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EVALUATION OF PROGRAMMATIC APPROACHES IN THE GEF

VOLUME II – TECHNICAL DOCUMENTS

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Technical Document 1

GEF Programs and Beyond: A Comparative Analysis

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Acronyms

CPP	Country Program Partnership
CIDA	Canadian International Development Agency
DANIDA	Denmark Agency for International Development Agency
EC	European Commission
EU	European Union
FAO	UN Food and Agriculture Organization
FIP	Forest Investment Program
GEF	Global Environment Facility
KME	Knowledge, Monitoring and Evaluation
MPPs	Multi Project Programs
OECD-DAC	Organization for Economic Cooperation and Development, Development Assistance Committee
PBA	Program-Based Approach
PPCR	Pilot Program for Climate Resilience
PRSP	Poverty Reduction Strategy Paper
SIF	Strategic Investment Fund
SIP	Strategic investment Program
STAP	Scientific and Technical Advisory Panel of the GEF
SWAp	Sector-Wide Approach
UN	United Nations
UNDP	United Nations Development Program
WB	World Bank

Introduction

The purpose of this study is to discuss the different conceptual notions related to “programmatic approaches”. As noted by stakeholders during the development of the Approach Paper for the Evaluation of Programmatic Approaches in the GEF, the GEF’s conceptual framework for programs appears unique. In particular, it was noted that the usual OECD definition of “program” may not be applicable to the GEF’s work, suggesting it would be appropriate to compare the differences in conceptual frameworks and practices.

An initial survey of the different approaches to programs was undertaken during the internal Review of Programmatic Approaches conducted by the GEF Secretariat in 2012.¹ Therefore, the purpose of this study is to delve deeper into the different ways in which programs are conceived, designed, and implemented in the GEF as well as in the broader development context, in order to draw lessons that may be applicable to the GEF in future years. This will help understand how different aspects and modalities of programs being implemented in the broader development context may help achieve higher impact within the GEF’s scope of work.

The study reviewed the available documentation on programs both from the GEF and from the broader development cooperation sector. The analysis was conducted by comparing the different programmatic approaches (in this study, the term program, programmatic approach, and program-based approach are used interchangeably) according to a broad set of characteristics, such as:

- Objectives and purpose
- Processes and governance
- Finance
- Country ownership and leadership
- Costs/Benefits

The comparative analysis aims at setting GEF programs side by side with other types of programmatic approaches. Some of these have been used in the environment sector:

- Sector Investment Programs (SIP) originally set up by the World Bank
- Sector-Wide Approaches (SWAs), implemented by various donors
- Program-Based Approaches (PBAs), implemented by bilateral and multilateral agencies
- Multi-project programs (MPPs)
- Strategic Investment Funds (SIFs), also spearheaded by the World Bank, particularly on environmental and climate change issues.

History and evolution of programs

The idea of “programs” or programmatic approaches in the development cooperation context emerged in the late 1980s, in response to slow progress in achieving tangible impacts in developing countries through the project support modality. In particular, there was concern among the donor community that the project-based approach was unsustainable and inefficient in creating “economic growth and self-reliance”. One of the factors pin-pointed as a root cause of the lack of sustained results was the lack of ownership of the development process by the recipient countries, while others noted the dispersion

¹ GEF Secretariat. *“Internal Review of Programmatic Approaches”*, 2012.

of efforts into many discrete projects that were neither related to nor coordinated with one another or with national policies.²

These concerns were initially formalized with the introduction of the concept of the program approach in United Nations resolution 44/211 of 22 December 1989, which called for “...more integrated and coordinated programming (...) in which programming processes would be based on an overall national program framework (...) to be prepared by the recipient Government (...) which would enable the system to support more effectively the development priorities of developing countries and to be more country-focused and would facilitate the development of a program approach”.³ Following this request, in 1993, a definition of the program approach to development was agreed to by all United Nations agencies⁴. According to this definition, a program “... is a coherent set of policies, strategies, activities and investments designed to achieve a specific time bound national development objective or set of objectives and the program approach refers to the “...pursuit of national development goals through cohesive national programs”.⁵

During the 1990s, various new aid delivery mechanisms emerged in line with the program approach, for example SWAPs, whose origins can be traced to a 1995 World Bank paper entitled “The Broad Sector Approach to Investment Lending” which introduced the notion of sector-wide scope in World Bank-funded sector investment programs (SIPs).⁶ Under the SWAp, funds contribute directly to a country-defined sector policy. In 2000, the European Commission and its members adopted a policy orientation in favour of the sector approach and sector budget support. The “European Consensus on Development”, adopted in December 2005, also confirms commitment towards aid effectiveness principles⁷. It notes that: “where circumstances permit, the use of general or sector budget support should increase as a means to strengthen ownership, to support partners’ national accountability and procedures, to finance national poverty reduction strategies (PRS) (including operating costs of health and education budgets) and to promote sound and transparent management of public finances”⁸. Many bilateral donors also followed suit during the 2000s, with their own definitions and guidelines on the implementation of SWAPs, program-based funding and budget support.⁹

The pressures to increase coordination, maximize impact, and reduce transaction costs, while increasing national ownership of development processes, continued to increase during the 1990s and 2000s. This led to a series of major policy responses, including the 2000 Millennium Development Goals, the Monterrey Consensus of 2002 and the 2003 Rome Declaration on harmonization¹⁰, among others.

In 2005, the Paris Declaration on Aid Effectiveness enshrined the principles that govern programs and programmatic approaches, including¹¹:

- Strengthening partner countries’ national development strategies and associated operational frameworks (e.g., planning, budget, and performance assessment frameworks).

² UNDP. “The Program approach: ownership, partnership and coordination”, 1998.

³ United Nations. “General Assembly”, 1989, (A/RES/44/211).

⁴ UNDP. “The Program approach: ownership, partnership and coordination”, 1998.

⁵ UNDP. “The Program approach: ownership, partnership and coordination”, 1998.

⁶ ODI. “Evaluation of Sector-wide approach in environment”, 2008.

⁷ European Commission. “Support to Sector Programs, covering the three financing modalities: Sector Budget Support, Pool funding and EC project procedures”, 2007.

⁸ European Commission. “Support to Sector Programs, covering the three financing modalities: Sector Budget Support, Pool funding and EC project procedures”, 2007.

⁹ See for example European Commission. “Sector approaches in agriculture and rural development”, 2008.

¹⁰ DANIDA. “Evaluation of Programmatic Approaches to support for the environment in Africa 1996-2009”, 2010.

¹¹ OECD. “Harmonising Donor Practices for Effective Aid Delivery”, volume 2, 2006.

- Increasing alignment of aid with partner countries' priorities, systems and procedures and helping to strengthen their capacities.
- Enhancing donors' and partner countries' respective accountability to their citizens and parliaments for their development policies, strategies and performance.
- Eliminating duplication of efforts and rationalising donor activities to make them as cost-effective as possible.
- Reforming and simplifying donor policies and procedures to encourage collaborative behaviour and progressive alignment with partner countries' priorities, systems and procedures.
- Defining measures and standards of performance and accountability of partner country systems in public financial management, procurement, fiduciary safeguards and environmental assessments, in line with broadly accepted good practices and their quick and widespread application.

Since the Paris Declaration, efforts have continued to deliver more coordinated development support, to increase national ownership, and to streamline development cooperation efforts for increased impacts. The emergence of Poverty Reduction Strategy Papers (PRSPs) as key requirements for debt cancellation, as well as Medium-Term Expenditure Frameworks, have also contributed to more “program-based” development cooperation, in which donors can coalesce around a set of broad policy priorities and contribute assistance through the recipient government’s institutions and processes. PRSPs, in particular, have seen their consecration as the higher level of development program to which development aid should contribute. Delivery mechanisms in support of PRSP objectives include budget support, sector budget support, project support, pooled arrangements and trust funds.

Based on work conducted within bilateral agencies, as well as through collaborative fora such as the OECD-DAC, a definition of program-based cooperation was also formalized by the OECD in 2004, as seen in the box below¹².

Box 1

Program-based approaches (PBA) are a way of engaging in development co-operation based on the principles of coordinated support for a locally owned program of development, such as a national development strategy, a sector program, a thematic program or a program of a specific organization. Program based approaches share the following features:

- (i) Leadership by the host country or organization;
- (ii) A single comprehensive program and budget framework;
- (iii) A formalized process for donor co-ordination and harmonization of donor procedures for reporting, budgeting, financial management and procurement;
- (iv) Efforts to increase the use of local systems for program design and implementation, financial management, monitoring and evaluation.

However, it should be noted that in some development cooperation contexts, “programs” are still defined, designed and implemented as a cluster or group of projects sharing a common goal, or as a series of sequential initiatives (phased projects), without necessarily referring to the national ownership or the national policy basis. It is still possible today to encounter development cooperation initiatives that are “programs” but do not exhibit the basic requirements of a “program-based approach” as

¹² OECD. “*Harmonising Donor Practices for Effective Aid Delivery*”, volume 2, 2006.

defined above, demonstrating that despite much progress in defining programmatic approaches, the concept has remained limited to a few key applications, donors or sectors.

In parallel to the evolution of programmatic approaches as operational mechanisms, and in line with the need to increasingly demonstrate and account for results, approaches to knowledge management, monitoring and evaluation (KME) also evolved. The application of KME systems to programmatic approaches, however, is not yet standardized, and M&E systems are designed differently depending on a host of factors, including donor practices and requirements, project design practices, programmatic limitations, and expected results. While results for individual programs or program-based approaches are often well documented and communicated, the question of whether programmatic approaches as a whole are efficacious means to deliver development or environmental benefits, remains. As an aside, it has been difficult to identify, for this study, documents that provided high-level analytical information about programs as programs, or about programmatic approaches in and of themselves. Beyond initial operational guidelines provided by some donors, there seems to have been little effort to document the actual efficiency and effectiveness of PBAs as a whole.

Evolution of GEF programs

Programs in the GEF have evolved differently than those in the broader development context, with their own definitions and set of procedures. At the 14th GEF Council meeting in December 1999, the Council supported the evolution of GEF support to recipient countries through a more programmatic approach. The first GEF “program” was the Danube/Black Sea Basin Strategic Partnership, which was launched in 2001 with the coordinated support of multiple donors, and long-term financial engagement. This initiative was intended as a phased approach to addressing a specific environmental problem, around a given shared ecosystem.

Later, the GEF clarified that the overall aim of GEF programs should be “to secure larger and sustained impact on the global environment through integrating and mainstreaming global environmental objectives into a country’s national strategies and plans through partnership with the country.”¹³ In May 2008, the GEF Council approved a set of objectives and basic principles for programmatic approaches¹⁴, along with detailed operational guidelines.

While the GEF policy documents do make reference to the same principles as those invoked in the various program-based approaches highlighted above (e.g. country ownership, donor coordination), not all of the principles put forward by the OECD and other donors seem to have applied to the GEF programs. GEF programs, throughout its history, have presented different characteristics, which have also evolved over time. For example, there have been GEF programs that were collections of individual projects (country-based or otherwise), programs that represented long-term strategic sectoral engagement, multi-country projects, sequenced interventions, etc. An early typology offered in the internal review of programmatic approaches¹⁵ proposed the following types of projects:

- i. Country programs, also known as country program partnerships (CPPs), which were intended to provide long-term and large-scale focus on a set of specific issues within a single country. For example, the PRC-GEF Partnership on Land Degradation in Dryland Ecosystems Program, or the Country Pilot Partnerships in Namibia and Burkina Faso. Most Country Programs were thematically based, and focused on a single Focal Area.

¹³ GEF Programmatic Approach: Current Understandings (GEF/C.17/Inf.11)

¹⁴ From Projects to Programs: Clarifying the Programmatic Approach in the GEF Portfolio (GEF/C.33/6)

¹⁵ See footnote 1 above.

- ii. Regional programs, where countries of a same region or sub-region worked to achieve a shared goal, usually in a shared or trans-boundary ecosystem, and where the parts of the program, and the country-based initiatives, were highly inter-dependent. In this typology, Regional Programs are constituted when a group of countries work together to achieve environmental impact in a given shared geographic unit. Examples of this type of programs are found through all GEF replenishments, for example the Danube/Black Sea Basin Strategic Partnership on Nutrient Reduction (GEF-2), or the Lake Chad Basin Regional Program for the Conservation and Sustainable Use of Natural Resources and Energy Efficiency.
- iii. Multi-country programs occur where a group of countries, co-located or not, work separately to achieve similar objectives, sometimes using similar approaches, under a common overarching goal. In the case of multi-country programs, there is lower inter-dependency between the parts of the program than in regional programs. An example would be the Pacific Island Ridge-to-Reef program that includes different projects in 16 countries all according to the same conceptual approach, with knowledge sharing among all, but where the outcome of each individual project does not impact on the others. A more recent example would be the Integrated Approach Pilot on Food Security, which was developed in GEF-6 as a model for future integrated programming, but in which there is more emphasis on cross-fertilization among program countries, embodied through a “Regional Hub sub-project”.
- iv. Portfolio programs are programs comprising any number of countries, where all countries are implementing more or less the same project(s), and whose primary objective is to create a portfolio of projects addressing a given global environmental issue. Portfolio programs, often referred to as “umbrella programs”, include child-projects that are similar in intention, in nature, or in scope, in which the scope of intended results is national. These include for example the GEF-4 Biosafety Program where a number of countries implement similar activities in order to advance their biosafety agenda at national level. Portfolio programs are more akin to rapid delivery mechanisms than true program-based approaches.
- v. Public-Private partnership programs were added to the programmatic portfolio in GEF-5, whereby an Agency uses a programmatic approach to set up investment funds that are disbursed according to specific objectives and rules in one or more countries, towards a set objective. Public-Private Partnership platforms resemble sector investment funds in that the design, approval and disbursement of child-projects and specific investments is more or less delegated to the Agency in charge, and where the investments themselves are based on demand. Public Private Partnerships create a funding envelope from which the private sector proponents can draw. The PPPs were designed to increase access to specific technologies, open new markets, and provide dedicated access to the private sector. An example of this would be the IDB-PPP MIF Public-Private Partnership Program.

As noted in the Approach Paper to this evaluation¹⁶, until GEF-5, Council discussions about programs centered more on operational, financial and administrative matters and as a result, the approved program modalities were also based on such characteristics. However, at its meeting in October 2014, the GEF Council classified programs into two main types: Thematic and Geographic and in GEF-6, the GEF introduced the Integrated Approach Pilots (IAPs) in which the focus is more on the transformational result than on the delivery modality. This reflects the ongoing debate on the usefulness and effectiveness of programmatic approaches as aid delivery mechanisms, and on whether programs are sufficient in and of themselves to achieve stronger development impact.¹⁷

¹⁶ GEF Independent Evaluation Office, Evaluation of programmatic approaches in the GEF: Approach Paper, 2016

¹⁷ Boesen Nils, Dietvorst Desiree. “SWAps in motion Sector wide approaches: From an aid delivery to a sector development perspective 2006-2007”, 2007.

These evolving definitions and delineations of programmatic approaches within the GEF Council documents also reflect an ongoing concern with the effectiveness and efficiency of the approach itself, which has led to the current formal evaluation of programmatic approaches.

Analysis and results

The below analysis provides an overview of the main characteristics of the different types of programs, and compares their main features to the other programs and to those that have been implemented with GEF support to date. The categories below do not intend to be exhaustive, nor are they necessarily mutually exclusive. Typically, some of these will present similar features, and there will exist hybrid forms of these instruments.

Sector Investment Programs (SIPs) represent a tool to channel large-scale, long-term investment into specific economic sectors, whereas strategic investment funds – while presenting similar characteristics from an operational perspective – target themes and topics that go beyond traditional economic “sector” definitions. SIPs were more widely used during the 1990s, and gradually evolved towards SIFs, representing today’s practice in terms of integrated approaches to development assistance. In the environment sector, the World Bank spearheaded for example the Strategic Investment Program on Sustainable Land Management (through TERRAFRICA), and more recently the Strategic Investment Funds on Forests or Climate Change. The TerrAfrica platform is an interesting case, in that it began as a program – and indeed the GEF participated in its early inception - but evolved into a platform or a partnership, to which donors and executing agencies contributed differently. The SIP then became the operational tool through which TerrAfrica sub-projects (investment projects) were implemented. The TerrAfrica platform was funded by donors such as France, Norway, Netherlands and the European Union, and implemented at national level by agencies such as World Bank, FAO, IFAD, or UNDP. GEF funding contributed to the TerrAfrica platform, through individual projects amounted to US\$ 150 million, and co-financing represented over US\$ 800 million¹⁸. While the TerrAfrica SIP in itself consisted in a programmatic approach, the GEF’s contribution to it was still operationalized through individual projects. Coordination among the different projects did not occur at the level of the GEF, though it did benefit from GEF funding (through UNEP).

