Independent Evaluation Office
GLOBAL ENVIRONMENT FACILITY

Evaluation of the Multiple Benefits of GEF Support through Its Multifocal Area Portfolio

DECEMBER 2018

VOLUME 1

Global Environment Facility
Independent Evaluation Office

Evaluation of the Multiple Benefits of GEF Support through Its Multifocal Area Portfolio

December 2018

Evaluation Report No. 124

This report was presented to the Council in November 2017.

1818 H Street, NW, Washington, DC 20433
Internet: www.gefieo.org/; email: gefevaluation@thegef.org

ISBN: 978-1-64233-007-6

Cover: Senegalese women balance basins of water on their heads; the GEF provides support in communities such as theirs to help balance livelihood needs with low-carbon energy sources and biodiversity preservation, by Jeneen R. Garcia/GEF IEO

Contents

Tables

Foreword

The Global Environment Facility (GEF) is designed as a financial mechanism to help meet the targets of multilateral environmental agreements on biodiversity, climate change, land degradation, chemicals, and transboundary marine and freshwater resources. Given the interconnected nature of environmental issues, interventions intended to meet the targets of one convention may also produce benefits aligned with the targets of other conventions. On the other hand, conflicts may also occur, where benefits to one environmental sector may lead to losses in another.

This evaluation aimed to assess the extent to which GEF support has generated multiple benefits—including any synergies and trade-offs—as the funding mechanism of these multiple environmental agreements. The multifocal area (MFA) portfolio was chosen as the focus of this evaluation because it explicitly aims to achieve benefits for more than one focal area. In the process, the evaluation also characterized the MFA portfolio, which is a rapidly growing subset of the GEF portfolio that had not yet been comprehensively assessed.

The evaluation used a mixed-methods approach, and drew on four main sources of evidence: portfolio analysis, geospatial analysis, case study analysis, and institutional process analysis.

The evaluation's approach paper was approved in June 2016. Case study missions in Brazil, China, Malawi, and Senegal were conducted in August and September of the same year. The evaluation report was presented to the GEF Council in November 2017.

Juha I. Uitto
Director, GEF Independent Evaluation Office

Acknowledgments

Jeneen R. Garcia, Evaluation Officer of the Global Environment Facility Independent Evaluation Office (GEF IEO), led this evaluation. The team consisted of Peixuan Zhou, IEO Evaluation Analyst, and Sandra Znajda, consultant to the IEO. Anna Viggh, IEO Senior Evaluation Officer, conducted the case study mission to Malawi. Anupam Anand, IEO Evaluation Officer, provided coordination and technical support on the geospatial components. Sara El Choufi, IEO Evaluation Analyst, provided portfolio analysis support in the early phase of the evaluation. Technical inputs were provided through field visits and interviews by Bakary Docoure, Sarah Irffi, Robert Kafakoma, and David Todd; additional analytical work was performed by Min Feng, Virginia Gorsevski, Chenhao Liu, Laura Nissley, Qianjing Wang, Semi Yoon, and AidData, particularly Dan Runfola and his team. All are consultants to the IEO.

The evaluation benefited from guidance and oversight provided by Juha Uitto, Director of the IEO; quality control was provided by Geeta Batra, IEO Chief Evaluation Officer. Peer review was provided by Annette Cowie of the New South Wales Department of Primary Industries, Lauren Kelly of the World Bank Independent Evaluation Group, Michael Stocking of the University of East Anglia, and independent consultant Michael Wells.

The evaluation team was supported by Marie-Constance Manuella Koukoui, IEO Senior Program Assistant, and Evelyn Chihuguyu, IEO Program Assistant. Mark Athitakis edited the draft, and Nita Congress designed and laid out the final document.

The evaluation team thanks the Reference Group composed of representatives from the GEF Secretariat, the GEF Agencies, and the GEF Scientific and Technical Advisory Panel, as well as all GEF Secretariat and GEF Agency staff for their cooperation in providing information and feedback. We also express our deep gratitude to the offices of the GEF focal points, GEF Agencies, executing agencies at the national and local levels, project managers, local government staff, communities, and civil society organizations in Brazil, China, Malawi, and Senegal, who provided both information and logistical support during the case study missions.

The GEF IEO is grateful to all these individuals and institutions for their contributions. Final responsibility for this report remains firmly with the Office.

Abbreviations

CEO	Chief Executive Officer
CNR	community nature reserve
GEF	Global Environment Facility
GHG	greenhouse gas
IAP	integrated approach pilot
IEM	integrated ecosystem management
IFAD	International Fund for Agricultural Development
IUCN	International Union for Conservation of Nature
LULUCF	land use, land use change, and forestry
MEA	multilateral environmental agreement
MFA	multifocal area
NDVI	Normalized Difference Vegetation Index
OP	operational program
OPS5	Fifth Overall Performance Study
PMIS	Project Management Information System
PU	pastoral unit
RAF	Resource Allocation Framework
REDD+	reducing emissions from deforestation and forest degradation, and conservation of forest carbon stocks
SDG	Sustainable Development Goal
SFA	single-focal area
SFM	sustainable forest management
SLM	sustainable land management
STAP	Scientific and Technical Advisory Panel
STAR	System for Transparent Allocation of Resources
tCO_2e	tons of carbon dioxide equivalent
UNDP	United Nations Development Programme

The GEF replenishment periods are as follows: pilot phase: 1991–94; GEF-1: 1995–98; GEF-2: 1999–2002; GEF-3: 2003–06; GEF-4: 2006–10; GEF-5: 2010–14; GEF-6: 2014–18; GEF-7: 2018–22.

All dollar amounts are U.S. dollars unless otherwise indicated.

Executive summary

Multiple benefits refer to the global environmental benefits achieved within a project or program that meet the priorities of at least two focal areas, including any local environmental and social benefits that contribute to achieving and sustaining these global environmental benefits. The purpose of this evaluation was to assess the extent to which Global Environment Facility (GEF) support has generated multiple benefits—including any synergies and trade-offs—as the funding mechanism of several multilateral environmental agreements. More specifically, it aimed to assess the extent to which GEF support through multifocal area (MFA) projects has resulted in multiple benefits and to identify the factors influencing achievement of these benefits.

Since GEF-3, when the integration of the objectives of multiple focal areas in single projects was formalized, the number of MFA projects has increased by about 50 percent in each succeeding GEF period in terms of both number of projects and total GEF grants. The most common focal area combinations in MFA projects include biodiversity and land degradation (54 percent), half of which also include climate change (biodiversity, land degradation and climate change jointly, 27 percent). While single-focal area projects may also generate multiple benefits, the MFA portfolio was chosen as the focus of this evaluation because it explicitly aims to achieve benefits for more than one focal area. The evaluation drew on four main sources of evidence—project documents, big data, field visits, and interviews—and combined qualitative, quantitative, and geospatial methods for analyses.

Conclusion highlights

The large majority of completed MFA projects report achievement of multiple benefits and broader adoption by project end. All completed projects in the MFA portfolio reported positive environmental outcomes in their terminal evaluations ($n = 49$). Of these, 80 percent reported benefits in the same focal area combinations they had targeted, as well as in socioeconomic aspects. Broader adoption was reported to have begun or taken place in 80 percent of projects by project end, primarily in the form of mainstreaming and replication. Of the completed projects with outcome ratings, 77 percent were rated moderately satisfactory or higher, similar to the overall GEF portfolio. Factors within the project's control such as good engagement of key stakeholders, good project design, and coordination with related initiatives were among those most frequently cited as contributing to successful outcomes, with low institutional capacity contributing to poorer outcomes.

The majority of MFA projects address focal area priorities through integrated approaches. The majority of projects approved under GEF priorities that are cross-focal in nature are implemented as MFA projects. Examples of these priorities are land use, land use change and forestry (at least 78 percent), integrated landscapes (67 percent), and forest ecosystem services and sustainable livelihoods in drylands (63 percent). Mainstreaming, particularly in landscapes, was the most commonly addressed priority. Seventy-four percent of MFA projects were designed to implement integrated ecosystem management, landscape-based management, or both; these are management approaches that address multiple focal area issues simultaneously. Forty-three percent addressed both agriculture and forestry sectors by combining approaches such as sustainable agriculture or sustainable land management with sustainable forest management and sustainable forest use/protection; of these, 71 percent also addressed biodiversity concerns through ecosystem-based management.

Integration in different project dimensions has the potential to enhance synergies. Opportunities for synergies across the focal areas, as well as with socioeconomic objectives, were commonly found in tree planting, ecosystem protection and rehabilitation, clean energy technologies that reduced fuelwood use, and sustainable land management practices. MFA projects that reported the highest number and diversity of types of benefits had three common features: designs that integrated additional types of benefits, mechanisms for integrated decision making among multiple sectors, and an integrated spatial unit for delivering a set of interventions. These features enhanced synergies and mitigated trade-offs in a way that essentially produced synergies.

Trade-offs may be mitigated in a way that enhances synergies. The most common trade-off in case studies was between environmental and socioeconomic objectives. Potential losses from trade-offs were reduced through three types of mitigating measures: compensation, compromise, and value addition. Compensation involved direct payment or replacement of income to address the loss of socioeconomic benefits. Compromise occurred when the benefit to one focal area was decreased to reduce the anticipated loss to another focal area or socioeconomic aspect. Value addition occurred when an intervention not only addressed the trade-off, but also created focal area and socioeconomic benefits beyond the status quo, essentially producing synergies.

MFA projects have the potential to address both global and national concerns. Of the MFA projects funded through biodiversity or climate change focal area allocations, at least 79 percent respond directly to convention guidance by addressing strategic priorities related to land use and land use change, protected areas, and biodiversity mainstreaming. The MFA portfolio reflects global trends toward integration across sectors, and between environmental and socioeconomic objectives as stated in the three Rio conventions and the Sustainable Development Goals. MFA projects also respond to national priorities through flexibility in addressing global environmental commitments (e.g., the Paris Agreement) and national sustainable development goals together. The GEF has promoted focal area integration through financial incentives and strategic country engagement.

At the institutional level, MFA project implementation generates benefits, but is also associated with higher costs. Benefits occur in the form of opportunities to fulfill global and national commitments simultaneously, leverage focal area funding, streamline project management costs, and increase multisectoral interaction. The option to integrate funds from multiple focal areas has allowed each focal area's priorities to be addressed through more interventions while using less of each focal area's allocation. This is particularly true for the land degradation focal area, which typically receives lower funding; for the biodiversity focal area, this has leveraged higher cofinancing. Since MFA projects tend to be larger on average, they allow for economies of scale in project management, relative to implementing the same interventions through several smaller single-focal area projects. The involvement of more actors provides an opportunity for interaction among sectors that might otherwise not typically interact.

Costs occur in the form of efficiency losses, mainly during project design, review, and monitoring due to the increase in number of stakeholders and sectors required to provide inputs. Whether at the country or corporate level, the involvement of more actors leads to more complex and time-consuming decision making, as each actor tries to maximize benefits for its respective focal area or sector. Current reporting requirements for multifocal area projects increase operating costs; at the same time, synergies generated and trade-offs mitigated are not captured.

Implementing a project as MFA is most appropriate when the environmental issues to be addressed, or management approaches to be supported, provide opportunities to enhance synergies and mitigate trade-offs across focal areas. More specifically, these include (1) environmental issues whose causes, consequences, or spatial occurrence are linked to multiple focal areas; and (2) management approaches that inherently address multiple focal area priorities. In some cases where conditions for an MFA project were appropriate, the lack of institutional arrangements for sectoral integration was found to limit these opportunities. Lack of strategic and operational guidelines for MFA projects contribute to this limitation.

Recommendations

Identify conditions appropriate for the implementation of MFA projects at the project design and review stage. MFA projects are not required to be integrated, or to seek synergies and mitigate trade-offs. However, projects successful at enhancing synergies and mitigating trade-offs have common conditions and characteristics that have enabled them to maximize the benefits of having multiple focal area objectives. GEF Agencies must ensure that the environmental issues and management approaches targeted by MFA projects allow for such benefits while managing the higher transaction costs. Existing capacities and institutional arrangements for sectoral integration at the corporate and country levels should be assessed as part of the MFA project design and approval process. Opportunities for good stakeholder engagement, partnerships to leverage resources from multiple sectors, and integration in project interventions, should be considered in this assessment.

Streamline and enhance monitoring and reporting of MFA projects, including their synergies and trade-offs. Although attempts have been made at program level to remove repetitive and irrelevant indicators from tracking tools, streamlining of monitoring and reporting tools in MFA projects is needed at the institutional level. Project monitoring tools should also measure and report on the synergies generated and trade-offs mitigated.

Develop shared guidance on the conditions for designing, reviewing, and implementing MFA projects across the GEF partnership. While strategic priorities have been developed for each focal area, none specify how and which focal area synergies might best contribute to the GEF's vision. As a starting point, members of the GEF partnership need to adopt a common understanding of key concepts, such as multiple benefits, synergies, trade-offs, and integration. Building on the findings of this evaluation, the GEF should develop guidance on the conditions under which MFA projects should be designed and implemented, to enhance synergies across focal areas. Minimum criteria or standards for MFA project design and monitoring will ensure that the benefits of focal area integration are maximized, while transaction costs at the corporate and country levels are managed.

1: Context

This evaluation is intended to inform the Global Environment Facility's (GEF's) strategy of achieving multiple benefits through programs and projects that are funded through multiple focal area allocations and trust funds in GEF-7. This chapter provides a background of the evaluation's purpose, key concepts used, and a review of the GEF's approach to multiple benefits since its inception.

1.1 Purpose

"Multiple benefits" refer to the global environmental benefits achieved within a project or program that meet the priorities of at least two focal areas, including any local environmental and social benefits that contribute to achieving and sustaining these global environmental benefits. The purpose of this evaluation was to assess the extent to which GEF support has generated multiple benefits—including any synergies and trade-offs—as the funding mechanism of several multilateral environmental agreements (MEAs). The multifocal area (MFA) portfolio was chosen as the focus of this evaluation because it explicitly aims to achieve benefits for more than one focal area.[1] In the process, the evaluation also characterized the MFA portfolio, which is a subset of the GEF portfolio that had not yet been comprehensively assessed. It complements the evaluation of the GEF's programmatic approaches, which assesses how MFA programs are implemented.

Key terms used throughout this evaluation are defined in box 1.1 and visualized in figure 1.1. Section 1.2 provides their historical and institutional context.

BOX 1.1 Key terms in evaluation

MFA project or program. A project or program that is funded through allocations from more than one focal area, or is labeled as such.

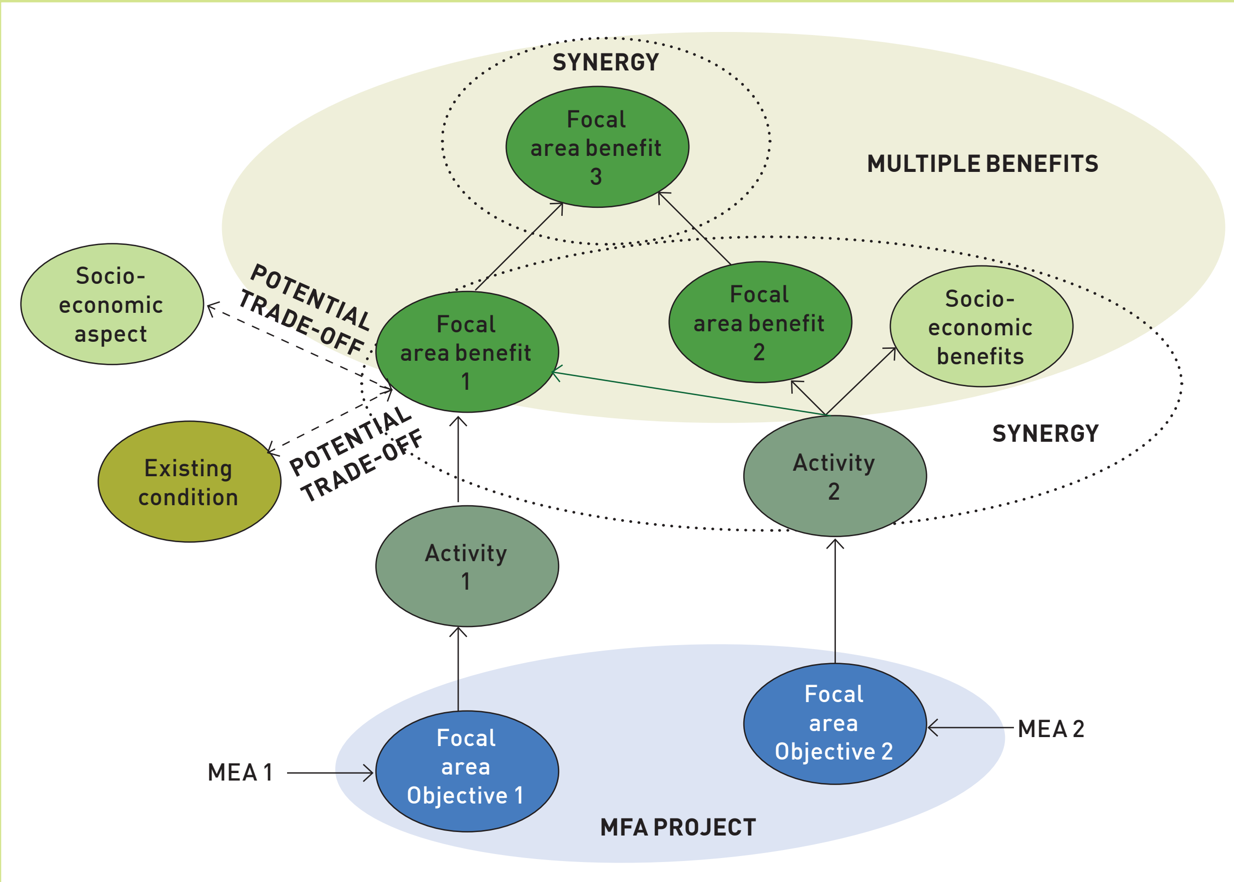
Multiple benefits. The **aggregate** global environmental benefits achieved within a project or program that meet the priorities of at least two focal areas, including any local environmental and social benefits that contribute to achieving and sustaining these global environmental benefits.

Synergy. Multiple benefits achieved in more than one focal area as a result of a **single intervention**, or benefits achieved from the interaction of outcomes from at least two separate interventions in addition to those achieved, had the interventions been done independently.

Trade-off. A reduction in one benefit in the process of maximizing or increasing another benefit.

[1] The GEF focal areas are biodiversity, climate change, international waters, land degradation, chemicals and waste, and multifocal. Single-focal area projects may also generate multiple benefits, but do not explicitly target priorities of multiple focal areas.

FIGURE 1.1 Visualization of key terms used in the evaluation



1.2 Background and key concepts

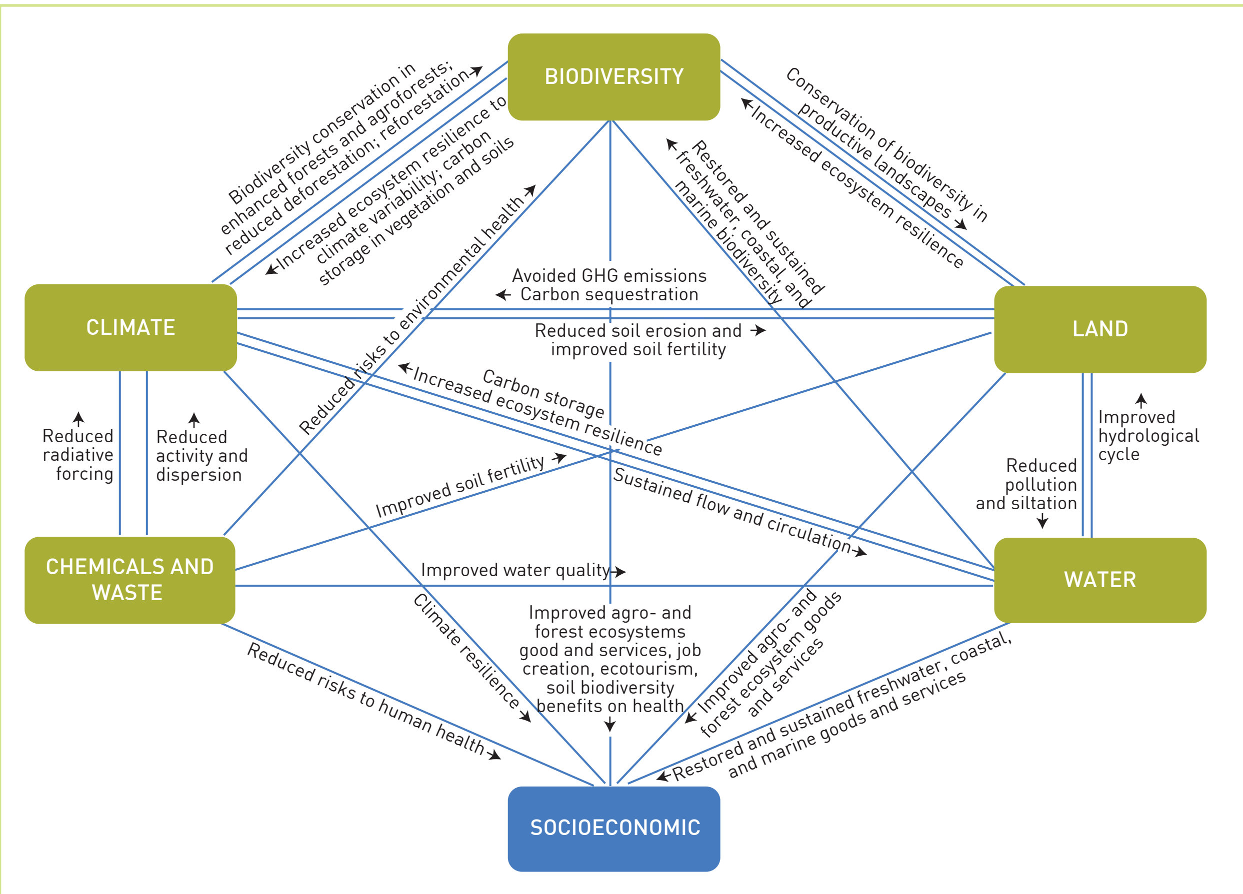
MULTIPLE BENEFITS AND SYNERGY

Given the interconnected nature of environmental issues, interventions intended to meet the targets of one MEA can produce benefits aligned with the priorities of others (Cowie, Schneider, and Montanarella 2007). Within international institutions such as the GEF, the term "multiple benefits" is used to refer to the benefits achieved by a project or program in more than one sector (e.g., IEA 2014; Melo, Turnhout, and Arts 2014; Milne et al. 2015; Sinnassamy et al. 2016). In the literature, this concept is referred to as "co-benefits" (e.g., Brown, Seymour, and Peskett 2008; Karousakis 2009), "synergy" (e.g., Cowie, Schneider, and Montanarella 2007), "win-win" (e.g., Chhatre and Agrawal 2009; Haase et al. 2012; Howe et al. 2014) or even "win-win-win" (Halpern et al. 2013, referring to biodiversity conservation, efficiency, and equality). Multiple benefits and synergy cover similar concepts, with multiple benefits being a more general term that avoids treating some benefits as more important to maximize than others (IEA 2014).

The three main areas of global environmental change—land, biodiversity, and climate— are ecologically interlinked in a way that make them particularly suited for exploring synergies (Gisladottir and Stocking 2005; see figure 1.2). Several interventions targeting different outcomes can also together produce a benefit that is greater than the sum of its parts; in other words, "a more positive form of win-win" (GEF IEO 2005). For example, the prevention of deforestation, ecological restoration of fragmented landscapes, and reforestation on degraded lands address biodiversity and climate change goals simultaneously (Totten, Pandya, and Janson-Smith 2003). Tscharntke et al. (2012) describe the benefits that protecting biodiversity in native habitats can have on agro-ecosystems through pest management, pollination, and soil and water quality. It was immediately apparent when discussions on reducing emissions from deforestation and forest degradation, and conservation of forest carbon stocks (REDD+) began in 2005 that activities for reducing emissions through deforestation and forest degradation could simultaneously contribute to poverty reduction, biodiversity, and land benefits (Brown, Seymour, and Peskett 2008; Karousakis 2009).

In the GEF, "multiple benefits" refer to both global environmental benefits (e.g., ecosystem goods and services that have global significance, such as reduction in forest loss and degradation) and the local benefits that support their achievement (e.g., food security and access to sustainable energy). Local environmental, social, and economic

FIGURE 1.2 Opportunities for synergy across different focal areas as well as to the socioeconomic sphere



SOURCE: Compiled from synergies identified in various sources including Brown, Seymour, and Peskett 2008; Cowie et al. 2011; Karousakis 2009; Visseren-Hamakers et al. 2012; and Wall, Nielsen, and Six 2015.

benefits are recognized within the GEF as tightly linked to global benefits, with the former supporting achievement of the latter by providing incentives and the appropriate social conditions and enabling behaviors that sustain global environmental benefits (GEF IEO 2006).

TRADE-OFF

Contrasting with the notion of win-win is the argument that it is not possible to maximize benefits in two or more sectors at the same time; trade-offs are inevitable (Hirsch et al. 2011; McShane et al. 2011). At a basic level, the term "trade-off" expresses the idea that "when some things are gained, others are lost" (McShane et al. 2011). Trade-offs have been discussed in the literature between sector objectives, between environmental and socioeconomic outcomes, between geographic locations, and between global and local benefits, in addition to temporal trade-offs between short-term and long-term benefits (see examples in table 1.1). The call for recognizing trade-offs is reflected in a GEF report on mainstreaming biodiversity, which noted that "in practice, most apparent win-win biodiversity mainstreaming projects actually involve trade-offs between desired conservation outcomes and desired social outcomes" (GEF 2016b).

Quantitative assessments of trade-offs have been limited by the need to oversimplify assumptions in modeling (Butler et al. 2013; Lee et al. 2014; Persha, Agrawal, and Chhatre 2011). However, identifying potential trade-offs and understanding real and potential gains and losses have been recognized as important for learning and comprehensive planning for interventions that aim for multiple benefits (Hirsch et al. 2011; McShane et al. 2011). While the complexity of social-ecological systems means there is no one-size-fits-all solution to mitigating trade-offs, management approaches can play a key role. For example, the impact of the trade-off between land-intensive renewable energy (e.g., biofuel) and habitat for biodiversity varies depending on the region, type of renewable energy used, and restrictions on harvest (Santangeli et al. 2016).

INTEGRATION

The GEF's Scientific and Technical Advisory Panel (STAP) outlines 14 possible domains of integration based on where they could occur during a project cycle—during problem diagnosis, project design,

TABLE 1.1 Types of trade-offs and examples identified in the literature

Type of trade-off	Examples
Between focal areas	Land used for biofuel production for greenhouse gas reduction is an opportunity cost for land uses that benefit biodiversity or food production (Santangeli et al. 2016)
Between environmental and socioeconomic outcomes	Maximizing conservation targets through protected areas restricts access to natural resources and reduces opportunities for local communities to meet their needs (Adams et al. 2004; Christie 2004; West, Igoe, and Brockington 2006)
Between geographic locations	Forest protection activities through REDD+ can displace human pressure to areas considered "low carbon" but which are biodiversity rich, such as grasslands (Visseren-Hamakers et al. 2012)
Between global and local benefits	Loss of local ownership and benefits could occur if governments assume control of common forests for achieving REDD+ benefits (Hirsch et al. 2011)
Between short- and long-term benefits	Forest plantations for carbon sequestration over more biologically diverse natural ecosystems represent a temporal trade-off between short-term carbon sequestration benefits and long-term ecological resilience (Cowie, Schneider, and Montanarella 2007)

and implementation (Tengberg and Valencia 2017). For example, during project design, integration can occur across land, water, and soil (or focal areas in the GEF context), within landscapes, between environmental and development concerns, across agencies, across policy, and through multiple stakeholder engagement in design. During implementation and governance, integration can be seen in, among others, the involvement of multiple stakeholders in decision making, inclusion of equity concerns, and adaptive policy and decision making.

Integration has been seen globally through MEAs, with a trend toward aiming for the generation of multiple benefits through integrating environmental with socioeconomic goals. The MEAs adopted during the Rio Summit all emphasize the need for addressing their objectives within the context of sustainable development.[2] Opportunities for synergies across MEAs are being explored, such as through a Joint Liaison Group formed in 2001 among the Secretariats of the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change, and the United Nations Convention to Combat Desertification. The Sustainable Development Goals (SDGs) build on the Millennium Development Goals by taking a more integrated approach to development interventions that seeks connections and synergies across goals. While not formally mandated to deliver on SDGs, the GEF contributes to SDGs 2, 6, 13, and 15 related to zero hunger, clean water and sanitation, climate action, and life-sustaining forests and biodiversity through the delivery of global environmental benefits corresponding with multiple MEA targets.

The GEF gives priority to "integrating global environmental concerns with national ones in the framework of national sustainable development strategies" (GEF 2015). The STAP has been a strong advocate for delivering global environmental benefits within the context of sustainable development in an integrated manner, where "the synergy between development and environment is pursued, and the generation of multiple benefits is promoted vigorously" (Bierbaum et al. 2014).

