future.

45. STAP contributed to the development of indicators for both climate change and biodiversity. STAP's ideas on approaches to the formulation of performance indicators for measuring the impact of GEF interventions in the biodiversity and climate change focal areas were taken into consideration by the GEF Monitoring and Evaluation Unit.

46. STAP also worked closely with the GEF Monitoring and Evaluation Unit on the programme impact reviews. The main modality used by STAP in contributing to the programme studies was the selective review, which became an integral part of the overall corporate exercise, focusing on scientific and technical dimensions. The criteria which guided STAP's selection and input in the process were:

- (h) Projects that are highly innovative in terms of science, (including the social sciences) technology and/or with significant element of risk;

- (i) The extent to which indicators have been utilized;

- (j) The extent to which the GEF intervention has advanced the state of science and technology in the target area/country.

The specific outputs and recommendations from the STAP reviews are reflected in the chapter on focal area specific issues below.

## 8. Support to research

47. Debate around GEF support for research activities took place on two levels: at the programme level through the targeted research window of opportunities, and at the project level. Both STAP members and STAP roster reviewers commented that many project proposals, in particular the more experimental, complex and innovative ones, call for a research component. STAP is of the opinion that it is not sufficient to state an intent regarding the sustainable management or conservation of natural resources in a project for example, but that instead, research activities that support the goals of the project should be built in. This would strengthen the projects scientifically and would enhance their effectiveness.

48. A second modality for support to research is provided by the GEF's targeted research project window of opportunities. Targeted research is defined as "goal-oriented research that supports the GEF operational strategy by providing information, knowledge and tools that improve the quality and the effectiveness of the development and implementation of GEF projects and programmes". Procedures for the review of targeted research projects were developed and agreed on in STAP II's first year, and stipulate that proposals are circulated for review and comments to the Research Committee, which is chaired by the STAP chair, and to designated experts if required. The first targeted research projects were approved at the beginning of STAP II, and are now under implementation. Therefore no targeted research portfolio review has yet been undertaken.

49. The implementing agencies have emphasized the need for STAP to take leadership in identifying potential targeted research areas through STAP workshops, brainstorming sessions and selective reviews. Consequently, the identification of gaps in knowledge and information and possible areas for targeted research was consistently on the programmes of STAP workshops, resulting in concrete suggestions for GEF support of targeted research activities. However, currently no mechanism is in place to facilitate dialogue between the GEF task forces and STAP to further examine the potential targeted research areas and prioritize them.

50. STAP II is of the view that the GEF targeted research policy could be used as a mechanism to engage the wider scientific and technical community in GEF work. To do this, however, possible areas requiring targeted research should be identified early in the GEF process.

## 9. Small island developing States

51. Through a brainstorming on small island developing States held in Bridgetown, Barbados, 17-18 February 2000, STAP highlighted a number of areas that provide opportunities for GEF interventions in small island developing States. These included, but were not limited to, ocean management with an emphasis on integrated management systems and approaches; adaptation and vulnerability analysis; disaster management and preparedness; land management including watershed protection and use; coastal and marine protected areas; and a new energy agenda for small island developing States, one based on energy efficiency and the renewable energy technologies including ocean thermal energy conversion, solar, wind, biomass and geothermal technology. The strengthening of regional and intra-regional mechanisms to facilitate management of the environmental resources in small island developing States was identified as a critical element. Mechanisms should be built in GEF projects in these States to facilitate exchange of experience between small island developing States from different regions. In addition, STAP suggested that a programmatic approach for small island developing States should be pursued.

## II. FOCAL AREA SPECIFIC ISSUES

52. This chapter provides an overview and summary of all scientific and technical issues specific to focal areas that emerged during STAP II, including advice and recommendations offered by STAP to GEF, both expressed in workshop reports and reviews and as summarized in the STAP meeting reports. Issues in the climate focal area are organized by operational programme, reflecting their quite distinct nature, while the other focal areas are treated in their totality. In the biodiversity section, the

broad shifts in the focal area are laid out, reflecting STAP's response and specific activities, followed by a review of the key recommendations made by STAP across the focal area that were not addressed as topics of a workshop or brainstorming session. A chronological organization is followed in the land and water section, reflecting the shift in approach in GEF, marked by the establishment of the land and water task force.

#### A. Climate change

53. No major paradigm shift occurred in the climate change area during GEF II, and the premises upon which the operational programmes were based remained unchanged. With the exception of the ongoing trend of power sector reform and the new guidance from the conference of the Parties on adaptation, the scientific and technical issues that emerged and were debated during STAP II originated from analyses of the climate change portfolio, and related to the type of projects funded, project categories omitted and the justification of support to certain technologies and energy-related activities. STAP however, made a call for the re-examination of the learning curve methodology used to justify support to the commercialization of operational programme 7 type of technologies. STAP's advice in the climate change focal area was targeted at both the policy and technology levels.

54. Cross-cutting all climate change operational programmes, is the social dimension of GEF climate change projects. An issue of major concern for STAP is the current limited focus in the climate change projects on social dimensions and their implications for the success of GEF projects. STAP believes that greater attention should be paid in these projects to the income generation potential of renewable sources of energy in operational programme 6 and in energy efficient technologies in operational programme 5 projects. Some of the best examples of this come from specific projects, such as the "India biomass" project which involves gasification of wood grown in community woodlots to generate electricity to pump water for irrigation and domestic use. The benefits of such projects are far more broadly and visibly shared by the weaker segments of the population than is the case, say, with grid connected photovoltaic projects. Income generation provides a promising mechanism for ensuring sustainable dissemination of renewables and energy efficient technologies beyond the lifetime of a GEF intervention, thus facilitating the catalytic function of GEF financing. In so doing, it is important to place the income generating emphasis in the wider context of the sustainable development of the target area and its inhabitants

##### 1. Removal of barriers to energy efficiency and energy conservation

55. Generic demand-side management programmes accounted for two-thirds of the operational programme 5 portfolio in GEF II, with additional projects incorporating some approach based on the use of energy service companies as a delivery mechanism. Therefore, STAP has urged for a review to assess the experience with this model.

56. Generally, STAP found that the operational programme 5 project portfolio was imbalanced in the type of projects financed. Projects not adequately represented in the operational programme 5 activities include those dealing with passive heating and cooling/energy efficient buildings; manufacture of energy efficient equipment other than lighting such as boilers and refrigerators; and micro-turbines/combined heat and power. The limited range of technology options deployed by projects under this operational programme was pointed out, notably the heavy emphasis on energy efficient lighting. It was noted that the win-win benefits of energy efficient lighting type projects are very substantial. It is therefore increasingly difficult to justify the incremental cost element of such well-proven interventions.

57. STAP is therefore recommending that consideration be given to reducing the emphasis placed on projects dealing with energy efficient lighting in operational programme 5. This type of project can eventually be delegated to third parties with the active involvement of networks such as the United Nations Environment Programme/GEF technology alternatives network. In countries where the

energy conservation and energy efficiency industry is still embryonic, the case for continued promotion of this type of projects is, however, still strong.

58. STAP advice is to increase efforts to diversify the range of technology options promoted under operational programme 5. Of particular interest is increased support for projects aimed at improving the energy efficiency of basic materials industries that are growing rapidly in many developing countries. Other options that deserve additional support include passive heating and cooling/energy efficient buildings; manufacture of energy efficient equipment such as boilers and refrigerators; and combined heat and power and micro-turbine systems.

59. There is also a case for continued support for projects with a heavy emphasis on policy initiatives that ensure the inclusion of efficiency and energy conservation options in client country energy investment plans. For example, the ongoing power sector reform and electricity re-regulation initiatives provide an ideal platform for ensuring that energy conservation and efficiency remain on the priority agenda of client countries. Other opportunities for influencing national investment plans can also be explored.

60. As part of the programme studies, STAP undertook a selective review of the “China efficient industrial boiler” project, which was selected mainly for its technology transfer aspects. The review resulted in a number of findings, which should be given consideration in the future design of technology transfer projects under operational programme 5. These are summarized as follows:

(k) The domestic adoption capacity in the target country is crucial for technology selection and transfer. It is essential that such projects should be country driven and emphasize local involvement;

(l) Capacity-building should be emphasized in technology transfer projects. Knowledge transfer is a key component of technology transfer. Success of technology transfer depends on the absorption by local manufacturers of the transferred knowledge, in addition to the availability of the hardware and software components of technology transfer;

(m) Technology transfer, in general, occurs between business entities. The technology procurement will follow market rules even under GEF and government intervention. The project design and implementation schedule should avoid being too drawn out and complex, hindering the active involvement of the private sector;

(n) Market barrier removal for technology transfer is an important element to technology transfer projects. Without grant resources for removal of market barriers, the adoption and replication of new technology will be difficult.

## 2. Promoting the adoption of renewable energy by removing barriers and reducing implementation costs

61. Operational programme 6 has promoted a wide variety of renewable energy technologies (i.e., low temperature solar thermal heating; biomass; geothermal; wind, hydro and photovoltaic power for rural electricity supply; and grid-connected wind farms and photo-voltaics). Rural photovoltaic projects continue to dominate the portfolio with about 50 per cent of all such projects focusing on off-grid application.

62. The scientific and technical issues arising out of the analysis of the portfolio are again the omission of categories and types of projects, namely village-scale systems, agricultural applications, storage systems, and grid-connected wind power.

63. Consideration of other categories of energy systems becomes necessary when one considers that key barriers for future growth of photo-voltaic use seem not to be so much the barriers addressed by operational programme 6, but the fact that the vast majority of all rural households that are currently

not connected to the grid are simply too poor to afford costs associated with such technologies. The relatively high costs and risks of rural photovoltaic barrier removal interventions demand a more thorough comparison with alternative programming options.

64. In its discussions with the GEF secretariat and the implementing agencies, STAP underlined the need for greater diversification in the range of technologies covered by operational programme 6. The current heavy emphasis on solar photovoltaic systems in operational programme 6 needs to be addressed urgently. In addition STAP recommends that GEF redouble its efforts to diversify the operational programme 6 portfolio to encompass other renewable energy projects such as wind power; wind mechanical, small-scale modern biomass energy technologies and small hydro. Small-scale geothermal programmes could also assist in diversifying the operational programme 6 portfolio. The aforementioned renewable energy options would, in most cases, offer more attractive opportunities for the reduction of carbon emissions – the most common baseline option is small diesel generators. In addition, the income generation and employment creation potential of renewable energy sources such as wind power, wind mechanical, small hydro and small-scale modern biomass energy technologies are significantly higher than that of solar home photovoltaic systems.