SIPs were designed as an investment mechanism to channel funding towards covering expenditures of a given sector. They were intended to cover all relevant public expenditure (both current and capital) and policies of the targeted sectors. Under the SIP mechanism, the government – who often is the direct beneficiary of assistance – or private sector, had to be directly in charge of managing and administering expenditures. Implementation arrangements were intended to be common to all financiers, and the use of local capacity, rather than long-term technical assistance, was promoted¹⁹. Most importantly, SIPs were to be based on a clearly enunciated and nationally developed strategy and policy framework. This allowed for SIPs to support multi-donor approaches, where multiple sources of financing would be tapped to support a coherent set of nationally-driven investments in a specific sector. The fundamental objective of the SIP was to achieve higher level impact across a sector, and to fulfil a broader scope of needs than could be addressed by a single project approach. The multi-donor and multi-stakeholder approach was strongly encouraged at the start of the SIP development process, but later evaluations found that this was the hardest element to achieve²⁰. In many regards, it was thought that SIPs would only be successful if all donors signed on to the same framework, using common procedures for

¹⁸ FAO. « informing future interventions for scaling up sustainable land management: lessons learned for decision-makers from a review of experiences of the Terrafrica strategic investment program on SLM in sub-saharan Africa (SIP) under the NEPAD-Terrafrica Partnership Framework. 2016

¹⁹ World Bank. “*Moving from Projects to Programmatic Aid*”, 2000.

²⁰ World Bank. “*Best Practice in sector Investment Programs*”, 1996

procurement, training and reporting. The success of SIPs was to be measured through shared high-level sector-wide indicators, corresponding to the objectives of the national policy²¹.

SIPs were intended to finance a set of goods and services (through lending in the case of the WB), as outlined in the sector investment plans that accompany a sector policy or strategy. The SIPs did away with the traditional distinction between recurrent and capital expenditures, and focussing on the overall expenditure needs of the sector. In terms of cost-effectiveness, the World Bank noted in its initial research on SIPs that while the early preparation costs for SIPs would be high, these were intended to replace the cost of developing multiple individual projects. Saving would therefore be realized during implementation as well as for the broader sector partners in the longer term²².

No SIPs were developed or implemented for the environment sector. This is attributed to multiple reasons: the environment is not considered a traditional sector, with a distinct set of investment priorities and institutions, environment ministries were relatively weak during the period where SIPs were being implemented, and environment funding has traditionally used grants rather than lending instruments. Environment-related investment programs only emerged during the late 2000's, with programs such as the Strategic Investment Program for Sustainable Land Management, which was co-financed by the GEF, and is more akin to a Program-based approach or a multi-project program (see below) than a sector-based approach. GEF SIPs also exhibited other differences with mainstream SIPs: GEF SIPs were conceived as multi-country initiatives, and the GEF funding came in to partially co-finance the mainstream initiative. In fact, GEF funding typically does not cover "investment" related costs (usually financed through loans), but incremental environmental costs that were identified as an add-on and financed through grants; hence whereas GEF could participate in a SIP as one among many donors, it cannot, by virtue of the incrementality principle, support an entire sector investment program.

Sector Wide Approaches (SWAp) present similar characteristics and intents as SIPs above, from which they are derived. Under the SWAp, funds contribute directly to a sector-specific umbrella and are tied to a defined sector policy under a government authority. They are defined as initiatives in which "all significant funding for the sector supports a single sector policy and expenditure program, under Government leadership, adopting common approaches across the sector, and progressing towards relying on Government procedures to disburse and account for all funds"²³.

Where the SWAp also encourage multi-donor contributions to a shared policy framework, one key difference between a SWAp and a SIP might be that SWAp promote more strongly the use of national systems for expenditures and monitoring – whereas SIPs could design their own systems in this regard²⁴. In addition, where SIPs were mechanisms to channel investment funding, most often loan-based, SWAp coordinated multiple sources and types of financing under the umbrella of a sector policy or plan, and did not necessarily focus on investment related costs within the sector. Furthermore, it was noted that where a SIP is an "instrument" or an aid modality, a SWAp is "... a framework setting a direction of change - towards better coordinated and more effective aid management."²⁵, "a policy planning and management approach which can in reality be funded by a variety of financial aid instruments"²⁶.

As noted in Sector-Wide Approaches for health Development²⁷, the terms SIPs and SWAp are actually donor terms, and reflect the approach to channelling assistance, more than the country-owned policies

²¹ TerrAfrica. "Informing Future Engagement for Scaling up Sustainable Land Management in Africa", undated

²² TerrAfrica. "Informing Future Engagement for Scaling up Sustainable Land Management in Africa", undated

²³ ODI. "Evaluation of Sector-wide approach in environment", 2008

²⁴ DFID. "Sector Wide Approaches (SWAp)", 2001.

²⁵ ODI. "Evaluation of Sector-wide approach in environment", 2008

²⁶ GDFRD. "Sector-Wide Approaches in Agriculture and Rural Development", 2006

²⁷ WHO. "Sector-Wide Approaches for health Development", 1999

they are designed to support. Country ownership, which is the key principle at the origin of programmatic approaches, can be seen in varying degrees in the setup and implementation of various SWAp: this can range from head of state impulse for a particular sectoral policy objective (e.g. achieve universal school enrolment), to cases where donor leadership is more evident, particularly in developing the policies and frameworks that would be the object of their later support.

Most evaluations have found that SWAp generally contributed to more streamlined dialogue between the donor community and government, strengthened government leadership and coordination between donors. However, it was also found that this often took place at the cost of a centralization of policy-making and excessive attention on the workings of the SWAp rather than on the policy objectives^{28, 29}.

There also appears to be limited evidence that SWAp have actually led to a reduction in transaction costs - in fact, heavy management structures have often been created to support the design, implementation and monitoring of the SWAp. Also, and despite the original intent, SWAp have ended up concentrating almost exclusively on the way resources are channeled to the beneficiary sectoral ministry, doing little to stimulate linkages across government and with non-state actors. Finally, as noted above, there is limited evidence - at least to-date - that SWAp have actually contributed to a more efficient use of public resources and better service delivery.

SWAp initially targeted social sectors in highly aid dependent and low-income countries, in sectors with a large number of donors where aid fragmentation was a significant problem. In practice, some SWAp were funded by a single donor, and some others focused on sub-sectoral and multi-sectoral issues. This latter point has allowed for the emergence of environment-related SWAp, or Rural Development SWAp, such as for example the Netherlands supported Environmental SWAp in Colombia (2007-2010), which was funded to the tune of 16 million Euro. Key characteristics of this SWAp included the fact that funding was channeled to the national level, in response to a strong policy statement and accompanying expenditure framework, using both budget support and project-based aid. However, this SWAp did not succeed in leveraging other donor support, as most programmatic approaches intend to do.

The use of SWAp in the environment sector has also been limited, but has yielded some interesting lessons. In a 2010 report, DANIDA also evaluated the effectiveness and impacts of the sector-based or programmatic approach in the environment sector, which they termed "Environment Support Programs (ESPs)"³⁰, which they had begun implementing since the late 1990s. The evaluation found that the approach was not entirely successful for various reasons. For example, "ESPs sought to build national frameworks or systems that would benefit more of the poor – because of their linkages to national poverty reduction plans – but in order to do so would require long-term engagement and strong national ownership. Thus, while these ESPs were better aligned to and provided support for national strategies and legislation, they nevertheless faced challenges in terms of insufficient national leadership and in being anchored to institutions with weaker political influence and capacity."³¹ It was also found that few of the ESPs actually lasted for the intended duration of 10-20 years. Furthermore, as with the Colombia example above, or the CIDA-GTZ led Forest and Environment Support Program in Cameroon, donor fragmentation remained an issue, as few other donors joined the ESPs with more than small-scale, ad hoc support. This latter example was one where the GEF was also able to provide additional funding, but where it was not engaged in the totality of the program – neither in scope nor in duration.

²⁸ ODI. "Evaluation of Sector-wide approach in environment", 2008

²⁹ GPRD. "Sector-Wide Approaches in Agriculture and Rural Development", 2006

³⁰ DANIDA. "Evaluation of Programmatic Approaches to support for the environment in Africa 1996-2009", 2010.

³¹ DANIDA. "Evaluation of Programmatic Approaches to support for the environment in Africa 1996-2009", 2010.

This mitigated success in the environment and natural resources sector has also been attributed to the fact that SWApS and PBAs were conceived from the supply-side as aid delivery mechanisms that did not necessarily take into consideration the political realities of a given sector in the recipient country³². In addition, inherent complexities in sectors such as agriculture, forestry and rural development meant that a pure “single-sector-based” approach were not as easily forthcoming.³³ This applies especially to the GEF, where single-actor sectors are not usually easily found, except perhaps in the energy and water sectors – and where in most cases, the primary interlocutors are environment ministries, whose limited operational powers in many developing countries do not always allow for the effective implementation of sector-wide approaches.

As with the case of SIPs above, the GEF’s participation in a SWAp depended on whether incremental costs could be easily identified and “carved-off” for grant funding. In most cases, the GEF’s participation in an environment SWAp was actually operationalized as a project within the GEF (see for example Madagascar “Third Environment Program”). As with the case of SIPs, where the GEF could participate as a funding partner in a SWAp, in no case could the GEF be the lead agency or initiator of a SWAp, even if said program was focused on environmental or natural resources issues. This was most likely owed to the need to limit funding to the incremental costs of achieving GEBs and to avoid using GEF funds to cover recurring costs of any given sector program.

Program-Based Approaches (PBAs) are another extension of the SWAp. The term refers to a generic approach based on comprehensive and coordinated planning in a given sector, thematic area or under the aegis of a national poverty reduction strategy (PRS). According to the Canadian International Development Agency’s (CIDA) primer on PBAs: “PBAs are intended to support locally owned programs of development, so the word ‘program’ in the expression refers to the program of a developing country or institution, which one or more donors have agreed to support...the program may be a PRS, a sector program or a thematic program or the program of a specific organisation such as a non-governmental organisation”³⁴. To some extent the concept of PBA offers a higher degree of institutional flexibility by focusing on a policy program and objectives – which can be multi-sectoral, sectoral or sub-sectoral – rather than a bureaucratic institutional structure, i.e. the sector”³⁵. In theory this approach can apply more readily to environmental issues, many of which are cross-sectoral and multi-stakeholder in nature. In practice, there have been very few PBAs in the environmental area, owing perhaps to the absence of a single, integrating and rallying environmental policy and program statement in most countries, and to differing ideas of what governments should do about environmental degradation.

In contrast to the above approaches, multi-project programs (MPPs) make no assumptions about the degree of donor coordination or country ownership. MPPs can be considered as straightforward aid delivery instruments comprised of a set of interlinked projects or initiatives. MPPs lend themselves well to environmental issues because they can coordinate multiple stakeholders and implementing entities around multiple time-bound initiatives, while encouraging the development of shared frameworks, procedures and monitoring. It is no surprise, therefore, that these types of programs are the ones found most frequently within the GEF’s portfolio, and the ones that can most readily be operationalized through the GEF’s own procedural requirements. That is not to say that MPPs do away with the requirement of country ownership, but that the way in which this ownership is manifested is more flexible than in the case of the other programmatic approaches, where a single policy document formed

³² Boesen Nils, Dietvorst Desiree. “SWApS in motion Sector wide approaches: From an aid delivery to a sector development perspective 2006-2007”, 2007.

³³ See for example SWAp Studies Synthesis Report and European Commission. “Sector Approaches in Agriculture and Rural Development”, 2008.

³⁴ CIDA. “CIDA Primer on Program-Based Approaches”, 2003.

³⁵ GDFRD. “Sector-Wide Approaches in Agriculture and Rural Development”, 2006

the basis of donor engagement. MPPs also allow for multi-donor coordination as well as the coordination of multiple types of financial instruments. The main characteristic of MPPs is that the projects that comprise them have to be linked among them by some kind of unifying principle. This principle could be regional unity, a specific theme or issue, a common methodology, or a higher-level objective.

MPPs have advantages and disadvantages, for example they may promote learning and sustainability, but they also can create multiple structural layers depending on the number of partners, sometimes creating issues with accountability and delays or inequalities among the different stakeholders. Another potential drawback is that MPPs tend to become organizations in themselves, and the longer they last, the harder they may be to disband, even if the original objectives have been achieved. Working across multiple countries, sectors, or administrative, legal and currency systems may increase also transaction costs³⁶. However, despite these potential shortcomings, MPPs are among the most widely used types of programmatic approaches in all sectors, and because they offer the most flexibility and allow for higher-level impact monitoring. They also provide the possibility for donors to channel larger amount of financial assistance in a smaller number of transactions (though the transaction costs may simply be displaced from the donor to the recipients, in some cases).

Examples of such programs abound in the GEF, including for example the “strengthening climate early warning systems” program (which is comprised of 10 separate national projects without an integrative umbrella); the “Integrated Approach Pilot on Food Security”, which includes 11 child projects and one integrative regional project; or the “Ridge to Reef” initiative, which is implemented across regions using a similar methodology. Conversely to the SWAs and SIPs, MPPs can and often are, initiated by GEF or GEF agencies, and are often focused around GEF-channeled grant funds, which are added on to the development baseline funding in the country (as opposed to donor-channeled loans). MPPs also lend themselves more easily to being exclusively grant financed, and are also usually completed within a relatively short time-frame, which allows the GEF to play a more central role in their conception, if not their operationalization. It should be noted that the Integrated Approach Pilots, of which there are three under implementation under GEF-6, are designed to pave the way in which the GEF intends to operate in GEF-7 and beyond.

Finally, one of the most recent instruments that embody a programmatic approach is the Strategic Investment Fund (SIF), which is implemented by the World Bank. SIFs are the next generation of SIPs, in that they channel investment funding – meaning they cover a certain type of expenditure, but focusing on cross-sectoral issues and with a strong accent on access by non-governmental partners, mainly the private sector. SIFs also provide a venue where donor coordination and harmonization can be pursued around joint objectives, shared methodologies and approaches, and common evaluation frameworks. This modality has been used by the World Bank to support large-scale environmental sector programming, such as for example through the Climate Investment Funds, which include the Pilot Program on Climate Resilience (PPCR), the Clean Technology Fund (CTF), the Forest Investment Program (FIP) and the Scaling-up Renewable Energy Program (SREP).

The PPCR, FIP and indeed most SIFs, combine programmatic and project-based approaches. For example, they are still delivered to some extent through country projects, but projects are articulated together through a common framework. “The PPCR programmatic approach entails a long-term, strategic arrangement of linked investment projects and activities to achieve large-scale, systematic impacts and take advantage of synergies and co-financing opportunities”³⁷. Funds for the PPCR are

³⁶ Buffardi Anne L., Hearn Simon. “Multi-Project Programs”, Methods Lab, 2015.

³⁷ Climate Investment Funds, <https://www-cif.climateinvestmentfunds.org/fund/pilot-program-climate-resilience>

grants contributed by various donors. Some of these programs, or their sub-projects, have been co-financed by the GEF, for example the Tajikistan Environmental Land Management and Rural Livelihoods Project, financed through a US\$9.45 million grant from the PPCR and a US\$5.4 million grant from the GEF.

Like MPPs, the SIFs involve multiple stakeholders, larger institutional setups and institutional layers, but provide flexibility for channeling investment funding towards well established policy priorities in countries. By grouping individual country initiatives together in an umbrella program, the SIFs also allow for knowledge sharing, and some reduction of transaction costs at the donor level. Common reporting frameworks are established, while providing flexibility for country-owned objectives and reporting mechanisms.

In general, the SIF modality goes beyond what the GEF has been able to operationalize to date. This could be because the level of financing available in SIFs is higher than what is usually provided in a given replenishment, and because it doesn't have to be separated into country allocations or be concerned with issues of equity of access (as in the case of LDCF, for example). It could also be because SIF financing is also most often concentrated in sectors or sub-sectors with strong private sector interest, and the possibility for higher rates of return, whereas GEF funding is limited in scope, purpose and nature. This opens SIFs up for the possibility of innovative sources of financing, whereas GEF continues to rely on voluntary contributions from its members, with the policy requirements inherent to a negotiated aid delivery mechanism. If in theory the GEF could participate, through a project, in a SIF sub-project, it could not participate in the SIF at the highest level because of the need to demonstrate clear and measurable, localized GEBs.

In fact, this need to demonstrate clear and measurable GEBs is also at the root of a key emerging feature of GEF programs, which is the concern with knowledge management and lessons learning. Most other programmatic approaches are concerned with demonstrating progress along the development spectrum, and will use as indicators the country's own development priorities and targets. Ultimately, contributions through a SWAp or a PBA would therefore be measured for success against the country's ability to meet its sectoral targets. A SWAp or a PBA should not, in theory, have its own results framework. In practice, as was noted during this study, this has meant that best practices and knowledge might have focused more on the operational aspects of conducting a programmatic approach, rather than on the results it has generated on the ground.

In the case of GEF programmatic approaches, monitoring, evaluation and knowledge management, have always been a concern. In almost all types of GEF programs, efforts have been made to tie all child projects together through some form of knowledge exchange. Early programs demonstrated such efforts through "coordination child projects", or "regional projects", and later through the program coordination budgets. The most recent example of this effort would be the three Integrated Approach Pilot programs, which have a dedicated child project designed to identify, gather and disseminate best practices and lessons arising from other child projects and to assist in coordination among child projects. In many regards, this feature of GEF programs has contributed to creating the "glue" that binds collections of individual projects together. During the internal review of programmatic approaches, this feature was highlighted as a key aspect that should be strengthened in future programs, and indeed the three IAPs have integrated this lesson, as a model for future GEF programming. The upcoming FAO-led program "The Restoration Initiative" also integrates this feature through a dedicated coordinating function.