1.3 Evolution of the GEF's approach to multiple benefits

The intent to generate multiple benefits has been evident in GEF support prior to the emergence of the MFA label in GEF-4. In 2000, the GEF Secretariat issued guidance for Operational Program (OP) 12: Integrated Ecosystem Management (IEM), considered by many the precursor to MFA programming (box 1.2). OP12 was the primary entry point for land degradation focal area projects, seen as a cross-cutting issue linked to biodiversity, climate change, and international waters focal areas. Projects were intended to be multifocal and synergistic, "where achievement of benefits in one focal area leads to increased benefits in another" (GEF IEO 2005). Projects approved under OP12 were required to generate at least two out of four types of environmental benefits related to biodiversity conservation and sustainable use, carbon storage and emissions reduction, conservation

[2] The Rio Summit is the popular name of the United Nations Conference in Environment and Development held in Rio de Janeiro in June 1992, which designated the GEF as the primary financial mechanism for these global conventions. The conventions adopted as a result of the Rio Summit are the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change, and the United Nations Convention to Combat Desertification, which form the bases for GEF's biodiversity, climate change, and land degradation focal areas, respectively.

BOX 1.2 Timeline of MFA projects

GEF-3. The GEF Secretariat issues official guidance on OP12 that aims to address concerns across focal areas and theoretically provide multiple focal area and socioeconomic benefits. OP12 is considered by many as a precursor to MFA programming.

GEF-4. The RAF, later replaced by STAR, is introduced. MFA as a category of projects emerges.

GEF-5. Additional funding envelope for SFM, piloted in GEF-4 through $50 million Forest Management Program, is made available for MFA projects.

GEF-6. IAPs introduced. These are MFA programs intended to address drivers of environmental decline and catalyze transformational change at higher scales. Countries receive additional matching funds when part of their STAR allocation is used toward IAPs.

and sustainable use of water bodies, and pollution prevention in globally important ecosystems.[3]

OP12 also aimed to generate socioeconomic benefits at the local scale in response to the three Rio Summit MEAs, with explicit guidance to "Catalyze widespread adoption of comprehensive ecosystem management interventions that integrate ecological, economic and social goals to achieve multiple and cross-cutting local, national and global benefits" (GEF 2000, 3). Country demand for more integrated projects was cited by the GEF Secretariat as one of the reasons OP12 was introduced.

When the Resource Allocation Framework (RAF) was introduced in 2006—revised and renamed the System for Transparent Allocation of Resources (STAR) in 2009—the GEF transitioned from approving projects by operational program to focal area strategies. Under the new system, each country is given a specific funding envelope for the biodiversity, climate change, and land degradation focal areas. Projects that combine funding from different focal areas are categorized as MFA. In addition, projects that combine the priorities of at least two of these three focal areas can access the sustainable forest management SFM/REDD+ funding envelope. SFM/REDD+ funding could match STAR funds by as much as 33 percent in GEF-5, and up to 50 percent in GEF-6 per project. The GEF provided this incentive with the goal of "encouraging investments in the forestry sector and promoting integrated approaches" (GEF 2017).

The GEF-6 Programming Directions, presented to the GEF Assembly in May 2014, further identify the different ways each focal area might produce synergies that benefit other focal areas. One innovation in GEF-6 is the integrated approach pilots (IAPs), which were launched to catalyze transformational change at higher scales. IAPs are designed as integrated investments targeting the underlying drivers of environmental degradation with the goal to "overcome focal area silos and build on the necessary linkages that help achieve sustainable development goals" (GEF 2014c). Countries are offered additional matching funds of up to 100 percent when part of their STAR allocation is used toward projects that are part of IAPs.

[3] Two other cross-focal area programs introduced were Integrated Land and Water Multiple Focal Area (OP9) and Operational Program on Sustainable Land Management (OP15). OP9 aimed to produce benefits for land, biodiversity, and climate specifically linked with transboundary water bodies, as one area of work under the international waters focal area. OP15 aimed to mitigate the causes and negative impacts specifically of land degradation on the structure and functional integrity of ecosystems, to contribute to improving people's livelihoods and economic well-being. OP15 mainly supported sustainable land management and was the first financing window dedicated to the then-new land degradation focal area.

Apart from providing financial incentives, the GEF Secretariat in GEF-6 has taken on a more active role in influencing the strategic decision of whether a project should be funded as an MFA. This has taken place through consultations during the conferences of the parties (COPs) of the conventions and national portfolio formulation exercises, as well as through direct communication with GEF operational focal points on how focal area funding may be better structured. As a result of all these developments combined, the MFA portfolio has grown quickly in recent years.

1.4 Structure of the report

Chapter 2 provides an overview of the evaluation's approach and methods. Chapter 3 presents the characteristics of the MFA portfolio assessed by this evaluation. Findings that respond to the key evaluation questions are discussed in chapters 4, 5, and 6. Chapters 4 and 5 present the multiple benefits, synergies and progress toward impact achieved, mechanisms used to mitigate trade-offs, and the factors that have affected these outcomes. Chapter 6 discusses the opportunities and risks of the GEF's multifocal approach, as well as conditions under which it is most suitable for implementation. Chapter 7 presents conclusions and recommendations drawn from findings in the preceding chapters.

2: Evaluation approach

This chapter provides an overview of the evaluation's approach and methods.

2.1 Evaluation objective and key questions

The main objective of the evaluation was to assess whether interventions designed to meet the strategic priorities of multiple focal areas have generated multiple benefits in these focal areas, focusing specifically on the MFA portfolio. The evaluation also sought to explore the extent to which synergies were achieved and trade-offs mitigated through these projects.

The four main questions guiding the evaluation were:

- To what extent has GEF support generated multiple benefits through multifocal approaches?
- What synergies and trade-offs are produced by GEF support through multifocal approaches?
- What factors and conditions contribute to and prevent synergies and trade-offs in multiple benefits of GEF-supported interventions?
- How effective has GEF been in enhancing synergies and mitigating trade-offs among multiple benefits?

2.2 Scope

As of September 30, 2016, 532 projects labeled as MFA in the GEF's Project Management Information System (PMIS) have been endorsed or approved by the Chief Executive Officer (CEO), totaling $2.4 billion in GEF grants and $9.7 billion in cofinancing. Of these, 174 are enabling activities, accounting for 33 percent of projects and 2 percent of GEF funding of the MFA portfolio; 48 are Small Grant Programme (SGP) projects, equivalent to 9 percent of MFA projects and 34 percent of the GEF funding. Cross-cutting capacity development projects comprise 11 percent of projects and 4 percent of GEF MFA funding. These capacity development projects support interventions that primarily aim to enhance country capacities for meeting their MEA obligations, such as through mainstreaming convention guidance into national policy and financial frameworks.

The remaining 250 MFA projects, equating to $1.4 billion (60 percent) of GEF MFA funding, were identified as those primarily intended to achieve multiple environmental benefits. This set of MFA projects comprises the evaluation portfolio. It includes projects funded prior to GEF-4 that were retroactively labeled as MFA by the GEF Secretariat.

Only those projects CEO endorsed or approved in GEF-4 and onward have funding components that are explicitly linked to multiple focal areas through the RAF/STAR. Thus, only projects from

GEF-4 and onward were included for analyses involving financing. This reduced the total number of projects and sites that could be analyzed; however, it ensured that the results are comparable within this subset of projects. Because this subset of projects is more recent and reflective of the GEF's current operational processes, the findings are expected to be more applicable to the GEF's newer portfolio of MFA projects that have yet to be implemented.

As stated in section 1.1, the main purpose of the evaluation was to assess the multiple benefits of GEF support, focusing on this MFA portfolio as the source of evidence. Due to the wide variety and distinct nature of MFA projects, the evaluation did not aim to assess whether projects have better or worse results when implemented as MFA rather than as single-focal area (SFA). However, comparable SFA projects were also assessed when feasible to identify characteristics that may be distinct to the MFA portfolio. Also, because of the wide variety of MFA projects in terms of size and objectives targeted, the evaluation did not assess the scale of impacts of the MFA portfolio in aggregate, or compare the scale of impact across projects. Rather, it assessed the extent to which multiple benefits have been achieved across the portfolio, and investigated some of the ways that projects have generated these benefits, given each project's particular set of resources and objectives.

2.3 Evaluation components

The evaluation assessed outcomes and GEF contributions at the portfolio level, at site level in select case studies, and at the institutional level. Within each of these components, different sources of evidence, data collection tools, and analytical methods were used to derive the findings through a mixed-methods approach. Wherever possible, MFA portfolio characteristics and contributions were assessed against a comparison group to more precisely distinguish the role of GEF support through its MFA approach (see table A.1). Any quantitative differences between the MFA portfolio and comparison groups, as well as between subsets of the MFA portfolio, were tested for statistical significance, and are reported in the text when significant at a 95 percent confidence level.

- **Portfolio component.** Spatial, temporal, and institutional trends were identified across the portfolio of MFA projects (n = 250) using GEF and GEF IEO data sets. A standardized protocol was used to perform an in-depth review of project documents. From this in-depth review, a data set on the portfolio's design characteristics and outcomes was constructed and analyzed. The evaluation conducted geospatial analysis using propensity score matching, causal tree analysis, and multiple linear regression to assess the impact of MFA projects specifically on forest cover loss and vegetation productivity relative to similar nonsupported sites and SFA projects (n = 460 MFA sites). Datasets covering project start dates up to 2015 from the Global Land Cover facility at 30 m resolution for forest cover loss, and the long-term Normalized Difference Vegetation Index (NDVI) at 500 m resolution for vegetation productivity were used for this purpose.[1]

- **Case study component.** Given the amount of variation across the MFA portfolio, the case study component provided a more in-depth understanding of MFA projects that could not be obtained from the portfolio analysis alone. Five MFA projects in four countries (Brazil, China, Malawi, and Senegal) were selected (see table

[1] See Technical Documents 1 and 2 in volume 2 of this evaluation for a full description of methodology and results for the portfolio and geospatial analysis.

A.2 for case study descriptions). Rather than drawing generalizations about the MFA portfolio, the case studies served to provide evidence of the different types of benefits that may be generated by MFA projects, and the types of interventions that generate these benefits in specific environmental contexts. Project outcomes were not part of the criteria (see table A.3 for selection criteria). Case studies were also done on SFA projects in the same countries to understand similarities and differences in characteristics between the two types of projects (see table A. 4 for all countries, projects, and sites visited). These projects were selected using the same criteria as for the MFA projects.

For each case study, interviews were conducted with key national and local level stakeholders from government, GEF Agencies, beneficiary communities, and civil society organizations (see table A.5). Multiple benefits were compared across case studies through a weighted scoring method (see section A.6 in annex A). Synergies, trade-offs, and factors affecting outcomes were assessed from a review of project documents and interviews.[2] Geospatial analyses on changes in forest cover, vegetation productivity and land use were performed at up to an eight-day temporal resolution to verify and complement information from self-reported data in interviews, project reports, and environmental monitoring data provided by stakeholders.

- **Institutional component.** This component sought to assess the varying perspectives of different members of the GEF partnership in designing, reviewing, and implementing MFA projects. Interviews were done with the different GEF Secretariat teams and GEF Coordination Units of GEF Agencies, as well as GEF Coordination Units within the convention Secretariats of the three Rio conventions. GEF country focal points were also interviewed in countries visited for case studies for both this and the Evaluation of GEF Programmatic Approaches. Information on non-GEF donor support was collected through project documents and in-country interviews.

Stakeholders were engaged at different stages of the evaluation to ensure that it accounted for multiple perspectives and data sources. A Reference Group, which consisted of members of the GEF Secretariat, GEF Agencies, and the GEF STAP Secretariat, was convened to provide feedback on aspects of the evaluation that would be most relevant and useful to the GEF partnership in the next replenishment period. Reference Group members and country stakeholders also provided assistance in accessing various sources of project information. A peer review panel of evaluation and science experts provided guidance on the interpretation and communication of evidence.

2.4 Methodological challenges and mitigating measures

The number of projects included in the analyses for the portfolio component was constrained by the availability of project documents, accuracy of PMIS data, and precision of location information provided in project documents. The most up-to-date and complete set of information available after verification with different sources was selected to address this data limitation. A double-blind coding system using the AidData development finance and international aid geocoding methodology was used to extract location information from project documents.

Global positioning system coordinates and boundary definitions of GEF intervention sites

[2] See Technical Document 2 in volume 2 for details on the case study analysis methods and results.

were rarely available. To measure environmental impact at the portfolio level through geospatial analysis, a 10 km radius around geolocated points was used to estimate the actual area of intervention. Potential errors therefore exist through estimating impacts across areas that may not have been covered by GEF support, or in underestimating impact in areas that were larger than this radius. Projects for which sites could not be geocoded due to insufficient information, and which were implemented prior to GEF-4, were excluded from the final data set.

At the portfolio level, wherever possible, comparisons were done within countries to account for national governance factors influencing financing decisions. Propensity score matching was done prior to performing geospatial analyses to minimize the measurement of differences in environmental outcomes resulting from contextual factors. SFA projects with similar parameters were assessed as comparison units in all components wherever feasible and appropriate, to identify characteristics that may be distinct to MFA projects. Information on similar non-GEF projects and areas without support was also collected where it was available.

Data on outcomes were obtained through terminal evaluations, project reports and monitoring data, and field interviews. Since these data are considered self-reported, this evaluation only reports on outcomes that can be reasonably linked with project activities that have been completed, and that can be expected to generate those outcomes, based on the scientific literature. In cases where benefits were inferred solely from achieved project outputs (e.g., number of trees planted, hectares of forest protected), anticipated benefits may not be generated over the long term, as various contextual factors can impede the causal links between outputs and impacts (e.g., attrition in trees planted means lower carbon sequestration than expected or initially reported).

The mixed-methods approach outlined in section 2.3 was used to address the limitations and mitigate the biases inherent to the individual data sources and methods. Because each method provides evidence using different units of analysis, no single method is considered more valid or reliable. Each one provides complementary information that, when assessed together, provides a broader picture and more robust findings. Having different types of comparison units outside of the evaluation portfolio allowed further triangulation of evidence to define the characteristics and outcomes of MFA projects.

3: The multifocal area approach: portfolio profile

This chapter reports on the MFA portfolio's distribution across GEF replenishment periods, regions, and Agencies. Financing for MFA projects is compared with SFA projects in the biodiversity, climate change, and land degradation focal areas. Design characteristics of MFA projects are also presented.

3.1 Distribution

Finding: The number of MFA projects has increased by about 50 percent with each GEF replenishment period in terms of both number of projects and total GEF grants. All regions have a similar percentage of MFA projects within their respective GEF portfolios.

The portfolio of 250 MFA projects accounts for 10 percent of the GEF portfolio, equivalent to 13 percent of total GEF grants. Six percent of MFA projects (15) were supported through funds from more than one of the GEF-administered trust funds.[1] Thirty-five percent (87) of the MFA portfolio is comprised of child projects under 21 programs,[2] the majority (91 percent) of which are from GEF-4 and GEF-5. Since GEF-3, when the integration of the objectives of multiple focal areas in single projects was formalized, the MFA portfolio has grown by about 50 percent in each succeeding GEF replenishment period in terms of both number of projects and total GEF grants (table 3.1). Similar growth is seen in terms of the portfolio's percentage share of the overall GEF portfolio. The trend is mainly due to a higher number of countries implementing MFA projects. In GEF-4, only 27 countries had at least one national MFA project; this increased to 80 countries in GEF-5. However, the majority of countries to date implement one or no MFA projects.

Of the four regions, Africa has the highest number of MFA projects and share of MFA grants, while Europe and Central Asia has the lowest (figure 3.1). MFA projects comprise about the same proportion of each region's GEF portfolio in terms of number of projects and total grant amount, with the exception of the Latin America and the Caribbean region, which has slightly more MFA projects and higher total MFA grant relative to its entire portfolio.

The bulk of the MFA portfolio (73 percent, equivalent to 69 percent of total MFA grants) was implemented by the three original GEF Agencies—the World Bank, the United Nations Development Programme (UNDP), and the United Nations Environment Programme—with the World Bank having the largest share of projects and grant amount. The remainder of the portfolio was implemented by Agencies that became members of the GEF

[1] Multitrust fund projects include those funded through the GEF Trust Fund, the Least Developed Countries Fund, the Special Climate Change Fund, and the Nagoya Protocol Implementation Fund.

[2] The 21 programs include the Food Security IAP.

TABLE 3.1 Distribution of MFA projects and grants across GEF replenishment periods

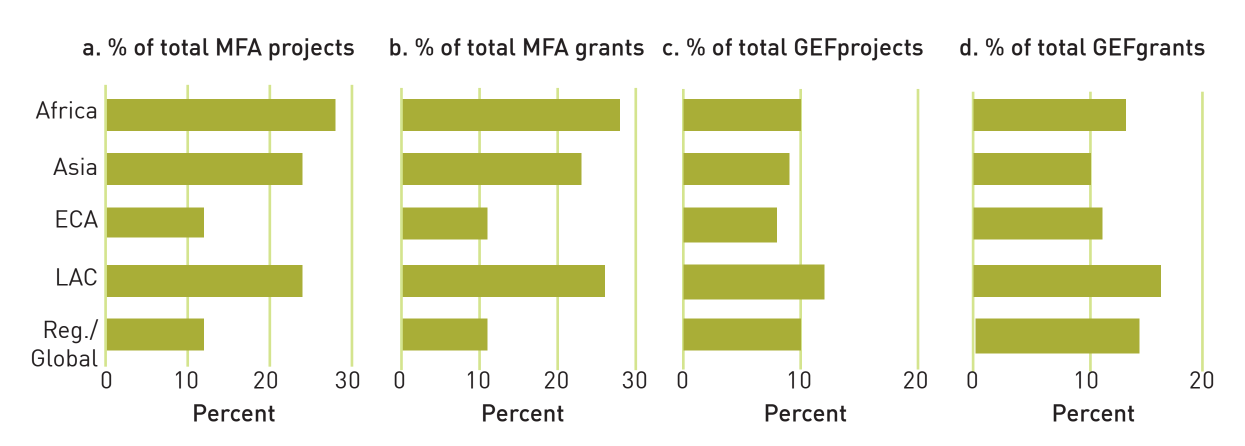
Period	MFA projects			MFA grants			Total GEF portfolio	
	No.	% of MFA portfolio	% of GEF portfolio	GEF grant (mil. $)	% of MFA portfolio	% of GEF portfolio	No. of projects	GEF grant (mil. $)
Pilot phase	0	0	0	0	0	0	82	453.2
GEF-1	2	1	2	3.7	0.3	0.4	111	856.1
GEF-2	16	6	5	53.4	4	4	308	1,436.4
GEF-3	44	18	9	202.8	14	9	477	2,221.0
GEF-4	62	25	9	348.1	24	14	701	2,432.6
GEF-5	109	44	14	722.0	50	20	761	3,531.7
GEF-6[a]	17	7	22	102.7	7	27	77	383.5
Total	250	100	10	1,432.6	100	13	2,517	11,314.5

SOURCE: PMIS database as of September 30, 2016.

NOTE: GEF funding data exclude Agency fees and project preparation grants.

a. Data for GEF-6 are as of September 30, 2016.

FIGURE 3.1 Distribution of MFA projects and grants across regions compared with distribution of total GEF portfolio



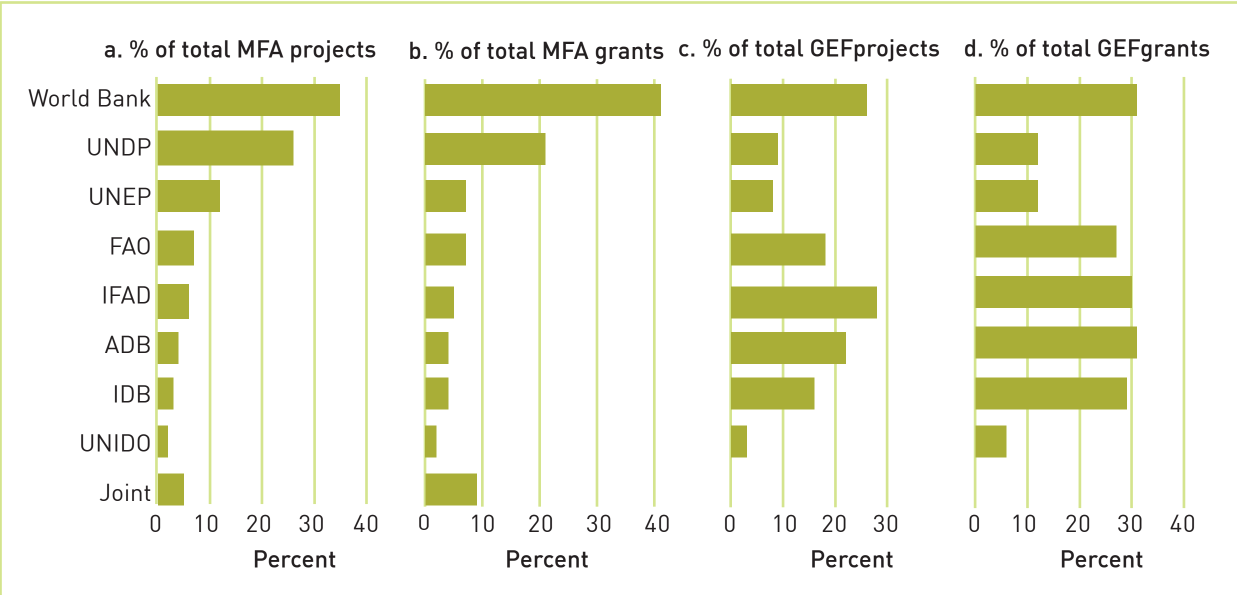
SOURCE: PMIS database as of September 30, 2016.

NOTE: ECA = Eastern Europe and Central Asia; LAC = Latin America and the Caribbean.

partnership in GEF-3 or later, or jointly by two or more Agencies.

From GEF-4 onwards, the majority of Agencies had MFA projects comprising more than 15 percent of their respective GEF portfolios, and at least 25 percent of total GEF funding (figure 3.2). Exceptions to this are the United Nations Industrial Development Organization, which generally implements chemicals-related projects; UNDP; and United Nations Environment Programme. The African Development Bank and European Bank for Reconstruction and Development did not have any MFA projects in their portfolios when this evaluation was carried out. Among the new Agencies, the Development Bank of Latin America (CAF), and

FIGURE 3.2 Distribution of MFA projects and grants across GEF Agencies compared with distribution of total GEF portfolio



SOURCE: PMIS database as of September 30, 2016.

NOTE: ADB = Asian Development Bank; IDB = Inter-American Development Bank; FAO = Food and Agriculture Organization of the United Nations; UNEP = United Nations Environment Programme; UNIDO = United Nations Industrial Development Organization. Newer Agencies (after GEF-4) excluded because of to small numbers. Joint Agencies that implemented MFA projects include FAO-UNEP, IFAD-UNIDO, UNDP-UNEP, UNEP-UNIDO, UNEP–World Bank, and World Bank–IFC.

International Union for Conservation of Nature (IUCN) each have one MFA project to date, comprising half or all of their respective GEF portfolios and funding; none of the other Project Agencies had any approved.

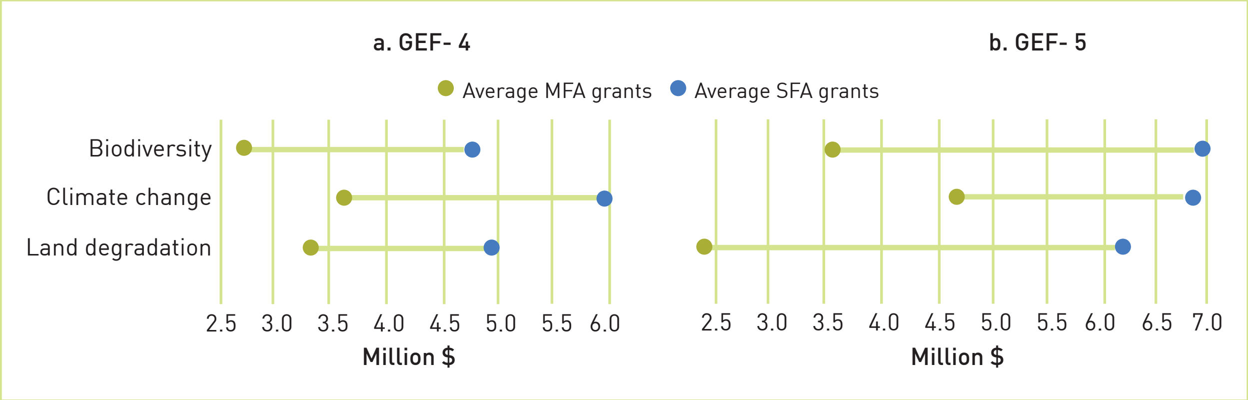
3.2 Financing

PROJECT SIZE

Finding: On average, the grant amount for an MFA project is larger than for an SFA project, partly due to incentives for greater focal area integration. Funding from the SFM envelope matched STAR resources allocated to MFA projects by 28 percent on average in GEF-5, and by 50 percent in GEF-6.

In GEF-4, the average grant amount for an MFA project with a biodiversity or climate change focal area component was at least 60 percent more than for an SFA project in either of these focal areas (figure 3.3). Similarly, in the land degradation focal area, the grant amount for an MFA project was on average 41 percent larger than for a land degradation SFA project. When the SFM/REDD+ funding envelope became available in GEF-5, 63 percent of MFA projects (*n* = 109) received SFM funding. This matched STAR resources allocated to MFA projects by 28 percent on average. In actual numbers, an MFA project with biodiversity or land degradation components in GEF-5 was on average more than double the size of an SFA project. In GEF-6, SFM funding matched STAR resources for an MFA grant by 50 percent on average. As of September 30, 2016, 77 percent of the GEF-6 MFA portfolio (*n* = 17) has received SFM funding. The distance between points in figure 3.3 shows the difference in average project size between MFA and SFA

FIGURE 3.3 Comparison of MFA and SFA grants by focal area in GEF-4 and GEF-5



SOURCE: PMIS database as of September 30, 2016.
NOTE: Included in this analysis are 171 MFA projects and 1,291 SFA projects from GEF-4 and GEF-5.

projects funded through each focal area in GEF-4 and GEF-5.

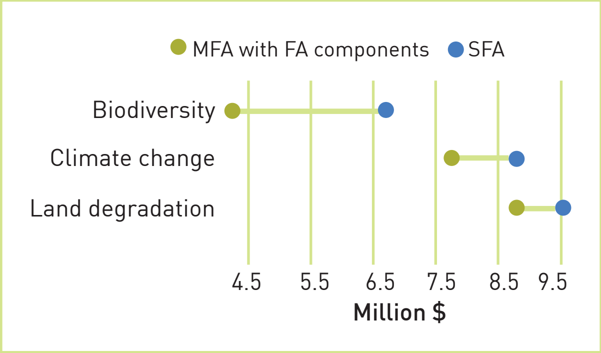
COFINANCING RATIO

Finding: Each GEF grant dollar for MFA projects has leveraged $6 in cofinancing, consistent with the overall GEF portfolio. MFA projects with a biodiversity component have a significantly higher cofinancing ratio on average than SFA projects in the biodiversity focal area.

The total promised cofinancing for MFA projects is $6 for every GEF dollar. This is similar to a ratio of 6.4 in the overall GEF portfolio (GEF IEO 2017). The ratio of cofinancing to GEF grant for MFA projects has risen from 3.7 in GEF-3 to 5.8 in GEF-4, reaching 7.0 in GEF-5. Development banks showed higher cofinancing ratios for MFA projects, led by the Asian Development Bank (ADB) with a ratio of 9.5 and the World Bank with a ratio of 7.7. The cofinancing ratio for the Asia region was highest at 8.7, followed by Africa (6.8), Latin America and the Caribbean (4.4), and Europe and Central Asia (4.2). Annex B presents the cofinancing ratios across all GEF replenishment periods, Agencies, and regions.

MFA projects with a biodiversity component have a higher cofinancing ratio on average compared to SFA projects in the biodiversity focal area (6.5 versus 3.8).[3] MFA and SFA projects in all other focal areas had similar cofinancing ratios on average, and were all higher than those for the biodiversity focal area (figure 3.4).

FIGURE 3.4 Cofinancing ratio of MFA projects compared to SFA projects within each focal area



SOURCE: PMIS database as of September 30, 2016.

[3] MFA and SFA projects in GEF-4 and GEF-5 were compared within countries to account for contextual differences. The difference is statistically significant at a 95 percent confidence level.

FOCAL AREA ALLOCATION

Finding: Funds allocated from the biodiversity and climate change focal areas were significantly less for an MFA than for an SFA project on average. However, the proportion of funds allocated to MFA projects through each focal area increased from GEF-4 to GEF-5.

The average amount allocated from the biodiversity focal area to an MFA project was $3 million in GEF-4 and $4 million in GEF-5 (figure 3.5), equivalent to less than half (29 percent and 45 percent, respectively) of the average allocation to a biodiversity SFA project. For the climate change focal area, the average amount allocated to an MFA project was $1.6 million, equivalent to only 7 percent of that for a climate change SFA project in GEF-4. While the actual amount doubled in GEF-5, this was equivalent to only 23 percent of the average grant amount for a climate change SFA project. The distance between points in figure 3.5 shows the difference in average funding allocation between MFA and SFA projects approved through the biodiversity and climate change focal areas.[4] Land degradation projects were excluded from the analysis due to insufficient numbers for comparison.