### Power sector reform

65. Power sector reform was one of the emerging issues STAP drew to GEF's attention as having implications and creating opportunities for its operational programmes 5 and 6. In June 2000, STAP organized a brainstorming session to explore implications and opportunities, and to make recommendations on how power sector reform could be taken into consideration by GEF in its programmes and projects.

66. Given the implications of power sector reform for the energy sector, STAP recommends that:

- (o) GEF should develop appropriate instruments for incorporation of relevant power sector reform issues in climate operational programmes;

- (p) GEF should support (possibly through targeted research) a series of empirical studies on the impact of power sector reform on the deployment of renewable energy and efficient energy technologies in selected GEF client countries;

- (q) GEF should support covering of the incremental transaction costs associated with the introduction of renewable energy and efficiency perspectives in ongoing power sector reform initiatives;

- (r) GEF should be involved in the reform process to ensure that the deployment of renewables and energy efficiency programmes is encouraged.

67. STAP concluded that there is a need for high-level intervention to ensure that ongoing power sector initiatives take cognizance of the recommendations of the STAP workshop on power sector reform. In this context, the importance of a programmatic approach was emphasized.

### 3. Reducing the long-term costs of low greenhouse gas-emitting energy technologies

68. Although operational programme 7 is proving to be a difficult portfolio to develop, STAP emphasized that it will and should be an important element in future GEF operations. With the exception of integrated gasification of clean coal, the portfolio is to support "transforming technologies" that will be fundamental for addressing climate change in the long-term, all of which are proven and are capable of considerable development with the support of GEF in concert with other parties. Developing countries are likely to have a comparative cost advantage in the use of two of the technologies – grid connected photovoltaics and thermal solar – on account of high solar insolation in these regions. The difficulty is that operational programme 7 technologies are "near -



commercial" rather than commercial, and entail incremental costs in addition to the market barriers encountered in operational programme 5 and operational programme 6 type projects.

69. For these reasons, STAP supports the efforts of the implementing agencies and the secretariat to establish partnerships with the private sector to enhance the development and use of grid-connected renewable energy technologies. They also emphasized that partnerships with the public sector are needed.

70. STAP raised the following specific issues:

(s) The omission of categories and types of projects. Several technologies identified as promising in the operational programme remain unaddressed, including advanced biomass to liquid fuels, large-scale grid connected wind power, fuel cells for distributed combined heat and power applications, and advanced fossil-fuel gasification and power technologies;

(t) The difficulty that operational programme 7 technologies are "near-commercial" rather than commercial, and entail incremental costs in addition to the market barriers encountered in operational programme 5 and operational programme 6 type projects. For these reasons STAP supports the efforts of the implementing agencies and the secretariat to establish partnerships with the private sector to enhance the development and use of grid-connected renewable energy technologies. Partnerships with the public sector are needed;

(u) Reconsideration of wind technologies : The increasing win-win potential for distributed power wind application and excellent potential to promote their widespread use in the context of energy sector restructuring and re-regulation warrants a review of wind-power as an operational programme 7 technology. Major technological developments are taking place now, making it possible to reduce costs and improve reliability, and industrial countries are strongly supporting the further development and use of the technology. STAP believes that, in the light of these developments and the fact that substantive experience has been gained over the past decade, now would be a good time for an international workshop, perhaps run jointly with the United States of America and the European Union, on the status of wind technologies, operational experience to date, and lessons of experience from policies of support.

71. STAP also recommended that concentrated efforts should now be made to develop a portfolio of grid connected photovoltaics. Fuel cells for decentralized or "embedded" forms of electricity generation also show much promise, and a planned international workshop on this subject should help pave the way forward.

72. A call was made for a re-examination of the assumption on which this operational programme was designed, namely, technological adoption according to the learning curve. The re-examination is necessary in order to analyse the extent to which one can base the commercialization of technology on the methodology of the learning curve.

73. Furthermore, consideration should be given to employing a programmatic approach to technologies such as fuel cells, solar thermal plants, etc. With the help of STAP, the first major steps towards a programmatic approach to technology commercialization for fuel cells and solar thermal plants have been achieved.

74. As with other GEF operations, operational programme 7 projects need to be complemented by a policy environment favourable to their use. This was a recurrent theme of STAP participation in discussions on these projects, including discussions in the above-mentioned workshop on power sector reform and GEF. The rationale for this rests not only on environmental criteria—the removal of the negative externalities of pollution—but on the positive externalities of environmental innovation. It is the view of STAP members that these technologies, with the support of progressive policies, will give rise to economic as well as environmental benefits for the GEF client countries.

## Technology-specific advice under operational programme 7

75. Integrated gasification of clean coal: This has become an increasingly anachronistic item in the operational programme 7 list of technologies, and it is difficult to support its use in terms of mitigating climate change unless, as a STAP report of September 1997 concludes, "it is part of a strategic plan to use coal in a climate friendly way". The case that it will raise energy efficiency has always been modest; there is a wide range of options, under operational programme 5, that are cheaper and which can be more rapidly deployed; these options include a range of efficient "clean coal" technologies, albeit with marginally lower efficiencies – but appreciably lower costs – than integrated gasification of clean coal that are commercially proven.

76. In the context of a request of the GEF secretariat to review an integrated gasification of clean coal project proposal, STAP recommended that support for integrated gasification of clean coal under operational programme 7 should be reconsidered and that a strategy paper should be prepared demonstrating a detailed path to zero emission for the coal industry and that current and future projects should be assessed within that context.

## Ocean thermal energy conversion technology

77. At the request of the GEF secretariat and the World Bank, STAP was requested to review ocean thermal energy conversion technology, since this technology is not presently covered by operational programme 7. The main focus of the STAP review was the desirability and rationale for GEF support for the technology.

78. The summary of the conclusions of STAP's review is that:

(v) The potential of ocean thermal energy conversion technology is promising, particularly for small island developing States, and the potential multi-purpose benefits of the technology deserve recognition;

(w) The main attractions are (i) its multipurpose nature, and (ii) the scope of innovation if combined with other technologies in the longer term, such as solar ponds to provide higher temperature heat input. The multi-purpose possibilities include electricity production, desalination, marine-aquaculture using nutrient rich waters from the deep ocean, and district cooling, which include new applications to increase the yields of high valued crops (through reducing evapotranspiration);

(x) Though the technology does not strictly meet the operational programme 7 criterion of being "proven or demonstrated on a commercial scale" (operational programme 7, paragraph 7.7), it meets, or is capable of being designed to meet, all other criteria;

(y) STAP is proposing a development grant to explore and test the technology in a small island developing State.

## Solar thermal technologies for power generation

79. STAP II members also participated in workshops convened by the World Bank in Washington, D.C. on the future of these technologies and the implementing agencies/GEF strategies for supporting them. At a later stage, they were also part of a project review exercise.

## Grid connected photovoltaics

80. Similarly, STAP II members were also involved in a World Bank/International Finance Cooperation hosted workshop on the future of these technologies. These are an emerging and

important area for investment, on which solid experience has been gained in the industrial countries, and in some developing countries. They are the next logical step for GEF investment in solar energy.

#### 4. Promoting environmentally sustainable transport

81. The GEF transport portfolio (operational programme 11) is currently dominated by technology-oriented options. Major initiatives promoting fuel cell technology and electric/hybrid vehicles have been launched. Close to 70 per cent of the full projects in operational programme 11 are promoting either fuel cells or hybrid electric vehicles. STAP has expressed concern over the limited number of GEF initiatives aimed at promoting non-technology options that can lead to significant modal shifts to more efficient and less polluting forms of public and freight city transport and reiterated the importance of examining the non-technology options for leveraging a modal shift in city transport systems. Moreover, STAP feels that additional technologies, beside fuel cells, should evolve within this operational programme.

82. Another area that warrants more consideration in the evolving portfolio on transportation is the linkage of transport planning to air quality.

83. To assist the GEF secretariat and the implementing agencies in their efforts, a brainstorming session on “Non-technology options for sustainable transport” was convened by STAP in March 2002.

84. The aim of the brainstorming session was to recommend a set of non-technology priority options that could constitute the key focal themes of the evolving GEF transport portfolio. Emphasis was placed on options that have demonstrated verifiable successes and that are suitable for deployment in developing countries. The options that are likely to be the most beneficial and deserve special attention from proponents of future GEF sustainable transport initiatives are public rapid transit, traffic demand management, non-motorized transport, and land-use planning.

85. It is also recommended that the criteria for the prioritization of GEF sustainable transport initiatives would differ with location and type of the option that is being promoted. In this regard, emphasis could be placed on smaller towns and secondary urban centers where vested interests and barriers are not so daunting.

86. In addition, the meeting recommended that, in the near term, GEF should initiate smaller barrier removal/planning/demonstration projects (e.g. in the framework of its medium-sized projects portfolio) that would lay the groundwork for larger private sector or government investments in public rapid transport, traffic demand management, non-motorized transport and land-use planning.

#### Fuel cells

87. STAP II sees no reason to reverse the recommendations of the previous STAP, nor to reverse the positions of operational programme 7 and operational programme 11, that fuel cells for both stationary and mobile applications are and should be eligible for GEF support.

88. However, any GEF strategy to develop fuel cell buses for developing countries should be cognizant of the following issues:

(z) The high cost of using hydrogen, as compared to hydrocarbon fuels, poses an enormous barrier to its commercialization, which would also require the build-up of a hydrogen production and distribution infrastructure. The uncertain cost-reduction potential of hydrogen is an important issue determining its future adoption on a commercial scale. Targeted research into hydrogen and hydrogen infrastructure in relation to the kinds of technologies supported by GEF programmes would be merited;

(aa) Fuel cell technology. Fuel cell technology is an uncontroversial technology which is at a pre-commercial stage, meaning it will be commercial in the next decade. Fuel cells can be used with hydrogen or hydrocarbon fuels. Costs are expected to decline significantly, though the extent of this is uncertain, and there will be much "learning-by-doing" as experience is gained. The technology is a long-way from standardization and replication. Any intervention of GEF in this area should be phased, such that each project can learn from its predecessors, and take advantage of ongoing developments in the technology.

89. The initial issue is the ownership of the technology; the developers and owners of the technology are a few concerns in the North that are going through a learning experience, a process the developing countries are not benefiting from. Should GEF provide the capital cost of the pre-commercialization of a technology developed and manufactured by an industry in the North? The developing countries cannot be passive recipients of the technologies, and financial support from GEF can be legitimate if the firms benefiting from the "learning-by-doing" process in manufacturing the cells can be identified in the client countries of GEF. STAP is unanimous that local ownership would be central to the success of GEF projects in developing countries, and to the purposes and ideals of GEF; everything should be done to ensure that local ownership takes place.