Summary Comparative Table

Program	Key characteristics	Comparison with GEF Programs
Sector investment programs (SIPs)	<ul style="list-style-type: none"> • Channel large-scale, long-term investment into specific economic sectors by targeting themes and topics that go beyond traditional economic sector; • A mechanism to direct funding to cover all expenditures of a given sector; • SIPs has to be based in national strategy and Policy Framework; • The Government or Private sector has to manage and administrate the expenditure and policies; • Implementation arrangements and use of local capacity are promoted; • Use of multi-donor and multi-stakeholder approach; • SIPs are usually at least partially loan-financed. 	<ul style="list-style-type: none"> • Similarities with some of the earlier GEF sequenced programs, allowing for channeling long-term funding (international waters); • GEF agencies could participate as co-financiers into a SIP, but would likely have to submit a project through GEF Council for operationalization, highlighting incremental costs covered; • GEF grants cannot cover recurring or “investment” costs.
Sector Wide Approaches (SWAs)	<ul style="list-style-type: none"> • Funds are used for a sector-specific umbrella and defined sector policy under the government leadership; • SWAs are a framework setting a direction of change; • Coordinate multiple sources and types of financing under the umbrella of a sector policy or plan; • Use of multi-donor and multi-stakeholder approach • Use of national systems for expenditures and monitoring; • Target social sectors in highly dependent and low income countries; • SWAs contribute to facilitate the dialogue between donors and government and so strengthen the government leadership and coordination; • Resources are concentrated exclusively into the beneficiary sector. 	<ul style="list-style-type: none"> • Environment Sector-based SWAs exist but have experienced mitigated success. The GEF has been involved in a few as a funding partner; • The GEF cannot initiate or lead a SWAP, even in the environment and natural resources sector; it depends on certain types of costs being financed from other sources; • The weakness of environmental ministries makes environmental SWAs difficult to operationalize, and the cross-sectoral nature of some environmental issues does not lend itself well to SWAP-like arrangements.
Program-Based Approaches (PBAs)	<ul style="list-style-type: none"> • PBAs are a generic approach based on comprehensive and coordinated planning in a given sector, thematic area or under the aegis of a national poverty reduction strategy (PRS). • They focus more on the policy program and objectives (multi-sectoral, sectoral or sub-sectoral) and support locally owned program of development; • High degree of institutional flexibility; • More adapted to environmental issues. 	<ul style="list-style-type: none"> • In theory at least, all GEF projects and programs are intended to be based on a national policy priority; • There are few PBAs in the environmental area, owing perhaps to the absence of a single, integrating and rallying environmental policy and program statement in most countries, and to differing ideas of what governments should do about environmental degradation;

		<ul style="list-style-type: none"> • GEF planning horizons and time limits on fund availability mean that long-term recurring costs of PBAs are excluded from GEF processes.
Multi-Project Programs (MPPs)	<ul style="list-style-type: none"> • Most widely use type of programmatic approach; • Make no assumptions about the degree of donor coordination or country ownership; • Use of multi-donor and multi-stakeholder approach and multi type of financing; • The main characteristic of MPPs is that the projects that comprise them have to be linked among them by some kind of unifying principle; • MPPs offer the most flexibility and allow for higher-level impact monitoring and provide the possibility for donors to channel larger amount of financial assistance in a smaller number of transactions. 	<ul style="list-style-type: none"> • Frequently found in GEF programming; • Lend themselves well to GEF cofinancing as they encourage multi-donor approaches, with blended types of financing; • GEF multi-project programs have sought to create internal coherence and consistency through various means (integrative projects, shared methodologies and approaches); • Reflects the intention of programmatic approaches in the GEF (more effective means of channeling funds, higher level impacts, smaller number of transactions); • GEF Agencies can initiate and operationalize MPPs without much need for outside partnerships and funding.
Strategic Investment Fund (SIF)	<ul style="list-style-type: none"> • Involve multiple stakeholders, larger institutional setups and institutional layers but also provide coordination around joint objectives, shared methodologies and approaches; • Used to support large-scale environmental sector programming; • SIFs also allow for knowledge sharing, and some reduction of transaction costs at the donor level. 	<ul style="list-style-type: none"> • GEF can participate in SIFs as a co-financier, focusing its grant funds on the generation of specific GEBs, through the project modality; • SIF funding differs from GEF in scope, purpose and nature.

Concluding remarks

This brief comparative overview of different types of programmatic approaches provides some insights into the evolution of the GEF's own programs. As noted by stakeholders during the discussions on the Approach Paper for the Evaluation of Programmatic Approaches, the OECD definition is not found to be entirely applicable to the GEF's programs, despite the fact that GEF programs also claim to follow the same principles of donor coordination, harmonization, country ownership, and effectiveness.

It appears that while all the above approaches seek to apply the same principles, they differ mainly in terms of the degree of flexibility they allow in their operationalization. For example, in the case of SWAPs, a single sector policy was needed to bring together donors and to operationalize assistance; in the case of MPPs, a common objective – supported by participating partners – is sufficient as a convergence principle. GEF programs fall in the category of MPPs, mostly because the main operational tool for channeling GEF resources remains the project. Even the most recent group of programs funded by the GEF continues to be operationalized through individual projects with clear time and resource limits, and strong attention placed on individual project results. This is the case where GEF “initiates” the idea of a program, for example for GEF-specific programs such as the Danube Program. In fact, GEF programs before 2008 were operationalized as individual projects, with the clear exception that the *intent* of long-term programmatic engagement was clearly mentioned.

In theory, it would be possible to see cases where the GEF acts as one among many donors supporting a given country policy or program, meaning where leadership on programmatic approaches comes from outside, and in particular from recipient countries; while this was attempted in the case of the early SLM country partnerships, it was achieved with limited success and has rarely been seen since then.

This could be because GEF funding is based on the principle of incrementality, which reduces the scope of the types of costs it may cover – whereas other sector-based approaches, for example, are intended to cover the full scope of expenditures. Perhaps the incremental cost principle lends itself less to sector-based approaches, SWAPs and PBAs because of the need to report on specific environmental results (even though these may contribute to overall sectoral performance). This highlights a key difference between the GEF and other development cooperation partners, which could be referred to as the “power of agency”: whereas development cooperation institutions have the ability to self-direct various sorts of funding towards different types of policy priorities, the GEF was created as a means to channel funds and it can only channel one type of funding towards clearly measurable global environmental benefits.

Almost by definition, grant funds are not intended to be provided on a long-term basis, but rather to be focused on a clear set of time-bound targets, and are usually not used to support baseline investments, profit-seeking ventures, or recurring costs. This limits the ability of the GEF to influence long-term results or to engage in strategic-level policy making, even through programmatic approaches. The fact that funds are also replenished on a voluntary basis every four years also limits the GEF's ability to engage in long-term partnerships. Therefore, programmatic approaches in the GEF are bound to be narrower in scope than those implemented by development cooperation agencies, be they bilateral or multilateral. MPPs have so far provided the most appropriate program approach through which the GEF can strive to channel more strategic and programmatic assistance to countries for environmental issues, which fit with the operational requirements of periodical replenishments and the principles of incremental financing.

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Technical Document 2

Geospatial Impact Analysis of Programmatic Project Implementations in the GEF

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Appendix I. Definitions and Frame of Analysis

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Abbreviations and Acronyms

AVHRR	Advanced Very High Resolution Radiometer
BD	Biodiversity
CDIAC	Carbon Dioxide Information Analysis Center
GLCF	Global Land Cover Facility
GEF	Global Environment Facility
LD	Land Degradation
LTDR	Long Term Data Record
MODIS	Moderate Resolution Imaging Spectroradiometer
NASA	National Aeronautics and Space Administration
NDVI	Normalized Difference Vegetation Index
UNCCD	United Nations Convention to Combat Desertification

Background and Objective

1. In its role as a financier of Multilateral Environmental Conventions, the GEF faces a unique global context driven by recent policy moves by the global community (including the Sustainable Development Goals and Paris Climate Negotiations [GEF/ME/C.50/07]). Against this background, the GEF is entering into a sixth comprehensive evaluation “to provide solid evaluative evidence to inform the negotiations for the seventh replenishment of the GEF” [GEF/ME/C.50/07]. This report provides technical information on the methodology and a synopsis of the results from a geospatial impact analysis performed as a part of a collaboration between the GEF Independent Evaluation Office (IEO) and AidData, a research lab at William & Mary, assessing how GEF support delivered under programmatic approach modalities have contrasted to other approaches (pursuant to GEF/ME/C.48/01). It extends recent work (GEF/ME/C.51/Inf.2) integrating satellite and other sources of spatial data to answer two key questions:

- *What is the impact of GEF projects implemented under programmatic approaches?*
- *In what contexts have GEF projects implemented under programmatic approaches delivered broader and longer term environmental outcomes as compared to non-programmatic implementations?*

2. Contained in this report — and made available for future analysis — are data on the geographic locations (i.e., longitude and latitude) of GEF projects implemented under programmatic approaches, as well as related measurements following the indicators suggested by the United Nations Convention to Combat Desertification (UNCCD 2015) and Convention on Biological Diversity (CBD 2016). These data, alongside related information on the geographic context and project characteristics of GEF projects, are used in a matching-based quasi-observational study design to test a variety of hypotheses related to the effectiveness of GEF projects along two primary dimensions: Forest Cover and Vegetative Density³⁸.

Summary of Findings

3. This report leverages a multiple-stage modeling approach in order to attribute impact to GEF programmatic projects. First, locations at which GEF programmatic projects were implemented are paired with areas at which no GEF project existed, but all other geographic characteristics were similar. Second, a causal tree is fit to these matches — a machine learning technique that helps to identify heterogeneity in impact effects. Third, a traditional linear econometric model is fit with relevant interaction terms to test model significance. Both of these models — the causal tree and linear model — are then interpreted to determine an overall level of confidence (see Appendix II for more information). Finally, this process is repeated to answer the key question posed in this impact evaluation, contrasting GEF projects implemented under programmatic approaches to GEF non-programmatic projects in order to measure the marginal gains (or losses) attributable to GEF programmatic implementations.

³⁸ An additional analysis was conducted based on in-situ estimates of the state of biodiversity; however, due to a lack of spatial overlap between programmatically implemented projects and protected areas at which measurements were collected we intentionally omit these results. More detailed, in-situ spatial information on the state of biodiversity could enable future analyses.

4. We consider three levels of confidence in this study; these levels are reflected in the discussion below. Findings in which we indicate high confidence have evidence above and beyond traditional parametric confidence associated with them: not only is their significance in the linear statistical modeling efforts, but also evidence of importance in the machine learning models. Further, in the case of high confidence, these models agree in their findings. Standard confidence is akin to traditional significance testing: this descriptor is used if either the traditional, linear parametric model or the causal tree indicate significance or robustness (respectively), and the models agree in finding. Finally, lower confidence is flagged as cases where the models agree in findings, but neither model ascribes clear significance or robustness. These levels of confidence are summarized in figure 1.

5. In addition to these levels of confidence, for each finding we highlight if it is directly attributable to GEF programmatic approaches, or if the finding is descriptive of the contexts in which GEF programmatic approaches have been successful. As an illustrative example, figure 6 summarizes the attributable impact of GEF programmatic projects relative to single focal projects along the dimension of monetary scale. While the models

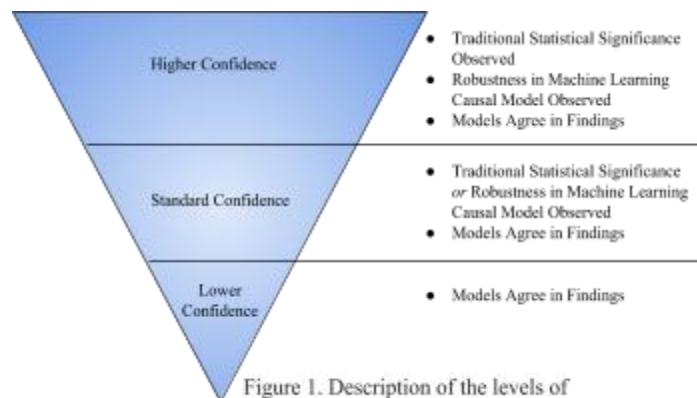


Figure 1. Description of the levels of confidence used in this study.

employed in this analysis enable us to directly ascribe impact to GEF projects as contrasted to single focal projects, we did not contrast large-scale GEF projects directly to small-scale GEF projects (a contrast that would be confounded by many factors). Thus, this figure can only be interpreted as descriptive: we do not provide evidence that GEF programmatic interventions at the 20th percentile of financing are the most effective due to financing; rather, we describe that — of all the projects to which we attributed impact — those at the 20th percentile of financing tend to provide the most bang for the buck relative to single focal projects. In this particular example, we cannot directly attribute this cause to monetary scale, but highlight the finding as a potentially important element for program implementers to consider. Throughout this summary, each finding is flagged as either attributable or descriptive to highlight this distinction.

6. At a global scale, there is high confidence that GEF projects implemented under programmatic approaches have resulted in attributable improvement to local environmental conditions, though some heterogeneity in the effectiveness of these projects is highlighted in the detailed findings below. When contrasted to non-programmatic projects, GEF programmatic implementations were found to be more successful only under some conditions; non-programmatic project implementations still remain a strong option for the GEF under other conditions.

- On average, the models provided standard confidence that improved environmental outcomes are attributable to GEF programmatic projects as contrasted to non-programmatic projects in the case of single focal biodiversity projects. However, no such evidence existed for multi-focal projects with biodiversity components.

- GEF programmatic multifocal area projects with land degradation components had mixed results when contrasted to non-programmatic multifocal projects with land degradation components. Under many geographic and project contexts programmatic implementations resulted in an attributable improvement in satellite-sensed vegetation density; however, universally GEF programmatic multifocal projects with land degradation components underperformed non-programmatic multifocal projects with land degradation components in terms of improvements of forest cover. Because of an insufficient sample of programmatic projects which were single focal land degradation projects, this result is only based on the best-matched multifocal with land degradation components cases.

7. Figures 2 and 3 descriptively summarize all findings on heterogeneity across all models for GEF-4 and GEF-5 projects, in each case choosing the best available counterfactual set (i.e., GEF programmatic multifocal projects with land degradation components are contrasted to GEF non-programmatic projects with land degradation components which had similar multifocal components). As these figures illustrate, for projects in GEF-4 and GEF-5 there was considerable heterogeneity in the conditions under which programmatic projects led to improved benefits relative to non-programmatic projects. In particular, projects implemented under programmatic approaches in GEF-5 had stronger outcomes than those in GEF-4, as contrasted to non-programmatic implementations.

Figure 2. Descriptive heterogeneity in findings for NDVI outcomes for biodiversity projects implemented under programmatic strategies. Areas in green indicate projects sharing that characteristic had a better outcome under programmatic implementations; areas in red indicate that non-programmatic projects with those characteristics had better outcomes.

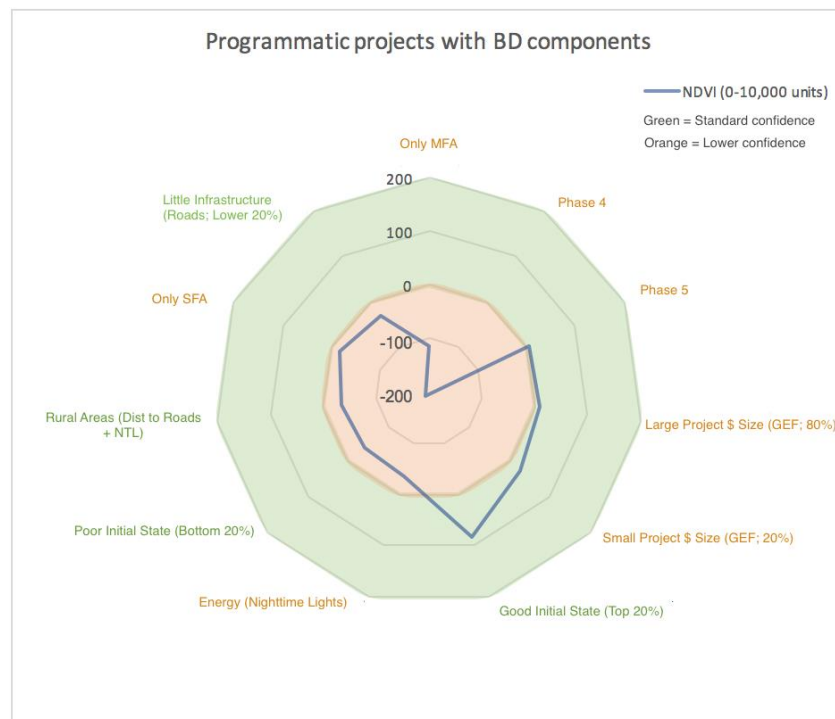


Figure 3. Descriptive heterogeneity in findings for NDVI outcomes for land degradation projects implemented under programmatic strategies. Areas in green indicate projects sharing that characteristic had a better outcome under programmatic implementations; areas in red indicate that non-programmatic projects with those characteristics had better outcomes.