The share of grants allocated from the biodiversity, climate change, and land degradation focal areas to MFA projects increased from GEF-4 to GEF-5 (table 3.2). In the biodiversity focal area, the percentage of projects implemented as MFA increased by 20 percent, even though the total number of biodiversity projects decreased by 12 percent. While having the highest increase in funding allocation from GEF-4 to GEF-5 at 89 percent, the climate change focal area had the lowest increase in percentage of projects and funding approved as MFA (5 percent). Within the land degradation portfolio, the percentage of both projects and grants approved as MFA increased by 13 percent. The actual number of projects targeting land degradation focal area priorities (both SFA and MFA) increased by 56 percent, despite only a 4 percent increase in the land degradation focal area funding allocation.

3.3 Design

FOCAL AREA COMBINATIONS AND PRIORITIES

Finding: Almost all MFA projects address biodiversity, climate change, or land degradation focal area priorities; more than half of the projects combine the biodiversity and land degradation focal areas. By addressing these focal area priorities, the majority of MFA projects respond to convention guidance.

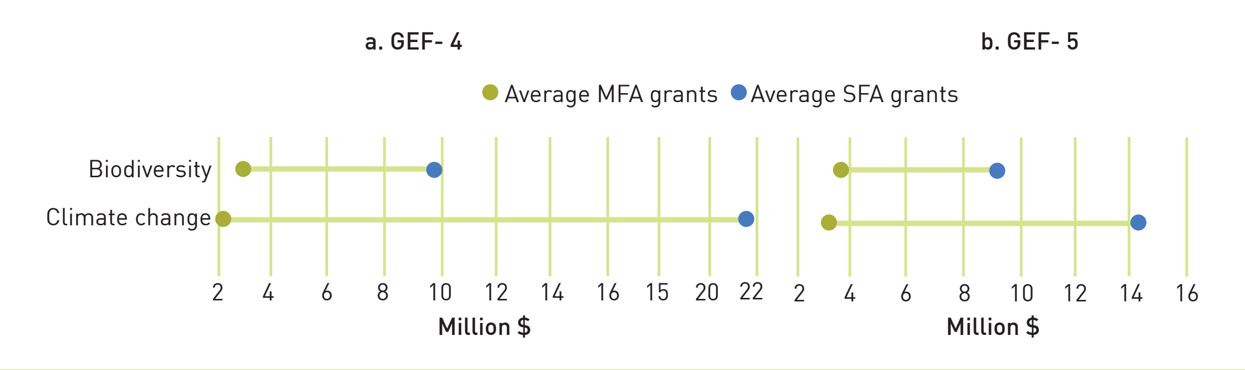
Of the 169 MFA projects in GEF-4 and GEF-5, 97 percent intended to produce a combination of benefits to either the biodiversity (76 percent), land degradation (70 percent) or climate change (60 percent) focal areas (figure 3.6). The remainder targeted focal area priorities combining solely the chemicals and waste, ozone-depleting substances, or international waters focal areas. The most common combinations include biodiversity and land degradation (54 percent), half of which also include climate change (biodiversity, land degradation, and climate change jointly, 27 percent), either in combination with additional focal areas or otherwise.

Sixty-seven percent of MFA projects (n = 169) combined two focal areas;[5] 25 percent combined

[4] MFA and SFA projects in GEF-4 and GEF-5 were compared within countries to account for contextual differences. The differences are statistically significant at a 95 percent confidence level.

[5] For this analysis, only the GEF focal areas are considered: biodiversity, climate change, land degradation,

FIGURE 3.5 Grants allocated to MFA projects versus SFA projects within each focal area



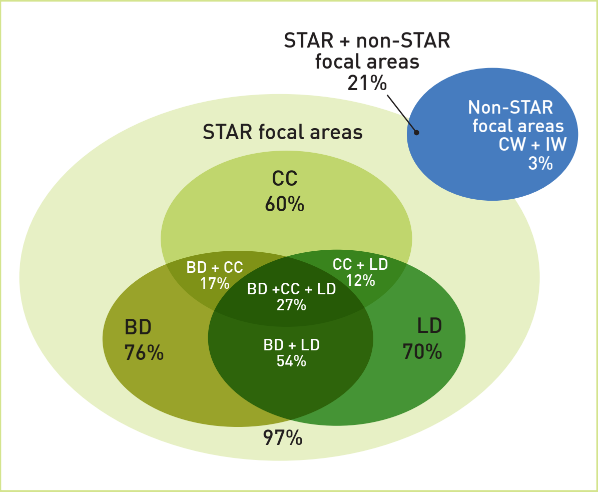
SOURCE: PMIS database as of September 30, 2016.

TABLE 3.2 Share of MFA projects and grants within each focal area

Focal area	GEF-4				GEF-5			
	MFA projects with FA component		Total FA funds allocated to MFA projects		MFA projects with FA component		Total FA funds allocated to MFA projects	
	No.	% of MFA portfolio	Million $	% of FA portfolio	No.	% of MFA portfolio	Million $	% of FA portfolio
Biodiversity	42	15	91.8	12	87	35	240.3	30
Climate change	32	12	59.7	6	70	18	198.3	11
Land degradation	40	50	90.6	40	79	63	124.7	53

SOURCE: PMIS database as of September 30, 2016.

FIGURE 3.6 Focal area combinations of MFA projects in GEF-4 and GEF-5



NOTE: n = 169. BD = biodiversity; CC = climate change; IW = international waters; LD = land degradation.

three focal areas. Only eight projects covered four focal areas (biodiversity, climate change, land degradation, and international waters). However, in terms of targeted focal area priorities, the 49 MFA projects in GEF-4 that indicated their target priorities featured 40 unique combinations, while the 109 MFA projects in GEF-5 had 97 unique

international waters, and chemicals and waste, which in this evaluation includes ozone-depleting substances. The SFM funding envelope is not counted as a focal area, though it has its own strategic priorities and tracking tool. For example, if a project received funding from the biodiversity, land degradation, and SFM allocations, then it is counted as an MFA project covering two focal areas.

combinations. The high number of unique combinations suggests that, while most projects have biodiversity and land degradation components, almost every MFA project is designed to simultaneously address a distinct set of focal area priorities.

Most MFA projects target focal area priorities that mainstream different focal area concerns, especially in landscapes. In GEF-4, most MFA projects (*n* = 62) aimed to mainstream biodiversity through policy and regulatory frameworks (BD-4, 32 percent)[6]; address issues on land use, land use change, and forestry (LULUCF) (CC-6, 29 percent); and support sustainable forest management in production landscapes (LD-2, 27 percent). The majority of MFA projects in GEF-5 (*n* = 109) targeted land degradation and biodiversity priorities in landscapes, including integrated landscapes (LD-3, 58 percent), protected area systems (BD-1, 56 percent), and production landscapes (BD-2, 53 percent).

In contrast, SFA projects in the GEF-4 portfolio (*n* = 639) more commonly targeted sustainable protected area system financing (BD-1, 10 percent of total SFA portfolio); energy efficiency in residential and commercial buildings (CC-1, 9 percent); and partnering for investments to implement national plans (POPS-2, 8 percent). In GEF-5, most SFA projects (652) addressed climate change adaptation priorities (CCA-2, increasing adaptive capacity, 19 percent; and CCA-1, reducing vulnerability, 18 percent), and again sustainability of protected area systems (BD-1, 13 percent).

MFA projects comprised the majority of projects approved since GEF-3 under priorities that by nature address multiple focal areas using an integrated approach. These were OP12 (72 percent), LULUCF (CC-6, 78 percent; and CCM-5,87 percent), persistent organic pollutants in water bodies (IW-4, 58 percent), integrated landscapes (LD-3, 67 percent), forest ecosystem services and sustainable livelihoods in drylands (LD-2, 63 percent), and agriculture in rangeland ecosystems (LD-1, 52 percent).

By addressing LULUCF priorities, 65 percent of MFA projects with climate change focal area funding respond to guidance given by the 12th Conference of the Parties (COP 12) of the United Nations Framework Convention on Climate Change in 2006. This guidance specifically requested the GEF to explore options for undertaking land use and land-use change projects within the climate change focal area (GEF 2010). Similarly, by addressing priorities on protected areas and mainstreaming, at least 91 percent of biodiversity-funded MFA projects address 17 of the 20 Aichi Biodiversity Targets, with which these two focal area priorities are associated (GEF 2012). Overall, 79 percent of MFA projects funded through the biodiversity and climate change focal area allocations respond to the guidance of these conventions. The United Nations Convention to Combat Desertification has not provided similar guidance to date, and therefore the responsiveness of MFA projects to this convention could not be assessed.

ENVIRONMENTAL ISSUES AND MANAGEMENT APPROACHES

Finding: Most MFA projects aim to address drivers of biodiversity loss, land degradation, and deforestation or forest degradation, and are designed to generate multiple benefits through management approaches that address the priorities of multiple focal areas simultaneously.

[6] These abbreviations (BD, CC, LD, etc.) refer to the strategic priorities supported by each focal area in each GEF replenishment period.

Biodiversity loss was identified as the most frequently mentioned environmental degradation problem targeted by MFA projects, at 78 percent (n = 235[7]), followed by land degradation (72 percent). MFA projects also intended to address overexploitation or unsustainable use of natural resources as a driver of biodiversity loss (75 percent), and targeted unsustainable land use practices as the driver causing land degradation (69 percent). Agricultural activities for food production were targeted by 59 percent of MFA projects as the main driver of deforestation or forest degradation. These activities were further classified into agricultural production, overgrazing, and poor management of shifting cultivation.

Seventy-four percent of MFA projects (n = 235) were designed to implement IEM, landscape-based management, or both, which according to the scientific literature are management approaches that address multiple focal area issues simultaneously (see section 1.2). Almost half of the MFA projects (43 percent) addressed both agriculture and forestry sectors at the same time by combining approaches such as sustainable agriculture or sustainable land management (SLM) with sustainable forest management and sustainable forest use/protection. Of these projects addressing agriculture and forestry concerns together, 71 percent also addressed biodiversity concerns through ecosystem-based management.

FOCAL AREA INDICATORS

Finding: Almost all MFA projects tracked indicators specific to each focal area that provided a corresponding funding allocation. The majority of MFA projects also tracked environmental indicators of focal areas that did not allocate any funding.

Based on a review of project documents, 95 percent of MFA projects with climate change focal area funding (n = 95) specified climate change-related environmental indicators in GEF-4 and GEF-5. On the other hand, 75 percent of MFA projects with land degradation focal area funding (n = 115) and 88 percent of MFA projects with biodiversity focal area funding (n = 123) specified indicators tracking environmental outcomes relevant to their corresponding focal areas.[8] MFA projects that did not track environmental indicators despite receiving funding allocations from the relevant focal areas were found to track only process-related outputs and outcomes (e.g., development of natural resource management plans, awareness raised of new technologies).

The majority of MFA projects also tracked environmental indicators of focal areas that did not allocate any funding to them. Twenty-seven out of 31 (87 percent) MFA projects that did not receive funding allocation from the biodiversity focal area tracked biodiversity-related indicators. In the land degradation focal area, 78 percent (n = 27) of MFA projects without land degradation focal area funding tracked land degradation–related indicators. Of the 58 projects without climate change focal area funding, 88 percent tracked climate change mitigation or climate change adaptation indicators. More than half of the MFA portfolio (56 percent) tracked biodiversity, land degradation, and climate change environmental indicators together in the

[7] Only 235 out of 250 MFA projects were included in the analysis due to lack of accessible documents for the other projects.

[8] Climate change focal area–related indicators were carbon sequestration, carbon mitigation, vulnerability/resilience. Land degradation focal area–related indicators were soil cover and/or quality, soil productivity/vegetation cover, water coverage and/or quality. Biodiversity focal area–related indicators were ecosystem cover and/or quality, biodiversity and/or species populations.

same project, even though only 27 percent of projects were funded through all three focal areas.

In addition to environmental indicators, socioeconomic indicators were specified in 85 percent of MFA projects (*n* = 20615[9]) to track socioeconomic outcomes as part of the multiple benefits. Fifty-three percent of MFA projects reported indicators tracking changes in income or access to capital, and 37 percent had indicators related to cooperation or reduction in conflict. Gender-related indicators were specified in 29 percent of the MFA projects.

[9] Only 206 out of 250 MFA projects were included in the analysis due to lack of accessible documents in the other projects to identify indicators used.

4: Results: multiple benefits

This chapter reports the extent to which multiple benefits have been achieved in the MFA portfolio. Findings are derived from a review of terminal evaluations, geospatial analyses, and in-depth analysis of case studies from four countries. For each case study, benefits to the relevant focal areas as well as socioeconomic outcomes are presented to illustrate the diversity and extent of multiple benefits. Factors contributing to and hindering the achievement of outcomes and broader adoption are explored at both the portfolio and case study levels.

4.1 Extent of achievement of multiple benefits

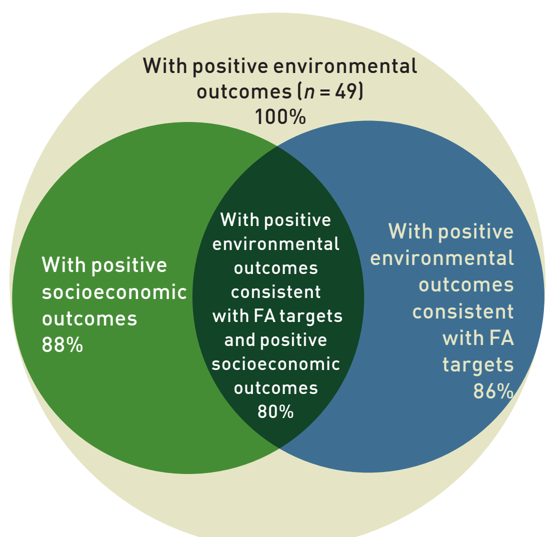
Finding: The large majority of GEF-supported MFA projects reported achieving multiple benefits and broader adoption of intermediate outcomes at project end. Of the completed projects that had outcome ratings ($n = 44$), 77 percent were rated Moderately Satisfactory or higher. However, the generation of benefits linked to project activities was not necessarily contingent on overall project performance.

All 49 completed MFA projects that had terminal evaluations reported the achievement of environmental outcomes occurring in at least one project site, while 88 percent reported achieving some type of socioeconomic outcome. Eighty-six percent reported positive environmental outcomes consistent with the combination of focal areas for which they aimed to produce benefits. Overall, 80 percent reported achieving both positive socioeconomic outcomes and environmental outcomes consistent with their focal area targets (figure 4.1).

Almost all projects (98 percent, $n = 47$) that received funding from or had objectives linked to the biodiversity focal area reported positive environmental outcomes on biodiversity indicators. For the climate change and land degradation focal areas, this figure was 74 percent and 71 percent, respectively ($n = 39$ for each).

Positive environmental outcomes were most commonly reported to be reduction in environmental

FIGURE 4.1 Multiple benefits reported according to targeted focal area



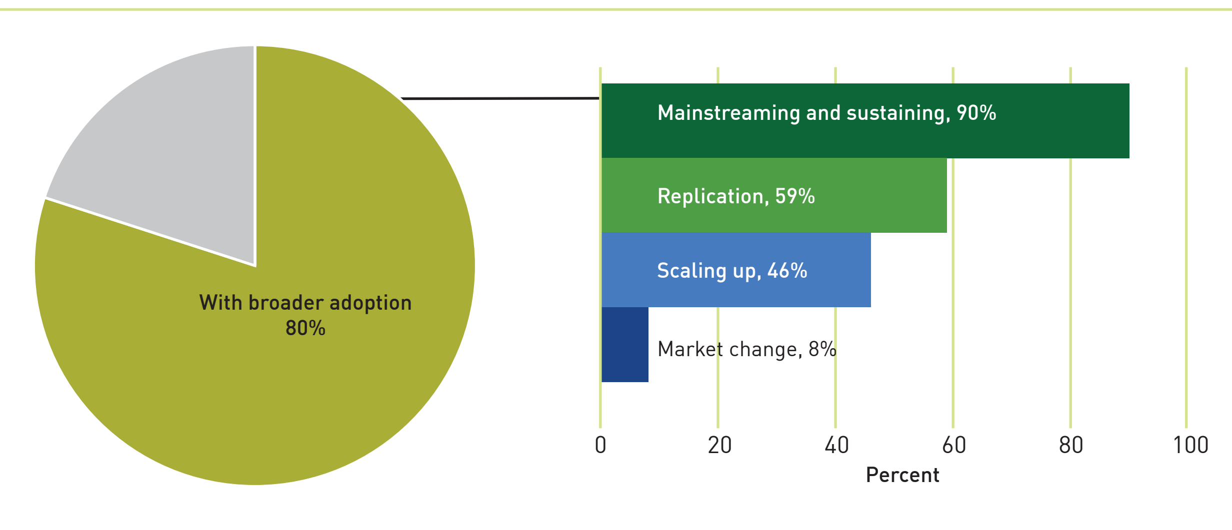
stress or threats (90 percent) and improvements in ecosystem cover or quality (71 percent), both of which are typically associated with benefits to the biodiversity focal area. A little more than half of the projects (51 percent) reported improvements in soil productivity or vegetation cover. Among socioeconomic outcomes, increased income or access to capital was the most frequently reported (79 percent). Other commonly reported positive socioeconomic outcomes were related to cooperation or reduction in conflict among stakeholders (33 percent), increased access to natural resources (30 percent), and gender equality (28 percent). Table C.1 provides a full list of the types of outcomes reported.

Some degree of broader adoption of governance, management, and institutional capacity-related outcomes was reported in 80 percent of projects (figure 4.2). These projects had fully or partially started the broader adoption of these outcomes, indicating progress toward larger-scale impact. Most projects reported broader adoption occurring in the form of mainstreaming and sustaining of outcomes (90 percent) and replication (59 percent).

Despite having achieved some extent of positive environmental outcomes on certain aspects, four projects (8 percent) reported no improvement or worse conditions on other aspects, which is the same percentage for the larger portfolio of completed projects reviewed for the Fifth Overall Performance Study (OPS5).[1] In these four projects, positive outcomes were reported at some sites, while other sites within the same projects reported no improvements by project end. This was reported in terminal evaluations as due to insufficient time elapsed for the interventions to have had measurable positive environmental impact on those indicators, or to contextual conditions or events slowing down the achievement of some outcomes. In six other projects (12 percent), no improvements in environmental status were reported due to GEF-supported technology either not being fully implemented, inappropriate for the local conditions, or both. Seven projects

[1] See table A.1 for information on OPS5 portfolio.

FIGURE 4.2 Types and areas of broader adoption reported



(14 percent) were unable to ascertain achievement of some targeted outcomes due to lack of monitoring data or unreliable monitoring methods, both of which are related to lack of local monitoring capacity. Eight projects (16 percent) also reported some unachieved environmental or socioeconomic outcomes but did not provide explanations in their terminal evaluations.

4.2 Types of multiple benefits

Finding: All case study projects generated multiple benefits. Some projects had a greater diversity of types of focal area and socioeconomic benefits than others.

Case studies were analyzed to better understand the different types of benefits that may be generated by MFA projects. This approach also allowed for the identification of links between benefits and interventions, specifically within the context of the environmental issues that each project aimed to address. Outcomes were not known at the time of case study selection (see table A.3), nor were the MFA projects intended to be representative of the broader MFA portfolio. As explained in section 2.4, benefits were identified from self-reported quantitative and qualitative information. Given that multiple benefits are defined as outcomes generated in more than one focal area or sector, the case study analysis focused on assessing the number of focal areas—and the diversity of types of benefits within those focal areas—that each project contributed to.

Biodiversity benefits included improvements in ecosystem cover, species population numbers and diversity, and reduced threats to biodiversity. Land degradation benefits included improvements to soil structure, greater soil productivity, and reduced threats to both. Climate change focal area benefits accounted for were carbon sequestered, greenhouse gas (GHG) emissions reduced, and carbon sinks maintained. Other environmental benefits reported were more local in nature, such as improvements in air quality and reductions in organic waste and chemical pollution. Socioeconomic benefits consisted mainly of increases in income, access to capital, and food sources. Other socioeconomic benefits documented were more context specific, such as reduced rural emigration, especially among youth, land tenure rights, and women's access to capital.

To facilitate comparison across case studies, benefits were scored and a weighted sum was calculated (see section A.6 in annex A for details on scoring and benefit categories). Each score represents the diversity of types of benefits achieved under that sector. The final score represents the diversity of all types of benefits achieved by a project. All case study projects generated multiple benefits, as evidenced by outcomes identified in more than one focal area, as well as socioeconomic benefits (table 4.1). Four of the five MFA projects—Senegal PGIES, Brazil Rio Rural, China IEM Drylands, and Senegal Ecovillages—had scores higher than 5. One MFA, Malawi Shire Basin, scored lower in part due to the project's more long-term objectives (see **case study summary** later in this chapter. All SFA case study projects received a total weighted benefit score of less than 4 and are used in this and the next chapter only to illustrate similarities and differences with the MFA case study projects. Details of the SFA scores are in table C.2.

Projects with a higher score indicate more types of environmental or socioeconomic benefits and more benefits that are quantitatively measured, as opposed to qualitatively observed or inferred from project outputs. Higher socioeconomic scores capture a greater diversity of both income and food sources generated by a project.

TABLE 4.1 Weighted benefit scoring of MFA case study projects

Project	Benefit					Weighted score
	Biodiversity	Climate	Land	Other environmental	Socio-economic	
Senegal PGIES	1.75	1.17	0.92	0	2.42	6.25
Brazil Rio Rural	1.17	0.92	1.50	0.17	3.58	7.33
China IEM Drylands	2.17	0.75	1.50	0.50	3.67	8.58
Senegal Ecovillages	1.17	1.42	0.58	0.08	4.08	7.33
Malawi Shire Basin	0.83	0.58	0.50	0	1.67	3.58

SOURCE: Benefits were identified from self-reported indicators documented through interviews and project reports.

NOTE: Scores were weighted based on whether the benefit was quantitatively measured, qualitatively reported, or inferred. See section A.6 in annex A for scoring method.

A comparison of the extent or magnitude of benefits achieved across projects was challenging given the wide diversity of project types and activities, and the need to consider these benefits within the context of the environmental and socioeconomic baselines that the project aimed to change. The scale of resources, project objectives, and geographic scope was considered in assessing the benefits in each case study. Scales ranged from a five-year demonstration project targeting 10 villages and their surrounding areas (Senegal Ecovillages) to a 15-year river basinwide project that includes protected areas, marshes, floodplains, and multiple sectoral interests under one broad management plan (Malawi Shire Basin) (table 4.2). Given this range of differences in project characteristics, comparing the scale and magnitude of impacts across case studies was beyond the scope of this evaluation. Instead, the case study analysis looked at how each project generated its range of types of benefits, given its particular set of financial resources, objectives, and social-ecological context.

The following case study descriptions provide examples of the types of benefits reported and the interventions that contributed to their achievement. Table 4.3 provides a summary of quantitative environmental and socioeconomic benefits generated in each case study project.

SENEGAL PGIES

The UNDP-implemented Integrated Ecosystem Management in Four Representative Landscapes of Senegal project (Senegal PGIES, GEF IDs 933 and 2268) was a two-phase project that sought to address threats to both land and biodiversity from, among other things, overgrazing, deforestation, poaching of wildlife that preyed on livestock, and uncontrolled fires. The project operated in four of the country's distinct ecosystems: silvopastoral, dry forest, coastal, and marine-inland-savannah. All sites were noted as having a high degree of conflict between local community members and protected area staff.

The project helped establish 26 community nature reserves (CNRs) and three pastoral units (PUs), which served as buffer areas for existing protected areas. These CNRs and PUs, covering a total of 577,000 ha, also linked fragmented ecosystems across 270 villages. This resulted in higher habitat connectivity, contributing to a reported 30 percent increase in the presence of animal and plant species of global importance at each site. The project assisted villages in obtaining legal land rights through the CNRs and PUs to allow access

TABLE 4.2 Summary characteristics of MFA case study projects

Project	Objective/ approach	Total financing	GEF financing	Focus of GEF grant	Geographic scope
Senegal PGIES	Community-based management	Phase 1: $14 million; Phase 2: $11 million	Phase 1: $4 million Phase 2: $3.6 million	Planning/capacity building; natural resource management in CNRs and villages; protected area (PA) management; alternative livelihoods	4 representative ecosystems (57.7 million ha)
Brazil Rio Rural	SLM	$15 million	$6.8 million	Planning; adoption of SLM practices; capacity building for IEM	48 micro-catchments in 5 watersheds (31,650 ha) covering 30,000 farms
China IEM Drylands	IEM	$29.5 million	$4.5 million	Planning; sustainable livelihoods; PA management; education/ awareness	3 provinces (8,685 km^2 total area)
Senegal Ecovillages	Pilot of ecovillage model	$16 million	$2.9 million	Planning/capacity building; natural resource management in CNRs; clean energy; carbon sequestration	10 pilot villages and PAs (225,788 ha)
Malawi Shire Basin	Basinwide multiuse/ multisector management plan	$73 million	$6.6 million	Studies; plans; PA management; forest co-management[a]	3 PAs and 6 forest reserves (22,317 km^2, 520 km long)

a. Other project components (alternative livelihoods, sustainable land and water management, and large- and small-scale water infrastructure) were funded wholly through cofinancing. In the other case study projects, the project components listed were either funded in part through cofinancing, or wholly with GEF funds

to timber, forage, and other resources that were previously only allowed by government permit. Local management plans developed for each site helped reduce conflict among users, and between local villagers and park staff. This contributed to reducing rangeland clearing in the PUs. Former poachers were engaged as ecoguards and tour guides, and given alternative income sources. Fire control activities undertaken by both protected area management staff and community members were reported to result in a 90 percent reduction in bush fires by Phase 2.

Reduced soil erosion, while not directly measured, was inferred from documented reforestation in CNRs, the planting of live hedges, and dune fixation. Improved soil quality was inferred from a reported increase in vegetable and rice production in areas that used salt dikes and compost. Carbon benefits were similarly inferred from tree-planting activities, a shift to fuel-efficient stoves, and the rehabilitation of mangrove, forest, and rangeland ecosystems. A pilot study in eight CNRs reported a reduction of 2.295 million tons of carbon dioxide equivalent (tCO_2e) between 2004 and 2009.

In addition to more equitable access to natural resources, local villagers planted and harvested nuts and fruits in the CNRs, which was reported to increase their income, allowing the purchase of a variety of food items. Fruit trees in orchards and live hedges also increased access to and diversity of food. Among other alternative livelihood

TABLE 4.3 Summary of quantitative environmental outcomes of MFA case study projects

Project	Intervention	Biodiversity	Climate change	Land degradation	Socioeconomic
Senegal PGIES	BD—established 29 interlinked spatial units (577,000 ha) with protected area (PA) core, CNRs/PUs in buffer, and village territories; fire control; tree/vegetation planting LD—dune fixation; dams and dikes for salt control; compost Livelihoods—e.g., beekeeping; harvesting nontimber forest products; orchard fruit trees	30% increase in presence of animal and plant species of global importance 90% reduction in bush fires 1,169.21 ha of wetlands restored Increases of up to 70 animals in giant eland herds	Reduction in 2.295 million tCO_2e calculated between 2004 and 2009 in 8 CNRs	No quantitative data available	At one site earned up to CFAF 7,500 in a day from fish and shrimp in marine PA Women accounted for 53.8% of beneficiaries
Brazil Rio Rural	BD—riparian and forest tree planting; excluding cattle from riparian areas; private natural heritage reserves LD—soil conservation; minimum tillage; pasture rotation; rainwater capture Livelihoods—e.g., beekeeping; rustic poultry; agroforestry	No quantitative data available	Carbon storage: 19,040 tCO_2e for 224 pasture rotation projects; 9,475 t for 336 ha of land put aside for biodiversity; 295 t per year from source water protection	26% reduction in average values of sediment concentrations and 31% reduction in maximum values of sedimentation in one microcatchment Average increase in soil organic material of 5.04 g/dm^3 Increased potassium (average 2.14 mmolc/dm^3) and phosphorus (average 10.14 mg/dm^3) in five subprojects	Pasture rotation: 80% increase in milk production in 90% of subprojects; average IRR 59% in 6 subprojects Eggs and poultry: IRR of 26.2% for 4 projects; profitability of R$0.52 to R$0.84 per R$ spent Beekeeping: IRR of 32.7% in 4 subprojects; profitability of R$0.50 to R$0.90 per R$
China IEM Drylands	IEM planning and training BD—improved PA management and enforcement; habitat restoration LD—artificial pasture; maize-sheep biofuel system; plastic film and mulch Livelihoods—fruit trees, medicinal herbs, greenhouse, warm sheep sheds, fruit and vegetables	Illegal extraction of resources reduced by 80% in Shaanxi, 100% in Ningxia, and down to 4% in Gansu Ningxia: vegetation cover in PA increased from 33.4% to 36.9% from 2012 to 2014; vegetation height increased from 16.7 cm to 18 cm; biomass increased from 86.7 kg/mu to 194 kg/mu Shaanxi: vegetation increased from 80% to 83% by 2015 Fire occurrence rate reduced by 50%	No quantitative data available	Erosion in grasslands reduced by 22% in Gansu, 25% in Ningxia and 75% in Shaanxi Ningxia: desertification reduced 4.9% by 2015 Gansu: land productivity improved by 7.7%	Local farmers' income increased 20% from 2012 (additional data available per province and per activity) Maize yields increased 38% to 830 kg/mu; potatoes increased 62% to 2,865 kg/mu Women accounted for 48% of beneficiaries

(continued)

TABLE 4.3 Summary of quantitative outcomes of MFA case studies *(continued)*

Project	Intervention	Biodiversity	Climate change	Land degradation	Socioeconomic
Senegal Ecovillages	BD—established and extended CNRs; perennial livestock fodder CC—renewable energy (alternative fuel/fuel-efficient stoves, Jatropha for biofuel, biodigesters, solar panels); carbon sequestration—tree planting in CNR, live hedges, bamboo, mangroves, firebreaks LD—compost, biochar Livelihoods—e.g., gardening, harvesting nontimber forest products, fruit trees, soap making, poultry, bakery	Net biomass gain of 1.7–2.4 m^3/ha/year in the CNRs Avoided deforestation equivalent of 900 ha	42% reduction in carbon balance from baseline to 2016 Carbon storage: 57,750 tCO_2/year from 28,875 ha of new CNRs established; 110 tCO_2 per village/year from hedges; 54 tCO_2 per year from 40,000 bamboo plants; 1,184 tCO_2e/year from 400 ha of mangrove planted	No quantitative data available	CFAF 2.5 million/year from double vegetable cropping Gardening production increased by 4 and revenues increased by 6 due to sales during peak periods 73% of women involved in ecovillage jobs
Malawi Shire Basin	BD—protected area management; road network enhancement; research; forest co-management	No quantitative data available	79.8 million t of carbon maintained in carbon sinks across all 9 sites	No quantitative data available	K617,270 raised from sale of trees and firewood in 1 forest block

NOTE: BD = biodiversity; CC = climate change; LD = land degradation; IRR = internal rate of return.

activities supported were beekeeping, oyster cultivation, fish processing, and payment for mangrove planting. A network of mutual savings groups was established, which continued to provide microloans to local businesses at the time of this evaluation.