## 5. Vulnerability and adaptation

90. Scientifically and politically, adaptation to the impacts of climate change has emerged as one of the most urgent, critical and contemporary societal issues.

91. In its response, GEF sought STAP's advice on how to operationalize the guidance provided by the Conference of the Parties to the United Nations Framework Convention on Climate Change and to inform the GEF policy response. To this end, STAP organized a brainstorming session to identify key issues and formulate a programme for an adaptation workshop. As a result, the STAP expert group workshop adopted a bottom-up approach, focusing on sector-specific case studies of past and ongoing experiences of adaptation activities rooted in regional and/or national perspectives.

92. The aim of the workshop was to identify gaps in current scientific knowledge on impacts and adaptation; provide advice on how to integrate adaptation concerns into mainstream development projects in specific sectors in a scientifically sound manner; develop guidelines for the formulation of a framework for GEF to fund adaptation interventions; and outline the main elements of a targeted research agenda for adaptation. In its approach, STAP took into consideration the current level of scientific and technical knowledge in adaptation, regional differences in terms of vulnerability and adaptive capacity, and the social, economic and environmental impacts of adaptation as well as the need to address the issue within the overall context of sustainable development.

93. A major barrier identified by STAP to develop adaptation strategies in developing countries is the lack of scenarios and data to assess impacts and the lack of institutional capacity to collect data, develop the scenarios and models, and evaluate adaptation options. The existence of gaps in information and understanding of impacts and adaptation underscores the need for the use of the GEF targeted research policy as a vehicle for the improvement of scientific and technical information and knowledge on adaptation.

94. With respect to assessing adaptation, STAP recommended that consideration should be given to moving from an essentially "scenario-based" approach to include a "risk assessment" approach. The basic principles of that approach are as follows:

(bb) Pay greater attention to recent climate experience. Link climate, impacts and outcomes to the coping range;

(cc) Address adaptation to climate variability and extremes as part of reducing vulnerability to longer-term climate change;

(dd) Assess risk according to how far climate change, in conjunction with other pressures (e.g., land and water degradation, resource over exploitation, etc.), may drive activities beyond their coping range;

(ee) Focus on past and present vulnerability to ground future adaptation policy development in present-day experience;

(ff) Consider current development policies and proposed future activities and investments, especially those that may increase overall sector or system vulnerability.

95. According to STAP an adaptation strategy should:

(gg) Be flexible so as to respond to diversity in vulnerability and resilience;

(hh) Be multi-purpose, simultaneously addressing other issues in an integrated way, because climate change is only one of a number of global changes and pressures;

(ii) Ensure the fusion of a “top-down” approach that identifies impacts from global scale climate change, and a “bottom-up” approach rooted in local, national and regional experience. The former would be driven by scientific knowledge, and the latter would be directed towards enhancement of resilience capacity;

(jj) Not be deterministic but rather be flexible and based on the risk management concept because decisions are made under scientific and societal uncertainty;

(kk) Adopt a multi-scale and stage approach, integrating policies throughout the stages, and recognizing that stakeholders’ options differ from stage to stage.

96. As a first priority, funding needs to be directed at better understanding and enhancing of adaptive capacity, including identification of priorities for adaptation, strengthening institutions and networks, increasing skills, knowledge and awareness and developing information and communication technology.

97. At the same time, vulnerability to climatic hazards should be reduced and maladaptation that increases risks avoided. Early warning systems, preparedness, disaster recovery and insurance are existing strategies that need to be more widely applied. Opportunities to create synergies with other environmental issues, such as combating land degradation and conserving biodiversity, etc., should be pursued.

98. In addition, STAP formulated criteria for prioritization as well as priority areas for intervention.

## B. Biodiversity

99. Contrary to the climate change focal area, the biodiversity focal area underwent major shifts during STAP II as a result of new priorities and guidance coming from the Conference of the Parties to the Convention on Biological Diversity. Emphasis shifted from a predominant support to protected areas, to sustainable use of biodiversity as part of an integrated, ecosystem-based approach to biodiversity conservation, and interventions in productive landscapes. The promotion of sustainable development to adopt a broader view of biodiversity conservation and sustainable use within the production land and sea scapes, while maintaining support for protected areas, became a major theme during GEF II. Within this theme, a multi-year programme of activities aimed at promoting the positive effects and mitigating the negative impacts of agricultural practices on biological diversity in agro-ecosystems and their interface with other ecosystems received support.

100. STAP's efforts in the biodiversity focal area were a direct response to the new priorities and fed directly into GEF's policy frameworks and the new operational programmes under development. On the theme of sustainable use, STAP contributed through detailed advice on biodiversity conservation in production forests and the potential use of green certifiers (biomarkers), whilst in the area of agro-biodiversity STAP helped to shape the new operational programmes. Furthermore, STAP helped GEF operationalize the guidance received from the Convention on Biological Diversity on taxonomy, providing concrete suggestions on a GEF role in the delivery of some aspects of the Global Taxonomy Initiative and on possible GEF interventions. As a direct input to activities of the GEF family, including monitoring and evaluation, STAP reviewed the "Biosafety enabling activities" pilot project, took part in a biodiversity programme study and worked closely with monitoring and evaluation on the biodiversity indicators.

101. STAP's advice in the above areas was not limited to the natural science domain but also encompassed the social science domain, particularly when addressing sustainable use and agro-biodiversity issues. Examples of the social issues STAP drew to GEF's attention were green marketing, incentives, participatory approaches, capacity-building and indigenous knowledge. STAP stressed their importance for the success of interventions aimed at conserving biodiversity. In this regard STAP strongly recommended that links should be established at the project level between the social and natural sciences.

102. Equally important is the realization that many of the scientific and technical issues STAP put forward to GEF originated from experience on the ground with conservation and sustainable use of biodiversity, and were directed to the implementation level. Lack of understanding and operational definition of many of the proposed management practices in projects, led STAP to stress the need to take measures to provide appropriate information and generate a better understanding of them. STAP underscored the importance of basing assumptions concerning sustainability or destructiveness of present patterns on adequate information, and of generating this information through monitoring and targeted research activities. This would include assessing the impact on resources as well as more broadly on ecosystem function. At the level of implementation of solutions, STAP questioned, for example, how well the specifics of various proposed new uses are understood and described, i.e., beyond generic terms such as "agro-forestry" and "sustainable harvesting", and how adequately they have been tested.

103. As a consequence, an adaptive management approach was advocated as a means to come to grips with the uncertainties and unknowns while generating the necessary feedback and experience that could form the basis for a more scientifically founded approach. This view was expressed in STAP workshop reports and selective reviews.

104. Although no formal brainstorming session took place, key ingredients of integrated ecosystem management were much debated by STAP, exposing the lack of experience and understanding of the scope and application of integrated approaches and sustainable use practices in projects. However, STAP made an important contribution in advancing the understanding within the GEF context of the scientific and ecological basis of biodiversity conservation in productive forests. Among the key issues of integrated ecosystem management discussed were methodologies to characterize ecosystem management patterns with appropriate indicators; assessment of mid-term changes in ecosystem use trends, including global benefits and ecosystem management approaches that offer the best potential to achieve widespread global benefits; and the impact of biodiversity on the global environment. Although some of these recommendations are included in the advice STAP provided on specific issues, STAP felt that they deserved a more detailed examination.

105. With regard to specific biodiversity issues requiring further development and support, STAP listed biosafety, alien and invasive species, benefit sharing and incentive measures as the main ones. In addition, STAP stressed the need for better defined interaction among components of biodiversity from a scientific standpoint.

## 1. Specific scientific and technical issues addressed by STAP

### (a) Biodiversity conservation in production forests

106. In October 1999, STAP convened a brainstorming meeting on "Biodiversity conservation in production forests" in Mexico City with a view to providing a systematic analysis of the factors that influence biodiversity conservation in production forests, including strategies or approaches to address them and guidelines or tools to ensure they are adequately reflected in potential GEF projects.

107. STAP provided the following elements for incorporation into the GEF framework paper on sustainable logging:

(ll) Conserving biodiversity in production forests is not substantially different to conserving it in a nature reserve. A major reason identified for the loss of biodiversity in the tropics is the absence of adequate policy and institutional frameworks under which sustainable management can be implemented. The policy and institutional constraints at the national, regional and international levels that mitigate against biodiversity conservation include lack of community empowerment and organization of local communities; land and resource tenure systems; unsuitable forest management and competition for land resources; valuation of biological resources; and market imperfections, international trade agreements and intellectual property rights;

(mm) Investment in adaptive management approaches was considered to be an effective means of facilitating biodiversity conservation in production forests. In this regard, a number of concrete suggestions on how GEF funds could be used to mobilize a participatory, decentralized, adaptive management approach towards forests were highlighted;

(nn) Learning from past experience, that is, the need to pull together existing experience, and on that basis formulate guidelines and identify geographical areas where the chances of success are maximum;

(oo) Capacity-building at various levels directed towards strengthening community participation in biodiversity conservation and the establishment of participatory monitoring systems for adaptive management.

### (b) Agrobiodiversity

108. STAP carried out two major activities in support of the formulation of an operational programme on agrobiodiversity, namely, the STAP selected review on "Ethiopia: a dynamic farmer-based approach to the conservation of African plant genetic resources" and the STAP brainstorming session on "Agricultural biodiversity", convened in Barbados in February 2000.

109. The selective review was undertaken with a view to drawing out practical lessons which could assist in the design of the operational programme and was a major input to the brainstorming session, which had, as its major objective, the identification of scientific and technical elements which should form the basis of the operational programme.

110. A number of broad issues were identified which, in STAP's view, should be taken into consideration in the final design of the operational programme, namely linkages between diversity within species and evolution; economic, social and genetic benefits derived from in-situ conservation; and strategic directions in collection and conservation. In addition, based upon the findings of the selective review, a number of critical issues were identified which should be taken into consideration in future initiatives in agricultural biodiversity. They include ecological and plant genetic issues; local knowledge and farmers practices; agricultural policies and farmers' rights; and benefit sharing and market and non-market incentives.