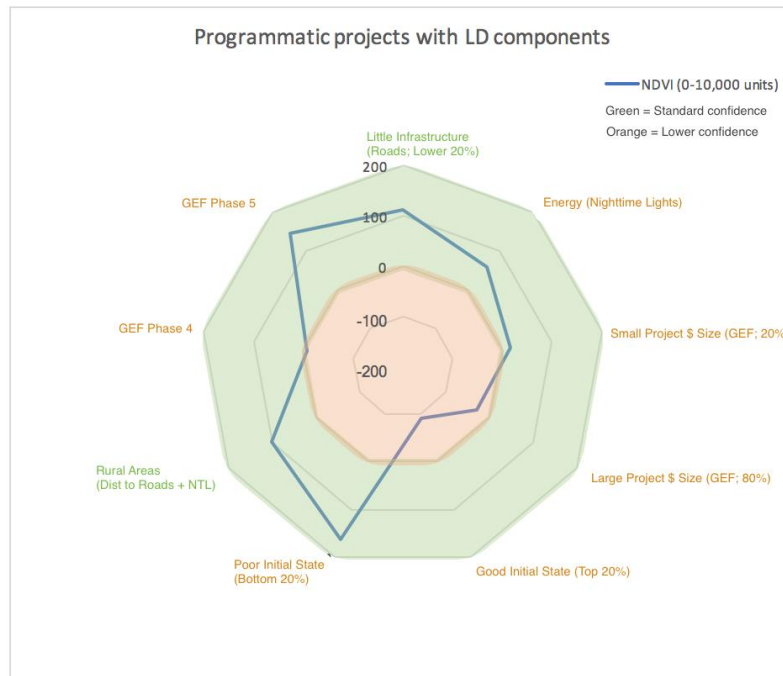
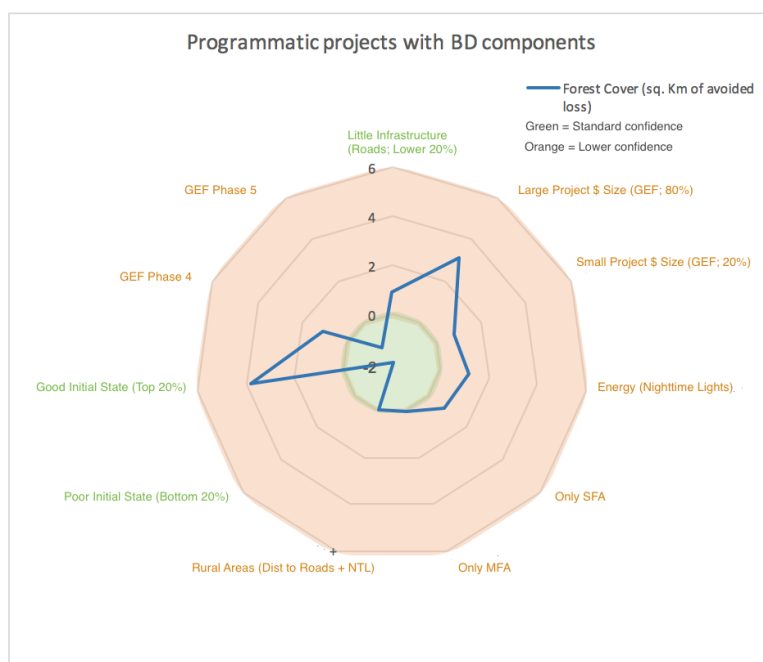


Figure 4. Descriptive heterogeneity in findings for forest cover outcomes for land degradation projects implemented under programmatic strategies. Areas in green indicate projects sharing that characteristic had a better outcome under programmatic implementations; areas in red indicate that non-programmatic projects with those characteristics had better outcomes.



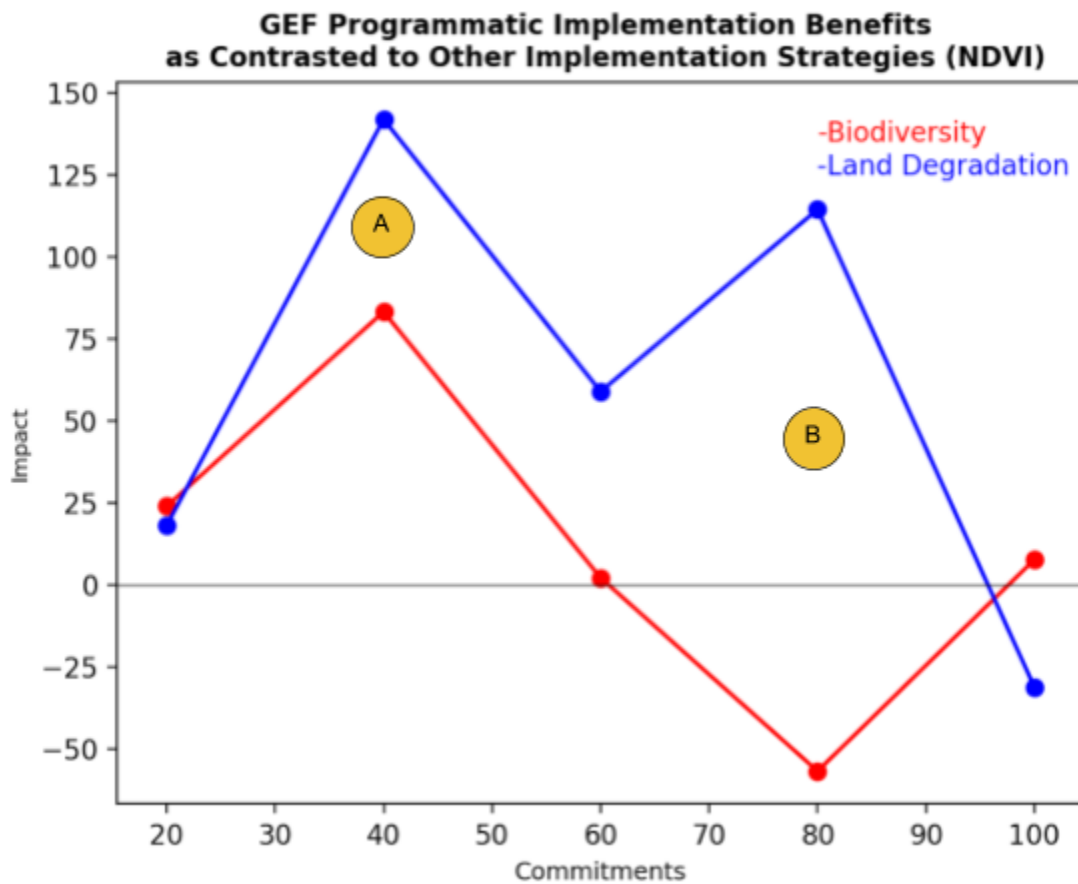
Figure 5. Descriptive heterogeneity in findings for forest cover outcomes for biodiversity projects implemented under programmatic strategies. Areas in green indicate projects sharing that characteristic had a better outcome under programmatic implementations; areas in red indicate that non-programmatic projects with those characteristics had better outcomes.



8. Figures 4 and 5 provide descriptive summaries of the impact of land degradation and biodiversity projects implemented under programmatic approaches as contrasted to those not implemented under programmatic approaches. This descriptive evidence suggests that programmatic approaches were more successful in cases with a poor initial condition and in areas with little infrastructure; however, evidence exists that single focal projects are more effective in areas with a better initial state.

9. Figure 6 provides descriptive information on heterogeneity as project scale increases, as approximated by increasing dollar values. In this figure, the X-axis represents the percentile of project dollar value, and the Y-axis represents estimated impact. Each case is scaled for comparison according to percentiles due to varying levels of funding: including multifocal cases, programmatic biodiversity projects range from \$2 to \$508 million, while programmatic LD projects range from \$1.5 to \$181 million. Two points (points A and B) are highlighted for the sake of example. Point A represents project scales at which both biodiversity and land degradation receive high bang-for-the-buck, as large average attributable impacts are observed at the 40th percentile of project costs. Point B represents a divergence, in which land degradation projects tend to receive large bang-for-the-buck, while biodiversity projects tend to receive less than other funding scales.

Figure 6. Description of the attributable impact of biodiversity and land degradation projects on NDVI as the total dollar value of programmatic project increases.



Overview of Hypotheses

10. All hypotheses, the key results and outcome variables, counterfactual groups, and total units of observation are summarized in Table 1. The hypotheses seek to directly answer the two primary questions being posed in this report:

- *Research Question 1: What is the impact of GEF projects implemented under programmatic approaches? (H1)*
- *Research Question 2: In what contexts have GEF projects implemented under programmatic approaches delivered improved environmental outcomes as compared to non-programmatic implementations? (H2, H3)*

Table 1: Hypotheses tested in this analysis.

Hypothesis and Measurement	Contrast	Key Results / Outcome Variables	N (Locations)		N (Projects)	
			T	C	T	C
H1. GEF programmatic projects provide positive environmental benefits relative to areas with no projects implemented.	(M1) Programmatic w/ land degradation components; Null Case Comparisons	Vegetative Density (NDVI) Forest Cover	259	4980	30	
	(M2) Programmatic w/ biodiversity components; Null Case Comparisons	Vegetative Density (NDVI) Forest Cover	477	4980	71	
H2. GEF programmatic land degradation projects provide greater positive environmental benefits relative to GEF non-programmatic land degradation projects*	(M3) Programmatic multifocal projects with a significant** land degradation component; non-programmatic multifocal projects with a significant** land degradation component*	Vegetative Density (NDVI) Forest Cover	212	137	20	13
H3. GEF programmatic biodiversity projects provide greater positive environmental benefits relative to GEF non-programmatic biodiversity projects.	(M4) Programmatic multifocal projects with a significant** biodiversity component; non-programmatic multifocal projects with a significant** biodiversity component.	Vegetative Density (NDVI) Forest Cover	86	87	14	12
	(M5) Programmatic single focal biodiversity projects; non-programmatic single focal biodiversity projects.	Vegetative Density (NDVI) Forest Cover	202	804	38	103

*Only multi-focal land degradation projects are contrasted in this study, as a very limited number of single-focal programmatic land degradation projects are available for comparison.

**Based on percentage of total funding which went to specified component relative to the number of components which were funded

Research Question 1: What is the impact of GEF projects implemented under programmatic approaches?

11. To answer this question, we test Hypothesis 1: GEF programmatic projects provide positive environmental benefits relative to areas with no projects implemented. Four total models are fit to examine this hypothesis, examining the impact of programmatic projects with either land degradation or biodiversity components on vegetative density and forest cover. The findings from these analyses are briefly summarized in Table 2, and full information on the relevant modeling strategies, data sources, covariate controls, and study population are provided in the appendix.

Table 2. Findings for models contrasting GEF programmatic projects (land degradation and biodiversity cases) to null cases.

Contrast	Outcome Variables	Summary Findings	
		Interpretation	Detailed Results
(M1) Programmatic w/ land degradation objectives; Null Case Comparisons	Vegetative Density (NDVI)	Evidence suggests that GEF programmatic projects with a land degradation component have had a positive impact on vegetative density . Estimates suggest projects in China, as well as those in protected areas, had the largest positive impacts; under narrow geographic criteria projects with less than 1.5 years since implementation have not yet shown positive results.	Full Results Model Matches Global Estimate Local Estimates Mapped Estimates
	Forest Cover	Evidence suggests that GEF programmatic projects with a land degradation component have slowed the rate of forest loss at the global scale . Areas with poor initial conditions (forest cover less than approximately 50%) saw larger improvements.	Full Results Model Matches Global Estimate Local Estimates Mapped Estimates
(M2) Programmatic w/ biodiversity objectives; Null Case Comparisons	Vegetative Density (NDVI)	Evidence suggests that globally, GEF programmatic projects with a biodiversity component have not positively impacted vegetative density . However, locally positive impacts are identified in areas with poor initial conditions . Satellite evidence suggests the best performing projects are in central Africa and northeastern China.	Full Results Model Matches Global Estimate Local Estimates Mapped Estimates
	Forest Cover	Evidence suggests that globally, GEF programmatic projects with a biodiversity component have slowed the rate of forest loss . Programmatic implementations were most successful in areas with limited access to roadways. Estimates are more uncertain in central Africa than other regions.	Full Results Model Matches Global Estimates Local Estimates Mapped Estimates

12. At the global scale, findings indicate that both GEF projects implemented under programmatic approaches have had positive environmental benefits, irrespective of their focus (biodiversity or land degradation). The measurements used here — examining vegetative density and forest cover — are found to be more positively impacted by projects that contain a focus on land degradation.

13. Locally, considerable heterogeneity emerged in where — and under what conditions — GEF programmatic projects had the greatest benefit. After controlling for natural confounds (such as rainfall, temperature, and other factors), projects located in northeastern China tended to have a larger positive impact on vegetation density — in projects with either land degradation or biodiversity components. Further, evidence suggests that programmatic projects are most effective in areas that have poor initial conditions. Of note is that considerable uncertainty in findings existed throughout Central Africa, so results in that region are of less certainty than others.

Research Question 2: In what contexts have GEF projects implemented under programmatic approaches delivered improved environmental outcomes as compared to non-programmatic implementations?

14. To answer this question, we test Hypothesis 2 and 3, considering if GEF programmatic projects provide greater positive environmental benefits relative to GEF stand-alone projects. Six total models are fit to examine these hypotheses. For Hypothesis 2, we examine the impact of programmatic projects with a land degradation component on vegetative density and forest cover, respectively; this is done only for the multifocal case due to a relatively rare implementation of land degradation in the single

focal programmatic context. Hypothesis 3 tests the relative effectiveness of biodiversity projects which were programmatic, under both single and multifocal contexts. The findings from these analyses are briefly summarized in Table 3, and full information on the relevant modeling strategies, data sources, covariate controls, and study population are provided in the appendix.

Table 3. Findings for models contrasting GEF programmatic projects to GEF non-programmatic projects (for both land degradation and biodiversity cases)

Contrast	Outcome Variables	Summary Findings	
		Interpretation	E-Appendices
(M3) Programmatic multi-focal projects with a significant**land degradation component; non-programmatic multifocal projects with a significant** land degradation component*	Vegetative Density (NDVI)	Evidence suggests that - on average - implementation of programmatic multifocal projects with a land degradation component outperform implementations of non-programmatic multifocal projects with a land degradation component. However, there is a stark geographic divide in this finding: areas in central and western Africa tended to have more positive impacts; areas in India and China tended to have less positive impacts from programmatic implementations.	Full Results Model Matches Global Estimate Local Estimates Mapped Estimates
	Forest Cover	No significant differences between programmatic multifocal projects with a land degradation component and non-programmatic multifocal projects with a land degradation component were found in terms of their impact on forest cover. This finding was relatively homogeneous across the globe.	Full Results Model Matches Global Estimate Local Estimates Mapped Estimates
(M4) Programmatic multi-focal projects with a significant** biodiversity component; non-programmatic multifocal projects with a significant** biodiversity component.	Vegetative Density (NDVI)	Globally, no significant differences between programmatic multifocal projects with a biodiversity component and non-programmatic multifocal projects with a biodiversity component were found. Limited evidence suggests areas in southeast Asia may have experienced improved outcomes due to programmatic implementations.	Full Results Model Matches Global Estimate Local Estimates Mapped Estimates
	Forest Cover	Globally, no significant differences between programmatic multifocal projects with a biodiversity component and non-programmatic multifocal projects with a biodiversity component were found. However, limited evidence suggests that programmatic multifocal projects with a biodiversity component tended to have improved outcomes in areas with relatively low population densities.	Full Results Model Matches Global Estimate Local Estimates Mapped Estimates
(M5) Programmatic single focal biodiversity projects; non-programmatic single focal biodiversity projects.	Vegetative Density (NDVI)	Evidence suggests that - on average - programmatic single focal biodiversity projects had improved outcomes as contrasted to non-programmatic single focal biodiversity projects. Considerable heterogeneity existed in this finding, which is more explicitly summarized in the full results accessible in the e-appendix to this analysis (see column to right).	Full Results Model Matches Global Estimate Local Estimates Mapped Estimates
	Forest Cover	Evidence suggests that - on average - programmatic single focal biodiversity projects had improved outcomes as contrasted to non-programmatic single focal biodiversity projects. The largest improvements attributable to programmatic implementations were largely found in southeast Asia.	Full Results Model Matches Global Estimate Local Estimates Mapped Estimates

15. At the global scale, we find that considerable complexity exists when seeking to identify where programmatic implementations may be favorable as contrasted to non-programmatic implementations.

As Tables 2 and 3 illustrate, the type of sub-project implementations (multifocal as contrasted to single focal), geographic location, monetary size of the child projects, and targeted outcome of interest all contribute to the relative value-add of programmatic approaches. In general, less clearly identifiable effects were attributable to multifocal projects in programmatic approaches as contrasted to multifocal projects outside of programmatic approaches; single focal biodiversity projects tended to benefit more from programmatic implementations.

Appendix I. Definitions and Frame of Analysis

The evaluation in this report examines the impact of all programs designed and implemented since the formal introduction of the programmatic approaches support modality in the GEF, approved by Council in May 2008, and the introduction of the requirement to design a Program Framework Document (PFD) for each program submitted to Council. This portfolio amounts at 38 programs, composed of 301 child projects.