Despite the reported socioeconomic benefits, many of the alternative livelihood activities in sites visited had been discontinued due to a lack of funds to purchase equipment that would allow community members to apply the training that they had received from the project. The mutual savings groups have insufficient capital to provide these. The project's planned third phase, which would have provided support for this, was unexpectedly not allocated any GEF funds. However, a new GEF project has recently been approved, intending to continue the socioeconomic benefits seen in Senegal PGIES.

BRAZIL RIO RURAL

The Rio de Janeiro Integrated Ecosystem Management in Production Landscapes of the North-Northwestern Fluminense project (Brazil Rio Rural, GEF ID 1544) was implemented by the World Bank in Rio de Janeiro, a state with the highest deforestation rate for the Atlantic Forest due to cattle raising, and boom-and-bust cycles in sugar cane and coffee production. It also had the lowest indicators for income, education, and infant survival. The project specifically aimed to address deforestation and soil erosion from unsustainable agriculture practices, which had been linked with poverty, especially in the state's dry northern region. The project piloted the use of microcatchments as the basis of IEM.

SLM activities such as pasture rotation and soil conservation were implemented in 48 microwatersheds covering over 31,650 ha. The project helped establish nature reserves on private farms, which protected 792 ha of land. This, in combination with reforestation efforts, increased the number of biological corridors in the project area from 5 to 34. Landowners and municipalities received financial compensation for establishing these private nature reserves under a national program.[2] To protect water sources, the project supported tree planting in riparian and native forests. Cattle were prohibited from grazing near spring headwaters to prevent soil compaction and protect water quality. The combination of activities was reported to increase wildlife numbers, including bird and frog species in one of the visited sites. Interviews reported that droughts in 2014 and 2015 did not lead to water scarcity due to the protected springs; conversely, excessive rainfall did not result in massive erosion as before. This anecdotal report was supported by a decrease in average sediment concentrations in springs by up to 26 percent in two microwatersheds tested.

An average 0.5 percent increase in soil organic material was measured in four pasture rotation subprojects. Carbon storage from pasture rotation, private reserves, and headwaters protection were estimated to total more than 28,000 tCO_2. Carbon sequestration benefits are also inferred from tree-planting activities.

[2] The municipalities of Natividade and Porciúncula received R$368,446 and R$360,806, respectively, from Environmental Compensation Chambers.

Internal rates of return of at least 26 percent were measured for livelihood activities supported by the project, such as rustic poultry, fruit trees, and beekeeping. Food security was improved directly through these additional food sources. Income from the sale of chickens, eggs, fruits, and honey allowed the purchase of other food items. Use of chicken waste as fertilizer was reported to reduce expenses from buying inorganic fertilizers. Pesticide use was also reduced or eliminated through the planting of species that served as natural pest repellents. About 56 percent of surveyed municipalities reported that diversification in income sources and reduced farming costs were associated with increased farmer incomes. Efforts at gender equality were made through the implementation of 9 percent of almost 3,000 subprojects under the direct leadership of women, such as in small-scale agro-industries, crafts, and clothes making.

CHINA IEM DRYLANDS

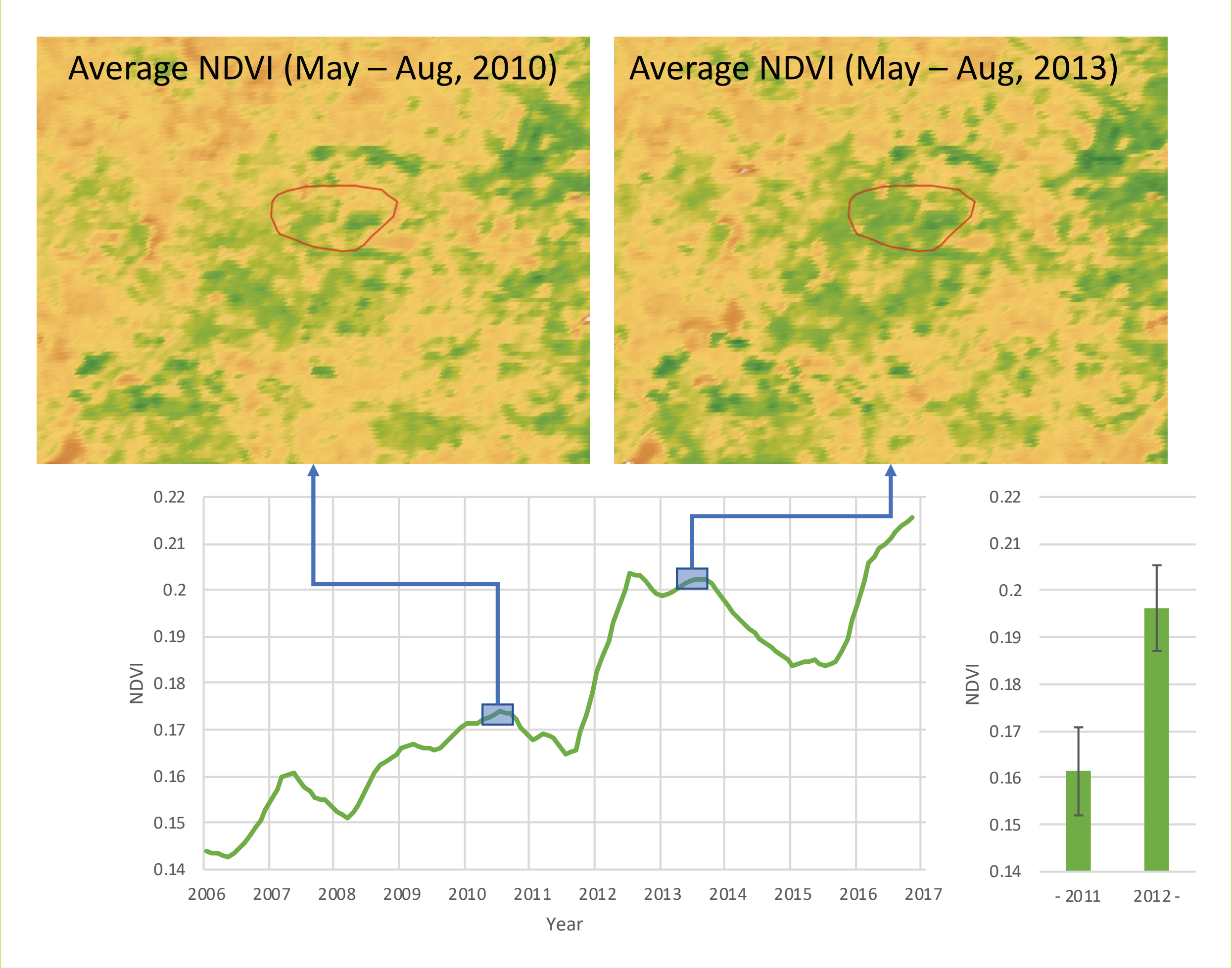
An IEM Approach to the Conservation of Biodiversity in Dryland Ecosystems (China IEM Drylands, GEF ID 2369), a project implemented by the International Fund for Agricultural Development (IFAD), aimed to address desertification, deforestation, and biodiversity loss resulting from land degradation in three of China's western dryland provinces. Poverty was found to influence the use of unsustainable land practices, the key driver of environmental degradation. The project supported existing government initiatives to protect forest and grassland ecosystems through activities both in protected areas and adjacent farms.

In the province of Ningxia, a 100 percent reduction in illegal grazing and medicinal herb extraction in grasslands was reported. This was achieved partly through the provision of greenhouses, warm sheds for livestock, and fodder, thus providing a better alternative to use of grasslands. Soil productivity was said to have increased in Gansu by 8 percent through the use of mulching, livestock manure, and biodigester effluent. Protection and restoration of grasslands were linked to a minimum of 22 percent reduction in soil erosion in each of the three provinces. Carbon benefits were inferred from tree-planting activities, ecosystem protection, and reduced firewood use through replacement with solar and biogas energy. Grassland sites in Gansu analyzed by this evaluation showed a statistically significant increase or at least no decrease in vegetation cover after project activities started.

Higher diversity in wildlife species was reported in all three protected areas supported in the three provinces. Populations of deer and wild pigs were reported to have increased to such a degree that the wildlife were destroying crops in farms around Mt. Taizi National Nature Reserve. To defuse human-wildlife conflict, the County Forest Bureau compensated farmers for the loss, as recommended by a GEF biodiversity project also supporting the protected area.

In Haba Lake National Nature Reserve in Ningxia, average NDVI showed a statistically significant increase in vegetation since 2011 (figure 4.3). However, destructive activities such as quarrying

FIGURE 4.3 NDVI change at Haba Lake Reserve, China (China IEM Drylands)



by some residents within the reserve continue to threaten biodiversity and land integrity. The provincial government plans to relocate all residents when sufficient funds for compensation become available.

Across all provinces, local incomes were reported to have increased by at least 20 percent from 2012 to 2015 as a result of medicinal herb and mushroom cultivation, greenhouse fruits and vegetables, tree nurseries, and livestock raising. These income sources also improved food security. Almost half (48 percent) of beneficiaries were women. They were encouraged to participate in project management, decision making, Village Implementation Groups, and public affairs.

SENEGAL ECOVILLAGES

The Participatory Biodiversity Conservation and Low Carbon Development in Pilot Ecovillages in Senegal project (Senegal Ecovillages, GEF ID 4080), implemented by UNDP, sought to meet energy and livelihood needs in rural villages without degrading natural habitats. The project tested the Ecovillage model that the national government wanted to adopt. It built on the Senegal PGIES project by establishing or expanding CNRs as one way to reduce resource extraction in protected areas. To replace these resources, the project provided solar and clay stoves, solar panels, biodigesters and Jatropha for biofuel, as well as several livelihood activities. These were reported to collectively reduce village GHG emissions by 42 percent from 2011 to 2016, or by 62,110 tCO_2e. Use of the alternative and fuel-efficient stoves reduced the amount of firewood extracted, estimated as equivalent to 900 ha of avoided deforestation. In addition, the planting of live hedges, fruit trees, and bamboo to reduce soil erosion were estimated to sequester at least 164 tCO_2 per year.

Improved soil quality was inferred from the reported doubling of vegetable production, an effect of the combined introduction of biodigester effluent, biochar, compost, and solar-powered irrigation. Increased vegetable production over an area of 70 ha was reported to generate CFAF 2.5 million per year. Income from gardening was said to have increased by six. Collection of timber and fruits from CNRs likewise contributed to higher incomes. The increase in diversity of crops is inferred to have contributed to food security in the villages. The diversity in sources of income has reduced the number of youth seeking livelihoods elsewhere. However, because younger men now have more income, they have the expectation of becoming village chiefs, a position traditionally held by the oldest men. This conflict is being resolved internally within the villages.

Low-carbon income sources employed 73 percent of women beneficiaries, such as in the making of clay stoves, processing of nontimber products, and soap production. Their time available for earning income also increased in part due to the reduced need to collect firewood. During interviews, women in the village of Mbackombel said that they could now solve problems without waiting to ask men for money. On the other hand, they noted that since they can now afford household costs, men might use the opportunity to take on second wives. Also as a result of improved income and living conditions, people can now acquire technology such as appliances and individual water pumps that are expected to increase water and energy use. The executing agency (ANEV) is currently looking at ways that this can be addressed in a sustainable manner.

MALAWI SHIRE BASIN

The Shire Natural Ecosystems Management Project (Malawi Shire Basin, GEF ID 4625), implemented by the World Bank, is the first phase of a

15-year project. The Shire River Basin is important for hydropower generation, fisheries, agriculture, and flood attenuation, among other things. The project aims to create a basinwide management plan to address lack of coordination among users, high vulnerability to flooding, and key threats that include deforestation for fuelwood and charcoal. The basinwide management plan will integrate the plans of existing protected areas, an innovation for the country. The CEO endorsement document notes that GEF support was essential to ensure that the basin planning approach includes biodiversity concerns and not solely resources under the executing agency's mandate, such as agriculture, water resources, and infrastructure, which are being addressed by the World Bank loan.

Despite funding delays, procurement challenges, a major macroeconomic shock, and a 2015 flood, and although this first phase focuses on building capacities, benefits were reported in some project sites. Increased patrolling, and improved infrastructure and road networks in Lengwe National Park were reported to decrease poaching, burning, and firewood collection. These biodiversity threats persisted, however, in other areas of the park where road access for patrolling was poor. Improvements in wildlife populations are anticipated from the recently installed water holes and solar-powered pumps, which restore the park's water supply for the first time in 30 years. Reduced incidents of poaching, burning, and firewood collection were also reported in co-managed forest reserves due to community forest patrols. Reduced GHG emissions are inferred from the reduced burning for charcoal. Carbon sequestration benefits are also inferred from tree-planting activities in the forest co-management blocks. Several of the tree species selected for tree planting in the forest reserves had other uses with potential benefits to local villagers such as forage and wood, although these benefits were not specifically reported. The project has provided additional sources of income and food in the form of maize grinding mills, goat breeding, and beekeeping in villages around the protected areas.

Co-management in three forest reserves was initiated under the two-phase European Union–funded Improved Forest Management for Sustainable Livelihoods Programme (2005–14). Therefore, not all benefits can be solely attributed to the Malawi Shire Basin project. Income was reported to have increased from beekeeping and sale of sustainably harvested timber and firewood, funds from which were used toward community improvements, and the establishment of a village savings and loan program. In two forest reserves, forest regeneration due to both patrolling and enrichment planting was reported to have promoted the growth of some medicinal plants, which are a source of income; biodiversity and climate change focal area benefits are inferred. Improved water flow in one stream was also reported as an outcome of forest regeneration. This facilitated the introduction of new crops such as strawberry, maize, and vegetables grown during the dry season through irrigated farming. While these reported outcomes may be linked more closely to the outputs of the previous European Union–funded project, GEF support provided the necessary funding to maintain these benefits, as well as to replicate co-management in additional forest reserves.

BROADER ADOPTION

Finding: Stakeholders have mainstreamed, replicated, and scaled up the management approaches demonstrated by the case study projects. Partnerships to leverage resources from multiple sectors contributed to broader adoption.

Broader adoption was evident in four MFA projects through the mainstreaming, replication, and scaling-up of demonstrated interventions.[3] As the first phase of the Malawi Shire Basin project is focused on capacity building to support the basin-wide plan and is still under implementation, no broader adoption was expected.

Mainstreaming. Through the China IEM Drylands project, IEM principles were mainstreamed into provincial, state, village, and township planning systems. Provincial planning approaches have shifted from a top-down to a multisector integrated approach. Recommended IEM actions served as inputs to county development plans, which have been incorporated into provincial and national budgets. Brazil Rio Rural's demonstration of SLM principles eventually changed the professional culture and career development system of EMATER-RIO, the state's agricultural extension agency. Through its partnership with 21 institutions, Brazil Rio Rural was also able to mainstream SLM through multiple channels. A permanent program management team now exists within the state government.

Replication. The CNR/PU model piloted by Senegal PGIES was adopted by nongovernmental organizations and other projects, including Senegal Ecovillages. In Senegal Ecovillages, project activities were replicated from the original 10 to 84 villages within the project implementation period by leveraging civil society organizations and private sector funds to establish infrastructure. Some village members also used their own funds to adopt technologies such as biodigesters. The National Ecovillage Strategy was translated from French into English and Arabic so that other countries could learn from and replicate the experience. Similarly, in China IEM Drylands and Brazil Rio Rural, the respective IEM methodologies these projects developed have been replicated in other government projects. Farmers that had not been supported by Brazil Rio Rural used their own funds to adopt SLM practices and protect more than 200 springs. Due to the benefits achieved by the project, the World Bank provided two more loans to the State of Rio de Janeiro to replicate the methodology from the original 48 to currently 566 more microwatersheds. The program management team was invited by the Food and Agriculture Organization of the United Nations to share the methodology to other countries.

Scaling-up. Management approaches introduced by Senegal PGIES and Senegal Ecovillages were scaled up to become the national approaches to biodiversity protection and sustainable development. CNRs have been adopted throughout Senegal's protected area system. The low-carbon Ecovillage model has now been extended to 400 more villages throughout the country under a national program, with funding from other donors as well as the government. Brazil Rio Rural's use of the microwatershed as the unit for policy planning and service delivery has been adopted as the state's approach to sustainable rural development. Continuity of project activities is being secured through the development of a Financial Sustainability System with institutional partners.

4.3 Factors affecting achievement of multiple benefits

Finding: Achievement of multiple benefits and broader adoption in MFA projects was most positively affected by internal factors such as project design and stakeholder engagement. Lack of institutional capacity within countries was the only factor in MFA projects significantly affecting outcome ratings.

[3] Box A.1 provides definitions of the different types of broader adoption.

CONTRIBUTING FACTORS

Factors most frequently mentioned in terminal evaluations as contributing to positive outcomes in MFA projects (n = 44) were good engagement of key stakeholders (77 percent), national government support (48 percent), highly relevant technology or approach (41 percent), good coordination with or continuity of previous or current initiatives (32 percent), good project design (32 percent), and support from other stakeholders (32 percent).

Good project design was noted in terminal evaluations more often in MFA projects than in SFA projects in the OPS5 portfolio as an important contributing factor to positive outcomes (table 4.4). In contrast, broader adoption using project resources was not a common contributing factor cited in MFA projects. This may be due to the innovative nature of the MFA projects, focusing project resources primarily on demonstrations rather than on the broader adoption of more straightforward and tested approaches. Regardless, as seen in the previous section, this did not prevent broader adoption in MFA projects. No MFA projects cited favorable political or economic conditions as being particularly important to project success. This suggests that the success of project outcomes in these MFA projects was well within the control of project management staff and direct beneficiaries.

Good engagement of key stakeholders, particularly engaging local communities in the selection of project activities, contributed to case study project outcomes by increasing support for and adoption of activities. In the case of Senegal PGIES, local management plans that included conservation and sustainable management activities were developed by forming local management committees. In China IEM Drylands, farmers chose the livelihood activities that would best suit their needs and context. The project's midterm review attributed this process to ownership of the village environmental development plans (prepared in 444 villages), and adoption of activities. A similar process has been initiated by Malawi Shire Basin in villages co-managing forest reserves.

Brazil Rio Rural organized community groups called COGEMs in each microwatershed. One function of these groups was to develop their own project proposals for their respective microwatersheds, which Brazil Rio Rural would then fund as an incentive to adopt SLM practices. The

TABLE 4.4 Comparison of factors contributing to positive outcomes across portfolio of completed MFA and SFA projects

Reported factor	Factor type	% of projects reporting	
		MFA (n = 44)	SFA (n = 440)
National government support	Contextual	48	58
Good project design	Project related	32	9
Broader adoption processes initiated using project resources	Project related	5	38
Previous/current related initiatives	Contextual	14	54
Favorable political conditions/drivers/events	Contextual	0	18
Favorable economic conditions/drivers/events	Contextual	0	9

SOURCE: Analysis of terminal evaluations of completed MFA projects and of SFA projects from the OPS5 portfolio.
NOTE: All percentage differences between MFA and SFA projects are statistically significant at a 95 percent confidence level.

COGEMs also provided socioeconomic benefits: they allowed small and medium farmers to access markets they could not as individuals, including national food and school programs that directly bought their produce. Prior to this, an intensive and broad-based consultation was undertaken with stakeholders at all levels during project preparation, which contributed to shaping the project concept and selection of project areas.

Good coordination or continuity with previous or current initiatives contributed to achievement of outcomes in several case study projects. For example, China IEM Drylands had strong links with national institutions through the PRC-GEF Partnership on Land Degradation in Dryland Ecosystem Program. This improved project efficiency, which in turn contributed to positive outcomes. In Gansu, the project was also implemented in close coordination with the Strengthening Globally Important Biodiversity Conservation Through Protected Area Strengthening in Gansu Province (GEF ID 3864) project implemented by UNDP. This biodiversity SFA project strengthened activities within the Mt. Taizi protected area, while the MFA project supported boundary demarcation, and addressed agricultural drivers outside the protected area. The project was also designed as a blended project with IFAD's South Gansu Poverty Reduction Program and the Environmental Conservation and Poverty Reduction Program (Ningxia and Shaanxi Provinces). This increased project efficiency due to existing project management arrangements. An important factor contributing to coordination with other projects was the role of the provincial government in distributing donor-funded resources within its jurisdiction to avoid overlap.

Good project design, particularly one that was appropriate for the context of the project, was noted in project documents as a key contributor to both project outcomes and broader adoption in the MFA case studies. For example, two MFA projects integrated project activities with existing national laws to leverage additional benefits. Brazil Rio Rural incorporated the establishment of natural heritage reserves on private property into the project design, for which municipalities and landowners could benefit from national tax incentives. In China IEM Drylands, a national grazing ban provided cash compensation and subsidies for warm sheep sheds and planting of fodder, which the project also supported, to further help reduce grazing on sensitive grassland areas. Providing access to funding was key to ensuring that stakeholders were able to adopt innovative, environment-friendly practices. In Brazil Rio Rural, SLM was implemented through subprojects made possible with technical assistance and grants of between R$4,000 and R$6,000 to cover the upfront costs of switching to more sustainable agricultural practices. These costs had been identified in project design as a barrier to adopting SLM practices.

Another important aspect of project design was engaging not only key stakeholders, but also the wider network of actors in the field. As highlighted in the previous section, broader adoption in the form of replication and scaling up occurred during or soon after the project ended in cases where the project formed partnerships that leveraged the resources of multiple sectors, such as private companies, research institutions, civil society organizations, and other donors with similar objectives. In Senegal Ecovillages, 13 interministerial protocols were signed and implemented between government departments, private sector agencies, and nongovernment actors. The project partnered with two microcredit agencies, one developed as part of Senegal PGIES, to finance the purchase of renewable energy equipment, and biodiversity-friendly livelihood activities (e.g., beekeeping, soap making, bakery, aquaculture). Private sector investment facilitated replication of the project methodology in other villages through agreements to invest in renewable technologies, such as solar panels. This made it easier for villagers to switch from firewood to renewable energy. Other infrastructure was funded through grants from civil society organizations and private companies through their corporate social responsibility programs. Another partnership between government ministries and Senegalese academic institutions led to the development of a prototype for radiative cooling that improved storage of cereals, dairy and vegetables. In Brazil Rio Rural, the local government executing agency pointed out that by implementing interventions through multiple partners, mainstreaming among different sectors was faster, and the risk of losing funding or interest to continue these interventions was reduced. Features of good project design for enhancing synergies are discussed in section 5.3.

HINDERING FACTORS

The three factors mentioned in the most number of terminal evaluations for hindering achievement of outcomes in MFA projects ($n = 44$) were low institutional capacity (50 percent), poor project management (39 percent), and overly ambitious project objectives (32 percent). Low institutional capacity to implement activities was particularly linked to unsatisfactory outcome ratings.[4]

Poor project management was more frequently reported in terminal evaluations as hindering project outcomes in MFA compared to SFA projects in the OPS5 portfolio, while poor project design was noted in significantly fewer MFA projects as a hindering factor compared to SFA projects (table 4.5). Unfavorable political and economic conditions or events were also noted in fewer MFA projects as a hindering factor.

The Malawi Shire Basin midterm review, for example, noted that low institutional capacity beyond the project's control and poor project management were found to hinder achievement of the project's outcomes. Strict procurement rules and complex disbursement procedures caused delays in transfers of funds to communities, and in turn delays in project activities. District Councils that were expected to lead implementation were underresourced in terms of operational costs to achieve their mandates related to the project. Also, budget constraints hampered the functioning of the Shire Basin Stakeholder Forum, and several field activities were noted as underbudgeted.

[4] Statistically significant at a 95 percent confidence level ($p = 0.009$) using Fisher's exact test.

TABLE 4.5 **Comparison of factors hindering project outcomes at portfolio level**

Reported factor	Factor type	% of projects reporting MFA ($n = 44$)	% of projects reporting SFA ($n = 440$)
Poor project management	Project	39	13
Unfavorable political conditions/drivers/events	Contextual	18	40
Poor project design	Project	7	34

SOURCE: Analysis of terminal evaluations of completed MFA projects and of SFA projects from the OPS5 portfolio.
NOTE: All percentage differences between MFA and SFA projects are statistically significant at a 95 percent confidence level.

Insufficient stakeholder engagement was also identified in the midterm review as a hindering factor in the Malawi Shire Basin project. While there were reports of high levels of engagement and ownership in the co-managed forest reserves, this received less attention in other components of the project. The project midterm review notes that government extension workers at the district level played a limited role, with most contracts given to international consultants. This compromised ownership and sustainability of activities due to staff resentment. Shire Basin Stakeholder Forum members were not involved in planning or implementation; during a workshop in 2015, they had limited knowledge of project objectives. Members of the area development committee in one district noted that the committee is "aware of the Project but it does not exactly know what its objectives are except that there are activities in the Lengwe National Park as Project vehicles seem to visit the park frequently."[5]

A combination of factors, rather than any single factor alone, likely affected how outcomes and broader adoption were achieved in the case studies. While the first phase of the Malawi Shire Basin targets fewer environmental and socioeconomic outcomes, factors such as those mentioned above combined to hinder the timely achievement of some of these outcomes, as reported in the project's midterm review in 2015. Unless resolved, these factors may also create challenges in later phases. Several of these hindering factors were likewise raised in project reports of the other MFA case study projects, even though they reported high diversity in types of outcomes and achievement of broader adoption. The presence of key contributing factors, such as effective stakeholder engagement, highly relevant approach, and good coordination with previous or existing projects, may have overcome these hindering factors to facilitate the outcomes. At the portfolio level, projects with low institutional capacity yet satisfactory outcome ratings had either the absence of poor project management and overly ambitious project objectives, or the implementation of a highly relevant management approach in common.[6]
The sample size was insufficient to determine correlations between outcomes and project characteristics such as GEF Agency and project size.

[5] Noted in the project's midterm review 2015, p. 36.

[6] Results derived using qualitative comparative analysis.

5: Results: synergies and trade-offs

This chapter presents findings on both actual and potential synergies, trade-offs, and the degree to which trade-offs have been mitigated in MFA case study projects. SFA case studies were also assessed to identify and better illustrate similar or differing mechanisms to create synergies and address trade-offs. The final section explores common features of MFA case studies that contributed to enhancing synergies and mitigating trade-offs.

5.1 Synergies

Finding: MFA case study projects with a high diversity of types of outcomes generated these benefits through synergies. Activities with high potential for synergies common to the projects included tree planting, ecosystem protection and rehabilitation, clean energy technologies that reduced fuelwood use, and SLM practices, including use of organic waste as fertilizer.

As defined in box 1.1, **multiple benefits** are the aggregate benefits produced in more than one focal area by a project. Synergies are benefits produced simultaneously in more than one focal area through a single intervention, or through the interaction of outcomes. MFA projects are not required to create synergies among focal areas to be approved for implementation. The minimum approval criteria are that (1) proposed interventions directly align with the strategic priorities of at least two focal areas, and (2) indicators are specified to measure the achievement of benefits for each of these focal areas.[1]

The portfolio analysis showed that 74 percent of projects (n = 206) mentioned the terms "synergy" or "mitigation of trade-offs" in project documents. Slightly more projects in GEF-3 (79 percent) mentioned synergies compared to GEF-4 (71 percent) and GEF-5 (75 percent), however the reason for this would require further study. Identifying actual synergies and trade-offs at the portfolio level was not possible, as it required more detailed information on project activities and associated outcomes. The case studies provided this level of detail.