111. Scientific issues raised by the review were potential uses of wild relatives of and underutilized plants; genetic diversity in providing resilience, not only in terms of genetic diversity, but also diversity at the community and different social levels; the interaction between components of biodiversity (i.e., management techniques, cultural norms, multi-cropping, species interaction); the role of pollinators and their relationship with communities; the role of soil and below ground diversity, which is fundamental to how systems operate; pest and disease control mechanisms, and technology adaptation. In addition, the socio-economic forces which have an impact on agro-systems, and the effects of climate variability and climate change on agro-systems, were identified as important areas which should be addressed by the operational programme. It is also important for the operational programme to address specifically the interaction with other systems; it should therefore not only focus on diversity of the systems, but also the impact of agriculture on biodiversity. STAP recommended that special attention should be paid to appropriate modern ecological approaches, as well as ways of working with folk knowledge and practices. Furthermore, it was concluded that there was a need for a better understanding of the scientific and technical dimensions of agricultural biodiversity. It was suggested that targeted research initiatives should be used to clarify the impact of interventions on diversity and genetic erosion.

112. With regard to the project, STAP felt it would be desirable to initiate attempts to refine and broaden this focus, so as to assist in developing a greater understanding of a number of other relevant issues, such as incentives and the use of local and traditional knowledge, and to strengthen the sustainability of the programme and facilitate its replication.

113. STAP also drew GEF's attention to the rapid, unprecedented and profound change in agro-ecosystems in South-East Asia. STAP is concerned that throughout the region agricultural biodiversity is being lost, and that the diversity of types of agro-ecosystems is being reduced.

114. In view of the fact that there is no broader regional recognition of the scope of these phenomena, nor a regional effort to monitor and manage the change, STAP suggested that an assessment should be carried out on (a) the major changes occurring in agro-ecosystems and associated ecosystems in South-East Asia, their pace, and scope as well as the principal forces driving these changes; (b) the implications of these changes for biodiversity, including agro-biodiversity, at various levels of analysis, as well as the implications for land degradation, local agricultural knowledge and practice and the well-being of rural populations; and (c) to make recommendations for potential GEF interventions.

(c) Biomarkers

115. "Green certifier systems" (or biomarkers) can be an important and indispensable way to deal with the reality of a constantly increasing trade of components of biological diversity and the need to preserve the ecosystems in which these species live. However, it was noted that there is no one universal method, but instead a diversified range of techniques will need to be devised.

116. The establishment of a green certifier system can be a way to reward kinds of sustainable practices by identifying where biodiversity products come from as well as in helping better to define property rights on components of biodiversity. In addition, green markets could translate into an important source of encouraging legitimate revenue for indigenous communities, which would become the authenticated producers, thus encouraging them to participate in the preservation of the natural areas that make this valuable wildlife possible.

117. STAP, which convened a brainstorming session on green certifiers in Mexico City, in October 1999, is of the view that "green certifiers" should be given more consideration by GEF, as an integral part of sustainable use and benefit sharing.

(d) Taxonomy



118. Taxonomy is one of the areas STAP provided advice on, which came directly from convention guidance. In the formulation of its advice, STAP worked closely with the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA).

119. It is generally agreed that the taxonomic impediment is a rate-limiting step to progress in implementing biodiversity programmes, and that the management and use of taxonomic information can help GEF to address the issues of conservation, management, benefit sharing and sustainable use of biodiversity. STAP considered a number of taxonomic themes, and reached some broad conclusions, on how GEF can assist countries deliver the aims of the Global Taxonomy Initiative, within the context of its operational programmes. It was understood that GEF could not possibly drive the Initiative; it is the product of a decision by the Conference of the Parties, which will be implemented jointly and severally by the Parties. Nonetheless, GEF has a key role to play through its work in countries with the operational programmes, to help in the delivery of some aspects of the Initiative such as development of taxonomic databases.

120. STAP recommended the following key areas for GEF funding of country-driven action to reduce the taxonomic impediment:

(pp) Repatriation of taxonomic information and building of taxonomic databases, on the lines of the Comisión nacional para el conocimiento y uso de la biodiversidad (CONABIO) of Mexico;

(qq) Capacity-building with the United Nations Development Programme (UNDP) and knowledge-based activities of UNEP;

(rr) Linking the Global Taxonomy Initiative with agro-biodiversity efforts;

(ss) Promoting the development of regional databases and networks (e.g., the Southern African Botanical Diversity Network (SABONET) and Bio-NET INTERNATIONAL) was considered a key activity and is a potential key role for GEF. Priority would be for groups of economic and/or conservation importance. This will also help efforts in promoting integration of traditional and more “western” scientific approaches.

(e) Biosafety

121. Consistent with the GEF Council’s recommendation, STAP undertook a selective review of the pilot project on “Biosafety” in November 1999. STAP’s view was that a scientific and technical meeting should address issues such as:

(tt) The critical mass of the scientists that are needed to implement the framework;

(uu) The institutional issues to implement the framework, since many countries lack an institutional mechanism to mobilize the existing scattered scientists;

(vv) The development of scientific and technological competence in biotechnology/biosafety;

(ww) Development of closer collaboration with the existing biotechnology agencies.

(f) Specific recommendations emanating from the selective review of the “Conservation of priority protected areas in the Philippines”

122. As part of the programme studies, STAP undertook a selective review of the “Conservation of priority protected areas in the Philippines” project, focusing on (a) participation of the scientific and technical community, including the social science community; (b) deploying traditional ecological knowledge and wisdom and sustainable use practices of local communities; and (c) putting to use an understanding of stakeholder behaviour and learning through doing.

123. The project is a pioneering experiment, supporting significant institutional innovations such as protected areas management boards that bring together multiple stakeholders to set policy and oversee implementation. The biodiversity monitoring systems are functional, generating periodic assessments of the efficacy of the system, providing important feedback to the managers and the management boards. There are, however, certain difficulties, especially in the resolution of issues relating to tenure and elaboration of sustainable livelihood projects so vital to participation of local communities. While this whole range of issues was dealt with by the monitoring and evaluation team, STAP worked hand-in-hand with them to focus on issues pertinent to its own specific mandate, namely, on what had been attempted and what broader lessons could be drawn in relation to providing science and technology, social sciences, and traditional ecological knowledge and wisdom inputs to the design, implementation and monitoring of the project, and then developing capacities and designing institutions in the three areas in conjunction with implementation of the project to build up capabilities to address global environmental challenges. STAP's conclusions were focused on these issues.

124. As an example of one of STAP's recommendations, it was observed that good beginnings have been made in involving the science and technology community in the prioritization phase and in designing the biodiversity monitoring systems. It is, however, important that strong links should be established amongst science-technology/social science/traditional ecological knowledge streams, links that are largely absent today. It is then necessary to involve these knowledge enterprise communities in advisory groups to work with protected areas management boards, and to assume a major responsibility for monitoring and evaluation that can provide inputs for adaptive management practices. STAP's review in fact helped forge such links amongst science-technology/social science/traditional ecological knowledge streams as well as the resource management agencies through a series of two meetings, the first of their kind, at the University of Philippines Marine Sciences Institute immediately following the review.

### C. Land and water

125. The structure of the land and water section reflects the evolution of the approach towards land and water issues in GEF, with separate international waters and land degradation themes at the outset of STAP II, followed by a merger whereby the two themes were dealt with by one team. From 1999 onwards, land and water were approached in an integrated fashion, as marked by the establishment of the GEF Land and Water Resources team. Within the integrated land and water management theme, STAP was specifically requested to examine the integrated ecosystem approach. One subsection is therefore devoted to the topic of integrated ecosystem management.

#### 1. International waters

126. Two main topics dominated the debate in the international waters programme: the transboundary diagnostic analysis/strategic action plans approach and its results, and persistent organic pollutants (POPs). With regard to the former, STAP highlighted the need to review their benefit and applicability, as well as the need to balance the planning process with results on the ground. Similarly, the question of how to facilitate the implementation and payment of transboundary diagnostic analysis/strategic action plans results was raised as needing further consideration. STAP in fact suggested to take the lead in a review. At the request of the international waters task force, STAP undertook a review of three lake projects in East Africa on lakes Victoria, Tanganyika and Malawi, with the main objective to assess the status of GEF projects undertaken in the lakes with a view to identifying the key scientific and technical issues emerging from the implementation processes.

127. STAP II's contribution to the international waters focal area was concentrated on a review of the East African lakes projects and on POPs, with the organization of a series of workshops, the main conclusions of which are outlined below. The advice on POPs fed into the development of the new operational programme on this issue.

128. In addition, STAP continued to provide inputs to the Global International Water Assessment through its participation in the project steering committee. Issues raised by STAP related to (a) the method to guide the environmental assessment and the scientific criteria it relies on; (b) the use of modeling; (c) the information on the basis of which conclusions are drawn and the need to take into account data gaps and lack of a long-term view; and (d) the causal analysis used.

129. Furthermore, the following gaps in the portfolio were identified: (a) land-base sources of marine pollution; (b) a more holistic approach to land and water management using a watershed/ecosystem management approach; (c) conservation and sustainable management of fisheries with particular reference to the removal of barriers to the use of sustainable fisheries technology; (d) ground water management and its relationship with biodiversity; (e) land/coastal interaction; (e) a more holistic assessment of POPs so that the necessary adjustments could be made in the existing GEF operational programmes; and (g) shifts in the hydrological cycle and its relationship with climate change.

### East African lakes review

130. A series of workshops with STAP participation on east African lakes, i.e., Lake Victoria, Lake Malawi and Lake Tanganyika, sites of major GEF projects that are under implementation or near completion, highlighted the need to take an integrated approach to water bodies and their land catchments. These very significant ecosystems have shown signs in recent years of losing their capacity to furnish the manifold services they have been providing. Catastrophes such as major fish kills are symptomatic of this degradation. STAP has attempted to provide suggestions to the implementing agencies towards the development of a programmatic approach to help bring science and technology inputs on a sustained basis in managing the East African lakes.

131. The STAP workshop on the review of the East African lakes provided an opportunity for the riparian countries of the East African lakes to meet and exchange views and experiences on approaches on the management of the lakes. It also provided an opportunity for an interface between local and international scientists and the donor community.

132. The need for a better scientific understanding of the biological, physical and chemical properties of these systems and the implications for management and policy was noted. It was also pointed out that the wealth of relevant scientific information generated within the framework of the International Decade for the East African Lakes (IDEAL) research was not being utilized by ongoing projects of GEF in East Africa (Victoria, Tanganyika, Malawi). The workshop was also concerned that there were few linkages between most of the initiatives on the East African lakes, including between the GEF financed projects in Lakes Victoria, Tanganyika and Malawi.