The selection of programs for this analysis is based on maturity in terms of implementation status of child projects. We define programs as mature which have either more than 60% of their child projects under implementation for more than 2 years (i.e. having been under implementation before April 1st, 2014), are completed, or both. The application of this maturity criterion results in 23 out of the 38 being eligible for evaluation. From these, we exclude four global programs known to be administrative arrangements designed with the main purpose to achieve cost-efficiencies rather than larger scale and longer term results. We also exclude Climate Change, Persistent Organic Pollutants (POPs), and International Waters programs due to the lack of global-scope outcome data on these topics (i.e., satellite information or other global sources are not at this time readily available for these outcomes). The application of the above-mentioned criteria resulted in a final study set of 13 programs with 105 child projects. Table A1 shows the selected programs stratified along relevant dimensions.

Table A1. Programs of the GEF evaluated in this report.

GEF Program ID	Single Agency	Multi Agency	Single Country	Multi Country	Single Focal Area	Multi Focal Area
3268		X	X			X
3420		X		X		X
3423		X		X		X
3482		X	X			X
3647		X		X		X
3661	X		X		Biodiversity	
3782		X		X		X
3785		X		X	Biodiversity	
3926		X	X		Biodiversity	
4511	X			X		X
4620	X			X		X
4635	X			X		X
4646		X	X		Biodiversity	

For each of 105 child projects under these 13 programs, impacts are examined along multiple indicators to capture fluctuations in natural capital, following the indicators suggested in the monitoring

framework of the UNCCD for measuring land degradation (UNCCD, 2015), and the Convention on Biological Diversity (CBD; COP decision VIII/15) for identifying trends in biodiversity. The first indicator, forest cover change, is identified under the UNCCD as a tier 1 metric, and considered ready for immediate use by the CBD. The second indicator, vegetative productivity, is classified as a UNCCD tier 2 metric, and also considered ready for immediate use by the CBD. Each of these measurements are defined following the below procedures for each GEF project location:

- a. **Vegetation Productivity** — The yearly maximum productivity for each GEF project is calculated on an annual basis from 1985 to 2015 using the Long Term Data Record NDVI product.
- b. **Forest Cover Change** — The Tree Cover product from the Global Land Cover Facility is employed to detect land cover change. These products are available at 30-meter resolution for circa 1980, 1990, and 2000, and on a yearly basis for years 2001 to 2015. The tree cover is expressed as percent cover per pixel. The absolute annual change in tree cover is calculated post-2000, while a baseline is calculated using the data from years prior to 2000.

Following these definitions, for each GEF project location outcome metrics are calculated based on the geographic locations identified through a geocoding methodology implemented by AidData (see Appendix II for more information on the geocoding procedures followed). Baseline trends and levels for each of these metrics are calculated by identifying the pre-intervention time period for each GEF project location. These values, along with key covariates identified in table A2 and GEF project characteristics, are used to contrast projects to similar, matched comparison areas to identify the impact of GEF projects under a variety of hypotheses.

TABLE A2. Key Covariate Data Sources						
Domain	Source	Topic	# of Obs.	Current Coverage		Spatial Res.
				Temporal	Spatial	
<i>Human Development</i>	DMSP-OLS VIIRS	Nighttime lights	N/A ³⁹	1992-2016	Global	Grid cell (1km; 250m)
	gROADS	Road networks	N/A	1980-2010	Global	Grid cell (~1km)
Political	WDPA	WDPA Environmental protection areas	220,453	2015	Global	Variable
<i>Demography</i>	GPW	Population	N/A	1990-2020 every 5 years	Global	Grid cell (5km / 1km)
<i>Environment and Natural Resources</i>	HydroSHEDS	River Networks	N/A	1995-2005	Global	Grid cell (~1km)
	SRTM	Elevation / Slope	N/A	2000	Global	Grid cell (500m)
	UDel	Air temperature	N/A	1900-2014	Global	Grid cell (50km)
		Precipitation	N/A	1900-2014	Global	Grid cell (50km)

³⁹ For raster datasets, see spatial resolution for a more accurate depiction of measurement density.

Defining Vegetation Productivity

There are many different approaches to approximating vegetation on a global scale, and satellites have been taking imagery that can be used for this purpose for over three decades. Of these approaches, the most frequently used — and applied in this study — is the Normalized Difference Vegetation Index (NDVI). The NDVI is a metric that has been used since the early 1970s, and is one of the simplest and most frequently used approaches to approximating vegetative biomass; further, it is recommended as an indicator by the GEF STAP (STAP, 2014). NDVI measures the relative absorption and reflectance of red and near-infrared light from plants to quantify vegetation on a scale of -1 to 1, with vegetated areas falling between ~0.2 and 1. The reflectance by chlorophyll is correlated with plant health, and multiple studies have illustrated that it is generally also correlated with plant biomass. In other words, healthy vegetation and high plant biomass tend to result in high NDVI values (Dunbar, 2009). Using NDVI as an outcome measure has a number of other benefits, including the long and consistent time periods for which it has been calculated. While the NDVI does have a number of challenges — including a propensity to saturate over densely vegetated regions, the potential for atmospheric noise (including clouds) to incorrectly offset values, and reflectances from bright soils providing misleading estimates — the popularity of this measurement has led to a number of improvements over time to offset many of these errors. This is especially true of measurements from longer-term satellite records, such as those produced from MODIS and AVHRR (NASA, 2015).

Defining Land Cover Change

Understanding the relationships between “process and pattern” — i.e., the links between drivers and observations of land cover change — has long been a focus of practitioners (Lambin et al., 2001; Liverman, 1998; Meyer and Turner, 1996; Nagendra et al., 2004; Turner et al., 2003). Land cover change has major implications for a broad range of phenomena, including the sustainability of human development, biogeochemical cycling, and levels of greenhouse gases (Turner et al., 1995; UN-REDD, 2010). Investigating the many factors which influence land cover and use provides an avenue through which the human-environment interface can be better understood, but recent research has emphasized the lack of understanding of how anthropogenic processes influence land change (Nagendra et al., 2004). The impacts of land use and land cover change on the vulnerability and sustainability of human-dominated landscapes is just beginning to be analyzed, and improving this understanding is a major goal of parties interested in understanding the consequences of land use change (Foley et al., 2005; GLP, 2010).

Both the geographic and development economics communities have sought to understand linkages between international development and land cover change, but often use different approaches and vocabulary. Within the geographic community, limited attention has been given to causal methodologies (including matching and difference-in-difference models), but rather focused on the (a) ability to accurately measure land cover change using satellite imagery (i.e., Borak, Lambin, and Strahler, 2000; Strahler, Moody, and Lambin, n.d.; Christman et al., 2015; Rogan et al., 2003; Schwert et al., 2013), (b) impacts of spatial autocorrelation on model estimates (Miller, Arun, and Timmons Roberts, 2012; Waldron et al., 2013), and (c) methods for predicting the impact(s) (and related uncertainties) of international aid on land change (Laurance et al., 2002; D. M. Runfola and Pontius, 2013; van Asselen and Verburg, 2013). Conversely, the development economics community has focused on the application of matching (Nelson and Chomitz, 2011) and difference-in-difference (Pfaff, 1999; Alix-Garcia, Shapiro, and Sims, 2012; Nolte et al., 2013) techniques to establish evidence of causal relationships between international aid and land cover change — methods that follow similar approaches to clinical trials with treatment and control groups.

To capture land cover change in this analysis, we leverage an analysis performed by Hansen et al. (2013), in which Landsat imagery was fused with a number of other sources to capture yearly, 30-meter resolution estimates of tree cover loss. This land cover change analysis is widely leveraged to capture trends in deforestation, and represents one of the highest-resolution efforts for such measurements ever conducted. Further, as a global analysis, this product enables a precise calculation of both (a) tree cover in the year 2000, and (b) tree cover loss from 2000-2013 for every GEF project location.

Appendix II. Methods

Each hypothesis is tested using a multiple-stage propensity score modeling approach tailored for global-scope analyses. First, for each hypothesis a counterfactual group is constructed to enable comparison — i.e., stand-alone multifocal projects, or “null case” contrasts where it is known no intervention occurred. These groups are used to define treatments (in this case, programmatic project locations) and controls (the constructed counterfactual group). Using a nearest-neighbor caliper (~ 0.25) matching approach, the sample of control and treated units is trimmed to include best-matches following a one-to-one matching strategy (i.e., every treated case is matched to the most similar control, and treated cases with no strong matches are removed from the sample).

Using each control and treatment set, a causal tree is used to examine the dimensions along which impact heterogeneity can be detected, as well as to estimate impacts. Recent work has illustrated that — with key adjustments — tree-based approaches can be used to identify how the causal effects of an intervention (i.e., international aid, or a medical treatment) vary across key parameters (such as geographic space; see Athey and Imbens, 2015a; Staff, 2014; Shen et al., 2016). This is key for top-down, or global-scope analyses, as it is unlikely that aid projects will have the same effect across highly variable geographic contexts, and the drivers of such variation may not be known. A detailed explanation of this approach is included in Appendix III, while figure A1 shows an example drawn from exploratory research in which a causal tree is applied to a limited subset of international aid, examining aid’s impact on a maximum observed NDVI value.

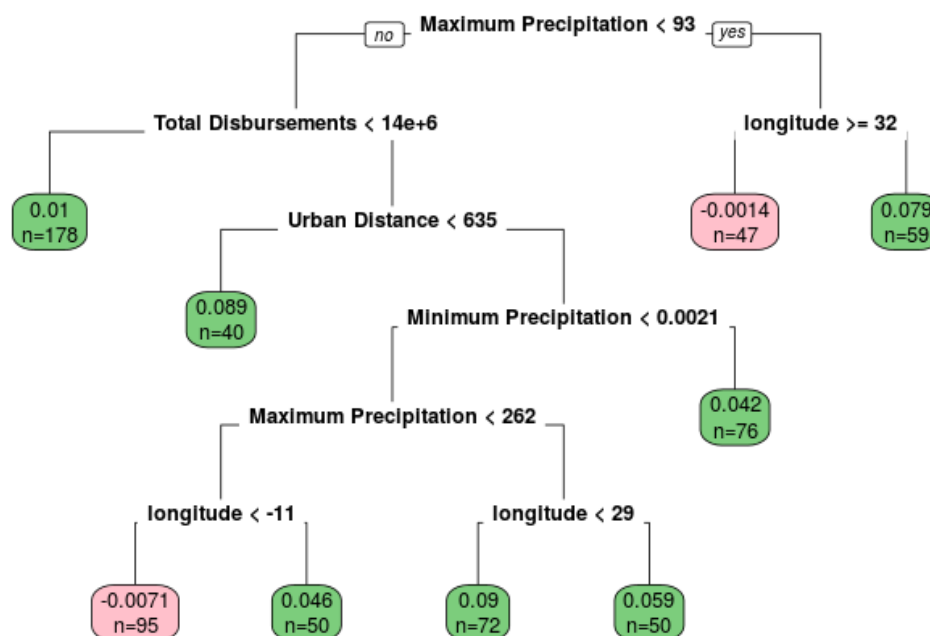


FIGURE A1. Illustrative example of a causal tree.

Figure A1 serves as an illustrative example of the outputs of causal tree based approaches to identifying how impact effects may differ across a dataset. Within each terminal node in figure A1, the difference between a weighted outcome of all treated cases (areas that received aid) is contrasted to control cases (areas that did not receive aid), and the value displayed can be directly interpreted as the causal impact of the treatment (in this example, the presence of aid) on the metric of interest (i.e., NDVI). At each step of the tree, a statement (i.e., “Maximum Precipitation < 93mm”) is tested as true or

false for each observation, and the impact of a given observation can be determined by identifying where it falls in the tree. As a simple example, the tree in figure A1 would provide evidence that international aid projects located in areas with a maximum yearly precipitation greater than 93 mm, that provide less than 1.4 million dollars of aid, and are more than roughly a kilometer (635 meters) away from an urban area tend to increase NDVI by 0.089. This approach is used to estimate the impact of projects on all outcome variables tested in this analysis. Accompanying the causal tree is a metric of uncertainty, generated following a Random Forest (CT-RF) approach. The CT-RF iteratively subsets the data, constructing unique trees until model convergence is achieved⁴⁰. For each hypothesis the CT-RF is used to illustrate the potential distribution of the directionality and magnitude of estimated impacts when uncertainty is accounted for.

Finally, after the tree is constructed, a linear model which includes all covariates as well as interactions between the treatment term and variables identified in the tree is estimated. While this model is not as valuable for the estimation of treatment impacts, it provides the ability to examine global, linear effects that may exist in the system.

Data Integration

Many of the datasets used in this analysis are collected at different spatial scales, necessitating an additional step of integration so that all observations can be analyzed at the scale of GEF projects (in this case, examining a 10km x 10km region around each project). To conduct this integration, we use the piecewise approximation procedure detailed in Goodchild et al. (1993):

$$V_t = \sum_{s=1}^S \left(U_s * \left(\frac{a_{st}}{a_s} \right) \right) \quad \text{eq. 1}$$

where t is an index for the zone one is aggregating to (the GEF project area of interest), s is an index for the set of zones one is aggregating from (i.e., a satellite pixels measuring NDVI), S is the maximum index for all zones s , U_s represents the value of interest at source zone s , a_{st} is the area of overlap between the two zones, a_s is the area of the zone one is aggregating from, and V_t is the estimated value for the target zone. In our application, this procedure weights each pixel of each dataset according to its overlap with each GEF project.

Causal Model

Classification and regression tree approaches have been commonly employed over the last two decades to aid in the classification of remotely sensed imagery (Friedl and Brodley, 1997; McIver and Friedl, 2002; Gamba and Herold, 2009). Here, we employ causal trees — a novel version of a CART which enables causal inferential analyses. Causal trees are implemented in a multiple step process, detailed below but simply summarized as (a) deriving a metric which indicates similarity between treatment and control groups; (b) using this metric to match pairs of treatment and control units via a tree; and (c) contrasting the outcome of treated units to control units within every terminal node of the tree. Figure A1 shows an example drawn from exploratory research in which a causal tree is applied to a limited subset of international aid, examining aid's impact on a maximum observed NDVI value. This figure serves as an illustrative example of the outputs of causal tree based approaches to identifying how impact effects may differ across a dataset. Unlike traditional econometric approaches in which interaction terms must be pre-specified to estimate differential impact effects, here clusters of similar treatment and control units are identified dynamically. Further, by including geographic factors in these

⁴⁰ Because uncertainty can manifest along a number of dimensions — including spatial uncertainties, attributional uncertainties, and model uncertainties — a large but varying subset of models is needed to ensure model convergence. The number of required iterations can range from tens to hundreds of thousands.

trees (i.e., latitude and longitude), many unobserved geographic characteristics can be captured. As in a traditional econometric analysis in which variables can be identified as statistically significant, here variables which are significant (defined as the variables which describe the most variance in the data) are represented in the tree. All variables are controlled for through the propensity adjustment of the outcome.

The primary distinction between causal trees and more traditional tree-based classifiers lies in the criterion along which splits in the tree are selected. Consider a data set with n independently and identically distributed units with $i = 1, \dots, n$, and for each unit a vector of relevant covariates are measured. In a simplified case where all things other than treatment are being constant, to estimate a causal effect for each geographic location i we can use the Rubin causal model (Rubin, 1997) and consider the treatment effect as being equal to:

$$\theta_i = Y_i(W_i = 1) - Y_i(W_i = 0) \quad \text{eq. 2}$$

where W_i is an indicator of if a unit of observation i received aid (1) or did not (0). Following this simplified model, we define the expected heterogeneous causal effect for any set of units as (Athey and Imbens, 2015b):

$$\theta_i = \mathbb{E}[Y_i(W_i = 1) - Y_i(W_i = 0) \mid X_i = x] \quad \text{eq. 3}$$

Athey and Imbens show that one can estimate the causal effect as $\theta_i = \mathbb{E}[Y_i^* \mid X_i = x]$ where the transformed outcome Y^* is defined as:

$$Y_i^* = Y_i \cdot \frac{W_i - e(X_i)}{e(X_i) \cdot (1 - e(X_i))} \quad \text{eq. 4}$$

and the propensity score function $e(x)$ is defined as $e(x) = \mathbb{E}[W_i \mid X_i = x]$. Several approaches to estimate the propensity score can be selected (Rosenbaum and Rubin 1983; Pan and Bai 2015) - here, we estimate $e(x)$ using logistic regression. Once the propensity score and Y_i^* have been estimated, many authors (Su et al. 2009; Athey and Imbens, 2015; Wagner and Athey, 2015; Denil et al., 2014; Meinhausen, 2016; Biau, 2012; Wagner et al., 2014) have illustrated that classification and regression trees can be used to isolate treatment effects within sets of similar units. These trees seek to classify units of observation into clusters that are similar along covariate axes, following different splitting and optimization rules.