In the case studies examined, the four MFA projects with high scores on diversity of types of benefits (table 4.1) were found to implement more types of activities that each had high potential for synergies, many of which were used in combination within a project. Highly synergistic activities common to the case study projects are discussed below, and the associated benefits of these synergies are summarized in table 5.1. Synergies identified in SFA case studies are in table D.3.

Tree planting was an intervention in all five MFA case studies. In Brazil Rio Rural, this was reported

[1] While no guidelines exist on the criteria for MFA project approval as of this writing, this information was triangulated from a review of project documents, field visits, and interviews at the corporate and country levels.

TABLE 5.1 Examples and reported benefits of synergistic interventions in MFA case study projects

Project and synergistic intervention	Benefit			
	Biodiversity	Climate	Land	Socioeconomic
Tree planting				
Senegal PGIES: Planting nontimber forest product species, fire breaks (538 km)	Habitat restoration (inferred); 90% reduction in bush fires reported	Carbon storage (inferred)	Reduced erosion (inferred)	Increased income from collection and sale of nuts, fruits reported but not measured
Senegal PGIES: Mangrove restoration (2,862 ha)	Increased populations of fish and shrimp reported in one community	Carbon storage (inferred)		Fish and shrimp have increased and are harvested for income (for up to CFAF 7,500/day)
Senegal Ecovillages: Planting bamboo, firebreaks, and live hedges; nontimber forest products	Habitat regeneration in CNRs (inferred)	54 tCO_2/year stored with bamboo; 110 tCO_2/year stored in hedges	Soil stabilization (inferred)	Estimated revenues from forest fruits was 20% of agricultural income; sale of 800 kg of acacia harvested in the CNR gained a community member CFAF 680,000 for family; sale of 900 kg of jujubes earned CFAF 225,000 to cover household needs
China IEM: Tree planting in and around reserves	Contributed to reported increases in wildlife populations; biomass increased from 86.7 kg/mu to 194 kg/mu (Ningxia); vegetation cover increased from 80% to 83% (Shaanxi), and from 31% to 35% (Gansu)	Carbon storage (inferred)	Improved water quality reported; reduced erosion (inferred)	Income from processing fruit of indigenous fruit trees
Ecosystem protection and rehabilitation				
Senegal PGIES: CNRs and PUs (577,000 ha)	30% increase in presence of animal and plant species of global importance; increases of up to 70 animals in giant eland herds; habitat connectivity through three transhumant corridors	Reduction of 2.295 million tCO_2e calculated between 2004 and 2009 in eight CNRs	Reduced rangeland clearing in PUs reported	Legal access to resources in CNRs; reduced conflict over resources reported

(continued)

TABLE 5.1 Examples and reported outcomes of synergistic interventions in MFA case study projects *(continued)*

Project and synergistic intervention	Benefit			
	Biodiversity	Climate	Land	Socioeconomic
Senegal Ecovillages: Established/extended CNRs (28,875 ha)	Increased habitat connectivity (especially in chimpanzee habitat); contributed to measured net biomass gain of 1.7–2.4 m^3/ha/year	Carbon storage of 57,750 tCO_2/year with new CNRs		Nontimber forest products in CNRs increased household income (e.g., one woman reported earning CFAF 50,000 from tamarind collection)
Brazil Rio Rural: Rehabilitation of 1,332 ha of riparian land/913 source waters through tree planting/excluding cattle from source waters	Contributed to observed increases in wildlife (e.g., in Magé, increase in birds, frogs, and white-browed guan reported)	Source water protection stores an estimated 295 tCO_2/year	26% reduction in average sediment values in one microcatchment; Improved soil and water quality reported	Increased availability of water from source water protection allowed farmers to increase irrigation; in one pilot farm, pineapple production increased by 12%; reduced vulnerability to effects of drought and excessive rainfall
Malawi Shire Basin: Management of two protected areas and a marsh; co-management in six forest reserves	Habitat regeneration (inferred)	79.8 million t of carbon maintained in carbon sinks across all nine sites		Inferred benefits from habitat regeneration (more diverse crops, income from herbs)
Clean energy technologies				
Senegal Ecovillages: Improved stoves (solar, peanut, and 40% fuel-efficient clay stoves)	Avoided deforestation estimated at 900 ha from reduced extraction of fuelwood for cooking	Contributed to 42% reduction in GHG emissions from baseline to 2016		Women's labor reduced from less need to cut, collect, and haul firewood
Senegal Ecovillages: Solar panels and biodigesters (for cooking gas and lighting)	Avoided deforestation estimated at 900 ha from reduced extraction of fuelwood for cooking and lighting	Contributed to 42% reduction in GHG emissions from baseline to 2016	Inferred soil quality improvements from biodigester effluent used as fertilizer	Increased children's school performance with lights to study at night; solar-powered well pumps increased water supply; market gardening production increased by four (from irrigation and biodigester effluent)
SLM practices				
Brazil Rio Rural: Pasture rotation	336 ha of land put aside to benefit biodiversity	Sequestered 19,040 t of carbon for 224 pasture rotation projects	Average increase in soil organic material of 5.04 g/dm^3	80% increase in milk production in 90% of subprojects; average internal rate of return of 59% in six subprojects

to generate biodiversity benefits for through habitat regeneration and increase in wildlife populations, and land benefits through soil stabilization, especially during excessive rainfall. Tree planting also has the potential to produce benefits to the climate change focal area through carbon sequestration over the long term. Live hedges and firebreaks in Senegal Ecovillages were reported to sequester carbon and contribute to a reduction in bush fires. They were also inferred to reduce soil erosion, especially in sandy regions (table 5.1). In Senegal PGIES, tree species that provided nontimber forest products were specifically chosen for planting in the CNRs. In addition to inferred biodiversity and land benefits, increased income from the collection and sale of nuts, fruits, and other products was reported, though not measured. In Senegal Ecovillages, revenues from forest fruits was estimated at 20 percent of agricultural income. In China IEM Drylands, tree planting in and around reserves contributed to reported increases in vegetation cover and wildlife populations, improved water quality, and reduced soil erosion by wind. High-value indigenous fruit trees planted in some communities also generated additional income.

Ecosystem protection and rehabilitation was also common across all MFA case study projects, through various forms of sustainable use arrangements. For example, Senegal PGIES and Senegal Ecovillages both implemented CNRs and PUs to allow natural resource use without further degrading protected areas, while Malawi Shire Basin promoted co-managed forest reserves. Protecting or restoring the integrity of ecosystems has the potential synergy of improving biodiversity, maintaining ecosystem services such as soil stabilization, water quality and quantity (land degradation focal area benefit), and maintaining carbon sinks (climate change focal area benefit).

In Senegal PGIES, the CNRs contributed to a 30 percent increase in presence of animal and plant species of global importance and increased size of giant eland herds, due to reduced pressure on protected areas, habitat rehabilitation, and improved corridors. A reduction of CO_2 emissions was calculated in eight CNRs (table 5.1). Reduced conflict over resources was also reported in the project, due to the legal access provided through CNRs. Complementing the CNRs, Senegal Ecovillages introduced the planting of fodder in home gardens to reduce foraging in protected forests. An unexpected benefit reported from this is that children now attend school more regularly. Prior to this, they had to bring livestock out to forage, which resulted in school attendance for only three or four months each year.

In Brazil Rio Rural, preventing livestock from grazing in riparian areas, in addition to tree planting, contributed to reported increases in wildlife, an estimated 295 tons of carbon stored per year, and at least 26 percent sediment reduction in waterways (table 5.1). Improved water flow from source water protection was reported, which improved irrigation in some cases, as well as reduced the negative effects of recent droughts.

Clean energy technologies were introduced in three MFA case study projects. These were in the form of solar and fuel-efficient clay stoves, solar panels, and biodigesters. In all cases, these technologies had the aim of reducing firewood use and, to a lesser extent, fossil fuel use. In Senegal Ecovillages, there was a reported decline in extraction of firewood from use of solar stoves, solar panels and biofuel for cooking and lighting, with an estimated 900 ha of avoided deforestation. This suggests that preserved forests were maintained as carbon sinks, and continued to stabilize soil against wind erosion in dry areas. Another potential synergistic benefit is the preservation of wildlife habitats through reduced resource extraction. The technologies also had socioeconomic benefits. Women reported that reducing the need to collect firewood gave them more time and physical energy to spend on income-generating activities. Electricity from solar panels provided additional unexpected benefits; it allowed children to study at night, and to access drinking water through solar pumps while at school, rather than going back to their houses during the day. While not measured by the project, it is inferred that climate change focal area benefits in the form of reduced GHG emissions were generated through the use of biogas instead of fossil fuels in China IEM Drylands. Biodigesters simultaneously reduced threats to protected grasslands from grazing (biodiversity benefit), indirectly maintained carbon sinks through the preservation of the grasslands (additional climate benefit), and increased soil fertility (land benefit) through the use of biodigester effluent as fertilizer.

Four MFA case studies used organic waste as fertilizer not only in the form of biodigester effluent as in China IEM Drylands and Senegal Ecovillages, but also through compost and direct application of animal manure. Use of organic waste, such as animal manure, crop residues, and household waste, has the potential to benefit long-term soil fertility, water quality, and human health through reduced chemical fertilizer use and improved waste management. While these benefits were not directly measured in any of the projects, field interviews revealed that these benefits were perceived by community members who implemented these activities.

More broadly, SLM was also found to be highly synergistic. Consisting of a set of practices, the type of SLM interventions depended on the context, and often include some combination of the activities mentioned above with those primarily intended to improve agricultural productivity. For example, Brazil Rio Rural used pasture rotation to help rehabilitate agro-ecosystems. By letting land rest from grazing for a specific period, 19,040 tons of carbon was estimated to be sequestered in soil and vegetation. It also provided the opportunity for higher plant diversity through 336 ha of land set aside for biodiversity. Farmers benefited through an 80 percent increase in milk production linked to the rehabilitated pasture lands. In combination with this, the project promoted the use of chicken manure as fertilizer to naturally improve soil structure, and the planting of certain plant species to naturally repel pests (integrated pest management). Both SLM practices were said to reduce chemical use and agricultural expenses. While not specifically monitored, these practices are also inferred to reduce hazards to soil, wildlife, and human health.

The benefits produced by these different interventions, when combined, have the potential to produce another synergy: reduced vulnerability to climate change.[2] The four high-scoring MFA projects each supported multiple sources of energy, food, and income, thereby reducing community dependence on any single resource that might be affected by climate change. For example, in Senegal Ecovillages, vegetable gardens, fruit tree cultivation, and rustic poultry contribute to both food security and income diversity. The introduction of various sources of clean energy has also improved food security through irrigation of a greater variety of crops, bread production, and refrigeration for longer food storage. Solar-powered well pumps have increased access to drinking water. Well pumps also ensure crop productivity in the dry season, which has become more susceptible to reduced rainfall. All of these

[2] Socioeconomic resilience, combined with ecological resilience from intact ecosystems, improves the capacity of local communities to recover from climate change-related disturbances, such as droughts, floods, and storms (Adger et al. 2005; Cowie et al. 2011).

contribute to the villages' food security while avoiding GHG emissions. At the same time, tree planting and ecosystem protection activities in forests and grasslands contribute to providing ecosystem goods and services that further mitigate the negative effects of climate change, such as soil productivity and regulation of the hydrological cycle, as seen in Brazil Rio Rural during droughts and excessive rainfall.

5.2 Trade-offs

Finding: Trade-offs were found in all case study projects, primarily between environmental and socioeconomic outcomes. Three out of five MFA projects mitigated trade-offs in a way that provided additional value rather than simply reducing losses, essentially producing synergies.

The portfolio analysis revealed that 8 percent of the 206 projects in the MFA portfolio specifically used the term "trade-off" in project documents. However, as the case study analysis showed, the lack of use of the term does not necessarily mean that trade-offs were not present, or that they were not recognized and addressed during project design.

For the case studies, trade-offs were identified through an analysis of project activities and outcomes against potential trade-offs discussed in the literature (section 1.2). Trade-offs were identified between environmental and socioeconomic benefits, among objectives within or between focal areas, between short- and long-term objectives, and between local and national benefits. (Table D.2 contains a detailed list.) Geographic trade-offs were not identified in the case studies. This was primarily due to the difficulty in assessing outcomes beyond project area boundaries and attributing them to the project. The magnitude of trade-offs could not be calculated, as available data to estimate what would have happened in the absence of the projects was not sufficient.

- **Trade-offs between environmental and socioeconomic objectives.** Trade-offs between environmental and socioeconomic objectives were the most evident type of trade-off in the case studies. A common example was restricting or eliminating access of local beneficiaries to a particular area or habitat in order to benefit biodiversity. All MFA case study projects, as well as most of the SFA projects visited, had components that supported ecosystem protection in various forms. In Malawi Shire Basin, the protected area boundaries were strengthened with increased patrolling and enforcement, while in Brazil Rio Rural, farmers set aside land for private reserves. While increasing the areas under protection, these interventions reduced the potential socioeconomic benefits from these resources, such as access to meat for food and timber as a source of income. The scale of this type of trade-off ranged from small plots where specific activities were promoted over others, to the exclusion of all villages and families in and around a protected area. On the other hand, interventions that aimed to generate climate change and land degradation focal area benefits tended to produce rather than reduce socioeconomic benefits in the case study projects.
- **Temporal trade-offs.** In Brazil Rio Rural, landowners who established private natural heritage reserves traded short-term economic benefits from timber, cash crops, and other natural resources for long-term biodiversity protection, as well as corresponding ecosystem services that benefit long-term agricultural productivity. While the monetary scale of this trade-off was not assessed, 792 ha of land were converted into private nature reserves during the project.

- **Trade-offs within and between focal area objectives.** Senegal Ecovillages introduced the planting of Brazil grass to reduce foraging and firewood extraction from protected areas, and Jatropha in villages to replace the use of fossil fuel. While already widespread in the country, these two exotic species could potentially displace indigenous species outside of the protected area. Thus, in the case of Jatropha, there is a potential trade-off between the biodiversity and climate change focal area objectives; to some extent, the planting of Brazil grass is also a potential trade-off between biodiversity within and outside the protected areas. This potential trade-off is localized to the villages that planted these species in large quantities. Similarly, in China IEM Drylands, protecting grasslands from grazing by promoting the planting of maize for fodder is a potential opportunity cost for lowland biodiversity and other more diverse agro-ecological systems, particularly if the volume of fodder needed increases.
- **Trade-offs between objectives at different scales.** In Senegal PGIES, the establishment of CNRs provided local benefits through legal access to resources such as firewood, timber, and nontimber forest products. The CNRs, however, are an opportunity cost for using the land to achieve national goals. For example, the terminal evaluation reported that the national government had an interest to mine zircon in one of the project areas. Meeting local objectives means the national economic development objectives cannot be met in the same location at the same time. The terminal evaluation notes that the CNR in question was at risk of being expropriated for this use.

MITIGATING TRADE-OFFS

Potential losses from trade-offs were reduced in some projects through what this evaluation classifies into three types of mitigating measures: compensation, compromise, and value addition. Trade-offs were also found where there was no evidence of mitigation (table D.2); however, this was in part due to lack of available evidence to determine if mitigation had been considered or had occurred. Table 5.2 summarizes the types of mitigation measures evident in the MFA case study projects. Compensation was the only mechanism for mitigating trade-offs identified in the SFA case studies (table D.3).

Compensation involved direct payment or replacement of income to address the loss of socioeconomic benefits. In Brazil Rio Rural, the temporal trade-off associated with private nature reserves was offset through tax benefits established through a national law. This law was not a result of project activities but was leveraged to achieve project outcomes. Similarly, some

TABLE 5.2 **Types of measures identified in MFA case study projects for mitigating trade-offs**

Project	Type of mitigation measure identified			Trade-off with no evidence of mitigation
	Compensation	Compromise	Value addition	
Senegal PGIES		x		x
Brazil Rio Rural	x		x	
China IEM Drylands	x		x	x
Senegal Ecovillages		x	x	x
Malawi Shire Basin				x

farmers in the provinces that China IEM Drylands supported received cash compensation from the government for being relocated outside of the protected grassland areas.

Compromise occurred when the benefit to one focal area was decreased to reduce the anticipated loss to another focal area or socioeconomic aspect. In Senegal PGIES and Senegal Ecovillages, the creation of CNRs and PUs was a compromise between benefits to biodiversity and the local economy. Co-managed forest reserves in Malawi Shire Basin have a similar purpose. Full protected area status would maximize biodiversity benefits, but this would negatively impact local villagers who obtain food and income from the areas. These sustainable use areas have increased community access to natural resources but reduced the maximum benefits to biodiversity that could have been obtained through complete exclusion, thus achieving a compromise between environmental and socioeconomic objectives. The projects provided training in sustainable natural resource management to communities around protected areas to help address biodiversity focal area priorities.

Value addition occurred when an intervention not only addressed the trade-off, but also created benefits beyond the status quo. For example, in China IEM Drylands the objective of protecting grasslands precluded livelihoods based on grazing livestock. One intervention supported to mitigate this trade-off was a "Circular Park" in Gansu province, aimed primarily to reduce cattle-grazing on grasslands. The Circular Park is a facility that produces commercial livestock. All small farmers in the village where it is located have switched their income source from grazing sheep on protected grasslands to planting maize that is sold as fodder to the Circular Park. Beneficiaries interviewed said that their income from selling fodder required less effort and was more predictable compared to their previous income from grazing sheep. The Circular Park was designed so that animal waste was managed through biodigesters. This provided a low-carbon energy source both for the Circular Park and for the village, as well as additional income from high-value organic fruits and vegetables fertilized with biodigester effluent.

At another project site, villagers were restricted from taking medicinal herbs and mushrooms from the protected area. The project supported row farming of the same plants that were previously taken from protected areas, which provided villagers with a more consistent supply of resources. This resulted in incomes higher than what villagers were previously making, while ensuring protection of grassland areas. As part of this intervention, mulching was also introduced to preserve soil moisture. The local government in turn took measures to mitigate the effects of using plastic in mulching while at the same time creating another source of income. Farmers were paid ¥ 120/ton of used plastic delivered to stations for recycling, processing and reuse. After five years, more than 70 tons of plastic film had been collected and sold to the recycling station for ¥ 8,500. Plastic pollution was reported to have been reduced substantially in rural areas within and beyond the project. Apart from contributing to the biodiversity and climate change focal area benefits of ecosystem protection, row farming was inferred to contribute to avoided soil erosion both in the grassland areas (by keeping the ecosystem intact) and in the farms.

To mitigate the loss of using indigenous grass as forage and bedding for sheep, the project provided warm sheep sheds, and alfalfa as substitute fodder. This had the added value of providing permanent shelter for sheep, which improved their survival in harsh climates. Alfalfa as fodder was found to improve the quality of the sheep, which farmers could then sell for a higher price. Further supplementing this, the project supported cultivation of vegetables and fruits through greenhouses, which enabled farmers to sell produce off season for up to 10 times more than the usual price.

Through this combination of activities, a 100 percent reduction in resource extraction was reported in one province, and villagers earned more income from the higher-value products than before the project (e.g., a 60 percent income increase reported in Ningxia province). Shifting community livelihoods from grazing on grasslands to less climate-dependent forms of agriculture—such as using sheds for livestock, and greenhouses for fruit and vegetables—has the additional synergistic opportunity to reduce socioeconomic vulnerability to climate change. The project's set of interventions has the added potential of being self-sustaining due to the higher income generated from multiple non-extractive livelihoods.

In Senegal Ecovillages, Jatropha trees were planted for their oil to fuel rice mills and other engines in lieu of firewood. By choosing to plant the Jatropha as live hedges rather than in the more traditional monoculture plantations, the project mitigated the potential trade-off between biodiversity and climate change focal area objectives that would occur when converting large areas of natural habitats into plantations. The choice to plant Jatropha as live hedges rather than as forest stands served the additional functions of shade for village paths and meeting spaces, and of aesthetic fences that delineated private and public areas.

5.3 Factors enhancing synergies

Finding: MFA projects that generated more types of multiple benefits through synergies and mitigated trade-offs had three common features: intervention designs that integrated additional types of benefits, mechanisms for integrated decision making, and an integrated spatial unit for delivering a set of interventions.

MFA projects that generated more benefits through synergies and mitigated trade-offs in a way that created synergies had three common features that incorporated integration across different project dimensions. First, they implemented interventions that integrated additional benefits beyond the expected synergies. Second, these projects supported mechanisms for integrated decision making. While inputs from multiple sectors is a requirement during an MFA project's design, review, and approval stage (see section 6.1), these MFA case study projects promoted interactions among these sectors that enhanced opportunities for synergies and mitigation of trade-offs during project implementation. Third, the projects delivered activities within a distinct geographical unit, which allowed multiple benefits to interact and, in some cases, for drivers of environmental degradation to be addressed.

INTEGRATED BENEFITS IN INTERVENTION DESIGN

In each case where interventions produced synergies, additional benefits were generated as a result of how these interventions intentionally or unintentionally integrated more types of benefits within their design. As outlined in the previous sections, beyond the synergistic focal area benefits from tree planting, economic benefits were also generated in projects that chose to plant indigenous fruit trees rather than just any tree species. The choice to plant trees as hedges rather than as forest plantations in Senegal Ecovillages has created social benefits in addition to the primary climate change and land degradation focal area benefits. The choice of where to plant trees can also generate additional types of benefits. For example, Brazil Rio Rural protected water sources by planting trees in riparian areas, contributing to farmers' resilience against droughts. In introducing SLM practices to reduce land degradation, Brazil Rio Rural substituted commercial crop varieties with indigenous ones that were more resistant to drought through a seed exchange network, thus also contributing to agrobiodiversity and potentially further strengthening climate resilience.

When Senegal Ecovillages introduced additional sources of food and income that would reduce pressure on protected areas, the project chose to power them with clean energy technologies intended to reduce GHG emissions while improving socioeconomic well-being. Solar panels rather than traditional diesel-run generators were used to power pumps for irrigation and drinking water. When bakeries were built to employ villagers and supply bread, the ovens were designed to be run with biogas from biodigesters.

For interventions intended to reduce resource extraction, the choice of alternative livelihoods has implications on the extent to which synergies were generated. Beekeeping was a supplemental livelihood introduced in four MFA projects. This allowed the harvesting of a high-value product within protected or buffer areas without degrading forest ecosystems. A study done through Brazil Rio Rural found that higher crop fertilization occurred when bees were present, with a higher diversity of bee species linked to high forest cover and low forest fragmentation. Thus, promoting this environmentally sustainable livelihood has the added potential benefit of increasing agricultural productivity, which is in turn enhanced when community beneficiaries ensure that forest cover remains intact to support healthy bee populations. China IEM Drylands chose to introduce forms of livelihood that generated sustainable socioeconomic and potential climate change mitigation and adaptation benefits in the process of addressing biodiversity and land degradation focal area priorities, as illustrated in the previous section.

In contrast, the Strengthening Globally Important Biodiversity Conservation Through Protected Area Strengthening in Gansu Province SFA project addressed biodiversity focal area priorities by compensating farmers with benefits generated by corporate enterprises, similar to payments for ecosystem services. In return for forest maintenance and fire prevention, agreements were made with different private companies and the provincial government for some households to receive free electricity, and assistance with children's school expenses. Some also received a share of profits from a tree nursery, if the profits reached a certain level. When compared with China IEM Drylands, which was carried out in the same province, this appears to be a missed opportunity to create additional biodiversity, climate change, and land degradation focal area benefits through the type of sustainable income sources promoted by the project.

Similarly, the ADB-implemented Ningxia Integrated Ecosystem and Agricultural Development Project (GEF ID 2788) aimed to reduce soil erosion through vineyard plantations and tree planting. The choice of primarily vineyards to stabilize soil required high capital, which means that financial benefits accrue mainly to the owner of the vineyards; the rest of the villagers earn income as vineyard workers. As opposed to choosing soil-stabilizing plants that could also provide biodiversity, climate, or direct socioeconomic benefits to local villagers, the project used exotic tree species primarily for their aesthetic value. While the GEF grant of $4.5 million was used mainly for IEM education and awareness-raising activities, and comprised 2 percent of the total project budget of $215 million, the project was nevertheless funded solely through the biodiversity focal area allocation, and could have aimed to generate additional biodiversity benefits.

MECHANISMS FOR INTEGRATED DECISION MAKING

All four high-scoring MFA projects had national- or local-level multisectoral mechanisms in place that facilitated integrated decision making on what and how interventions would be delivered. These mechanisms provided opportunities to share ideas, reduce conflicts or overlaps in mandates, and solve problems in an integrated manner. This reflects similar findings in the 2014 GEF report on land degradation which found that in landscapes with multiple uses, trade-offs were better mitigated and more ecosystem services maintained when structures for negotiation were put in place early in the project (GEF 2014a). These structures built trust and confidence in decision making at multiple levels.

At the local level, Brazil Rio Rural organized COGEMs in each microwatershed that it supports. The COGEM is composed of 10 to 12 members representing different sectors in the community, identified by community members themselves as sectors that need to be represented. In the town of Magé, the COGEM was the first-time farmers had a venue for organized group discussions among themselves. In addition to agricultural activities, farmers used the opportunity to talk about water, climate, sanitation, and social issues, and as an organization were able to engage the municipality as a partner in proposing ideas for rural development.

In China IEM Drylands, Village implementation groups upgraded local plans to village environmental development plans incorporating elements of ecosystems, land degradation control, and biodiversity conservation. In Senegal Ecovillages, Village Development Committees and Inter-Village Development Committees discussed solutions to water, energy, and other resource issues.

In the case of Senegal PGIES, the establishment of Local Management Committees in PUs was the first time transhumants and pastoralists were involved in discussions, as these groups were historically excluded from natural resource management. Through these committees, traditional knowledge was incorporated in decision making, and the committees were praised in the terminal evaluation for fostering "greater solidarity and better cooperation between stakeholders."

At the national level, Senegal Ecovillages established a national level steering committee with ministries representing economy and finance, environment, agriculture, power, hydraulics, and renewable energy. The committee met every three months and discussed overlapping jurisdictions and mandates within the Ecovillages and adjacent protected areas. In one project site, a section of the protected area was rezoned as appropriate for village use after committee discussions given that the area was already being used for livestock; with the rezoning, the Ministry of Agriculture could provide seeds and support. The committee also helped resolve constraints in bringing the electricity network to Ecovillage sites to reduce the need for fuelwood through discussions with the Ministry of Energy, with the result that 100 percent of the Ecovillages population had electricity at the end of the project compared to 10 percent at the start.

In comparison, the Malawi Shire Basin project has no mechanism for intersectoral decision making at the national or local levels to date. Project components have so far been carried out independently by the Ministry of Irrigation and Water Management, the Department of National Parks and Wildlife (national park activities) and the Forest Department (forest reserve activities). There was some multisectoral interaction in the form of a technical team; however, this team had capacity issues, with the midterm review noting members were spending a mere 1 percent of their time on the project. This lack of mechanisms for integrated decision making could lead to missed opportunities to benefit more than one focal area.

INTEGRATED SPATIAL UNIT FOR DELIVERY OF INTERVENTIONS

Projects that implemented multiple interventions generated more synergistic benefits when the set of interventions to benefit multiple focal areas were delivered within integrated spatial units, such as a village, landscape, or watershed. Such spatial units are integrated due to multiple sectors and focal areas being functionally linked within their geographical boundaries. Thus, the outcomes of one intervention may naturally interact with or affect the outcomes of another intervention to produce synergies.

For example, Brazil Rio Rural used microwatersheds as the spatial unit for delivering interventions. The project management team had realized that the socioeconomic well-being of the farmers they were assisting depended on the healthy hydrological functioning of microwatersheds where the farmers lived. Each microwatershed had a set of interventions implemented both in farms and around water sources. Since these interventions were within the same spatial unit, they interacted in such a way that biodiversity benefits generated near water sources upstream also resulted in land benefits to farms downstream (i.e., through a better-regulated hydrological cycle). To foster long-term hydrological benefits for farmers, the project introduced forest protection measures that limited pasture options. However, it simultaneously introduced soil and water conservation practices such as pasture rotation that resulted in more immediate socioeconomic benefits to these same farmers. Farmers reap both immediate and potential long-term benefits, because both types of interventions were delivered within the same microwatershed providing these different ecosystem services.

The Ningxia Integrated Ecosystem and Agricultural Development SFA project also generated multiple benefits for the biodiversity and land degradation focal areas, as well as for socioeconomic improvement. However, instead of implementing its multiple interventions in an integrated spatial unit, the project introduced land degradation focal area interventions in one area and invested in biodiversity conservation in two distinct wetland systems. As a result, it missed opportunities to enhance synergies among focal areas, e.g., greater biodiversity benefits in the wetlands through the generation of land benefits, such as reduced soil erosion and use of chemical fertilizers within the same wetland system.