133. A number of recommendations and conclusions were made and endorsed by STAP, the main ones of which were summarized as follows:

(xx) A programmatic multi-lake basin approach for the East African lakes is highly desirable given the commonality of issues being faced by the riparian States of the three lakes (i.e., watershed degradation; water hyacinth; blooms of potentially toxic algae; reduction of fisheries; fish kills; increasing sedimentation, etc.) as well as the need to share and disseminate monitoring and research results, information and experience on management approaches, and scientific information and technologies for addressing various issues. This approach would provide an overall framework within which interventions could be designed nationally, regionally or intra-regionally to ensure complementarity. This would also facilitate a more coordinated approach to resource allocation by donor agencies, technology transfer and exchanges of experiences between riparian countries and a framework for building sub-regional capacity as well as ensuring scientific standards for investigations being undertaken on the lakes. Such an approach would also provide a more predictable framework for longer-term private sector involvement and investment;

(yy) In order for the framework to be meaningful, a seven to eight year time span was deemed desirable for a programmatic multi-lake basin approach for the East African Great Lakes as well as the establishment of monitoring activities and the adoption of indicators to measure success;

134. STAP concluded that further consideration of the above ideas by the stakeholders was necessary as it marked a paradigm shift in the management of the East African lakes. Fundamentally, it calls for management based on integrated data systems in which science has an important role to play.

135. In light of the work undertaken by STAP on the East African lakes, STAP recommended that consideration should be given to integrating the conclusions of the STAP workshop in the implementation of the African Land and Water Initiative.

## 2. Persistent organic pollutants

136. Containment of POPs emerged as a significant global issue. The GEF Council requested the GEF secretariat to develop an options paper to expand the scope of GEF interventions in the area of POPs and/or the elements of a new operational programme dedicated to the phasing out of POPs. STAP was asked to provide substantive strategic advice in the development of the operational programme on POPs.

137. In response, STAP convened a brainstorming session to look at the manifold ramifications of an international legally binding instrument for implementing international action on certain POPs, including the identity of substances that might be targeted.

138. The brainstorming session examined a number of scientific and technical issues including options for dealing with stockpiles of these POPs, especially in developing countries. Some of these have seeped into the soil and need a different approach than those sequestered otherwise. Several of the stockpiles are in parts of the world with poor transport and communication facilities so that conventional routes of disposal such as incineration are not feasible. Substantial scientific inputs are called for in finding the most appropriate ways of elimination of these stocks. Other issues arise as new, more acceptable compounds are introduced, entering environments where the older compounds are already present. Questions arise as to how the microflora will react to these mixtures. There will also be some implications for the agricultural sector. Finally, there are intriguing possibilities of totally eliminating the need for the POPs molecules by approaches such as the development of vaccines against malaria and dengue so that controlling vector populations is not a prerequisite for the control of these diseases.

139. The discussion centered on a wide range of issues (use, fates and effects on the environment, including effects on biodiversity and land degradation, the state of monitoring, prevention and redemption, existing options and social-economic aspects) which are relevant for understanding the scope of POPs and which are likely to have implications for the implementation of the Stockholm Convention on POPs. The discussion highlighted the complexity of assessing effects on ecosystems and the constraints associated with the existing methodologies (lack of sufficiently sensitive and discriminatory instrumental, analytical techniques and authentic standards for compounds that occur in wildlife) to investigate POPs, their metabolites and decay products.

140. A number of general conclusions and recommendations were made taking into account the range of problems that must be overcome in developing countries and countries with economies in transition to attain the goals of reducing or eliminating persistent toxic chemicals. They pertain to (a) capacity-building; (b) monitoring and assessment activities to reduce data gaps, produce time series data, evaluate environmental status and provide input data essential to chemical fate modeling; (c) training programmes and technology transfer; (d) incentives for the implementation of integrated pest management; (e) appropriate technologies to deal with old stocks in specific conditions; and (f) implementation of best environmental practices and best available techniques to reduce emissions, as

well as the establishment of incentives (or penalties) to improve industry maintenance and operational practices needed to reduce industrial emissions.

141. Information gaps and potential targeted research areas were also identified. These included, inter alia, gaps regarding monitoring and assessment; biological effects; stock piles; persistent toxic substance management; and wildlife species sensitivity issues.

142. The implication of the ongoing POPs negotiations for GEF operations and the scientific and technical requirements needed for a holistic approach were considered in the context of the existing GEF framework, namely, operational programme 10, for addressing POPs. The main recommendations included:

(zz) UNEP's Regionally Based Assessment of Persistent Toxic Substances should be used as a basis for selecting potential chemicals as candidates for GEF interventions;

(aaa) Operational programme 10's "Contaminant-based programme" as currently written does not allow for a GEF response on a country-by-country basis, although actions in the context of POPs will have to be taken at the country level. Dealing with the requirements of the POPs Convention under operational programme 10 may restrict GEF actions in other issues of water contamination, some of which are at least as important in developing regions. A revision of operational programme 10 is recommended in the direction of keeping the broad scope of GEF interventions in dealing with persistent toxic substances other than the 12 POPs, and giving more emphasis to ephemeral contaminants (nutrients, etc.) which are equally or even more damaging to the marine environment;

(bbb) A new operational programme should be put in place to deal exclusively with the requirements emerging from the POPs Convention, in the event that GEF becomes the financial mechanism for the Convention. Such an operational programme should provide flexibility of action and a broad scope of interventions (addressing human and environmental health issues, land and water ecosystems, technical and socio-economic aspects and actions on the ground for elimination or substitution);

(ccc) For an appropriate range of POPs/persistent toxic substances issues to be addressed, the effects of this class of substances should not be limited to water pathways of exposure. For these to be dealt with holistically, all pathways of transport and exposure would need to be deemed relevant for GEF interventions;

(ddd) Though it was recognized that, for the purposes of the POPs Convention, such additional substances would be those accepted by the Parties to the Convention, it was not considered desirable that a specific persistent toxic substance would be identified for the purposes of defining their eligibility for GEF intervention, but instead the broad definitions of criteria for substances to be considered as persistent toxic substances would suffice. Broadly inclusive criteria such as persistence (e.g., > 6 months in soils), bioaccumulation (e.g.,  $\log K_{ow} > 10^3$ ) and promoting adverse effects in humans or animals, should be considered.

143. Further guidance from STAP was also requested on innovative technologies to address issues such as disposal, alternatives and remediation as well as issues relating to bi-products. In addition, technical and scientific support and advice will be required to support the implementation of a limited number of pilot projects to demonstrate innovative and cost-effective technologies and management practices. The preparatory work undertaken by STAP was handed over to STAP III for follow-up.

### 3. Land degradation

144. The first participants Assembly of GEF, held in New Delhi in April 1998, in its final statement recommended that *".... GEF should seek to better define the linkages between land degradation, particularly desertification and deforestation, and its focal areas, and to increase GEF support for*

*land degradation activities as they relate to the GEF focal areas*". To assist GEF in meeting this requirement, STAP convened an expert group workshop on "Land degradation interlinkages" in Bologna, in June 1999, to ensure input from a wider scientific community in its advice to GEF. STAP also commissioned expert papers as a basis for the discussions. The workshop was preceded by a synthesis session to review the interlinkages papers prepared by experts as background material for the workshop, and to guide the experts in finalizing the papers.

145. The goal of the workshop was:

(eee) To seek to define better, from a scientific and a technical viewpoint, the linkages between land degradation and GEF focal areas of climate change, biodiversity and international waters;

(fff) To explore possible interventions to address land degradation as it relates to GEF focal areas and the potential for achieving global benefits;

(ggg) The identification of gaps, where targeted research is necessary.

146. The complexity of the interactions between socio-economic and biophysical processes of land degradation was highlighted and land degradation was defined as an outcome of land-use change, which in many situations degrades soil and water resources and reduces bioactivity of flora and fauna. The workshop concluded that changes in land cover and vegetation status contribute to climatic change, alter biodiversity and modify hydrologic cycles which feed back to further influence land-use systems. In addition, criteria for assessing globally significant issues in relation to focal areas were developed, although this component needs more work.

147. The complexity of the driving forces was analysed and strong linkages between land degradation and the GEF focal areas were identified particularly with international waters, climate change and biodiversity. The driving forces include economic, social, cultural, environmental, institutional and policy driving forces on a range of scales. There are also strong overlaps between GEF focal areas in relation to land degradation. Biodiversity, land and water issues are often strongly linked with land degradation being the driving factor for these linkages. There are also strong links between climatic change and land degradation, especially as storm and rainfall intensity increases.

148. It was concluded that there were multiple opportunities for GEF intervention, which should not only address effects, but also the root causes and drivers. These interventions should be evaluated in the broader context of their multi-benefit potential. To be effective, however, these interventions will require a "people centred" rather than a "land centred" approach.

149. Intervention strategies were identified in six areas as they related to one or more GEF focal areas:

(hhh) Vegetation/forest management; revegetation; indigenous vegetation maintenance and management (production technology);

(iii) Sustainable rangeland/grassland management (production technology);

(jjj) Integrated catchment/watershed management/sustainable land and water management;

(kkk) Sustainable agricultural practices/management (conservation technology);

(lll) Energy related strategies;

(mmm) Establishment of transboundary mechanisms for management of shared resources.

150. Finally, gaps in knowledge and understanding of the interlinkages between land degradation and the GEF focal areas were identified and a targeted research programme to meet those gaps outlined.

151. The major contribution of STAP to advancing the understanding of the linkages between land degradation, including its global significance, and the focal areas of biodiversity, climate change and international waters was recognized by the GEF family. It was on the basis of the work of STAP in land degradation that new projects with a land degradation focus were developed.

#### 4. Integrated land and water management

152. As of 1999, STAP expanded its involvement in land degradation to the area of integrated land and water management and integrated ecosystem management, outlined below.

153. In 1999, GEF established a land and water resources team. This marked a paradigm shift in the way GEF had historically addressed issues relating to land and water. The overall objective of the land and water work programme became securing and maintaining the integrity of ecological systems, particularly land and water, through integrated ecosystem management, while the general theme was integration.

154. As an input to the efforts of GEF Land and Water Resources team, STAP was requested to assist with the identification and analysis of a number of case studies on integrated land and water management with a particular focus on Africa. The specific objectives of the case studies were to compile, synthesize, and disseminate good practices in community-based application of integrated land and water management, including traditional systems, with a view to contributing to a better understanding of different community-based management systems.

155. The compilation and analysis of these case studies were intended to support ongoing efforts by GEF, particularly the Africa Land and Water Initiative, as well as other organizations, in order to facilitate wider adoption of the integrated land and water management approaches. STAP examined the scientific and technical underpinnings of the case studies, the methodologies employed and the enabling environment which influenced the case studies. The case studies selected are representative of the range of situations found in Africa both from a human use and a geographical perspective.