Using the propensity score, causal tree approaches derive a transformed outcome variable, Y^* , and use this to generate tree splits instead of (the traditionally used) Y . This transformed outcome is calculated following eq. 5. The CT replaces the traditional MSE optimization criterion in trees by seeking to minimize the sum of $Y_i^* - \hat{\tau}(X_i)$ in each terminal node, where $\hat{\tau}(X_i)$ represents the estimated average treatment impact within a given node, i.e.:

$$\begin{aligned} \hat{\tau}^{CT}(X_i) = & \sum_{i: X_i \in \mathbb{X}_l} Y_i^{obs} \cdot \frac{W_i / \hat{e}(X_i)}{\sum_{i: X_i \in \mathbb{X}_l} W_i / \hat{e}(X_i)} \\ & - \sum_{i: X_i \in \mathbb{X}_r} Y_i^{obs} \cdot \frac{(1 - W_i) / (1 - \hat{e}(X_i))}{\sum_{i: X_i \in \mathbb{X}_r} (1 - W_i) / (1 - \hat{e}(X_i))} \end{aligned} \quad \text{eq. 5}$$

This new error term is then used to split the tree in a way identical to traditional regression trees, and provides a tree which increases the similarity of control and treated units within each node, as well as node-specific estimates of impacts.

Appendix III. Geocoding International Aid

This project leveraged the AidData development finance and international aid geocoding methodology. In 2010, AidData developed a methodology for geo-referencing development projects that IATI later revised and adopted as its global reporting standard. Leveraging a team of trained geocoders, the geocoding methodology and online toolkit relies on a double-blind coding system, where two experts employ a defined hierarchy of geographic terms and independently assign uniform latitude and longitude coordinates, precision codes, and standardized place names to each geographic feature. If the two code rounds disagree, the project is moved into an arbitration round where a geocoding project manager reconciles the codes to assign a master set of geocodes for all of the locations described in the available project documentation. This approach also captures geographic information at several levels — coordinate, city, and administrative divisions — for each location, thereby allowing the data to be visualized and analyzed in different ways depending upon the geographic unit of interest. Once geographic features are assigned coordinates, coders specify a location class ranging from 1 to 4 for categories including administrative regions or topographical features along with a location type specifying the exact feature (e.g., airport, second order administrative zone, etc.). Coders then determine the location's geographic exactness value of either 1 (exact) or 2 (approximate).

AidData performs many procedures to ensure data quality, including: de-duplication of projects and locations; correcting logical inconsistencies (e.g., making sure project start and end dates are in proper order); finding and correcting field and data type mismatches; correcting and aligning geocodes and project locations within country and administrative boundaries; validating place names and correcting gazetteer inconsistencies; deflating financial values to constant dollars across projects and years (where appropriate); strict version control of intermediate and draft data products; semantic versioning to delineate major and minor versions of various geocoded datasets; and final review by a multidisciplinary working group.

Technical Document 3

Global Online Survey

Introduction

A global online survey was conducted to gather perceptions from a wide range of country level stakeholders having been or being involved in the GEF programs under analysis. The GEF Agencies involved in those programs provided the IEO with detailed lists of program and child project stakeholders' contacts for all 38 programmatic approaches. Additional stakeholders were identified through field visits for the four program case studies conducted for this evaluation.

An email with a link to the survey questionnaire was sent to the 684 identified program and/or child project stakeholders. The survey received 353 responses, 183 of which were viable. Those responses were used in this analysis. The response rate for this survey is 27 percent.

Eighty-five percent of respondents indicated that they have been involved in a GEF program. Considering that this survey was administered to program and child project stakeholders, this indicates that about 15 percent of stakeholders are unaware that their projects are part of larger programmatic approaches; they are engaged only at the child project level. For them, the survey ends here, thereby reducing the total of respondents to 155.

Classification of survey respondents

Over 72 percent of the total of respondents to the survey was either from Government (49%) or GEF Agency (23%). These two groups are also the largest in the program/child projects database covered in this evaluation. Respondents self-identified themselves as follows:

- Forty-nine percent indicated they belong to government organizations, the majority of which are program executing partners or UN convention focal points.
- Twenty-three percent indicated they belong to GEF Agencies; the majority of them are either technical staff, country office staff, or program staff hired specifically for the program.
- The majority of all other stakeholders are from civil society organizations, either from NGOs, the private sector, and/or inter-governmental organizations.



Involvement in GEF Programmatic Approaches

Overall, 49 percent of survey respondents are involved in program coordination or management and 40 percent are part of the program steering committee; 30 percent are in the project management unit and 21 percent in the project steering committee.

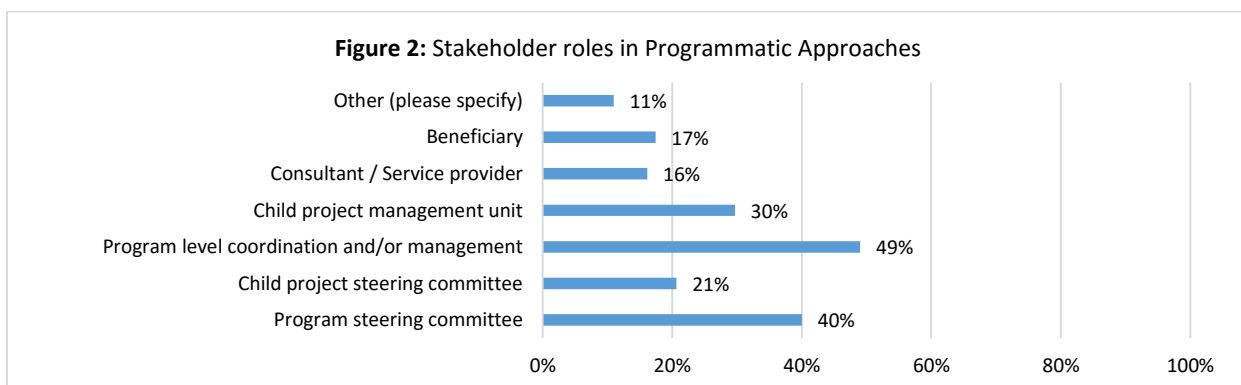
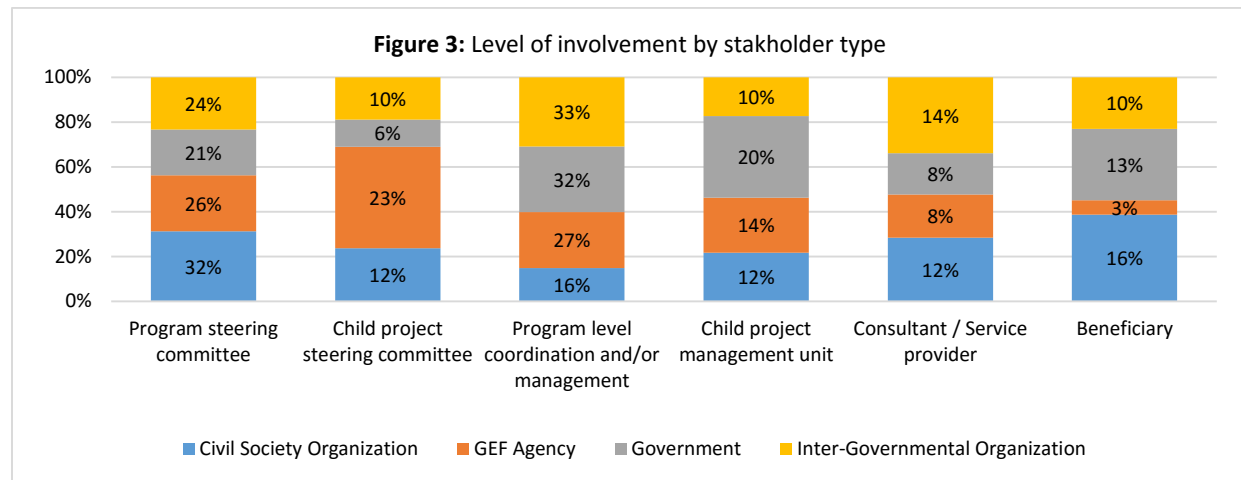


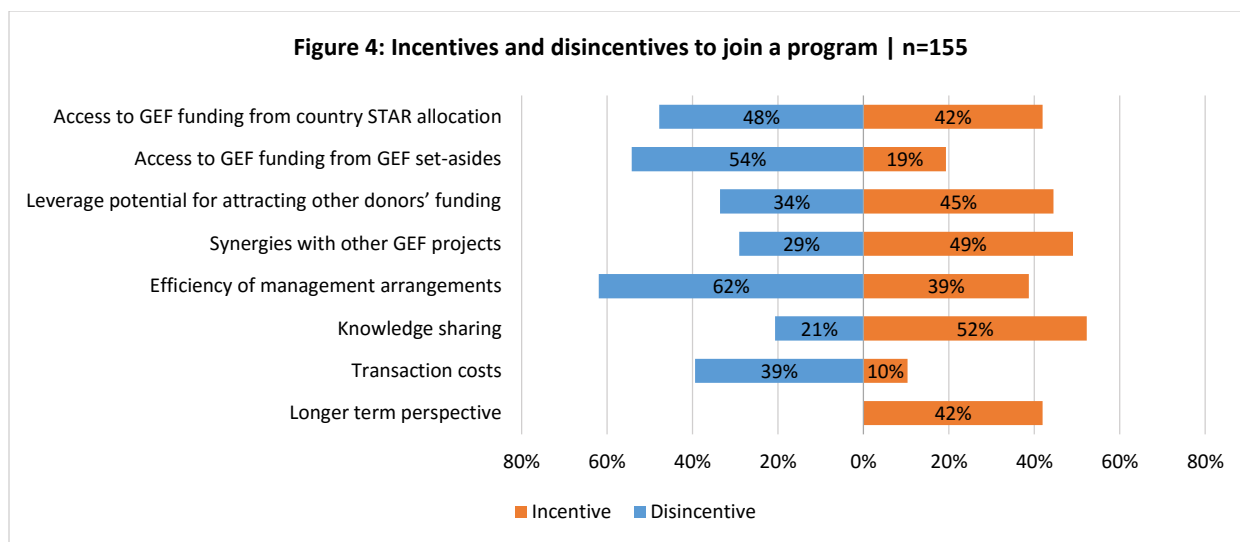
Figure 3 shows a breakdown of stakeholders' involvement in programs and/or child projects:

- The majority of individuals in these roles are from government or GEF Agency.
- NGOs or other stakeholders are involved as beneficiaries or consultants.
- Fifty-nine percent of program management units and 34 percent of child project management units are composed of government or GEF Agency representatives.
- Forty-seven percent of program steering committee are composed of government or GEF Agency representatives.

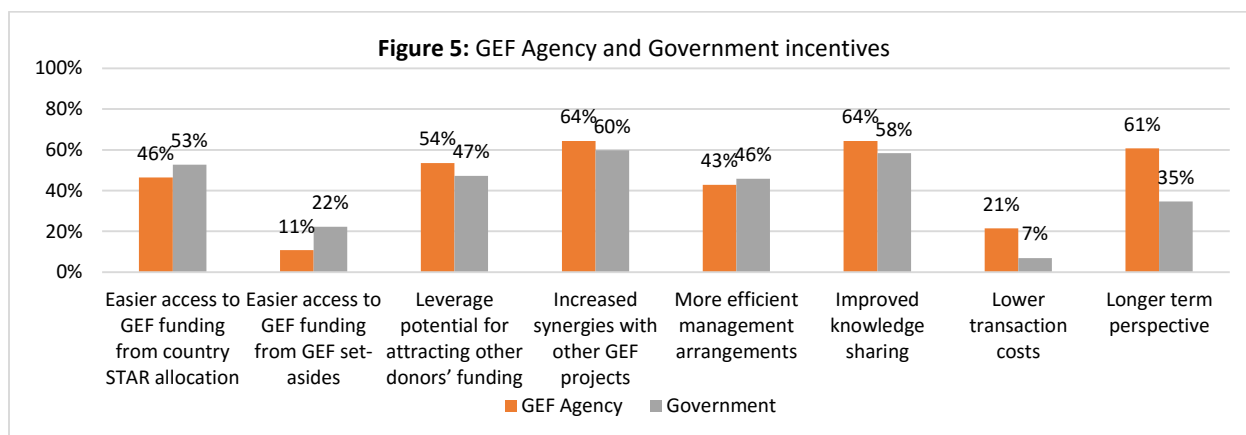


Main Incentives and Disincentives from being part of a program

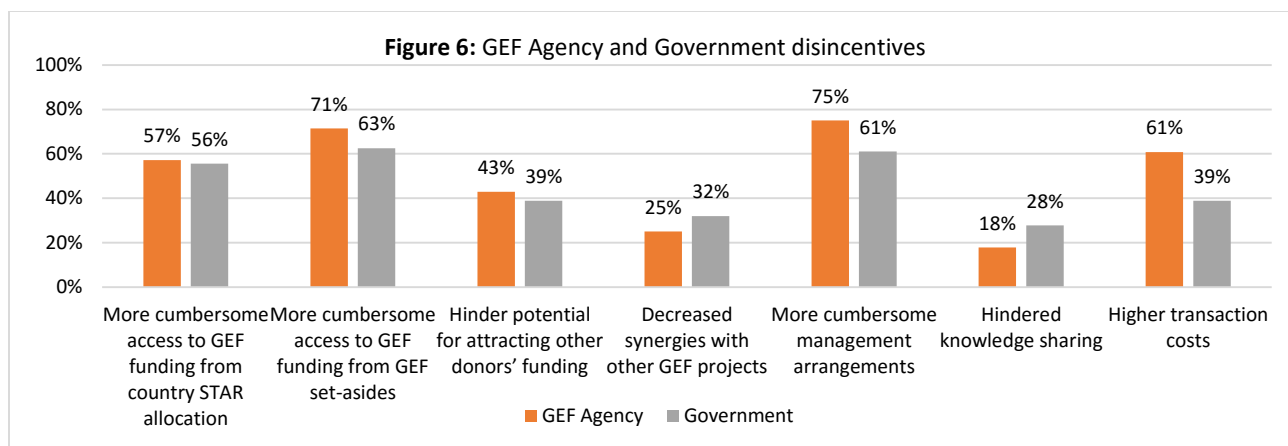
Stakeholders identified the main perceived incentives and disincentives for joining a GEF program by selecting from a multiple choice list of responses. The main incentives in being part of a program resulted to be “improved knowledge sharing” (52%) and “increased synergies with other GEF projects” (49%). Forty-five percent of stakeholders agree that one of the main incentives to be part of a program is the “potential for leveraging donor funding”. The main disincentives are a “More cumbersome management arrangement” (62%) and “More cumbersome access to GEF funding from GEF set-asides” (54%) and “More cumbersome access to GEF funding from country STAR allocations” (48%).



A detailed look at incentives for joining a GEF program shows that all stakeholders see “Improved knowledge sharing” as one of the three main incentives. Government stakeholders indicated that “increased synergies with other GEF projects” and “easier access from country STAR allocations” are also important incentives for participation in a GEF program. While GEF Agency stakeholders indicate that “increased synergies with other GEF projects” is a strong incentive, they believe that “Longer Term perspective” is more of an incentive than “access to GEF funding”.



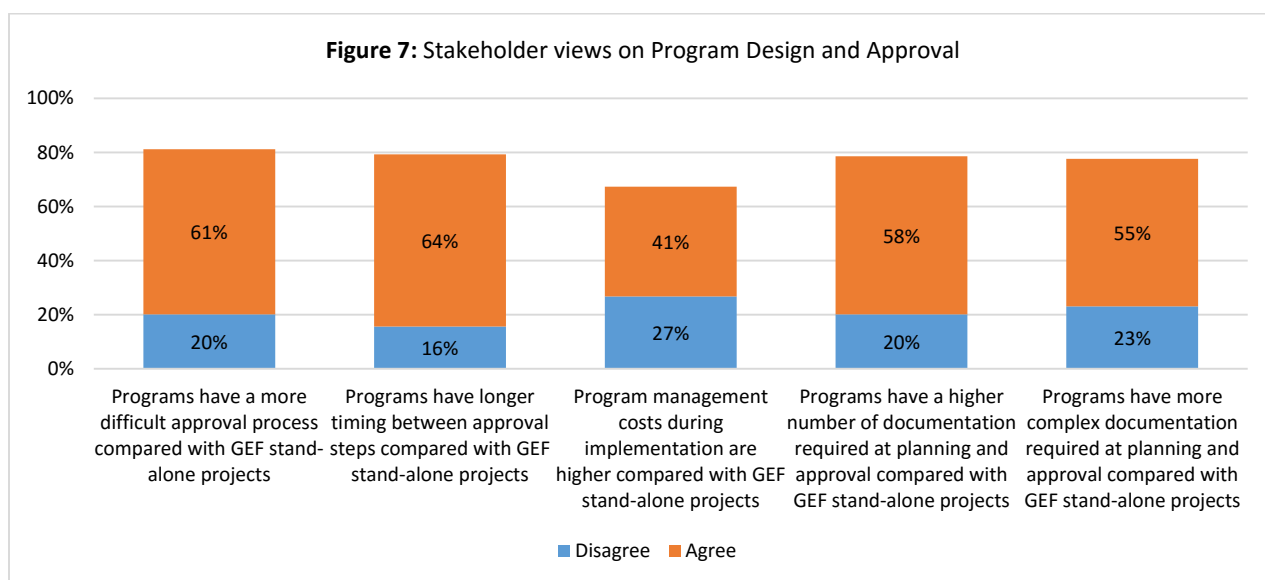
A detailed look at disincentives for joining a GEF program shows that all stakeholders see “More cumbersome management Arrangements” as one of the main disincentives. Government stakeholders indicated that “More cumbersome management Arrangements” and “More cumbersome access to GEF funding from GEF set-asides” are also among the most important disincentives for participation in a GEF program. Agency stakeholders indicate that “More cumbersome management Arrangements” and “More cumbersome access to GEF funding from GEF set-asides” are the most important disincentives for participation in a GEF program, followed by “Higher Transaction costs”.