Though working within a river basin, which is an integrated spatial unit, the outcomes of the first phase of the Malawi Shire Basin project to date suggest that interventions could be more integrated. For example, conservation activities were directed at two national parks, a marsh, and six forest reserves; however, there has been no integration with other project activities within the basin, which include large-scale water infrastructure enhancements and flood risk reduction. This is despite the project also being funded by climate change and land degradation focal area allocations. Separate funding for climate change adaptation was provided to support activities in the marsh, but so far activities in this area have focused on biodiversity studies, which are not linked to activities in other project sites in the river basin. Because the first phase primarily aims to build capacities over a large geographical area, the delivery of interventions in a way that would enhance synergies and mitigate trade-offs within the river basin may potentially occur in later phases.

6: The multifocal area approach: institutional aspects

This chapter lays out the opportunities and risks at the institutional level related to implementing projects as MFA rather than as SFA. It explores the GEF's role in enhancing synergies and mitigating trade-offs through the MFA approach, identifying the conditions which would allow opportunities to be maximized and the risks minimized.

6.1 Opportunities and risks

Finding: Implementing projects as MFA was found to allow opportunities to fulfill global and national commitments simultaneously, leverage focal area funding, streamline project management costs, and increase multisectoral interaction. However, the corresponding need to involve more sectors risks higher transaction and operating costs during project design, review, and monitoring.

At the institutional level, the decision to integrate multiple focal areas and implement a project as MFA rather than as an SFA has corresponding opportunities and risks. That is, some opportunities emerge when pooling funds from multiple focal area) allocations that otherwise do not when project funding is sourced from a single focal area. At the same time, some disadvantages and risks were also reported that are distinct to MFA projects.

SIMULTANEOUS FULFILLMENT OF COMMITMENTS

Several of the GEF country operational focal points interviewed (five of eight) mentioned that MFA projects allow countries to achieve multiple focal area and livelihood objectives simultaneously. Some mentioned that the option for MFA funding can help them meet the requirements of multiple conventions, as well as other national and international commitments (e.g., the Paris Agreement), through a single project. Interviewees pointed out that national action and local development plans tend to integrate multiple sectors and focal areas. Similarly, the conventions and SDGs call for addressing multiple focal areas and socioeconomic priorities together. In addition, MFAs provide flexibility in the set of interventions to be implemented, which allows the priorities of multiple stakeholders to be achieved alongside those of the GEF and the national government. For example, a study by the GEF on the OP12 and OP15 portfolios found that by making support to production systems a priority under the land degradation focal area, GEF funds have allowed countries to test approaches that integrate the achievement of global environmental benefits within development projects (GEF 2014a).

Some Agencies, especially development banks, find that the more comprehensive nature of MFA projects makes them more likely to be scaled up. About half of the Agencies interviewed said that

MFA projects were easier to integrate into their normal operations, because their mandates and approaches are already broad and holistic to begin with. Some of these Agencies are not environment focused, but rather deal with development issues that more often than not overlap with environmental issues. As an added benefit, the requirement of having to address different focal area priorities to access MFA funding was reported to push Agencies and countries to think in a broader, more systems-oriented manner. This kind of thinking has encouraged ideas for creating benefits for multiple focal areas in an integrated way.

On the other hand, some recipient countries and Council members have concerns that MFA projects are an avenue for GEF funds to be used for development interventions that do not directly address environmental issues. Focal area integration in MFA projects and programs is perceived as having less of a clear link to convention guidance and reporting, which makes it harder to determine whether country obligations to conventions are being met or not. Integration was said to also make it more difficult to directly link focal area funding with reported focal area benefits, especially because some benefits, such as resilience, are difficult to measure.

Interviews with government and donor staff in countries revealed that the GEF as a financial mechanism for multiple MEAs influences the types of interventions it supports relative to other donors; however, the role of GEF support varies depending on the country. For example, previous bilateral donor projects in Senegal that aimed to promote cleaner energy sources also identified areas for forest protection as part of SFM. But even though the Senegal Ecovillages model was scaled up at the country level, subsequent donors did not seek to produce synergies beyond socioeconomic and climate benefits. Replication sites are to date typically not linked with protected areas to also achieve biodiversity benefits. In China, projects in dry grassland regions funded by other donors were similarly focused on socioeconomic and land benefits, missing opportunities for biodiversity or climate synergies; some older projects failed to consider biodiversity trade-offs resulting from land management activities. On the other hand, in Brazil, the popularity of the Amazon Forest has historically channeled donor funds toward biodiversity-focused interventions, more recently in the context of primarily achieving climate benefits. GEF support in Brazil has allowed investments in "less popular" yet biologically diverse biomes, where additional synergies with land degradation focal area objectives are potentially higher. In Malawi, several donors have implemented community-based interventions similar to those in GEF-supported projects, but these were not linked to a larger-scale initiative such as that cofinanced by the World Bank.

LEVERAGED FOCAL AREA FUNDING

At the corporate level, the option to integrate funds from multiple focal areas has allowed each focal area's priorities to be addressed in more interventions while using less of each focal area's allocation. Leveraging STAR funds in this way is a synergistic effect that has resulted partly from the SFM funding incentive.

As shown in figure 3.4, biodiversity projects funded as MFA were found to have almost the double the cofinancing ratio on average compared to when they were implemented as SFA (6.5 versus 3.8). This was despite the biodiversity focal area funding in MFA projects being lower on average than the funding allocation for biodiversity SFA projects (figure 3.5). In interviews, the GEF Secretariat and GEF Agencies observed that the biodiversity focal area is able to leverage its funding allocation through MFAs because, first, it can channel more funds for biodiversity mainstreaming in landscapes, especially through the SFM and climate change funding allocations; second, in countries where the biodiversity agenda is not a priority, Agencies are able to mainstream it into more sustainable development-oriented interventions such as those producing land degradation focal area benefits in landscapes. The GEF has intentionally made support to production landscapes a biodiversity focal area priority in the last 15 years as a way to address drivers of biodiversity loss, and countries are now investing more cofinancing into this type of project, compared to those addressing only protected areas (GEF 2016b). The MFA portfolio's more integrated and flexible approach in simultaneously addressing environmental and socioeconomic issues leads to governments being more willing to provide counterpart support for interventions that benefit biodiversity focal area priorities.

While the climate change focal area has seen the greatest increase in funding allocation from GEF-4 to GEF-5 (89 percent), it has consistently had the lowest percentage of MFA projects and funding (18 percent and 5 percent respectively in GEF-5). Despite this, 87 percent of MFA projects that did not receive climate change focal area funding tracked climate change-related indicators. The majority of MFA projects address land degradation– and biodiversity-related drivers that are inferred to also produce climate benefits in the form of carbon sequestration and avoided emissions (section 3.3). These data suggest that, through MFA projects, climate change focal area priorities are being addressed indirectly without significantly affecting resources for the larger climate change focal area portfolio.

The option to fund projects as MFA has, in the case of the land degradation focal area, allowed the highest increase in number of projects (56 percent) in GEF-5 despite getting the lowest increase in funding allocation (4 percent) over the same period. The United Nations Convention to Combat Desertification Secretariat raised the concern in an interview that land degradation focal area funding in MFA projects may not be serving the poorest countries, which have the greatest need to address land degradation issues, but often do not have the biodiversity or forest resources required to access biodiversity or climate change STAR funding. This evaluation found that the number of low-income countries receiving land degradation focal area funding increased between GEF-4 and GEF-5 from 34 percent to 58 percent, primarily through MFA projects. This has translated to the share of low-income countries in terms of total MFA grants with land degradation focal area components increasing from 7 percent to 23 percent within the same period. No statistically significant difference was found in average MFA project size between low-income and other countries in GEF-5. However, the percentage of total land degradation focal area funding invested in low-income countries decreased from 38 percent to 21 percent within the same period—equivalent to a decrease of $31 million—despite more countries being supported. This means that higher-income countries are receiving the bulk of the land degradation focal area allocation through SFA projects.

PROJECT CYCLE BENEFITS AND COSTS

Larger projects are perceived by countries and Agencies to be more cost-effective, because this allows economies of scale in project management relative to implementing the same set of interventions through several smaller projects. Greater efficiency was seen particularly in MFA projects that work on multiple focal area issues within the same geographical areas, or with the same set of stakeholders or sectors, or both. Having a single MFA project under these conditions decreases the likelihood of potential overlaps in implementation activities, or coordination costs between multiple SFA projects.

In GEF-5, an MFA project was more than double the size of an SFA project in the biodiversity and land degradation focal areas on average (figure 3.3). The majority of stakeholders interviewed (16 of 29) cited the potentially larger size of MFA projects as one reason they were submitted as such rather than as SFA projects. This was said to be especially crucial for small countries, which could supplement their STAR resources with additional SFM funding. Larger projects can implement theoretically higher-impact interventions that address both national and global priorities. Larger projects are also required to have more cofinancing in terms of actual dollars, further increasing total project size.[1]

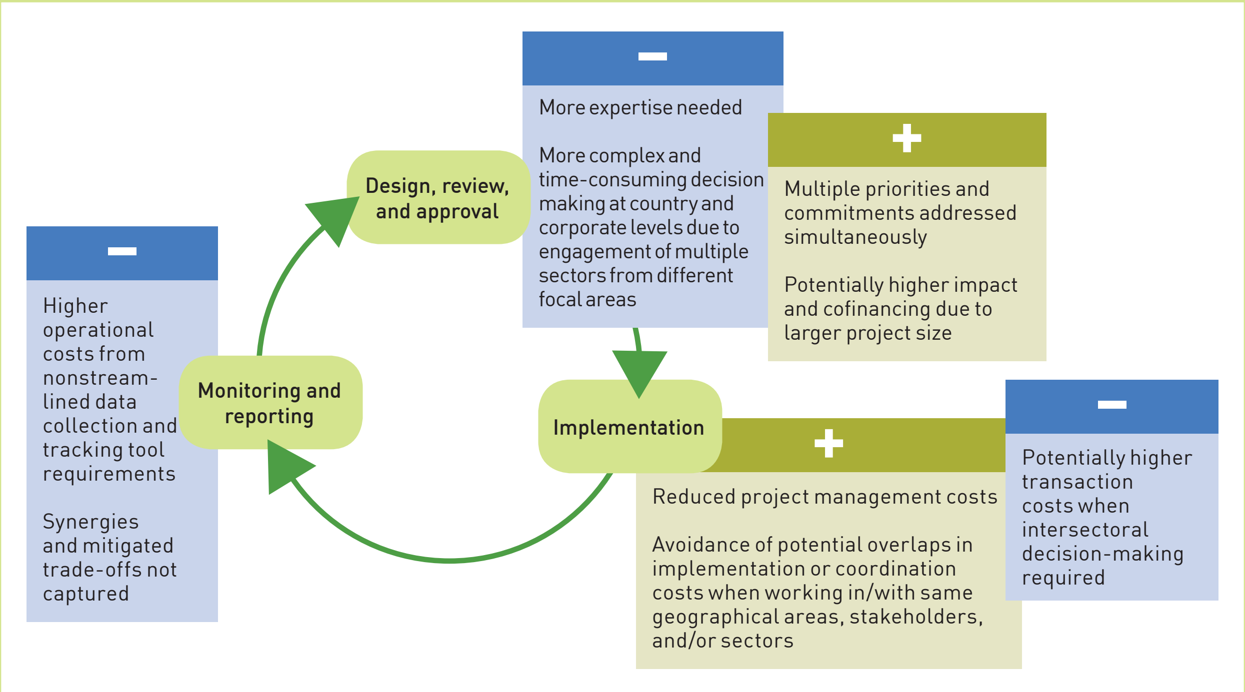
Yet despite prospects of having a larger project, of the 144 countries that received STAR allocations in GEF-5, the great majority implemented only one or no MFAs. Sixty-two percent of countries with flexibility in allocating STAR funds (STAR allocation ≤ $7 million) did not implement any MFA projects. Those that do not have STAR flexibility are expected to implement more MFA projects, since this would be a way for them to pool resources and develop larger projects. Yet these nonflexible countries allocated most of their funding to SFA projects as well, with 86 percent of such countries implementing only one MFA project or none compared to four or more SFA projects. These numbers suggest that despite the potentially larger size of MFA projects, most countries prefer to implement SFA rather than MFA projects. Countries typically submit proposals for MFA projects within the first half of each GEF replenishment period to take advantage of SFM funds, which tend to run out without warning later in the replenishment period; in the absence of SFM funds, they preferred to develop SFA projects. This was confirmed by interviews and a project cycle analysis.

One reason for this cited in interviews was the transaction costs arising from the need to engage multiple sectors and stakeholders associated with the different focal areas. This was cited as a concern particularly during project design, review and, approval (figure 6.1). Within the countries, stakeholders from various sectors need to be consulted iteratively. Local and national, as well as public and private stakeholders, have very different objectives and work cultures. Agreement is needed from all relevant convention focal points, who are often located within different ministries, and therefore have differing priorities, constituencies, and review processes. Procurement processes may be slower due to the additional expertise needed and sectors involved. Within the GEF Agencies, different focal area expertise are needed to identify the funding rationale and outcome indicators linked to each component focal area. Within the GEF Secretariat, members from the relevant focal area teams have historically also needed to provide feedback and agree on the proposed project, although this has reduced with the new structure organized around regions. Whether at country or corporate level, the involvement of more actors leads to more complex and time-consuming decision making as each one tries to maximize benefits for their respective focal area or sector. In some cases, this has created competition for funding at all levels of the GEF partnership rather than coordination of activities, further making the negotiations challenging.

A project efficiency analysis done by this evaluation showed however that, on average, MFA projects did not take longer to be approved or

[1] Technical Document 1 in volume 2 presents the results of all analyses conducted using GEF and GEF IEO data sets.

FIGURE 6.1 Benefits and costs of focal area integration within GEF project cycle



implemented compared to SFA projects.[2] Interviews with Agencies and GEF Secretariat staff independently supported this. These results suggest that more complex interactions in MFA projects may be slowing down not the project approval process but project preparation. In interviews, transaction costs were not mentioned as an issue during project implementation, as the same set of stakeholders typically implemented the same set of interventions, which then yielded benefits to multiple sectors. However, transaction costs could potentially be higher in projects where coordination and multisectoral decision making are required to implement different interventions on the ground.

In terms of monitoring, having more focal areas in one project translates into a greater variety of methodologies to be applied, and more data to be collected for each reporting period. Agencies are required to prepare separate tracking tools for all the focal areas targeted by an MFA project. An MFA project combining biodiversity, land degradation, climate change mitigation, and SFM focal area objectives required a total of 1,055 data fields to be filled in GEF-5, reduced to 772 in GEF-6, of which 20 percent were considered "high effort" (GEF IEO 2017). This means that to answer those fields, additional actions would have to be undertaken to obtain data. Agencies need to fill out these tracking tools at least three times during the project cycle. The data need to be verified across documents to ensure that no benefits are double counted. This can make project preparation and monitoring costlier in terms of time and funds.

[2] Variables tested were time elapsed between project approval, CEO endorsement, and actual start date; length of project implementation; time elapsed between project approval and actual completion date; and project extension length. Length of time between CEO endorsement and first disbursement was analyzed by the GEF Secretariat (GEF 2016a) and similarly showed no significant difference between MFA and SFA projects on this variable.

One Agency reported having to fill out tracking tools for about 70 protected areas even though the biodiversity funding allocation for the MFA project was less than $1 million. At least two MFA programs have attempted to streamline the tracking tools for their own reporting requirements, but none have been successful enough to be adopted at the institutional level. Almost all of the 12 Agencies interviewed said that despite all the data required by these tracking tools, synergies among focal area targets and indicators relevant to the country context are not captured. No additional project management fees are provided to cover the additional efforts required.

Due to these high transaction and operational costs, Agency estimates of the minimum threshold for a viable MFA project range from $4 million to $10 million, depending on the overall size of their portfolio. They say that only with projects this large would the benefits and efficiencies of doing an MFA project outweigh the costs. Agencies at country level noted that any project involving multiple sectors and stakeholder groups, whether MFA or SFA, would have the same challenges. Biodiversity SFA projects in particular were found to be complicated due not only to the multiple stakeholders to be consulted, but especially because of the biodiversity focal area tracking tool.

MULTISECTORAL INTERACTION

While the involvement of more actors at all levels does make the project design and approval process more complex, it also provides an opportunity for interaction among sectors that otherwise might not typically work together. For example, collaboration between the environment and agriculture local government agencies in Brazil and China during project implementation led to project activities being sustained, mainstreamed, and replicated beyond the project period (section 4.2). Ministries that normally might not be involved in environmental projects, such as the Ministry of Health, were approached to become co-executing agencies. Countries that reported learning and coordination as a benefit of implementing MFA projects were the same ones that had mechanisms for sectoral integration in place (section 5.3). In GEF Secretariat, the different focal area teams interviewed said that reviewing MFA projects allowed them to better understand the priorities of other focal areas. However, this did not necessarily translate to increased cooperation within GEF Secretariat or elsewhere at project design stage; the differences in structures and processes across sectors both at the corporate and country levels proved difficult to harmonize, and left little opportunity or time for deeper learning or collaboration.

6.2 Conditions suited to the multifocal area approach

Finding: Environmental issues and management approaches that by nature are linked to multiple focal areas were found to be more suited to being addressed through MFA projects. In some cases where an MFA project was appropriate, the lack of institutional arrangements for integration was found to limit opportunities to enhance synergies and mitigate trade-offs.

As shown in section 1.3, the GEF has promoted focal area integration by providing financial incentives and strategically engaging with countries to implement projects as MFA. However, while pooling focal area allocations in an MFA project may result in multiple benefits, it does not guarantee the creation of synergies and mitigation trade-offs. Addressing multiple focal area priorities together in one project was found to provide more opportunities for synergies to be enhanced and trade-offs to be better mitigated when the project was supporting certain environmental issues and management approaches. On the other hand, the lack of institutional arrangements and capacity for sectoral integration limited these opportunities.

ENVIRONMENTAL ISSUES

In interviews, three types of environmental issues emerged as most suitable for MFA projects: (1) when the issue has potential consequences on multiple focal areas, (2) when the issue is caused by drivers linked to multiple focal areas, and (3) when different issues linked to multiple focal areas occur within the same spatial unit (table 6.1).

Deforestation, unsustainable land use, and land use change are examples of environmental issues that can have negative consequences on the biodiversity, climate change, and land degradation focal areas. A review of project documents showed that 71 percent of the MFA portfolio addressed deforestation or forest degradation. Sixty-nine percent addressed unsustainable land use practices, while 29 percent addressed infrastructure expansion in forests.

In general, the degradation or destruction of ecosystems that provide goods and services benefiting these three focal areas is suited to being addressed through MFA projects. In interviews, one Agency mentioned forest, peatland, and grassland ecosystems as being particularly suitable, not only because they provide ecosystem services benefiting the biodiversity, climate change, and land degradation focal areas, but also because they are historically linked to community livelihoods that are vulnerable to climate change.

All five MFA case studies addressed ecosystem destruction or degradation. Each worked in forests, with one also in grasslands, all of which were being used for traditional livelihoods. By reducing ecosystem degradation, these projects generated or were expected to generate biodiversity, climate, and land benefits, while also creating socioeconomic benefits for adjacent communities. Three of the five SFA case studies also addressed deforestation through biodiversity focal area funding. However, the types of interventions implemented were biodiversity-focused, such as improving protected area infrastructure, and engaging communities in protected area management activities. The four high-scoring MFA projects supported interventions that also specifically targeted land degradation and climate change focal area priorities, which had synergistic socioeconomic benefits. Three of these MFAs generated multiple benefits that in combination are expected to reduce these communities' vulnerability to climate change (section 5.1).

All stakeholder groups interviewed identified climate change adaptation as an environmental issue linked to all focal areas. That is, failure to adapt to climate change can reduce or discontinue

TABLE 6.1 Environmental issues suited to being addressed through MFA projects

Type of environmental issue	Example
Has consequences on multiple focal areas	Deforestation, unsustainable land use practices, land use change, destruction or degradation of ecosystems such as forests, peatlands, and grasslands
Is caused by drivers linked to multiple focal areas	Climate change adaptation
Several linked to multiple focal areas within the same spatial unit	Loss of biodiversity from forest degradation, GHG emissions from burning of firewood, lack of food security, and out-migration of youth from rural areas due to lack of livelihood opportunities within village

biodiversity, land, and climate benefits. At the same time, when biodiversity, climate change, and land degradation focal area priorities are not addressed, vulnerability to climate change increases. For example, farmers in the state of Rio de Janeiro were vulnerable to droughts and landslides due to deforestation and other unsustainable agriculture practices. Brazil Rio Rural introduced interventions that contributed to forest protection and soil quality improvement, both of which benefited the biodiversity, climate change, and land degradation focal areas. By doing so, farmers report being less affected by droughts and landslides as a result of having more consistent water supply from springs and more stable slopes. In addition, GHG emission reductions through these interventions could be considered a significant contribution to climate change mitigation, as Brazil's carbon footprint is mainly from deforestation and unsustainable land use.

Similarly, two SFA case studies primarily addressed climate change adaptation using climate change focal area funding.[3] To achieve this, the Climate Adaptation for Rural Livelihoods and Agriculture project (GEF ID 3302) implemented by the African Development Bank in Malawi introduced irrigation, drought-tolerant crops, watershed management, tree planting in gullies to reduce erosion and sequester carbon, and a variety of livelihood activities. These activities in combination aimed to reduce vulnerability to climate change by addressing the biodiversity- and land degradation–related upstream drivers of flooding and erosion (deforestation due to charcoal production and agricultural expansion), while also increasing local capacity to adapt to these changes through less climate-dependent food and income sources. The IFAD-implemented Climate Change Adaptation Project in the Areas of Watershed Management and Water Retention (GEF ID 4234) in Senegal also introduced new crop varieties and dikes that would help communities adapt to saltwater intrusion resulting from climate change. However, while declining groundwater levels was a critical driver of vulnerability, the project did not implement any specific biodiversity-related interventions that could help improve the hydrological services provided by nearby forests.

When several environmental issues linked to multiple focal areas occur within the same spatial unit, MFA projects are also suitable, because interventions addressing these different issues can then be implemented by the same set of stakeholders that are driving and/or experiencing the environmental problems. In Senegal, forest degradation was being driven by the need for fuel and food in rural villages. Several issues needed to be addressed: loss of biodiversity from forest degradation, GHG emissions from burning of firewood, lack of food security, and out-migration of youth from rural areas due to lack of livelihood opportunities. Senegal Ecovillages therefore implemented interventions addressing biodiversity, climate change, and socioeconomic issues using villages as the spatial unit. All villagers were engaged in and benefited from the project's multiple interventions, which at the same time addressed biodiversity and climate change focal area priorities by reducing forest degradation. The project document states that the choice to address multiple issues using an integrated approach through an MFA project was a deliberate one, with the argument that separate noncoordinated projects in the same areas would have reduced overall effectiveness.

Consistent with the scientific literature and PMIS data, Agencies reported that issues common to the biodiversity and land degradation focal areas were especially conducive to focal area integration. More than half of the MFA portfolio combined

[3] These two projects were funded by the Least Developed Countries Fund.

these two focal areas. In contrast, they observed how it was difficult to put together a project that combined the climate change mitigation focal area with the biodiversity or international waters focal areas. PMIS data show that in GEF-4 and GEF-5, only two or fewer projects had these combinations; all other biodiversity or international waters focal area combinations with climate change mitigation only occurred in LULUCF projects. Projects that work primarily on land issues were generally perceived to be suitable for MFA projects, since multiple benefits to land degradation, climate change mitigation and climate change adaptation, and livelihoods are very likely to be produced by interventions seeking to improve soil and water quality, as well as to biodiversity in cases where globally significant ecosystems or species are involved.

On the other hand, certain environmental issues and strategic priorities have been more frequently addressed with a targeted, non-integrated approach through SFA projects. For example, programs or focal area priorities focused primarily on renewable energy, energy efficiency, sustainable transport, capacity building for biosafety and access to genetic resources, or invasive alien species were addressed by no more than two MFA projects in each GEF replenishment period, and in many cases, none. Although these priorities may also be addressed through MFA projects, GEF Secretariat staff interviewed said that in cases where the proposed interventions may also produce benefits for, but do not directly address a focal area's priorities, an MFA project may be asked to be resubmitted as an SFA project.

TYPES OF MANAGEMENT APPROACHES

When approaches to addressing environmental issues generate benefits to or target the priorities of multiple focal areas at the same time, they are also suited to being implemented through MFA projects. Examples given by Agencies and GEF Secretariat were those related to natural resource management and ecosystem-based management, which typically address biodiversity and land degradation issues at the same time; integrated agriculture that can touch upon land degradation, climate change mitigation and chemicals and waste, as well as biodiversity where agrobiodiversity is a concern; and SLM and ecosystem protection that respectively deal with land degradation and biodiversity focal area priorities, as well as climate change adaptation. As seen in section 3.3, the majority of MFA projects implement these types of management approaches.

Three of the MFA case studies with a high diversity of types of benefits used IEM as their main approach. The approach was adopted more broadly in Brazil and China due to its intersectoral way of simultaneously addressing food security, income, climate change adaptation, and ecosystem services protection.

INSTITUTIONAL ARRANGEMENTS

Though many countries have environmental issues suited to the design of MFA projects, they do not necessarily propose such projects. An important condition observed as necessary to design and implement MFA projects was the existence of institutional arrangements for integrating multiple sectors and focal area expertise.

At the project approval level, Brazil has a national committee composed of representatives from the five ministries hosting the three convention focal points and the two GEF country focal points. The committee discusses which environmental projects will be funded by which donor, and it may advise different stakeholders to merge their project proposals and work together on one large project if this is more cost-effective. In China IEM Drylands, all three provincial governments benefiting from the project functioned as executing agencies that integrated departments responsible for different sectors, such as environment (biodiversity focal area), agriculture (land degradation focal area), health, and social development.

Conversely, in contexts where capacity for focal area or sectoral integration is low, countries may be forced to rely more on Agency expertise, which reduces their control over the project preparation process. One Agency helps design MFAs only for executing agencies that have the broad mandates and funding resources necessary for integration. In some countries where interministerial bodies do not exist, the demand of various stakeholders to get funding for their respective priority projects may lead to GEF operational focal points allocating STAR funds to several small projects rather than to a larger MFA one, even when the latter may be more effective. Even within Agencies, expertise in multiple focal areas may not be available, therefore making them more likely to advocate for projects in a single focal area in which they specialize.

Exacerbating the effects of low institutional capacity for integration, no guidelines exist so far on how MFA projects are to be developed, reviewed, and approved. Because of this, MFA projects require more planning, consultation, and explanation with the stakeholders who are involved in approving them. Some Agencies noted that there was less risk in two SFA projects versus one large MFA project getting rejected if any of the stakeholders within the GEF partnership did not reach consensus on it. While the GEF has strategic priorities for each focal area, there are none that specify how and which focal area synergies might best contribute to the GEF's vision. Because of how the GEF is set up, project reviews are still done by focal area rather than holistically, which may discourage project designs that could potentially generate synergies that do not neatly align with any individual focal area strategy.

A GEF Secretariat study in 2014 on combating land degradation in production landscapes called for guidance to be developed for countries detailing strategic priorities for MFA programming, types of integrated approaches that GEF could invest in, options for achieving synergies in global environmental benefits, and indicators for quantifying benefits. In 2016, the GEF Secretariat began to develop internal guidelines on how to review MFA projects. The STAP also devised a screening tool especially for MFA projects, and commissioned a study on the science of integration in the same year. However, these recent developments do not aim to provide strategic or operational guidance to countries and Agencies on when or how MFA projects are best implemented.

7: Conclusions and recommendations

The purpose of this evaluation was to assess the extent to which the GEF's MFA portfolio has generated multiple benefits, including any synergies and trade-offs. In the process, it also aimed to characterize the MFA portfolio, a subset of the GEF portfolio that had not yet been comprehensively assessed. It did not, however, aim to determine whether MFA projects have better or worse results than SFA projects in general, due to the wide variety in types and aims of MFA projects. This chapter presents the main conclusions drawn from the findings presented in the previous chapters. Following are recommendations on how to maximize the opportunities for enhancing synergies and mitigating trade-offs in the MFA portfolio.

7.1 Conclusions

Conclusion 1: The proportion of MFA projects in the GEF portfolio is increasing, with most projects addressing multiple focal area priorities through integrated approaches. Since GEF-3, when the integration of the objectives of multiple focal areas in single projects was formalized, the number of MFA projects has increased by about 50 percent in each succeeding GEF replenishment period in terms of both number of projects and total GEF grants. The focal areas most commonly combined in MFA projects are biodiversity and land degradation (54 percent); half of these projects also address climate change focal area priorities (biodiversity, land degradation and climate change jointly, 27 percent). While MFA projects are larger than SFA projects on average, the evaluation found that this does not necessarily compel Agencies and countries to implement projects as MFA solely with the aim of having a bigger project. The majority of MFA projects in GEF-5 targeted land degradation and biodiversity focal area priorities simultaneously within landscapes, including integrated landscapes, protected area systems, and production landscapes. Seventy-four percent of MFA projects were designed to implement IEM, landscape-based management, or both, which are approaches that address multiple focal area issues simultaneously. Forty-three percent addressed both agriculture and forestry sectors by combining approaches such as sustainable agriculture or SLM with sustainable forest management and sustainable forest use/protection; of these, 71 percent also addressed biodiversity concerns through ecosystem-based management.