156. To guide the preparation of the case studies a number of questions critical to the successful implementation of community-based land and water initiatives were formulated. They pertained to (a) tangible and sustainable socio-economic and environmental benefits to livelihoods; (b) stakeholder involvement; (c) building on existing institutions and structures; and (d) ability to adapt to internal and external change. The goal of the analysis, on the other hand, was to expose critical issues determining the sustainability and replicability of the approaches. Much attention was paid to the question of how the biophysical and socio-economic systems interact to accomplish livelihood objectives, and the impact of this interaction on land and water management practices. This question was placed in the broader policy and enabling environment context to reveal driving forces and issues of spatial and temporal scale.

157. The case studies are to form part of a publication of a "Source book on integrated land and water management" the purpose of which is to provide an illustrative series of case studies of good practices in community-based integrated land and water management, identifying the key lessons learned and also providing a supporting analytical framework for implementing such projects. STAP also hopes it will serve as an input to guide the translation of the African Land and Water Initiative from concept to practical application in the field.

#### Integrated ecosystem management

158. Since its restructuring in 1994, GEF has adopted an ecosystem approach to the management of land and water resources. Through its ecosystem-based planning framework known as operational programmes, the GEF has supported projects to improve the conservation and sustainable use of biodiversity as well as management of international waterbodies.

159. Experience from GEF and non-GEF supported projects indicates that natural resource management in many countries has not had optimum results because of the use of sector-by-sector approaches. These approaches have led to fragmentation of policies, institutions and interventions. These lessons have brought to light the greater need for a more comprehensive and integrated approach to ecosystem management.

160. To facilitate a more comprehensive approach to natural resource management, GEF has developed an operational programme on integrated ecosystem management. This operational programme is aimed at catalysing widespread adoption of comprehensive ecosystem management interventions that integrate ecological, economic, and social goals to achieve multiple local and global benefits.

161. As a means to facilitate greater adoption of integrated ecosystem management approaches, the GEF land and water resources team, in partnership with STAP, the water scientific and technical community and other organizations, decided to prepare a handbook on integrated ecosystem management, with special emphasis on land and water resources. The handbook would clarify the principles underlying integrated ecosystem management and provide operational guidelines on the use of this approach in conservation planning and implementation based on good practice, particularly as it relates to biodiversity, capturing GEF experience and its linkage to global benefits and adaptive management principles.

162. STAP was requested by the Land and Water Resources team to take the lead in the preparation of the handbook, in collaboration with the GEF secretariat and implementing agencies, along with relevant inputs from a wide cross section of stakeholders (science and technology community, non-governmental organizations, etc.).

163. Although the handbook was not completed, STAP II prepared a framework for it. STAP proposed that it should (a) review existing approaches in integrated ecosystem management; (b) review the state of the art in integrated ecosystem management from a scientific and technical standpoint; (c) provide practical guidelines on how to design interventions within an integrated ecosystem management context that integrate ecological, economic and social goals to achieve multiple and cross-cutting benefits at the local, national and global levels; and (d) contain an outline of indicators which can be used for monitoring the implementation of interventions aimed at supporting integrated ecosystem management.

### III. PRIORITIES FOR STAP III

164. This chapter presents the priorities set out in a paper that was prepared by STAP for the May 2002 GEF Council meeting, and which identified a number of priorities that the incoming STAP should consider in GEF III. It is organized around five themes comprising the three main focal areas of the GEF portfolio, namely climate change; biodiversity; land and water; adaptation and generic cross-sectoral issues. Adaptation is addressed separately because of its cross-cutting nature.

165. It is important to note that the priorities proposed in the paper were indicative and largely designed to assist in formulation of the near-term work plan of STAP III. It is expected that STAP III will prepare, in its first set of meetings, more comprehensive and detailed priorities that reflect the expertise, skills and comparative advantage of its constituent members as well as the evolving GEF portfolio and guidance from the GEF Council and relevant United Nations conventions.



#### A. Priorities in the climate change focal area

166. The following are the identified priorities in the climate change area:

(nnn) Efficiency. Proposed options for strengthening GEF's role in improving the efficiency of future building stock in developing countries;

Renewables. Recommend innovative, low -cost and sustainable initiatives aimed at reducing green-house gas emissions from biofuel use in developing countries;

Reducing the long-term costs of new sustainable energy technologies. Suggest effective institutional and financial mechanisms – involving both the private and the public sectors – for the establishment of a network of research centres of excellence in the developing world that would address the question of advancing renewable and energy efficiency technologies in the developing world;

Transport. Recommend the most attractive options for diversifying the GEF portfolio (which is currently heavily focused on fuel cells and electric vehicles). Identified options include:

- (i) Public rapid transit, which encompasses bus rapid transit, light rail transit and trolley electric buses;
- (ii) Traffic demand management;
- (iii) Non-motorized transport and land-use planning;
- (iv) Address the question of how to reduce green-house gas emissions from intra- and inter-city freight transport;
- (v) Propose institutional options for improving the collection and dissemination of data and information on the impact of various sustainable transport options;
- (vi) Recommend innovative measures for enhancing participation, promotion, social marketing and awareness creation of sustainable transport options.

#### Cross-cutting (important to all energy operational programmes)

167. Cross-cutting issues include the following:

(ooo) Evaluate the importance of modularity as an ideal approach for GEF energy interventions. Modularity refers to small-scale modular technologies that allow concept and pilot testing at low cost and low risk. For example, bus rapid transit in urban transport can be tested through a few pilot trunk roads allowing the evaluation of the concept prior to full-scale implementation;

(ppp) Suggest how GEF can ensure that greater attention is given to upstream capacity-building and policy formulation issues that are central to sustainable energy interventions;

(qqq) Develop a flexible set of tools (regulatory, fiscal, technical guidelines) that promote sustainable energy in a rapidly reforming energy sector;

(rrr) Evaluate the impact of energy sector reforms (as well as reforms in other sectors with significant impact on energy use, e.g., transport) on sustainable energy development (energy efficiency, renewables, clean transport modes, etc);

(sss) Propose options that would ensure the development of sustainable energy alternatives while capturing the benefits associated with market liberalization and competition;

(ttt) Suggest GEF interventions that would ensure continued (and possibly increased) support for medium- and long-term energy research and development in a reforming energy sector;

(uuu) Identify win-win options that would promote sustainable energy in a rapidly reforming energy sector, while ensuring the provision of low-cost energy services to the rural and urban poor;

(vvv) Recommend measures that would protect the interests of the poor in GEF climate interventions.

## B. Priorities in the biodiversity focal area

168. The following are the identified priorities in the biodiversity area:

(www) How to deploy local or indigenous ecological knowledge to develop plans for management of natural resources, including planning, implementation, monitoring and adaptively redesigning the management regime on the basis of learning through doing. How to combine folk and scientific knowledge;

(xxx) How to sustain and build upon traditional practices of conservation in the new and ever changing social, demographic, political, economic, technological contexts;

(yyy) How to decide on appropriate levels of economic incentives for provision of environmental services such as biodiversity conservation, watershed protection and carbon sequestration;

(zzz) How to promote conservation and prudent use of common property resources. How social structures and institutions influence patterns of management of common property resources;

(aaaa) How to re-evaluate and manage green markets and trade in biodiversity;

How to manage heterogeneous landscapes, including conservation and production areas. How to design a system of conservation areas on different spatial scales and with different levels of human use. What the roles of corridors and stepping stones are in such systems;

How predictable are complex natural systems? What are the implications of the limits to predictability in designing management regimes? How to update predictions of behavior of complex natural systems by assimilating information on the state of the system generated through ongoing monitoring programmes. How to design management interventions so as to maximize learning in the process of utilization. How to develop adaptive management regimes;

How rapid change in agro-ecosystems, including the replacement of diverse and cyclic smallholder systems by large-scale plantations of export crops is affecting both wild and domesticated biodiversity;

How to recuperate disturbed areas and re-establish ecosystem functions and habitats;

How to re-deploy effectively the financial resources today devoted to payment of subsidies to environmentally undesirable inputs such as synthetic pesticides, and to running the bureaucratic apparatus.

What is the impact of emerging biotechnologies and genetically modified organisms on biodiversity;

How to promote synergies across conventions, including incentives in relation to environmental services that are the focuses of the various conventions.

### C. Priorities in land and water

169. The following are the identified priorities in the land and water area:

(bbbb) Development of a flexible and adaptive approach to land and water management in the GEF portfolio;

(cccc) Methodologies for incorporating land and water management issues in adaptation issues;

(dddd) Development of an integrated perspective in the way STAP addresses issues related to land and water, biodiversity and climate change;

(eeee) Evaluation of science-based transboundary diagnostic analyses and strategic action plans is necessary to demonstrate their efficiency and benefits;

(ffff) Proposing initiatives that would improve the dissemination of available data on land degradation, water pollution and hydrological changes at various levels (space and time);

(gggg) Identification of the most appropriate community-centered approaches that are essential in addressing land and water management successfully. The proposed approaches should also provide methodologies for the incorporation of indigenous knowledge in developing and implementing land and water projects;

(hhhh) Reorganization of operational programme 10 should take account of the new operational programme on POPs that is currently under preparation. It is also important that special attention should be paid to the growing relevance of sewage contamination, which is more complex than the traditional concern over organic nitrogen (N) and organic phosphorus (P) contaminants.

### D. Priorities in adaptation

170. Adaptation is a new science with numerous scientific and methodological questions that are still unanswered. The following listed priorities are not, by any measure, comprehensive but are designed to provide suggestions for near-term priorities that STAP III may wish to take on board.

(iiii) Adaptation requires a very broad approach in both its science and policy responses. In the near term, it is recommended that STAP III should provide guidance on options that would ensure the required broadening of the traditional sector-specific and discipline-specific approaches prevalent in current science and policy communities, respectively;

(jjjj) Review the suitability of the incremental cost model to the adaptation question and, if it proves appropriate, suggest methodologies for its effective implementation;

(kkkk) Propose how GEF could establish capacity-building as the core activity of adaptation initiatives. The complexity of the adaptation issue, which demands flexible responses across numerous sectors at both the policy and field levels, presents developing countries with an enormous capacity and skill-development challenge. Skilled adaptation scientists and practitioners who can meet these enormous analytical and implementation challenges and who can build on existing local and indigenous know-how are simply not yet available in many parts of the developing world.

Development of this critical mass of expertise is clearly an important priority for the GEF portfolio and STAP III should take the lead in providing the requisite technical and strategic advice;

(III) Recommend options for streamlining the various steps needed for adaptation interventions (e.g., from risk assessments to surveys, planning and finally implementation).