Further analysis on incentives and disincentives of GEF Agencies and Governments involved in GEF programs showed that 61 percent of agency stakeholders are dis-incentivized by higher transaction costs associated with programs and 75 percent are dis-incentivized by the more cumbersome management arrangements. To note, 61 percent of GEF Agencies are incentivized by the long term perspective of GEF programs.

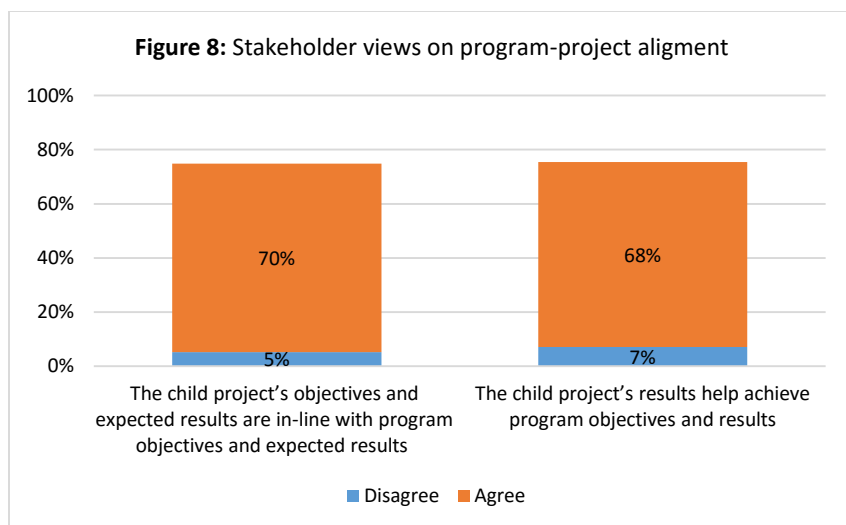
Program Design and Approval

Most stakeholders agree that compared to stand-alone projects, programs have a more difficult and longer approval process, which requires more complex documentation.



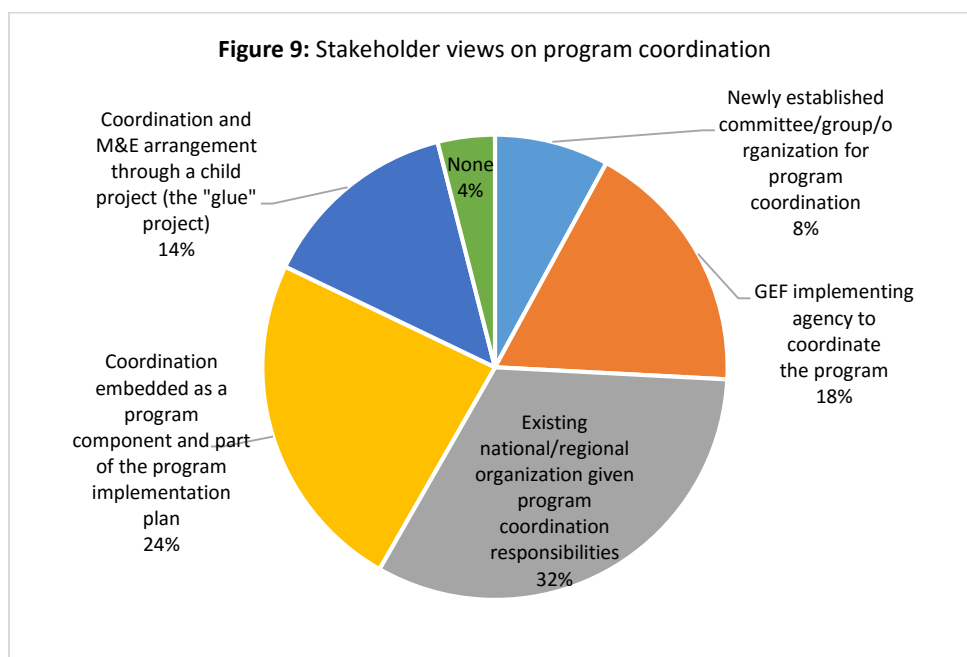
Program-project alignment

Seventy percent of stakeholders agrees that child projects' expected results are in line with program results and 68% agree that that project results help achieving program results.

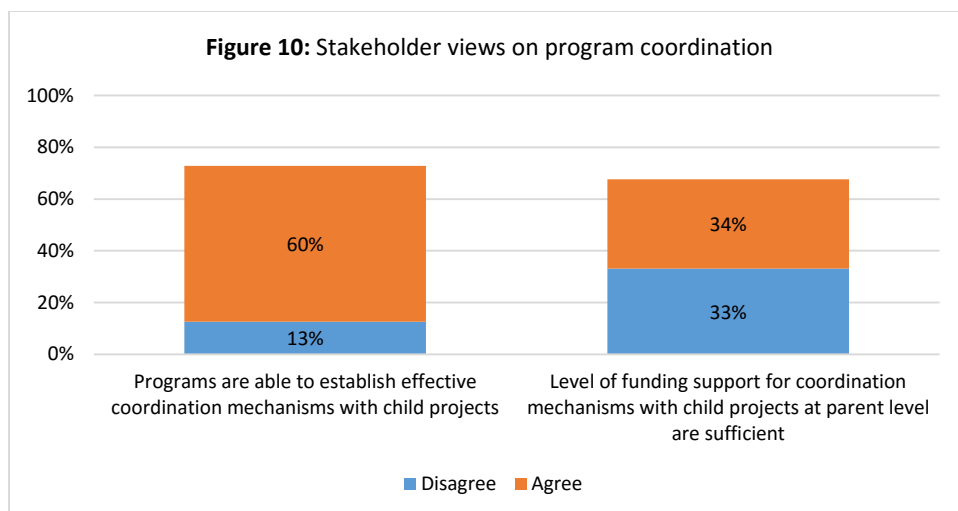


Coordination

Through their experience, 32 percent of stakeholders believe that programs are most successfully coordinated by an existing national/regional organization, at the same time National organizations (specifically government) end up having a significant role in program coordination for 65 percent of projects/programs; 24 percent of stakeholder believe it most successful when coordination is embedded as part of the program, yet only three percent of programs have coordination arrangement embedded in the program; and 18% believe it most successful when GEF implementing agency takes on the coordination role. In reality programs majority of programs are coordinated by the lead implementing agencies (50%).

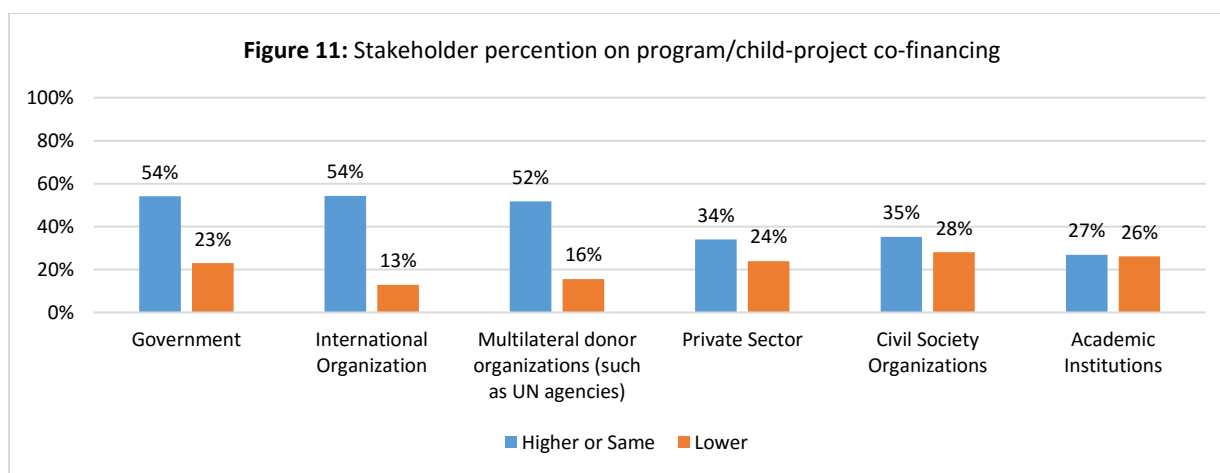


Stakeholders also perceive programs as able to establish effective coordination with child projects, however they equally agree and disagree that the level of funding for coordination is sufficient.



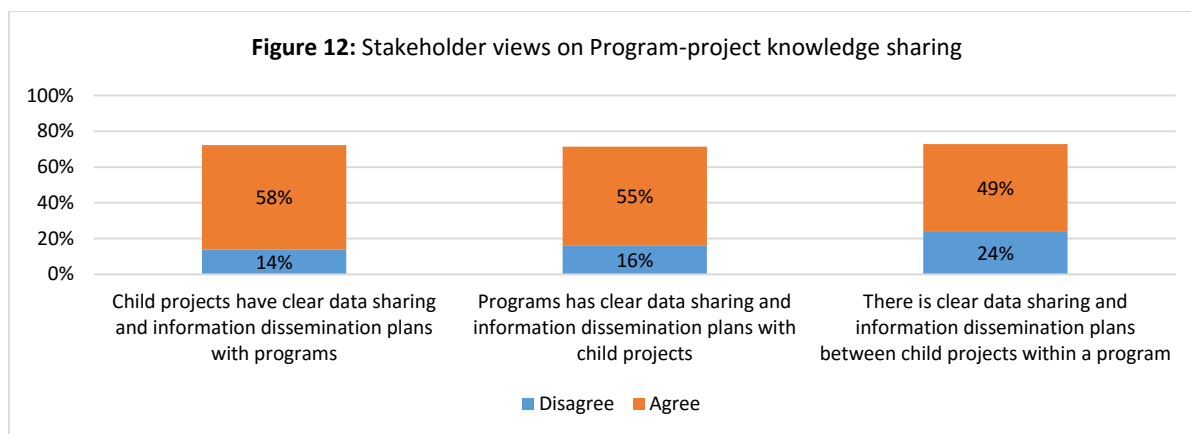
Program Financing

Over 50 percent of Government, International and multilateral organizations' stakeholders believe that programs tend to leverage the same or higher amounts of co-finance than GEF stand-alone projects. However, private sector organizations, CSOs and Academic institutions' stakeholders believe that programs leverage lower co-financing than stand-alone projects.

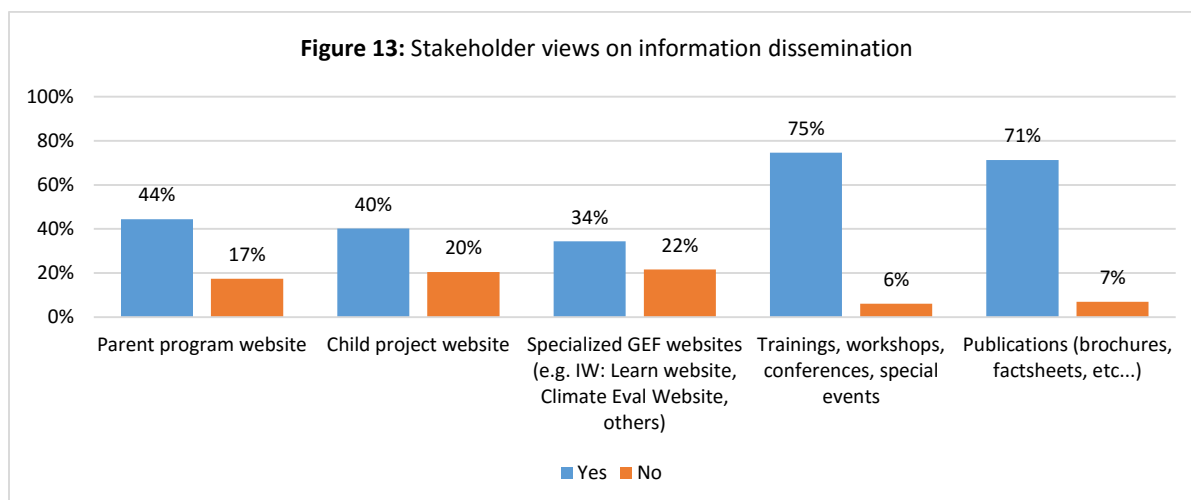


Knowledge Sharing and M&E

The majority of stakeholders (over 55%) believes that both programs and child projects have clear data sharing and dissemination plans, and 49 percent believe that child projects with the same program have clear data sharing and dissemination plans.

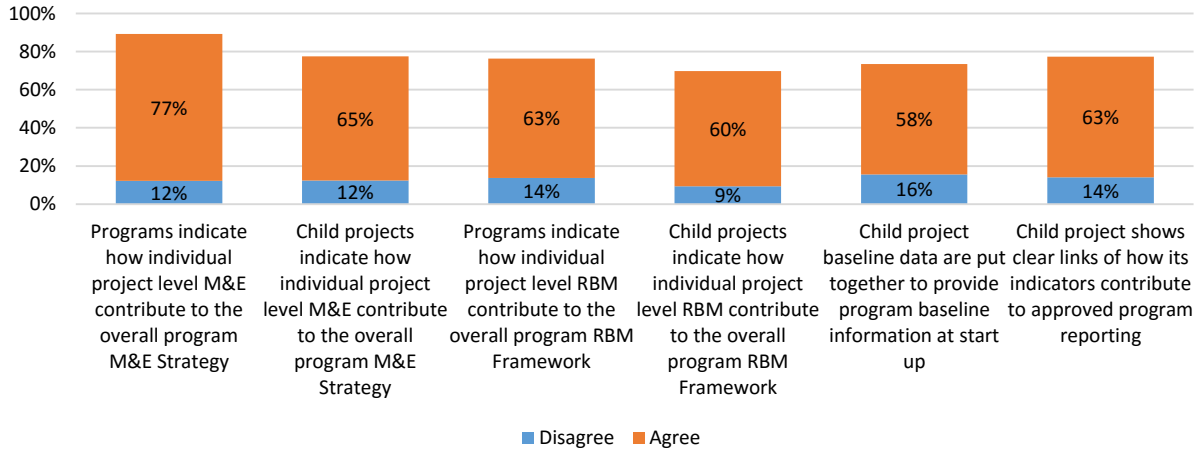


The majority of stakeholder believes that when dissemination occurs, most of the information (over 70%) flows through trainings, workshops, and publications. About 40 percent of information is shared through parent or child project websites and only 34 percent through specialized websites



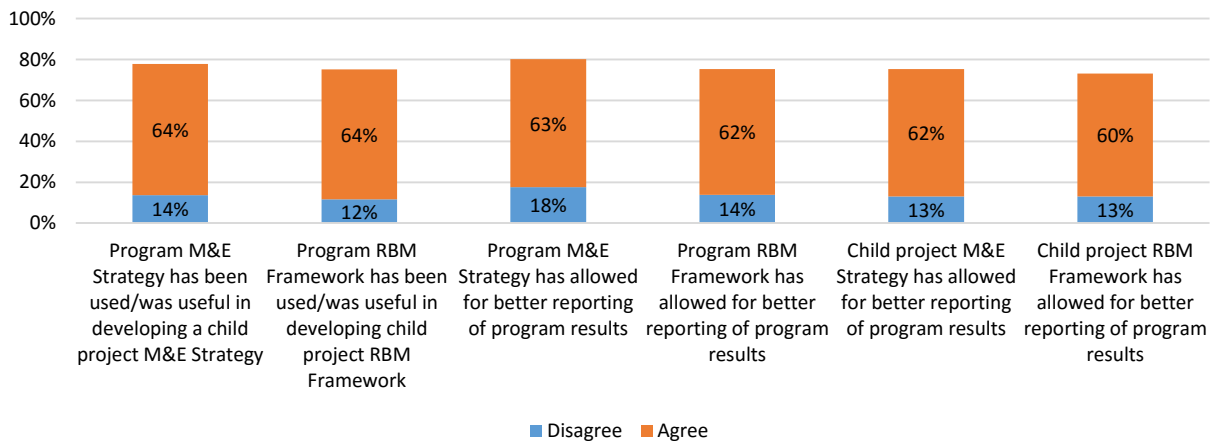
Seventy-seven percent of stakeholders believes that programs indicate how individual project M&E contribute to the overall program M&E strategy and 63 percent believes that programs indicate how individual project RBM framework contribute to the overall program RBM framework.