Conclusion 2: Most MFA projects respond to convention guidance, as well as to both global trends and national priorities. Of the MFA projects funded through biodiversity or climate change focal area allocations, at least 79 percent respond directly to convention guidance by addressing strategic priorities related to land use and land use change, protected areas, and biodiversity mainstreaming. The MFA portfolio reflects global trends toward integration across sectors, and between environmental and socioeconomic objectives as stated in the three Rio conventions and the Sustainable Development Goals. MFA projects also respond to national priorities through flexibility in addressing global environmental commitments (e.g., the Paris Agreement) and national sustainable development goals together. The GEF has promoted focal area integration by providing financial incentives and strategically engaging with countries to implement projects as MFA.

Conclusion 3: The large majority of completed MFA projects report achievement of multiple benefits and broader adoption by project end. Of the completed projects with outcome ratings, 77 percent were rated moderately satisfactory or higher, similar to the overall GEF portfolio. However, the generation of benefits linked to project activities was not necessarily dependent on project performance, as all 49 completed projects in the MFA portfolio reported positive environmental outcomes in their terminal evaluations. Of these, 80 percent reported benefits in the same focal area combinations they had targeted, as well as in socioeconomic aspects. Broader adoption was reported to have begun or taken place in 80 percent of projects by project end, primarily in the form of mainstreaming and replication. Low institutional capacity among executing agencies was a primary factor linked to poor achievement of outcomes and absence of broader adoption in the MFA portfolio. Factors within the project's control, such as good engagement of key stakeholders, good project design, and coordination with related initiatives, were among those most frequently cited as contributing to successful outcomes. These results are similar to the rest of the GEF portfolio. Partnerships forged to leverage resources from multiple sectors particularly contributed to replication and scaling-up in case study projects.

Conclusion 4: MFA projects that are designed for integrated benefits, include integrated decision making among sectors, and are implemented in an integrated spatial unit are associated with greater diversity in the number and types of benefits. They are also better able to enhance synergies and mitigate trade-offs. Opportunities for synergies across the focal areas, as well as with socioeconomic objectives, were commonly found in tree planting, ecosystem protection and rehabilitation, clean energy technologies that reduced fuelwood use, and SLM practices. The most common trade-off observed in analyzed cases was between environmental and socioeconomic objectives. Potential losses from trade-offs were reduced through three types of mitigating measures: compensation, compromise, and value addition. Compensation involved direct payment or replacement of income to address the loss of socioeconomic benefits. Compromise occurred when the benefit to one focal area was decreased to reduce the anticipated loss to another focal area or socioeconomic aspect. Value addition occurred when an intervention not only addressed the trade-off, but also created focal area and socioeconomic benefits beyond the status quo, essentially producing synergies. MFA projects that reported the highest number and diversity of types of benefits had three common features: intervention designs that integrated additional types of benefits, mechanisms for integrated decision making among multiple sectors, and an integrated spatial unit for delivering a set of interventions. These features enhanced synergies and mitigated trade-offs through value addition, essentially also producing synergies.

Conclusion 5: At the institutional level, MFA project implementation generates benefits, but is also associated with higher costs. Implementing projects as MFA has both benefits and costs. Benefits occur in the form of opportunities to fulfill global and national commitments simultaneously, leverage focal area funding, streamline project management costs, and increase multisectoral interaction. The option to integrate funds from multiple focal areas has allowed each focal area's priorities to be addressed through more interventions while using less of each focal area's allocation. This is particularly true for the land degradation focal area, which typically receives lower funding; for the biodiversity focal area, this has leveraged higher cofinancing. Because MFA projects tend to be larger on average, they allow for economies of scale in project management, relative to implementing the same interventions through several smaller SFA projects. The involvement of more actors provides an opportunity for interaction among sectors that might otherwise not typically interact.

Costs occur in the form of efficiency losses, mainly during project design, review, and monitoring due to the increase in number of stakeholders and sectors required to provide inputs. Whether at the country or corporate level, the involvement of more actors leads to more complex and time-consuming decision making, as each actor tries to maximize benefits for its respective focal area or sector. Current reporting requirements for MFA projects increase operating costs; at the same time, synergies generated and trade-offs mitigated are not captured.

Conclusion 6: Implementing a project as MFA is most appropriate when the environmental issues to be addressed, or management approaches to be supported, provide opportunities to enhance synergies and mitigate trade-offs across focal areas. Appropriate institutional arrangements enhance the synergies. Merely pooling focal area allocations in an MFA project may result in multiple benefits, but does not guarantee the creation of synergies or mitigation of trade-offs. When MFA projects were implemented under conditions that by nature are linked to multiple focal areas, more opportunities to generate synergies and better mitigate trade-offs were created. These conditions include environmental issues whose causes, consequences, or spatial occurrence are linked to multiple focal areas; and management approaches that inherently address multiple focal area priorities. In some cases where conditions for an MFA project were appropriate, the lack of institutional arrangements for sectoral integration was found to limit these opportunities. Lack of strategic and operational guidelines for MFA projects contribute to this limitation.

7.2 Recommendations

Recommendation 1: Identify conditions appropriate for the implementation of MFA projects at the project design and review stage. MFA projects are not required to be integrated, or to seek synergies and mitigate trade-offs. However, projects successful at enhancing synergies and mitigating trade-offs have common conditions and characteristics that have enabled them to maximize the benefits of having multiple focal area objectives. GEF Agencies must ensure that the environmental issues and management approaches targeted by MFA projects allow for such benefits while managing the higher transaction costs. Existing capacities and institutional arrangements for sectoral integration at the corporate and country levels should be assessed as part of the MFA project design and approval process. Opportunities for good stakeholder engagement, partnerships to leverage resources from multiple sectors, and integration in project interventions, should be considered in this assessment.

Recommendation 2: Streamline and enhance monitoring and reporting of MFA projects, including their synergies and trade-offs. Although attempts have been made at program level to remove repetitive and irrelevant indicators from tracking tools, streamlining of monitoring and reporting tools in MFA projects is needed at the institutional level. Project monitoring tools should also measure and report on the synergies generated and trade-offs mitigated.

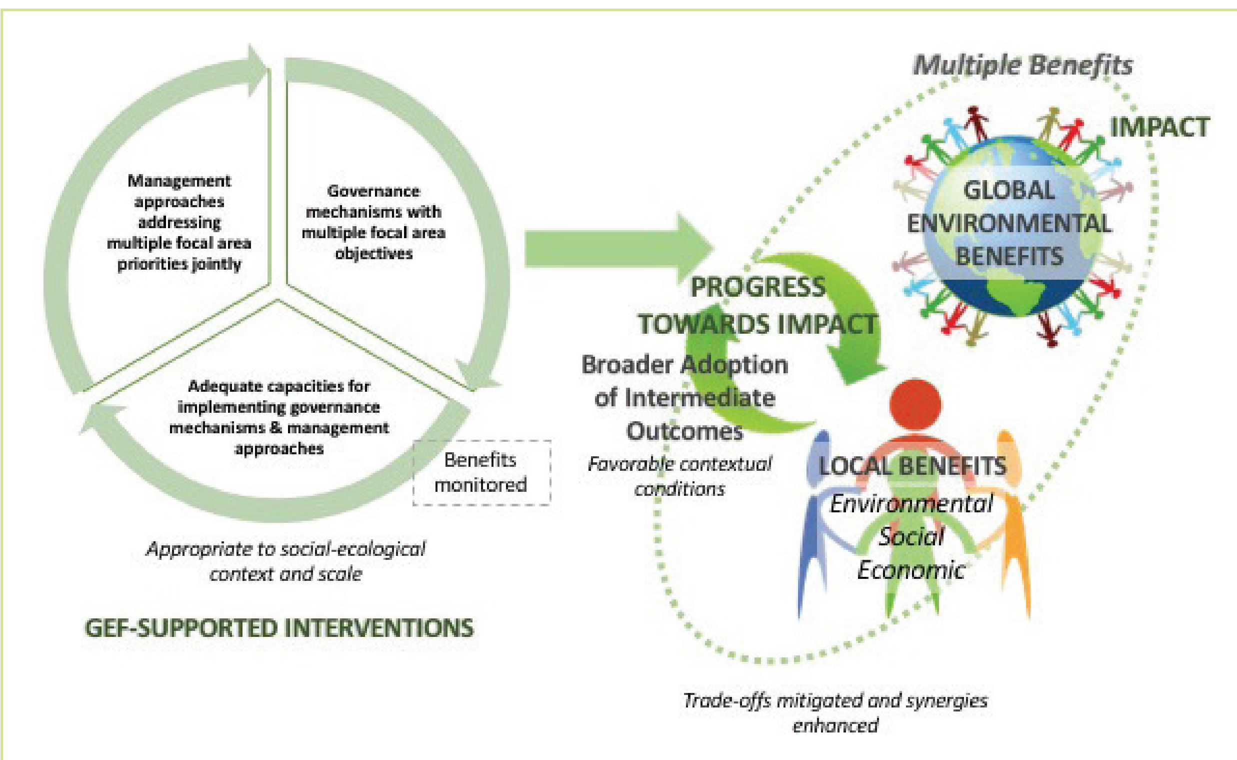
Recommendation 3: Develop shared guidance on the conditions for designing, reviewing, and implementing MFA projects across the GEF partnership. While strategic priorities have been developed for each focal area, none specify how and which focal area synergies might best contribute to the GEF's vision. As a starting point, members of the GEF partnership need to adopt a common understanding of key concepts, such as multiple benefits, synergies, trade-offs, and integration. Building on the findings of this evaluation, the GEF should develop guidance on the conditions under which MFA projects should be designed and implemented, to enhance synergies across focal areas. Minimum criteria or standards for MFA project design and monitoring will ensure that the benefits of focal area integration are maximized, while transaction costs at the corporate and country levels are managed.

Annex A: Approach and methodology

A.1 Theory of change for the evaluation

A theory-based evaluation designs its questions around an intervention's "theory of change," or the logical pathway of how the intervention is expected to lead to the desired impacts (Fitz-Gibbon and Morris 1996; Weiss 1972). A theory of change was developed for this evaluation as a heuristic to help identify the key activities and processes expected to occur for multiple benefits to be achieved (figure A.1). It builds on the scientific literature on multiple benefits and synergies, and the general theory of change framework for the GEF (GEF IEO 2013). Multiple benefits refer to both global environmental benefits (e.g., ecosystem goods and services that have global significance, such as reduction in forest loss and degradation) and the local benefits that support their achievement (e.g., food security, access to sustainable energy). Local environmental, social, and economic benefits

FIGURE A.1 Theory of change on how GEF support contributes to the achievement of multiple benefits



are recognized within the GEF as tightly linked to global benefits, with the former supporting achievement of the latter by providing incentives and the appropriate social conditions and enabling behaviors that sustain global environmental benefits (GEF IEO 2006).

The theory of change shows three types of GEF-supported interventions—governance mechanisms, management approaches, and capacity building—that typically interact to contribute to the achievement of impact, which in the GEF context is equated with achievement of global environmental benefits. For example, management approaches that address priorities of multiple focal areas jointly include sustainable agriculture, SLM, sustainable forest use and protection, ecosystem- or landscape-based management, and ecosystem-based adaptation (e.g., Cowie et al. 2011; Dudley and Stolton 2010; Bierbaum et al. 2014; Gisladottir and Stocking 2005). Capacities that the GEF helps develop may include the institutional architecture for leveraging private sector resources, to gradually reduce dependence on public and donor funding. These interventions must be appropriate to the scales and the specific social-ecological system that the interventions are implemented in, as the type and extent of benefits generated by the same interventions are expected to be different depending on the context (Cowie, Schneider, and Montanarella 2007).

Further multiple benefits may be generated through the broader adoption of intervention outcomes. Broader adoption may occur through these outcomes being sustained, replicated, mainstreamed or scaled up (box A.1). This requires contextual conditions to be favorable, such as the capacity and willingness of governments and other stakeholders to build on the outcomes of GEF support. As more multiple benefits are generated, this can create a positively reinforcing feedback loop of increasingly broader adoption—as indicated by the circular arrow in figure A.1—thus also increasing the extent of global environmental benefits. Monitoring the extent to which multiple benefits and broader adoption are being achieved is necessary for assessing the progress made through GEF support toward achieving longer-term impact.

BOX A.1 Definition of broader adoption

Broader adoption takes place when stakeholders (e.g., governments, private sector, civil society, other donors)— whether originally part of the project or not—adopt, expand and build on the initiatives that GEF funds, during the project period or afterwards, as a result of initial project successes. It can occur in the following ways.

- **Sustaining.** When a GEF-supported intervention or outcome is continued by the original beneficiaries without GEF support so that they can keep reaping the benefits.
- **Mainstreaming.** When information, lessons, or specific aspects of a GEF initiative become part of a stakeholder's own initiatives, such as laws, policies, regulations, and programs. This may occur through governments and/or through development organizations and other sectors.
- **Replication.** When a GEF-supported intervention is copied at a similar scale, often in other locations.
- **Scaling-up.** When a GEF-supported intervention is implemented at a larger geographical scale, often expanded to include more political, administrative, economic or ecological components. This allows concerns that cannot be resolved at lower scales to be addressed and promotes the spread of GEF contributions to areas contiguous to the original project site.
- **Market change**. When a GEF-supported intervention influences economic demand and supply shift to more environment-friendly products and services.

Impact is considered a dynamic value that is progressively being achieved through a combination of interventions interacting with various contextual conditions, rather than as a fixed target to be met. Thus, this value may accrue or decrease over time, depending on these nonlinear interactions.

While multiple benefits may be generated through synergies, trade-offs may also be expected, since maximizing one benefit may not be compatible with the generation of other benefits. Due to social-ecological systems being inherently complex, synergies and trade-offs may occur in a nonlinear fashion, where the addition or exclusion of a single environmental or socioeconomic objective can have cascading effects in terms of both benefits and costs. Furthermore, costs and benefits vary across spatial and temporal scales, as well as to the particular environmental, social, and economic contexts of the various stakeholders. These differences therefore need to be considered when assessing the opportunities and limitations of GEF support for mitigating trade-offs and enhancing synergies across focal area priorities; among environmental, social and economic objectives; and across spatial-temporal scales. Consistent with the principles underlying the GEF environmental and social safeguards, social and environmental risks posed by GEF-supported interventions to local communities were also assessed as potential trade-offs.

The evaluation theory of change takes into account the complex processes associated with the social-ecological systems in which GEF support is provided.[1] Changes in these systems may take place at time scales and geographical areas different from that of GEF support, and thus may not be directly observable or measurable. Outcomes produced by other actors and processes may interact with GEF support to promote or hinder progress toward impact. The evaluation therefore assessed not only elements related to GEF support, but also how contextual elements have affected achievement of outcomes.

A.2 Evaluation components: variables and methods used

Table A.1 presents the indicators and methods used for the three main evaluation components.

A.3 Overview of case study projects

Table A.2 provides an overview of the MFA and SFA case study projects used in this evaluation.

A.4 Selection criteria for case studies

The countries visited were selected based on the amount of GEF MFA funding received since the pilot phase, and the total amount of GEF funding allocated.[2] Selections were made from two categories of countries: countries that each account for about 10 percent of total national MFA funding (i.e., China, Brazil, India), and countries receiving mid-level funding (i.e., $9 to 15 million).[3] The selection of countries was further narrowed down to those that had at least one full-size MFA project and one full-size SFA project both approved in GEF-4 or later, when GEF's funding allocation system was already in place, and under implementation for at least four years. Table A.3 summarizes the criteria

[1] Social-ecological system is a term used to describe the interactions of human and environmental systems within a particular time and space. "Social" refers to all human spheres, such as economic, cultural and political systems. "Ecological" refers to all systems of nonhuman origin, such as biological, climate and biogeochemical systems.

[2] Using GEF-6 STAR allocations as indicative of total historical allocations. Information publicly available in GEF (2014b).

[3] (1) Based on PMIS data as of January 2016; (2) based on the third quartile of GEF-6 STAR allocations.

TABLE A.1 Summary of evaluation components and corresponding methods

Topic assessed	Data sources and analytical methods	Unit of analysis (max *n*)	Unit of comparison (max *n*)
Portfolio component			
History and design of MFA portfolio to achieve multiple benefits	▪ Statistical analyses of PMIS data set ▪ Document reviews ▪ Literature review	Project (250)	n.a.
▪ MFA portfolio trends ▪ MFA project design characteristics	▪ Statistical analyses of PMIS and terminal evaluation review data sets ▪ Aggregation and descriptive analysis of data from document reviews	Project (250)	▪ SFA projects in PMIS data set (2,267) ▪ SFA projects in terminal evaluation review data set (192)
▪ Progress toward impact ▪ Factors affecting outcomes	▪ Aggregation and descriptive analysis of data from review of terminal evaluations ▪ Qualitative comparative analysis	Project (49)	SFA projects in OPS5 progress toward impact data set (440)[a]
▪ Forest cover loss ▪ Vegetation productivity	▪ Geospatial analysis ▪ Econometric analysis ▪ Statistical analyses	Site (460)	▪ SFA sites (1593) ▪ Sites with no intervention (7420)
Case study component			
▪ Environmental and socioeconomic outcomes ▪ Synergies and trade-offs	▪ Comparative analysis of data from interviews, field visits, monitoring data and document reviews ▪ Geospatial analysis ▪ Literature review	Project (5)	SFA project (5)
▪ Progress toward impact ▪ Factors affecting outcomes	Comparative and thematic analysis of data from interviews and document reviews	Project (5)	SFA project (5)
Institutional component			
▪ Characteristics of MFA projects ▪ Project cycle differences between MFA and SFA projects ▪ The GEF's role and comparative advantage	▪ Thematic analysis of interviews and document reviews ▪ Statistical analyses of PMIS and terminal evaluation review data sets	▪ GEF corporate processes ▪ Country processes	▪ SFA processes ▪ Non-GEF processes and interventions at global and country levels

NOTE: n.a. = not applicable

a. The OPS5 progress toward impact data set consists of projects whose terminal evaluations were submitted between 2005 and 2012. This data set was used in lieu of the OPS6 data set, which was not completed at the time this evaluation was undertaken.

applied in sequence in the selection of case study countries.

Based on these criteria, China and Brazil were selected under the first category of countries, and Malawi and Senegal under the second category of countries. While India also accounts for about 10 percent of the MFA portfolio funding, no similar SFA site was available. However, it was visited as an additional source of information in synergy with the Programmatic Approaches evaluation and Land Degradation focal area study. Information

TABLE A.2 Overview of case study projects

GEF ID	Country and project	Summary project description	Focal area	Implementation period
MFA projects				
933/ 2268	Senegal: Integrated Ecosystem Management in Four Representative Landscapes of Senegal (PGIES)	Established biosphere-type reserves to address land degradation, fragmentation and pressures on biodiversity loss in four representative landscapes	Phase 1: OP12 Phase 2: LD	Phase 1: 2004–07 Phase 2: 2007–11
1544	Brazil: Rio de Janeiro Integrated Ecosystem Management in Production Landscapes of the North-Northwestern Fluminense (Brazil Rio Rural)	Used IEM, SLM, and establishment of private nature reserves to address deforestation and soil erosion from overgrazing and unsustainable agriculture	OP12	2005–11
2369	China: An IEM Approach to the Conservation of Biodiversity in Dryland Ecosystems (China IEM Drylands)	Used an IEM approach to address land degradation and associated decline in biodiversity and ecosystem services in three dryland provinces in Western China (Gansu, Ningxia, and Shaanxi)	BD, LD	2011–16
4080	Senegal: Participatory Biodiversity Conservation and Low Carbon Development in Pilot Ecovillages in Senegal (Senegal Ecovillages)	Implemented renewable energy, carbon storage, and biodiversity-friendly livelihood activities to address unsustainable management of natural resources and resulting threats to protected areas	BD, CC	2011–16
4625	Malawi: Shire Natural Ecosystems Management Project (Malawi Shire Basin)	Phase 1 of a long-term project to address key pressures in the Shire Basin through improved park management, forest co-management, sustainable livelihood activities, and water infrastructure improvements	BD, CC, LD	2012–ongoing
SFA projects				
2788	China: Ningxia Integrated Ecosystem and Agricultural Development Project	Implemented large-scale water infrastructure (through cofinancing), water and resource management, and conservation and tourism to address land and water degradation as threats to wetland biodiversity	BD	2009–16
2934	Brazil: Catalyzing the Contribution of Indigenous Lands to the Conservation of Brazil's Forest Ecosystems	Implemented forest protection, sustainable agriculture, management planning, and policy development activities to build capacity for strengthening the role of indigenous lands in biodiversity conservation at national, indigenous land, and site levels	BD	2009–16
3864	China: Strengthening Globally Important Biodiversity Conservation Through Protected Area Strengthening in Gansu Province	Improved management capacity and financial sustainability of the Gansu protected area system to address current biodiversity threats	BD	2011–15
3302	Malawi: Climate Adaptation for Rural Livelihoods and Agriculture	Implemented activities to improve response to the impacts of climate change at community levels, through irrigation, habitat restoration and drought-tolerant crops as well as national-level capacity building	CC	2012–16
4234	Senegal: Climate Change Adaptation Project in the Areas of Watershed Management and Water Retention	Combined water harvesting and conservation with climate-tolerant crops to address decline in agricultural productivity due to climate change impacts	CC	2012–16

NOTE: BD = biodiversity; CC = climate change; LD = land degradation.

TABLE A.3 Criteria for selecting countries for case studies

Criteria	Detail	Rationale
GEF funding	Accounts for about 10 percent of total MFA funding or receives GEF-6 STAR allocation of $9–$15 million	▪ Expected to have largest impacts on global environment due to size of country/economy and amount of GEF investment ▪ Expected to have more constraints in project design due to lack of flexibility and relatively low allocation
Project size	Full size	To ensure that intervention is large enough to be expected to achieve environmental outcomes
Years of implementation	At least 4 years (based on actual implementation start date, or CEO endorsement date if information not available)	To allow enough time for environmental outcomes to have been achieved by intervention and to be measurable
GEF period	GEF-4 or later	To allow assessment of effects of the GEF's funding allocation system (RAF and STAR) and ensure similarity in programming strategy (shift from operational programs to strategic programs)
Availability of comparison SFA project	▪ Same criteria as above ▪ Where possible, similar to MFA project in objectives/intended outcomes, type of intervention, ecosystem or drivers being addressed, and/or site location	To identify similarities and differences in characteristics between the two types of projects

from interviews of operational focal points in Jordan, Morocco and Tunisia, which were visited for the Programmatic Approaches evaluation, was also taken into account in the findings.

A.5 Selection criteria for sites visited

MFA project sites within countries were selected based on the availability of comparable SFA and non-GEF project sites (e.g., within the same eco-region or landscape), upon the recommendation of implementing and executing agencies. At least two sites were visited per MFA project to allow verification of spatial differences in outcomes. Table A.4 shows the sites visited in each country and project; table A.5 presents the numbers and types of stakeholders interviewed.

A.6 Benefit scoring approach

For each case study, quantitative and qualitative benefits were systematically collected in tabular format from self-reported outcomes identified in project documents (project implementation reviews, terminal evaluations, and other reports where available) and interviews with project staff and beneficiaries. Literature was reviewed where necessary for additional details and context regarding country-level policies or laws, specific interventions used, and species planted. Inferred benefits were recorded where there was sufficient evidence in the form of reported outputs with likely benefits (e.g., carbon sequestration from stated hectares or kilometers of trees planted). The analysis included benefits achieved across a broad scale as well as those benefiting one or a few individuals/families.

Outcomes were categorized into 15 categories, three for each of the following focal areas or sectors: biodiversity, land degradation, climate change, "other environmental," and socioeconomic. Under each category, a list of benefits was identified to standardize and capture the range of

TABLE A.4 Countries, projects, and sites visited

Country	GEF ID	Project Title	Focal area	Agency	Visited Project Sites
Brazil	1544	Rio de Janeiro Integrated Ecosystem Management in Production Landscapes of the North-Northwestern Fluminense	MFA	World Bank	Magé, Nova Friburgo and Niterói in the State of Rio de Janeiro
	2934	Catalyzing the Contribution of Indigenous Lands to the Conservation of Brazil's Forest Ecosystems	BD	UNDP	Rio de Janeiro and Angra dos Reis in the State of Rio de Janeiro, and Mangueirinha in the State of Paraná
	3767	Strengthening National Policy and Knowledge Frameworks in Support of Sustainable Management of Brazil's Forest Resources	MFA	FAO	Rio de Janeiro in the State of Rio de Janeiro, Caçador in the State of Santa Catarina, and Curitiba in the State of Paraná
China	2369	An IEM Approach to the Conservation of Biodiversity in Dryland Ecosystems	MFA	IFAD	Hezheng County, Taizishan National Nature Reserve and Liewa Village in Gansu Province; Yanchi County and Haba Lake in Ningxia Hui Autonomous Region
	2788	Ningxia Integrated Ecosystem and Agricultural Development Project	BD	ADB	Baohu Lake, Shahu Lake, and IEM center in Ningxia Hui Autonomous Region
	3483	PRC-GEF Partnership: Forestry and Ecological Restoration in Three Northwest Provinces (formerly Silk Road Ecosystem Restoration Project)	MFA	ADB	Heihe National Forest Park in Shaanxi Province
	3608	PRC-GEF Partnership: Sustainable Development in Poor Rural Areas	MFA	World Bank	Quliuyuan Village and Dingjiagou Village in Longxian County, Shaanxi Province
	3864	Strengthening Globally Important Biodiversity Conservation Through Protected Area Strengthening in Gansu Province	BD	UNDP	Taizishan National Nature Reserve and Liewa village in Gansu Province
Malawi	3302	Climate Adaptation for Rural Livelihoods and Agriculture	CC	AfDB	Chikhwawa, Lilongwe
	3692	Effective Management of Nkhotakota Wildlife Reserve (PDMNWR)	BD	World Bank	Lilongwe, Nkhotakota, Blantyre
	4625	Shire Natural Ecosystems Management Project	MFA	World Bank	Lengwe National Park, Nsanje, Lilongwe, Chikhwawa, Blantyre
Senegal	933/ 2268	Integrated Ecosystem Management in Four Representative Landscapes of Senegal, Phases 1 & 2	MFA & LD	UNDP	Dakar, Guembeul, Mbambara, Toubacouta, Keur Saloly
	4080	Participatory Biodiversity Conservation and Low Carbon Development in Pilot Ecovillages in Senegal	MFA	UNDP	Dakar, Mbackombel, Ndick, Sandiara, Sussane
	4234	Climate Change Adaptation Project in the Areas of Watershed Management and Water Retention	CC	IFAD	Dakar, Keur Saloly

NOTE: BD = biodiversity, CC = climate change; LD = land degradation; ADB = Asian Development Bank, AfDB = African Development Bank, FAO = Food and Agriculture Organization of the United Nations. Shading indicates projects included in the case study analysis. Non-GEF projects visited not included in list.

TABLE A.5 Number of stakeholders interviewed, by country and type

Country	Community group	Donor	GEF Agency	GEF Secretariat	Government	Indigenous group	CSO	Private sector	Acad./research institution	Total
Brazil	14	1	9		26	6	2	5	11	74
Country			8		9				4	21
Local		1			17		2	5	7	32
Site	14		1			6				21
China		2	6		3					11
Country		2	6		2					10
Local										
Corporate					1					1
Malawi	3	5	7		30		8	1		54
Country		5	6		13		1			25
Local			1		14		1	1		17
Corporate					3					3
Site	3						6			9
Senegal	82		4		17		1			104
Country			4		13		1			18
Site	82				4					86
Corporate			22	9						31
Total	99	8	48	9	76	6	11	6	11	274

specific outcomes reported or inferred from all 10 case studies. The types of benefits identified in each category are listed in table A.6.

Each type of benefit identified in a case study was given a score as follows:

Score	Description
1	Benefit quantitatively measured (M)
0.5	Benefit reported qualitatively (in terminal evaluations, project implementation reviews, interviews) but not quantitatively measured (R)
0.25	Benefit inferred from reported outputs (I)
0	No benefits reported (N)

Scores assigned to each benefit were added within a category, and then an average of the three categories was taken for each focal area or sector. Below is an example using the biodiversity focal area.