#### E. Priorities in generic cross-cutting issues

##### 1. Scientific and technical tools for addressing cross-cutting issues

171. Several priorities are mentioned in all the previous four sections of the present report and could, arguably, represent the most important priorities for STAP III. The first priority that is underlined in the priorities of all the focal areas is the need for the development of practical scientific and technical tools and approaches that would enable GEF to address cross-cutting issues. Biodiversity, land degradation, water, climate change and adaptation are, in many respects, interrelated.

172. GEF activities and operational programmes as well as institutional arrangements are, on the other hand, characterized by specialization. There is limited cross-sectoral interaction. As one of the few GEF institutions designed to be cross-sectoral, STAP is particularly well placed to address this challenge. It is, therefore, recommended that STAP III place high priority on the development of practical scientific and technical tools for addressing cross-cutting issues within the GEF portfolio.

##### 2. Capacity-building

173. Linked to the cross-sectoral question is the issue of new capacity-building efforts needed to develop expertise and skills that can address cross-cutting issues. All the focal area priorities stress the importance of local capacity-building. STAP III should consider setting aside a significant amount of its time and attention to providing advice on the design of the most effective capacity-building initiatives across the various GEF focal areas.

##### 3. Local participation and indigenous knowledge

174. Another important priority that is repeatedly mentioned in all focal areas is the urgent need for methodological approaches for ensuring local participation and facilitating the use of the enormous reserves of indigenous knowledge. While local participation and indigenous knowledge are often perceived as being not particularly relevant to the energy projects in the climate change portfolio, there is growing evidence that GEF energy interventions could benefit significantly from a better understanding of the importance of local participation and indigenous knowledge.

175. For example, renewable energy resource assessments would greatly benefit from local indigenous know-how. Local participation can facilitate and substantially reduce the cost of sustainable transport initiatives such as non-motorized transport projects. It is recommended that STAP III should pay special attention to the issue of local participation and indigenous knowledge.

##### 4. Poverty and equity

176. Closely linked to the issue of participation and indigenous knowledge, is the importance of addressing the impact of GEF programmes on poverty and equity issues. Experience has shown that it is difficult to realize project implementation success if the impact on poverty and equity is not addressed. Technologies and interventions that are perceived to be inequitable and that may be entrenching the interests of local elite groups and international investors are likely to be resisted and could lead to project failure. To date, there has been limited discussion on whether GEF interventions in the various focal areas address poverty and equity concerns.

177. For example, in the climate change focal area, investments in high-tech and capital-intensive technologies such as large-scale solar thermal plants for power generation could be perceived as inequitable as most of the critical and high cost components are imported thus yielding large benefits to international equipment and technology suppliers. In addition, for many developing countries with low levels of electrification, the generated electricity would largely benefit high and medium income groups who have access to electricity services. A similar case of inequitable impact can be made with respect to fuel cell technologies and with respect to the deployment of sophisticated modeling tools in both the climate and water focal areas. More attention on increasing the value of local content, which, in turn, leads to increased local employment and enhances local incomes could help in addressing equity concerns. It is, therefore, recommended that STAP III should pay special attention to the equity and poverty dimensions of GEF operational programmes and should advise on how GEF can address these issues in a comprehensive fashion.

#### IV. CONCLUSION

178. From the preceding chapters, it is clear that the range of questions that STAP II addressed and the modalities to do so varied widely, and that the level of detail and form of the advice generally reflected the state of readiness of GEF to address the issue, either at the policy, programmatic or operations level. Some form of prioritization was therefore essential, taking into account the comparative advantage of STAP and its limited resources (especially time).

179. Although STAP's advice was equally targeted at a range of levels, its influence was strongest at the policy level in terms of shaping new directions in GEF, and ensuring the scientific coherence of its programmes. Nevertheless, the benefits of STAP's role in the project cycle were unmistakably felt by STAP II through the selective reviews it undertook, through its participation in project steering committees, as well as through the project reviews by roster experts. STAP II raised many key scientific and technical issues that can determine the effectiveness of GEF projects, including monitoring issues, research and information, science capacity-building, indigenous knowledge and "technical" social issues. Furthermore, feedback from project reviews by roster experts and STAP's in-depth review of scientific and technical issues of GEF projects (selective reviews) led STAP to recommend the need for a framework for the evaluation of science and technology issues in GEF projects, as a means to ensuring that the approach and practices adopted in projects are scientifically informed. In this regard, STAP pointed out the role of the technical reviews by roster experts in raising key scientific and technical issues.

180. Without question, the need for further research in support of GEF's programmes and projects, either through targeted research projects or research components in projects, was STAP's most frequently expressed advice. STAP II is of the view that without sufficient information on and understanding of the issues it is addressing, and the tools and methodologies that can be used to deliver its goals, GEF projects cannot be expected to be fully effective. STAP II has therefore been a strong advocate of making full use of the targeted research window of opportunities, and of building in research components in projects, particularly those that are complex, experimental or innovative, or carried out in areas for which few data are available. Both pathways would lead to a greater involvement in GEF of scientific and technical communities at the national level, which was one of the recommendations coming out of the first GEF Assembly.

181. Mobilization of the wider scientific and technical community was another dominant theme during STAP II, with which the panel came to grips only after a number of brainstorming sessions with members and representatives of scientific networks and groupings. It was on the basis of these discussions that STAP formulated concrete suggestions on how to facilitate and institutionalize the involvement of the scientific and technical community in GEF.

182. During the second phase of GEF, STAP continued to rely on its networks and to draw on the best available expertise to ensure an input from a broad scientific base in its advice to GEF. In

carrying out its advisory role, STAP provided a forum for integrating scientific and technical expertise, and constituted an important conduit between GEF and the scientific and technical community. STAP II built strong relations with global, regional and national networks and institutions, which should be further expanded and strengthened by STAP III.

## Annex I

### STAP activities and outputs from July 1998 to June 2002

#### Climate change – part 1

Issue/Initiative/Project	STAP Activity/Input	Output
<b>I. OP5</b>	<ul style="list-style-type: none"> <li>• Selective review of the “China Efficient Industrial Boiler Project”</li> <li>• Advice on the portfolio</li> </ul>	<p>Report of the Review; recommendations for technology transfer projects; Part of the programme studies</p> <p>Strategic Advice contained in STAP meeting reports</p>
<b>II. OP6</b>		
<b>III. OP7</b>	<ul style="list-style-type: none"> <li>• Brainstorming session on Power Sector Reform (PSR), in conjunction with the CST of the FFEM, June 2000</li> <li>• Advice on the range of technologies and type of projects supported in the portfolio</li> <li>• Advice on: the type or projects supported; the development of partnerships; policy issues; the learning curve; and a programmatic approach</li> <li>• Review Session of a WB project proposal</li> <li>• Review Session of a project proposal</li> <li>• Portfolio Review; Participation in GEF Workshop</li> <li>• Participation in a GEF Workshop</li> </ul>	<p>Report; strategic advice on implications of PSR on GEF operations in OP6 and possible GEF responses</p> <p>Strategic Advice contained in STAP meeting reports</p> <p>Strategic Advice contained in STAP meeting reports</p> <p>Feedback on the project proposal ; and strategic advice on IGCC</p> <p>Report of the review; recommendations on OTEC as a potential OP7 technology</p> <p>Report of the review; strategic advice</p> <p>Strategic advice</p>
<ul style="list-style-type: none"> <li>• <b>IGCC</b></li> <li>• Ocean Thermal Energy Conversion Technology (OTEC)</li> <li>• Solar Thermal Technologies for Power Generation</li> <li>• Grid Connected PVs</li> </ul>		

Issue/Initiative/Project	STAP Activity/Input	Output
<b>iv. OP11</b>  <ul style="list-style-type: none"> <li>Fuel Cell Bus projects</li> </ul>	<ul style="list-style-type: none"> <li>Review of the draft OP on Environmentally Sustainable Transport</li> <li>Brainstorming Session on Environmentally Sustainable Transport, March 2002</li> <li>Request by UNDP to provide views on Potential Roles for the GEF Commercialization of Fuel Cell Buses, June 2000</li> </ul>	Comments and suggestions on the draft OP  Report of the brainstorming session; strategic advice on the diversification of the OP  Note with comments
<b>v. Adaptation</b>	<ul style="list-style-type: none"> <li>Planning meeting, March 2001</li> <li>Workshop on Vulnerability and Adaptation</li> </ul>	The concept, key issues and an agreed draft programme for a STAP workshop on adaptation  Report of the Workshop; Background paper on Adaptation; Strategic Advice
<b>vi. Indicators</b>	<ul style="list-style-type: none"> <li>Review of the climate change indicators developed by M&amp;E</li> </ul>	Input and comments on the cc indicators
<b>vii. AIACC</b>	<ul style="list-style-type: none"> <li>STAP representation on the project steering committee</li> </ul>	Scientific guidance to the project
<b>viii. SBSTA of the UNFCCC</b>	<ul style="list-style-type: none"> <li>STAP participation in SBSTA meetings; participation of the SBSTA chair in STAP workshops and meetings</li> </ul>	Strengthened links with SBSTA



## Biodiversity

Issue/Initiative/Project	STAP Activity/Input	Output
<b>I Policy Framework on Sustainable Forestry</b>	<ul style="list-style-type: none"> <li>• Brainstorming on Biodiversity Conservation in Production Forest (October 1999)</li> <li>• Electronic Forum</li> </ul>	Report of the workshop; Strategic advice; areas for TR identified
<b>II Sustainable Use of Biodiversity/Incentives</b>	<ul style="list-style-type: none"> <li>• Expert Group Workshop on green certifiers (October 1999)</li> </ul>	Strategic advice; report
<b>III OP 14 Conservation and Sustainable use of Biodiversity Importance to Agriculture</b>	<ul style="list-style-type: none"> <li>• Brainstorming Session on Agricultural Biodiversity (February 2000)</li> <li>• STAP Selective Review of “Dynamic Farmer-Based Approach to the Conservation of African Plant Genetic Resource”, Ethiopia, November, 1999</li> </ul>	<p>Report of the brainstorming session; Strategic advice; areas for TR identified</p> <p>Report of the review</p>
<b>IV Policy Framework for Biosafety-Implementation of the Protocol</b>	<ul style="list-style-type: none"> <li>• Review of the Biosafety Pilot Project</li> </ul>	Report of the Review and recommendations
<b>V The GTI – Resolving Taxonomic Impediments</b>	<ul style="list-style-type: none"> <li>• Brainstorming on the use of Taxonomic information: Key outcomes and suggestions (June 1999)</li> <li>• The Global Taxonomy Initiative: Shortening the distance between Discovery and Delivery, September 1998, in conjunction with Environment Australia and DIVERSITAS</li> </ul>	Reports; Strategic advice; areas for TR identified
<b>VI Programme Studies in the Biodiversity Focal Area (M&amp;E)</b>	<ul style="list-style-type: none"> <li>• Selective Review of the Conservation of Priority Protected Areas Project–Philippines (CPPA)</li> </ul>	Report of the Review and recommendations
<b>VII Indicators (M&amp;E)</b>	<ul style="list-style-type: none"> <li>• Review of the indicators proposed by M&amp;E, and input in their further development</li> </ul>	Recommendations
<b>VIII SBSTTA</b>	<ul style="list-style-type: none"> <li>• STAP participation in SBSTTA meetings; participation of SBSTTA chair in STAP meetings and workshops</li> </ul>	Strengthened links between STAP and SBSTTA; close collaboration on the GTI
<b>IX Biodiversity related Conventions</b>	<ul style="list-style-type: none"> <li>• One day meeting with heads of the Biodiversity related Conventions</li> </ul>	Areas for TR and collaboration identified; strengthened relations