Category	Benefit	Score
Ecosystem cover	Forest cover increased by 25% over the project period	1
Biodiversity and/or species populations	Diversity studies show an increase of 10% in bird species	1
	Community members have observed an increase in populations of grazing animals	0.5
Reduced threats to biodiversity	Extraction of nontimber forest resources was reported to have decreased with project activities	0.5
	Forest fires have reduced by 90% due to project activities.	1
Total score for biodiversity focal area		4÷3 = 1.33

The average scores for each focal area, other environmental benefits, and socioeconomic benefits were added together into a total score for the diversity of types of benefits per case study project. This allowed for a more standard method

TABLE A.6 Benefits, by category

Category	Benefit
	Environmental benefits
(BD) Ecosystem cover and/or quality increased and/or maintained	▪ Increased ecosystem cover (of relevant habitat)—e.g., habitat restored, habitat regenerated ▪ Improved ecosystem quality (e.g., improved wetland habitat observed improvements) ▪ Increased habitat connectivity (e.g., between protected areas, inferred if corridors deliberately created)
(BD) Biodiversity and/or species populations (flora or fauna)	▪ Increased or maintained flora/fauna population (observed or measured) ▪ Increase species diversity (observed or measured)
(BD) Reduced threats to biodiversity (includes reduced extraction)	▪ Reduced burning/fires/charcoal ▪ Reduced timber/firewood extraction ▪ Reduced grassland, rangeland and forest clearing for other land use purposes ▪ Reduced removal of nontimber resources (e.g., plants, mushrooms, other) ▪ Reduced poaching of animals
(LD) Improved soil quality	▪ Increased organic material (measured, or inferred from activities) ▪ Increased nutrients (measured) ▪ Increased agricultural productivity due to soil improvement activities (as a proxy for improved soil but use R)
(LD) Soil structure improvements	▪ Reduced erosion ▪ Water quality improvements due to reduced sedimentation in waterways ▪ Improved water flow from groundwater restoration
(LD) Reduced threats to land	▪ Reduced use of chemical fertilizer, pesticide use ▪ Reduced grassland and rangeland clearing ▪ Reduced burning ▪ Reduced deforestation
(CC) Carbon sequestered	▪ From active tree planting (calculated or inferred) ▪ From allowed regeneration (calculated or inferred from land protected, taken out of use, etc.)
(CC) Maintenance of carbon sinks	*Due to project activities, carbon that is currently stored (in forests, soils, etc.) is not released* ▪ From protection activities—e.g., CNRs, improved protected areas ▪ From reduced burning of forests ▪ From reduced deforestation
(CC) Reduced GHG emissions	▪ From reduced bush fires/burning ▪ From replacement of fuel sources with cleaner burning fuels
Other environmental benefits/reduced environmental threats: air	▪ Air quality improvements
Other environmental benefits/reduced environmental threats: waste/water	▪ Waste management/reduction

Category	Benefit
Environmental benefits	
Other environmental benefits/reduced environmental threats: chemicals	▪ Reduced chemical pollution in general
Socioeconomic benefits	
Income or access to capital	▪ Income gained—itemizing each income generation opportunity ▪ Access to credit ▪ Lower agricultural production costs/lower expenses
Food security	▪ Increased agricultural productivity (amount of food increased) ▪ Inferred from food-related activities, each itemized (direct and indirect from income gained)
Context-specific socioeconomic benefits	*Dependent on social conditions/problems in the area. Could include:* ▪ Access to natural resources and land rights ▪ Cooperation/reduction in conflict ▪ Benefits to women/access to income ▪ Benefits to women/labor reduced ▪ Education benefits/more children going to school ▪ Education benefits/improved performance ▪ Social integrity/reduced exodus of youth ▪ Social integrity/ability to participate in religious events ▪ Health benefits/better access to treatment ▪ Health benefits/reduced exposure to chemicals ▪ Health benefits/reduced exposure to disease or sanitation ▪ Improved housing ▪ Improved infrastructure ▪ Reduced risk of safety hazard

NOTE: BD = biodiversity; CC = climate change; LD = land degradation.

of assessing GEF contributions and understanding how these were achieved, rather than assessing GEF support primarily on the magnitude of the multiple benefits produced, considering the range of differences in types of interventions and contexts that the case study projects supported, as well as in the quality of data available.

Annex B: Cofinancing ratio by GEF replenishment period, region, and Agency

Item	No. of MFA projects	GEF grant (million $)	Promised cofinancing (million $)	Cofinancing ratio
GEF replenishment period				
GEF-1	2	3.7	4.0	1.1
GEF-2	16	53.4	207.4	3.9
GEF-3	44	202.8	741.0	3.7
GEF-4	62	348.1	2,027.2	5.8
GEF-5	109	722.0	5,067.7	7.0
GEF-6	17	102.7	564.7	5.5
Subtotal	250	1,432.6	8,612.1	6.0
Region				
Africa	70	405.7	2,764.0	6.8
Asia	61	335.3	2,921.3	8.7
Europe and Central Asia	31	150.5	631.8	4.2
Latin America and the Caribbean	59	377.4	1654.5	4.4
Multiregional and global	29	163.8	640.4	3.9
Subtotal	250	1,432.6	8,612.4	6.0
Agency				
Asian Development Bank	11	53.0	504.3	9.5
Development Bank of Latin America	1	9.7	58.2	6.0
Food and Agriculture Organization of the United Nations	17	97.3	478.3	4.9
Inter-American Development Bank	7	57.4	298.1	5.2
IFAD	14	67.6	351.5	3.8
IUCN	1	2.0	2.3	1.2
UNDP	66	307.2	1,463.8	4.8
United Nations Environment Programme	29	103.3	435.4	4.2
United Nations Industrial Development Organization	4	24.4	94.2	3.9
World Bank	87	585.7	4,509.1	7.7
Joint	13	125.0	416.8	3.3
Subtotal	250	1,432.6	8,612.1	6.0

NOTE: Capacity-building and capacity development projects are not included here. GEF grants do not include project preparation grants and Agency fees. GEF-6 covers CEO endorsed or approved MFA projects as of September 30, 2016.

Annex C: Multiple benefits

TABLE C.1 Types of positive environmental and socioeconomic outcomes achieved by completed MFA projects

Outcome	Number of projects	% of projects
Environmental change/trend	49	
Reduction in environmental threats/stresses	44	90
Ecosystem cover and/or quality	35	71
Soil productivity/vegetation cover	25	51
Biodiversity and/or species populations (flora or fauna)	23	47
Vulnerability/resilience	20	41
Soil cover and/or quality	12	24
Carbon sequestered	14	29
Water coverage and/or quality	11	22
Carbon mitigated	9	18
Socioeconomic change/trend	46	
Income or access to capital	34	74
Cooperation/reduction in conflict	14	30
Access to natural resources	13	28
Gender equality	12	26
Health/safety (reduced exposure to risks)	6	13
Land use rights	5	11
Access to basic services (e.g., education, health)	5	11

SOURCE: Outcomes identified from terminal evaluations.

TABLE C.2 Weighted benefit scoring of SFA case study projects

GEF ID	Project	Benefit					Weighted score
		Biodiversity	Climate change	Land degradation	Other environmental	Socio-economic	
2788	Ningxia Integrated Ecosystem and Agricultural Development Project	1.25	0.17	0.67	0.67	0.83	3.58
2934	Catalyzing the Contribution of Indigenous Lands to the Conservation of Brazil's Forest Ecosystems	1.33	0.67	0.58	0	1.00	3.58
3302	Climate Adaptation for Rural Livelihoods and Agriculture	0.17	0.17	0.42	0	1.50	2.25
3864	Strengthening Globally Important Biodiversity Conservation Through Protected Area Strengthening in Gansu Province	0.33	0.25	0.17	0	1.17	1.92
4234	Climate Change Adaptation Project in the Areas of Watershed Management and Water Retention	0.08	0.08	0.50	0	1.92	2.58

SOURCE: Benefits were identified from self-reported indicators documented through interviews and project reports.

NOTE: Scores were weighted based on whether the benefit was quantitatively measured, qualitatively reported, or inferred. See table A.7 for scoring method.

Annex D: Synergies and trade-offs

TABLE D.1 Examples of synergies identified in SFA case study projects, by focal area

Project	Intervention	Benefit			
		Biodiversity	Climate change	Land degradation	Socioeconomic
Senegal: Climate Change Adaptation Project in the Areas of Watershed Management and Water Retention (GEF ID 4234) (2012–16)	Planting: 10,000 acacia plants for saline land reclamation		Carbon storage (inferred)	Improved soil quality and reduced erosion (inferred)	
China: Ningxia Integrated Ecosystem and Agricultural Development Project (GEF ID 2788) (2009–16)	Ecosystem protection: Wetland protection (additional 53,150 ha under protected area)	Contributed to observed increase in wildlife (bird population increased from 10,000 in 2010 to 70,000 in 2016)	Carbon storage (inferred)	Increased water supply in wetlands (combined with large water infrastructure)	
	SLM: Vineyard planting (1,740 ha of drip irrigation)		Carbon storage (inferred)	Reduced erosion (inferred)	Contributed to 53% increase in local incomes
China: Strengthening Globally Important Biodiversity Conservation Through Protected Area Strengthening in Gansu Province (GEF ID 3864) (2011–15)	No interventions that by themselves achieved benefits in more than one focal area				
Brazil: Catalyzing the Contribution of Indigenous Lands to the Conservation of Brazil's Forest Ecosystems (GEF ID 2934) (2009–16)	Select cultivation practices: Agroforestry		Carbon storage (inferred)	Improvement in soil and water resources reported	Women gained income from vegetables grown in the agroforestry system

Project	Intervention	Benefit: Biodiversity	Benefit: Climate change	Benefit: Land degradation	Benefit: Socioeconomic
Brazil: Catalyzing the Contribution of Indigenous Lands to the Conservation of Brazil's Forest Ecosystems (GEF ID 2934) (2009–16)	SLM, including organic waste as fertilizer: Composting and crop rotation	Composting replaced burning, reducing forest fires and benefiting biodiversity through reduced deforestation	Reduced GHG emissions from reduced burning	Improvement in soil as indicated by improved yields	Greater variety of crops grown on the improved soil, benefiting food security
	Patrolling the indigenous land (combined with government moratorium on hunting)	Helped stop illegal hunting; community members noticed an increase in wildlife; deterred illegal logging and extraction of resources from the reserve, contributing to reduced deforestation (reflected in low deforestation rates measured)	Carbon storage from reduced deforestation (inferred)		
Malawi: Climate Adaptation for Rural Livelihoods and Agriculture (GEF ID 3302) (2012–16)	Tree planting: 821,735 trees planted for erosion control and gully remediation		Carbon storage (inferred)	Reduced erosion/ remediation of gullies reported	

TABLE D.2 Trade-offs identified in case study projects

Type of trade-off	Case study example
Between environmental and socioeconomic benefits	▪ Senegal PGIES (MFA); China IEM Drylands (MFA); 4625 Malawi (MFA); 3864 China (SFA-BD)—Protected area enforcement increases benefits to biodiversity through reduced illegal harvesting of resources; reduces access of villagers to food (herbs and fungi in China; meat in Malawi) and income from resources. (MITIGATED, except for meat in Malawi) ▪ China IEM Drylands (MFA)—Farmland converted to natural vegetation extends/restores habitat in the national nature reserves; takes land out of use for food production. (MITIGATED) ▪ Brazil Rio Rural(MFA)—Source water protection restricts cattle from water sources, benefiting water quality; reduces access of cattle to water with potential livestock production/income impacts. (MITIGATED) ▪ Brazil Rio Rural (MFA)—Private natural heritage reserves create wildlife corridors; owners trade short-term economic benefits (timber, cash crops, extraction of resources) in return for long-term biodiversity protection and ecosystem services (e.g., climate regulation, improved hydrological cycle). (MITIGATED) ▪ 4234 Senegal (SFA—CC)—"Bottom" phosphorus fertilizer supplied by project improves agricultural productivity; potential decrease in water quality through runoff. ▪ 2788 China (SFA—BD) — 53,150 ha of sensitive wetlands incorporated into protected area benefits biodiversity; prohibiting farming removes access to land by local villagers for producing food. ▪ 3864 China (SFA—BD) — Tree seedling nurseries established as revenue source for PAs, in direct competition with nurseries run by individuals/local villages around the PA; also trade-off between beneficiaries—those hired to manage the PA tree nurseries, versus other beneficiaries participating in community or individual tree nurseries pressured to accept lower prices and lower income. ▪ 3302 Malawi (SFA-CC)—472.5 ha planted in conservation agriculture benefits soil and water quality; opportunity cost for farmers to grow cotton cash crop. ▪ 3302 Malawi (SFA-CC)—Crop residue as mulch on conservation agriculture retains water and nutrients in the soil; diverts preproject use of crop residues as fodder to feed livestock, with livestock productivity impacts.
Between or within focal area objectives	▪ 2788 China (SFA-BD)—more visitors to PAs increases revenues for biodiversity conservation; increased tourism can cause land degradation without conditions in place. Ecotourism was identified as a risk in the CEO endorsement document due to past poorly planned tourist infrastructure.
	▪ Senegal Ecovillages (MFA)—Jatropha planted to provide oil to run small machinery benefits biodiversity by reducing fuelwood extraction; monoculture plantations for biofuel are an opportunity cost for biodiversity as well as food production. (MITIGATED) ▪ Senegal Ecovillages (MFA)—Brazil grass planted near villages as animal fodder replaces the extraction of fodder/grazing of animals in core Protected Areas; Brazil grass is an exotic species, potentially displacing indigenous species in the villages. ▪ China IEM Drylands (MFA)—Sheep/maize biofuel system used where maize grown for animal feed, and dung used in a biodigester to create electricity and effluent used as fertilizer. System halts grazing on vulnerable mountain grasslands, benefiting mountain biodiversity; monoculture maize is a potential opportunity cost for lowland biodiversity and other more diverse agro-ecological systems, especially if the volume of fodder needed increases
Between objectives at different scales	▪ Senegal PGIES (MFA)—CNRs provide local benefits through access to resources; opportunity cost for using land for national level economic development goals. The terminal evaluation for Phase 2 (GEF ID 2268) notes that there is interest in zircon extraction in the Niayes. If expropriation occurs, there is then the potential loss of local gains in return for national level economic development.

NOTE: This list of trade-offs is not exhaustive; further analysis beyond the information and time available for this evaluation may reveal additional trade-offs.

TABLE D.3 Types of measures identified in SFA case study projects for mitigating trade-offs

GEF ID	Project	Type of mitigation measure identified			Trade-off with no evidence of mitigation
		Compensation	Compromise	Value addition	
2788	Ningxia Integrated Ecosystem and Agricultural Development Project				x
2934	Catalyzing the Contribution of Indigenous Lands to the Conservation of Brazil's Forest Ecosystems				
3864	Strengthening Globally Important Biodiversity Conservation Through Protected Area Strengthening in Gansu Province	x			x
3302	Climate Adaptation for Rural Livelihoods and Agriculture				x
4234	Climate Change Adaptation Project in the Areas of Watershed Management and Water Retention				x

Bibliography

Adams, W.M., R. Aveling, D. Brockington, B. Dickson, J. Elliott, J. Hutton, D. Roe, B. Vira, and W. Wolmer. 2004. "Biodiversity Conservation and the Eradication of Poverty." *Science* 306 (5699): 1146–49.

Adger, W.N., T.P. Hughes, C. Folke, S. Carpenter, and J. Rockstrom. 2005. "Social-Ecological Resilience to Coastal Disasters. *Science* 309: 1036–39.

Bierbaum, R., Stocking, M., Bouwman, H., Cowie, A., Diaz, S., Granit, J., Patwardhan, A., Sims, R., Duron, G., Gorsevski, V., Hammond, T., Neretin, L., Wellington-Moore, C. 2014. *Delivering Global Environmental Benefits for Sustainable Development*. Report of the Scientific and Technical Advisory Panel (STAP) to the 5th GEF Assembly, Mexico 2014. Washington, DC: GEF.

Brown, David, Frances Seymour, and Leo Peskett. 2008. "How Do We achieve REDD Co-benefits and Avoid Doing Harm?" In *Moving ahead with REDD: issues, options and implications*. Center for International Forestry Research (CIFOR), Bogor, Indonesia.

Butler, J.R.A., G.Y. Wong, D.J.Metcalfe, M. Honzák, P.L. Pert, N. Rao, M.E. van Grieken, T. Lawson, C. Bruce, F.J. Kroon, J.E. Brodie. 2013. "An Analysis of Trade-offs Between Multiple Ecosystem Services and Stakeholders Linked to Land Use and Water Quality Management in the Great Barrier Reef, Australia." *Agriculture, Ecosystems and the Environment* 180: 176–91.

Christie, Patrick. 2004. "Marine Protected Areas as Biological Successes and Social Failures in Southeast Asia." American Fisheries Society Symposium.

Chhatre, A., and A. Agrawal. 2009. "Trade-offs and Synergies Between Carbon Storage and Livelihood Benefits from Forest Commons. *PNAS* 106 (42): 17667–70.

Cowie, Annette, Uwe A. Schneider, and Luca Montanarella. 2007. "Potential Synergies between Existing Multilateral Environmental Agreements in the Implementation of Land Use, Land-use Change and Forestry Activities." *Environmental Science & Policy* 10 (4): 335–52.

Cowie, A.L., T.D. Penman, L. Gorissen, D.M. Winslow, J. Lehmann, T. Tyrrell, S. Twomlow, A. Wilkes, R. Lal, J.W. Jones, A. Paulsch, K. Kellner, and M. Akhtar-Schuster. 2011. "Towards Sustainable Land Management in the Drylands: Scientific Connections in Monitoring and Assessing Dryland Degradation, Climate Change and Biodiversity." *Land Degradation and Development* 22: 248–60.

Dudley, Nigel, and Sue Stolton. 2010. *Arguments for Protected Areas: Multiple Benefits for Conservation and Use*. Routledge.

Fitz-Gibbon, T. Carol, and Lynn Morris. 1996. *How to Analyze Data: Volume 8 of CSE Program Evaluation Kit, CSE Program Evaluation Kit*. SAGE.

GEF (Global Environment Facility). 2000. "Operational Program #12: Integrated Ecosystem Management." GEF, Washington, DC.

———. 2010. *GEF-5 Focal Area Strategies*. Washington, DC: GEF.

———. 2012. "GEF Report to the Eleventh Meeting of the Conference of the Parties to the Convention on Biological Diversity." UNEP/CBD/COP/11/8. Convention on Biological Diversity, Montreal.

———. 2014a. *Combating Land Degradation in Production Landscapes: Learning from GEF Projects Applying Integrated Approaches*. Washington, DC: GEF.

———. 2014b. "GEF-6 Indicative STAR Allocations." GEF/C.47/Inf.08. GEF, Washington, DC.

———. 2014c. "GEF-6 Programming Directions." GEF/R.6/20/Rev.04. GEF, Washington, DC.

———. 2015. *Instrument for the Establishment of the Restructured Global Environment Facility*. Washington, DC: GEF.

———. 2016a. "Analysis of First Disbursement." GEF/C.50/Inf. 05. GEF, Washington, DC.

———. 2016b. *Biodiversity Mainstreaming in Practice: A Review of GEF Experience*. Washington, DC: GEF.

———. 2017. Sustainable Forest Management: A History of Support for Forests. GEF, Washington, DC.

GEF IEO (Global Environment Facility Independent Evaluation Office; formerly Global Environment Facility Evaluation Office and Global Environment Facility Office of Monitoring and Evaluation). 2005. "Review of the GEF Operational Program 12: Integrated Ecosystem Management." GEF/ME/C.25/5. GEF, Washington, DC.

———. 2006. *The Role of Local Benefits in Global Environmental Programs*. Evaluation Report No. 30. Washington, DC: GEF IEO.

———. 2013. *OPS5 Cumulative Evidence on the Challenging Pathways to Impact*. Evaluation Report No. 79. Washington, DC: GEF IEO.

———. 2017. *GEF Annual Performance Report 2015*. Evaluation Report No. 109. Washington, DC: GEF IEO.

Gisladottir, Gudrun, and Michael Stocking. 2005. "Land Degradation Control and Its Global Environmental Benefits." *Land Degradation & Development* 16 (2): 99–112.

Haase, D., N. Schwarz, M. Strohbach, F. Kroll, and R. Seppelt. 2012. "Synergies, Trade-offs, and Losses of Ecosystem Services in Urban Regions: an Integrated Multiscale Framework Applied to the Leipzig-Halle Region, Germany." *Ecology and Society* 17(3): 22.

Halpern, B.S., C.J. Klein, C.J. Brown, M. Beger, H.S. Grantham, S. Mangubhai, M. Ruckelshaus, V.J. Tulloch, M. Watts, C. White, and H.P. Possingham. 2013. "Achieving the Triple Bottom Line in the Face of Inherent Trade-offs Among Social Equity, Economic Return, and Conservation." *PNAS* 110 (15): 6229–34.

Hansen, M.C., P.V. Potapov, R. Moore, M. Hancher, S.A. Turubanova, A. Tyukavina, D. Thau, S.V. Stehman, S.J. Goetz, T.R. Loveland, et al. 2013. "High-Resolution Global Maps of 21st-Century Forest Cover Change." *Science* 342 (6160): 850–53.

Hirsch, P.D., W.M. Adams, J.P. Brosius, A. Zia, N. Bariola, and J.L. Dammert. 2011. "Acknowledging Conservation Tradeoffs and Embracing Complexity." *Conservation Biology* 25 (2): 259–64.

Howe, Caroline, Helen Suich, Bhaskar Virac, and Georgina M. Macea. 2014. "Creating Win-Wins from Trade-offs? Ecosystem Services for Human Well-being: A Meta-Analysis of Ecosystem Service Trade-offs and Synergies in the Real World." *Global Environmental Change* 28: 263–75.

ICSU (International Council for Science). 2017. A Guide to SDG Interactions: From Science to Implementation.

IEA (International Energy Agency). 2014. *Capturing the Multiple Benefits of Energy Agency*. Paris: IEA.

IISD (International Institute for Sustainable Development). 2003. *Earth Negotiations Bulletin* 12, 220.

Karousakis, Katia. 2009. "Promoting Biodiversity Co-benefits in REDD." OECD Environment Working Paper No. 11. Organisation for Economic Co-operation and Development, Paris.

Lee, Janice Ser Huay, John Garcia-Ulloa, Jaboury Ghazoul, Krystof Obidzinski, and Lian Pin Koh. 2014. "Modelling Environmental and Socio-Economic Trade-offs Associated with Land-sparing and Land-sharing Approaches to Oil Palm Expansion." *Journal of Applied Ecology* 51 (5): 1366–77.

Maclean, K., M. Cuthill, and H. Ross. 2013. "Six Attributes of Social Resilience." *Journal of Environmental Planning and Management* doi: 10.1080/09640568.2013. 763774.

McShane, T.O., P.D. Hirsch, T.C. Trung, A.N. Songorwa, A. Kinzig, B. Monteferri, D. Mutekanga, H. Van Thang, J.L. Dammert, M. Pulgar-Vidal, M. Welch-Devine, J.P. Brosius, P. Coppolillo, and S. O'Connor. 2011. "Hard Choices: Making Trade-offs Between Biodiversity Conservation and Human Well-Being." *Biological Conservation* 144 (3): 966–72.

Melo, Isabel, Esther Turnhout, and B. Arts. 2014. "Integrating Multiple Benefits in Market-Based Climate Mitigation Schemes: The Case of the Climate, Community and Biodiversity Certification Scheme." *Environmental Science and Policy* 35: 49–56.

Milne, Eleanor, Steven A. Banwart, Elke Noellemeyer, David J. Abson, Cristiano Ballabio, Francesca Bampa, Andre Bationo et al. 2015. "Soil Carbon, Multiple Benefits." *Environmental Development* 13: 33–38.

Mouat, David, Judith Lancaster, Ismail El-Bagouri, and Fernando Santibañez. 2006. "Opportunities for Synergy Among the Environmental Conventions: Results of National and Local Level Workshops." United Nations Convention to Combat Desertification.

Persha, Lauren, Arun Agrawal, and Ashwini Chhatre. 2011. "Social and Ecological Synergy: Local Rulemaking, Forest Livelihoods, and Biodiversity Conservation." *Science* 331 (6024): 1606–08.

Santangeli, Andrea, Tuuli Toivonen, Federico Montesino Pouzols, Mark Pogson, Astley Hastings, Pete Smith, and Atte Moilanen. 2016. "Global Change Synergies and Trade-offs between Renewable Energy and Biodiversity." *Global Change Biology Bioenergy* 8: 941–51.

Sims, R., V. Gorsevski, and S. Anenberg. 2015. "Black Carbon Mitigation and the Role of the Global Environment Facility." A STAP Advisory Document. Global Environment Facility, Washington, DC.

Sinnassamy, Jean-Marc, Rahul Madhusudanan, Sonja Teelucksingh, Matthew Foster, Ulrich Apel, Gustavo Fonseca, Christine Roeher, and Asha Bobb-Semple. 2016. "Quantifying the Multiple Environmental Benefits of Sustainable Land Management Projects: An Analysis of the Land Degradation Portfolio of the Global Environment Facility (GEF)."

Tengberg, A., and Valencia, S. 2017. "Science of Integrated Approaches to Natural Resources Management: A STAP Information Document." Global Environment Facility, Washington, DC.

Totten, Michael, Sonal I. Pandya, and Toby Jansen-Smith. 2003. "Biodiversity, Climate and the Kyoto Protocol: Risks and Opportunities." *Frontiers in Ecology and the Environment* 1 (5): 262–70.

Tscharntke, Teja, Yann Clough, Thomas C. Wanger, Louise Jackson, Iris Motzke, Ivette Perfecto, John Vandermeer, and Anthony Whitbread. 2012. "Global Food Security, Biodiversity Conservation and the Future of Agricultural Intensification." *Biological Conservation* 151 (1): 53–59.

UNDP (United Nations Development Programme). 2016. "UNDP Support to the Implementation of the 2030 Agenda for Sustainable Development.

Visseren-Hamakers, Ingrid J., Constance McDermott, Marjanneke Vijge, and Benjamin Cashore. 2012. "Trade-offs, Co-benefits and Safeguards: Current Debates on the Breadth of REDD+" *Current Opinion in Environmental Sustainability* 4: 646–53.

Wall, Diana H., Uffe N. Nielsen, and Johan Six. 2015. "Soil Biodiversity and Human Health." *Nature* 528: 69–76.

Wang, Shuai, and Bojie Fu. 2013. "Trade-offs Between Forest Ecosystem Services." *Forest Policy and Economics* 26: 145–46.

Weiss, Carol Hirschon. 1972. *Evaluation Research: Methods of Assessing Program Effectiveness*. Englewood Cliffs, NJ: Prentice–Hall.

West, Paige, James Igoe, and Dan Brockington. 2006. "Parks and Peoples: The Social Impact of Protected Areas." *Annual Review of Anthropology* 35: 251–77.

Zazueta, Aaron, and Jeneen R. Garcia. 2014. "Multiple Actors and Confounding Factors." *Evaluating Environment in International Development* 194.

Recent GEF IEO Publications

Evaluation Reports

123	Evaluation of Knowledge Management in the GEF	2018
122	Evaluation of GEF Support for Transformational Change	2018
121	GEF Project Performance and Progress to Impact	2018
120	Land Degradation Focal Area Study	2018
119	Evaluation of GEF Engagement with Indigenous Peoples	2018
118	Evaluation of Gender Mainstreaming in the GEF	2018
117	Program Evaluation of the Special Climate Change Fund	2018
116	Review of the GEF Policy on Agency Minimum Standards on Environmental and Social Safeguards	2018
115	Chemicals and Waste Focal Area Study	2018
114	International Waters Focal Area Study	2018
113	Evaluation of Programmatic Approaches in the GEF	2018
112	Review of Results-Based Management in the GEF	2017
111	Evaluation of GEF Engagement with the Private Sector, Volumes 1 and 2	2017
110	OPS6: The GEF in the Changing Environmental Finance Landscape – Final Report	2017
109	GEF Annual Performance Report 2015	2017
108	Evaluation of the GEF–Civil Society Organization Network, Volumes 1 and 2	2016
107	GEF Country Portfolio Evaluation: Tajikistan (1999–2015), Volumes 1 and 2	2016
106	Program Evaluation of the Least Developed Countries Fund	2016
105	FEM Evaluation du Portefeuille de Pays : Maroc (1997–2015)	2016
104	Impact Evaluation of GEF Support to Protected Areas and Protected Area Systems—Full Report	2016
103	Impact Evaluation of GEF Support to Protected Areas and Protected Area Systems—Highlights	2015
102	GEF Annual Performance Report 2014	2015
101	GEF Country Portfolio Evaluation: Eritrea (1992–2012)	2015
100	GEF Country Portfolio Evaluation: Tanzania (1992–2012)	2015
99	GEF Country Portfolio Study: Sierra Leone (1998–2013)	2015
98	GEF Country Portfolio Evaluation: Vanuatu and SPREP (1991–2012)	2015
97	Joint GEF-UNDP Evaluation of the Small Grants Programme	2015
96	Joint GEF–Sri Lanka Country Portfolio Evaluation (1991–2012)	2015
95	GEF Annual Country Portfolio Evaluation Report 2014	2015
94	Midterm Evaluation of the System of Transparent Allocation of Resources	2014
93	Midterm Evaluation of the National Portfolio Formulation Exercise	2014
92	GEF Annual Performance Report 2013	2014
91	GEF Annual Impact Report 2013	2014
90	Impact Evaluation on Climate Change Mitigation: GEF Support to Market Change in China, India, Mexico and Russia	2014
89	Report of the Second Professional Peer Review of the GEF Evaluation Function	2014
88	OPS5: Final Report: At the Crossroads for Higher Impact—Summary	2014
87	GEF Annual Country Portfolio Evaluation Report 2013	2014
86	OPS5: Final Report: At the Crossroads for Higher Impact	2014

To see all GEF Independent Evaluation Office publications, please visit our webpage.

Independent Evaluation Office
Global Environment Facility
1818 H Street, NW Washington, DC 20433, USA
www.gefieo.org
/gefieo_tweets
/gefieo