## Land and water

Issue/Initiative/Project	STAP Activity/Input	Output
<b>I. IW</b> <ul style="list-style-type: none"> <li><b>East African Lakes Projects</b></li> <li><b>POPs</b></li> <li><b>GIWA</b></li> </ul>	<ul style="list-style-type: none"> <li>Review of the East African Lakes: 1. STAP Workshop on the Review of the East African Lakes, January 2000. 2. The STAP brainstorming session on Freshwater Resources in Sub-Saharan Africa, February '99</li> <li>STAP Brainstorming session on POPs, February 2000.</li> <li>STAP participation in the steering committee of the Regional Based Assessment of POPs project</li> <li>STAP participation in the GIWA steering committee</li> </ul>	<p>Report of the Review and recommendations</p> <p>Report and strategic advice; areas for TR identified</p> <p>Scientific advice and guidance</p> <p>Scientific advice and guidance</p>
<b>II. LAND DEGRADATION</b>	<ul style="list-style-type: none"> <li>Commissioning of four papers by leading experts, addressing land degradation interlinkages with biodiversity, climate change, international waters and social dimensions</li> <li>STAP Land Degradation Interlinkages Synthesis Session, May 1999</li> <li>STAP Workshop on Land Degradation Interlinkages, June 1999</li> <li>STAP Participation in the CST of the UNFCCD</li> <li>STAP participation in the LADA project development meetings</li> </ul>	<p>Four draft papers</p> <p>Four papers responding to the GEF's need for a better definition of land degradation interlinkages</p> <p>Report and strategic advice; areas for TR identified;</p> <p>Strengthened links between STAP and CST</p> <p>STAP input and scientific guidance</p>
<b>III. INTEGRATED LAND AND WATER MANAGEMENT</b>	<ul style="list-style-type: none"> <li>STAP Planning Meeting on Integrated Land and Water January 2001</li> <li>STAP Technical Review Meeting on the Community-Based Integrated Land and Water Management Case Studies, April 2001.</li> <li>STAP Editorial Committee Meeting for the Sourcebook on Community-Based Integrated Land and Water Management, April 2002</li> </ul>	<p>Identification of 10 community-based Integrated Land and Water Management Case Studies; Conceptual framework and Guidelines for the preparation of the case studies.</p> <p>Reviewed Case-studies; Outline for a Sourcebook on Based Integrated Land and Water Management; Concepts for the introductory chapters.</p> <p>Edited Case Studies</p>
<b>IV. INTEGRATED ECOSYSTEM MANAGEMENT</b>	<ul style="list-style-type: none"> <li>Preparation of an outline for a Handbook on Integrated Ecosystem Management: a one day brainstorming session in January 2001, immediately following the Planning Meeting on Integrated L&amp;W</li> </ul>	<p>Outline for a Handbook</p>

## Cross-cutting and corporate issues – part 1

Issue/Initiative/Project	STAP Activity/Input	Output
<b>I. Mobilization of the wider Scientific and Technical Community</b>	<ul style="list-style-type: none"> <li>Brainstorming Session on “Integrating Science and Technology into GEF Work”, in conjunction with the Meeting of the Brazilian Academy of Science, LAC region, October 1998</li> <li>Workshop on “Integrating Science and Technology into GEF Work”, Global, January 1999</li> <li>A working session at the Indian Science Congress, Chennai, January, 1999</li> <li>A working session during the IGBP Meeting in Nairobi from September 1998;</li> <li>Presentations by STAP at Science meetings; and participation of representatives and the S&amp;T community at STAP meetings and workshops</li> </ul>	<p>Report of the brainstorming session; strategic advice</p> <p>Report of the Workshop; strategic advice including concrete suggestions for an increased engagement of the S&amp;T community in GEF</p> <p>Increased awareness of the role of science in the GEF, of STAP and the GEF; proposals for science mobilization initiatives</p>
<b>II. Country Dialogue Workshops</b>	<ul style="list-style-type: none"> <li>Development of a STAP module for the CDWs in collaboration with COSTED</li> </ul>	STAP module
<b>III. The STAP Roster of Experts</b>	<ul style="list-style-type: none"> <li>Management of the Roster; review of the quality of the roster; review of the review process; questionnaire to the roster reviewers.</li> </ul>	A revised and updated Roster of Experts available on the web; a STAP web site with information regarding the roster; the technical review process, guidelines and evaluations and other STAP related information; annual reviews of the reviewers by STAP members; 4 Annual Reviews of the Roster of Experts (FY99-02); feedback from the reviewers on the review process
<b>IV. Capacity Development Initiative (CDI)</b>	<ul style="list-style-type: none"> <li>Participation of STAP in the CDI Steering Committee; STAP input in the CDI study on scientific and technical capacity building</li> </ul>	STAP inputs to the CDI; study on scientific and technical capacity building by consultant with input from STAP
<b>V. Targeted Research (TR)</b>	<ul style="list-style-type: none"> <li>Finalizing of the Targeted Research procedure</li> <li>STAP chair chairing TR committee; review of TR proposals on a rolling basis</li> <li>Identification of TR proposals at STAP workshops and brainstorming sessions</li> </ul>	<p>TR procedure; agreed upon annex for TR projects</p> <p>Reviewed TR project proposals</p> <p>TR proposals</p>

## Cross-cutting and corporate issues – part 2

Issue/Initiative/Project	STAP Activity/Input	Output
<b>VI. Monitoring and Evaluation</b> <ul style="list-style-type: none"> <li>• PIR</li> <li>• Indicators</li> <li>• Programme Studies</li> <li>• OPS2</li> </ul>	<p>STAP participation in the annual PIR meeting</p> <p>Review of the draft indicators</p> <p>Two selective reviews; one programme review (solar-thermal)</p> <p>Provision of information; review of the drafts</p>	<p>Report; scientific and technical input</p> <p>Inputs and guidance</p> <p>Evaluation of scientific and technical aspects in two projects subject to a review by GEF for the programme studies; strategic advice</p> <p>Inputs and reviewed drafts</p>
<b>VII. The CST of the French GEF</b>	Joint meeting to explore collaboration options, June 1999	Report; Joint workshop on Power Sector Reform
<b>VIII. Council meetings and NGO consultations</b>	Statement of STAP Chair at the Council; participation in the NGO consultation; submission of reports to the Council	
<b>IX. GEFOP meetings</b>	Participation of the STAP Chair	
<b>X. STAP meetings</b>	Meeting of STAP with the IAs, the GEF Secretariat and Convention Secretariat representatives, and the Chairs of the Subsidiary Bodies of the Conventions, twice a year.	Agreed upon STAP work programme; priorities for STAP identified in consultation with the IAs and the GEF Secretariat; report
<b>XI. SIDS</b>	Brainstorming session, February 2000	Report; strategic advice

## Annex II

### List of reports by STAP submitted to the GEF Council, July 1998 – June 2002

#### STAP meetings

1. Report of the First Meeting of STAP II, September 1998, New York
2. Report of the Second Meeting of STAP II, February 1999, Nairobi
3. Report of the Third Meeting of STAP II, June 1999, Paris
4. Report of the Fourth Meeting of STAP II, September 1999, Washington, D.C.
5. Report of the Fifth Meeting of STAP II, February 2000, Barbados
6. Report of the Sixth Meeting of STAP II, June 2000, Bangalore
7. Report of the Seventh Meeting of STAP II, September 2000, Washington, D.C.
8. Report of the Eighth Meeting of STAP II, March 2001, Washington, D.C.
9. Report of the Ninth Meeting of STAP II, September 2001, Washington, D.C.
10. Report of the Tenth Meeting of STAP II, March 2002, Nairobi

#### STAP workshops and brainstorming sessions

1. Report of the STAP workshop on land degradation interlinkages, June 1999, Bologna
2. Report of the STAP brainstorming session on taxonomy, June 1999, Paris
3. Report of the STAP brainstorming on biodiversity conservation in production forest, October 1999, Mexico City
4. Report of the STAP expert group workshop on green certifiers, October 1999, Mexico City
5. Report of the STAP workshop on the review of the East African lakes, January 2000, Malawi
6. Report of the STAP brainstorming session on small island developing States, February 2000, Barbados
7. Report of the STAP brainstorming session on persistent organic pollutants, February 2000, Barbados
8. Report of the STAP brainstorming session on agrobiodiversity, February 2000, Barbados
9. Report of the STAP workshop on power sector reform, June 2000, Bangalore
10. Report of the STAP planning meeting on integrated land and water, January 2001, Bologna
11. Report of the STAP workshop on adaptation, February 2002, Nairobi
12. Report of the STAP brainstorming session on transportation, March 2002, Nairobi

#### Selective reviews

1. Report of the STAP selective review of “Dynamic farmer-based approach to the conservation of African plant genetic resource project”, Ethiopia, November 1999
2. Report of the STAP selective review of the “China efficient industrial boilers project”, December 2000, China
3. Report of the STAP selective review of the conservation of priority protected areas – Philippines (CPPA) Project, January 2001, Philippines

#### Miscellaneous

1. Report of the review of the OTEC project proposal, February 2000, Barbados
2. Note on support to fuel cell buses projects, June 2000, Bangalore
3. Priority issues which STAP should address in GEF Phase III, paper submitted to the May 2002 Council meeting
4. Adding greater value to STAP contributions to GEF operations, paper submitted to the May 2002 Council meeting

#### STAP roster of experts

1. Annual review of the STAP roster of experts, FY98
2. Annual review of the STAP roster of experts, FY99
3. Annual review of the STAP roster of experts, FY00
4. Annual review of the STAP roster of experts, FY01

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