Figure 14: Stakeholder views on program-project M&E systems



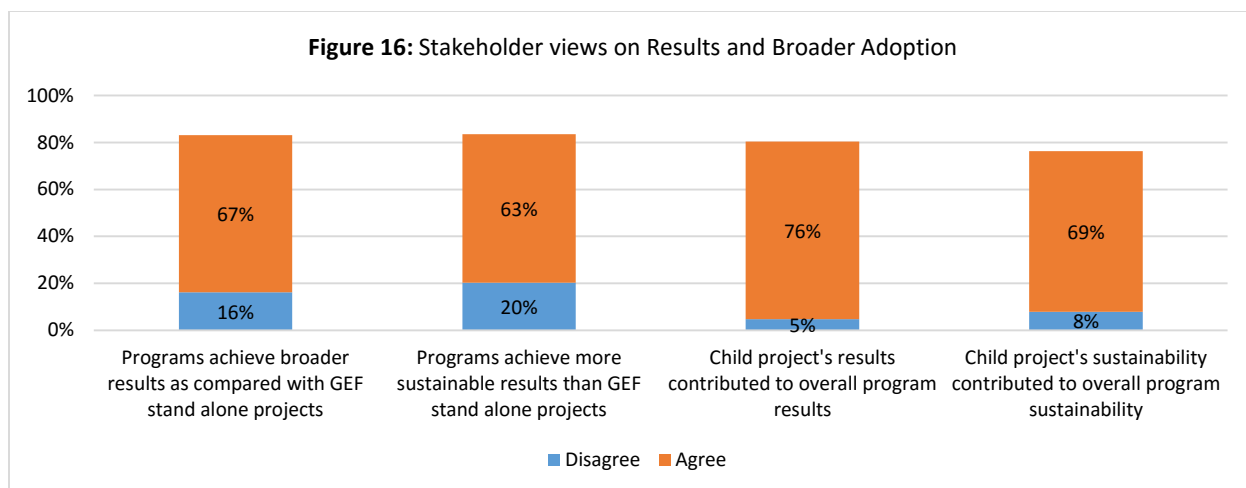
Over 60 percent of stakeholders believe that program level M&E strategy and RBM framework have been used in developing child project M&E strategy and RBM framework. Additionally, stakeholders believe that M&E and RBM allowed for better reporting on program results.

Figure 15: Stakeholder views on usefulness of program-project M&E systems



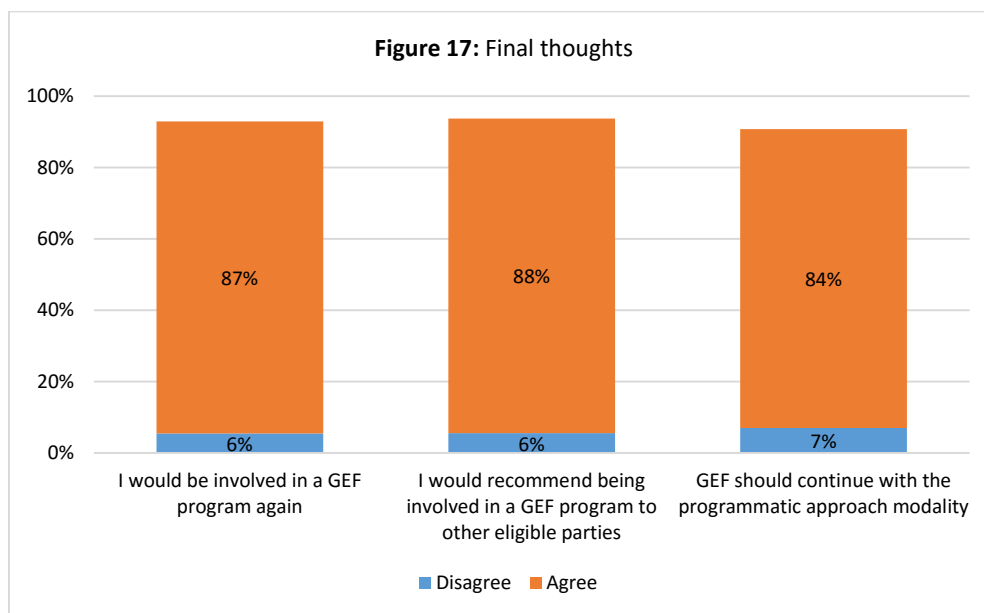
Program-level Results

Sixty-seven percent of stakeholders believe that programs achieve better broader adoption and 63 percent achieve more sustainable results as compared with stand-alone projects. Seventy-six percent of stakeholders agree that child project results contributed to overall program results, and 69 percent of stakeholders agree that child project sustainability contributed to overall program sustainability.



Final thoughts from survey respondents on GEF programs

Eighty-four percent of stakeholders believe the GEF should continue with the programmatic approach modality. Eighty-seven percent of stakeholders would be involved in a GEF program again and 88 percent would recommend involvement in GEF programs to other eligible parties.



The most recurrent open ended statements were on:

Coordination: programs should have a dedicated coordination mechanism and dedicated administrative staff.

Knowledge Sharing: programs are “useful in terms of knowledge sharing, increased sustainability and creation of partnerships” and “benefit from knowledge sharing and cross-fertilization across executing agencies and countries”

Technical Document 4

Program Case Studies

- 1. PRC-GEF Partnership on Land Degradation in Dryland Ecosystems**
- 2. India GEF Coastal Marine Program**
- 3. MENA-Desert Ecosystems and Livelihoods Program**
- 4. Reducing Industry's Carbon Footprint in South East Asia**

CASE STUDY: PRC-GEF Partnership on Land Degradation in Dryland Ecosystems, China

1. Introduction to the PRC-GEF Partnership

The People Republic of China (PRC) and the Global Environment Facility (GEF) set up in 2003 the PRC-GEF Partnership on Land Degradation in Dryland Ecosystems Program (“the Partnership”), initially in the form of a Country Programming Framework (CPF) for land degradation. It was composed by only one project, the Capacity Building to Combat Land Degradation (GEF ID 956), under the GEF Operational Program 12 (OP-12).⁴¹ The CPF was meant to support a sequenced set of high priority activities mutually agreed by PRC and GEF to strengthen the enabling environment and build institutional capacity for integrated approaches to combat land degradation, and to demonstrate viable integrated ecosystem management models for widespread replication.⁴²

In this first phase of the Partnership, GEF support focused on seven key barriers, namely: (i) lack of a comprehensive legislative framework; (ii) a fragmented institutional and policy agenda; (iii) lack of application of lessons learned from previous experience; (iv) lack of participatory approaches to address the root causes of land degradation; (v) absence of locality-specific land use planning; (vi) perverse incentives; and (vii) inadequate financial arrangements and incentives to address land degradation in the western region. The application of a long term programmatic approach was meant to provide for coherent planning and predictable financial support that was not possible under the previous ad hoc project-by-project approach to international assistance for combating land degradation. An ambitious set of government, development partner and GEF financial commitments over the period of 2003-2012 and implemented through the end of the 12th Five Year Plan (2011-2015) was envisioned.

In 2008 the Partnership evolved into a full program. A Program Framework Document (PFD) was approved in May 2008, at the same GEF Council meeting that formally approved the introduction of Programmatic Approaches in the GEF. The overarching goal stated in the PFD is to reduce land degradation and restore dryland ecosystems in Western China, furthering through this the goals of protecting dryland ecosystem biodiversity. The specific purpose is to support the establishment of an effective system of Integrated Environmental Management (IEM) applied in continuing programs and policies influencing land and ecosystem quality in Western China, and to maximize the ecosystem benefits of investment projects in the program region.

The PFD is composed by six child projects to be implemented by three GEF Agencies, namely the Asian Development Bank (ADB) as the lead agency, the International Fund for Agricultural Development (IFAD) and the World Bank (WB). Co-financing was foreseen mainly from China and from concessional loans provided by the three GEF Agencies concerned. To note, the PFD includes the Capacity Building to Combat Land Degradation Project (GEF ID 956) implemented under the CPF, i.e. before the approval of the PFD. Furthermore, the PFD mentions that a demonstration investment project had already been endorsed by the GEF Chief Executive Officer (CEO), specifically referring to the Xinjiang and Gansu Pastoral Development Project (GEF ID 1621). In reality, that project was already under implementation.⁴³ The

⁴¹ This was the first CPF supported by the GEF in the land degradation focal area.

⁴² PRC: Capacity Building to Combat Land Degradation Project – Completion Report (ADB, 2010).

⁴³ The Pastoral Project effectiveness date reported in the project Implementation Completion Report (ICR) – both of the WB loan and the related GEF grant – is 27 January 2004 (WB, 2011).

Pastoral Project objective was to promote sustainable natural resources management by establishing improved livestock production and marketing systems that would increase the income of herders and farmers in the project area. The project was implemented from September 2004 to June 2010, executed by the Foreign Economic Cooperation Center (FCCC) of the Ministry of Agriculture (MoA) under WB supervision.

The PFD also mentions that another demonstration investment project, the Ningxia Integrated Ecosystem and Agricultural Development Project (GEF ID 2788), was Council-approved and pending GEF CEO Endorsement. It does not surprise therefore that PRC, through the Central Program Coordination Office (CPCO) in the Ministry of Finance (MoF) and the Central Program Management Office (CPMO) in the Department of Science and Technology of the State Forestry Administration (SFA), consider the six child projects included in the PFD, the WB Pastoral project and the ADB Ningxia project, being all under the Partnership.⁴⁴ In 2009, the GEF included the Ningxia project in another partnership program, the China Biodiversity Partnership and Framework for Action (GEF ID 3926), while PRC continued to consider it as within the Drylands Partnership.

Table 1: PRC-GEF Partnership – Child Projects Status and Funding

GEF ID	Agency	Focal Area	Title	Status	GEF grant at CEO endorsement	Cofinance at CEO endorsement
3482	ADB, IFAD, WB	MFA	PRC-GEF Partnership on Land Degradation in Dryland Ecosystems Program		27,333,001	379,286,700
956	ADB	MFA	Project I-Capacity Building to Combat Land Degradation	Completed	7,700,000	7,300,000
2369	IFAD	MFA	An IEM Approach to the Conservation of Biodiversity in Dryland Ecosystems	Completed	4,545,000	25,023,700
3483	ADB	MFA	Forestry and Ecological Restoration in Three Northwest Provinces (formerly Silk Road Ecosystem Restoration Project)	Ongoing	5,119,546	176,660,000
3484	ADB	LD	Capacity and Management Support for Combating Land Degradation in Dryland Ecosystems	Completed	2,727,455	6,200,000
3608	WB	MFA	Sustainable Development in Poor Rural Areas	Completed	4,265,000	154,900,000
3611	WB	MFA	Mainstreaming Biodiversity Protection within the Production Landscapes and Protected Areas of the Lake Aibi Basin	Completed	2,976,000	9,203,000

While the Partnership has primarily been seen as one between PRC and the GEF, and between PRC-GEF and the three GEF Agencies involved, it can also be interpreted more widely as a partnership between sectors within China. The Partnership introduced a new working style for China, whereby different ministries are called to collaborate under a commonly shared integrated approach, IEM. The GEF too considers the Partnership a pioneer programmatic approach in land degradation, as it also embraces climate change and biodiversity. The main Partnership feature is its use of the IEM approach,

⁴⁴ PRC-GEF Partnership on Land Degradation in Dryland Ecosystems - Assessment Report (L. Zhou, K. Shuifa, 2013).

encompassing Sustainable Land Management (SLM) techniques targeted at achieving multiple local and global environmental benefits, as well as livelihoods.

1.1 Capacity Building to Combat Land Degradation Project

The ADB Capacity Building Project was launched in July 2004 and was completed in December 2009. The project was managed by the SFA's Department of Science and Technology. Nine departments of the Chinese Government were involved, including the Legislative Affairs Commission of the Standing Committee of the National People's Congress, the National Development and Reform Commission, the Ministry of Science and Technology (MST), MoF, the Ministry of Land and Resources (MLR), the Ministry of Water Resources (MWR), MOA, the Ministry of Environmental Protection (MEP), and SFA.

1.2 Management and Policy Support to Combat Land Degradation Project

In October 2009, the GEF Council approved the Management and Policy Support to Combat Land Degradation Project (the Management Project), which represented a continuation of ADB support to SFA in many of the coordination, knowledge sharing and M&E tasks after the closure of the Capacity Building project. This project was launched in May 2010 and ended in June 2013.

1.3 Forestry and Ecological Restoration Project in Three Northwest Provinces

The ADB Forestry Project (also called Silk Road Project) aimed at improving northwestern China rural poor's community environment, enhancing their capacity to adapt to climate change, and raising awareness on the sustainable use of land resources. The original project duration was 2010-2015, but activities were still ongoing at the time of the mission, in June 2016.

1.4 Sustainable Development in Poor Rural Areas

The WB Poverty Project objective was to explore and pilot more effective and innovative ways of supporting the poorest communities and households in Henan Province, Shaanxi Province and Chongqing Municipality through community driven development and participatory approaches. The project duration was 2010-2015. The project was managed by the State Council Leading Group Office of Poverty Alleviation and Development.

1.5 An IEM Approach to the Conservation of Biodiversity in Dryland Ecosystems

The IFAD Project objective was to promote the growth of agricultural and non-agricultural productivity in the project area, reduce the loss of biodiversity in the project area, restore the integrity of the ecosystem, apply suitable renewable energy technology, and reduce human pressure on the ecosystem. The official project duration was 2009-2014, but the project was closed in April 2016.⁴⁵ The project was managed by MoF.

1.6 Sustainable Management and Biodiversity Conservation of the Lake Aibi Basin

The Lake Aibi Project objective was to promote the comprehensive control and mitigation of land degradation within the Lake Aibi Basin, enhance the policy support and management capacity to optimize

⁴⁵ People's Republic of China – An Integrated Ecosystem Management Approach to the Conservation of Biodiversity in Dryland Ecosystems – Terminal Evaluation Review Report (IFAD, 2016).

water allocation, reduce the negative impact of land degradation on the ecosystem, integrate the biodiversity conservation into the natural resources management, and conserve and protect the significant and endanger species, ecosystems and biodiversity. The project duration was 2011-2015. The project was managed by SFA, the Government of Xinjiang Uygur Autonomous Region, and was supervised by WB.

Table 2: PRC-GEF Partnership – Components, Approach, Activities and Locations

GEF ID	Project	Components	Management Approach	Activities	Provinces
956	Capacity Building to Combat Land Degradation	1. improving policies, laws, and regulations for land degradation. 2. strengthening national and provincial coordination; 3. improving operational arrangements in provinces and autonomous regions and counties; 4. capacity development for land degradation investment projects; 5. a monitoring and evaluation system for land degradation; 6. implementation arrangements for the country programme framework	Sustainable land management (SLM); Integrated Ecosystem Management (IEM)	Mechanisms for stakeholder interaction/ trust-building/ conflict resolution	
2369	An IEM Approach to the Conservation of Biodiversity in Dryland Ecosystems	1. Planning, Policy and Institutional Strengthening. 2. Community Based Ecological Planning and Restoration & Alternative/Sustainable Livelihoods. 3. Protected Areas and BD Conservation: •Mit. Luya NNR established check dams at the critical area of soil erosion in the core zone of the natural reserve. •Increased vegetation cover, reduced hot spots of soil erosion and better habit of wildlife. •Decentralized management stations and watchtowers are built and the GIS spatial database has been integrated as tool to manage the NNRs. 4. Public Awareness.	IEM; environment protection and sustainable farming technique	Ecosystem restoration; Alternative sources of income; Renewable energy; Studies on payment for environment services (PES)	Gansu; Ningxia; Shanxi
3483	Forestry and Ecological Restoration in Three Northwest Provinces (formerly Silk Road Ecosystem Restoration Project)	1. Ecological forestry development 1.1 Ongoing. 91% achieved. Reforestation of about 637 ha of barren and steeply sloping land is completed in Gansu. 1.2 Ongoing. 28% achieved. Total of 296 hectares Haloxylon is planted to fix sands in Xinjiang, account for 28% of the planning. 2. Carbon market readiness and education with ecological forestry and climate change capacity development	IEM	Ecosystem restoration/ rehabilitation; carbon forestry improvements	Gansu; Xinjiang; Shaanxi
3484	Capacity and Management Support for Combating Land Degradation in Dryland Ecosystems	1. Management, implementation and dissemination of IEM strategies and approaches. 2. Policy support for innovative sustainable land management practices. 3. Comprehensive LD monitoring and assessment system. 4. Institutional strengthening at the regional and provincial levels.	SLM, IEM	Studies on carbon sequestration, SLM cost-benefit analysis, PES, public-private partnerships, land degradation monitoring	Gansu, Qinghai, Shaanxi, Inner Mongolia, Ningxia, Xinjiang
3608	PRC-GEF Partnership: Sustainable Development in Poor Rural Areas	Component 1: Community Driven Development (CDD) Component 2: Community Development Financing (CDF) and Capacity Building for CDD and CDF Component 3 (GEF component): Sustainable Land Management and Adaptation (SLMA) 3.1 To disseminate the improved sustainable land management approach through innovative community pilots mainstreaming the CDD model while addressing the vulnerability of poor rural area to Climate Change.	SLM	village assessments, resource mapping, innovative adaptation measures	Chongqing, Henan and Shaanxi
3611	PRC-GEF Partnership: Mainstreaming Biodiversity Protection within the Production Landscapes and Protected Areas of the Lake Aibi Basin	Water Resources Assessment and Optimized Allocation. Sustainable Land Management Practices Biodiversity Conservation and Local Livelihoods Enhancement Project Management, Monitoring and Evaluation	SLM; IEM; Integrated Water and Environment Management	Ecosystem restoration/ rehabilitation; Ecosystem protection/ threat reduction; fodder production demonstration	Xinjiang

This case study is based on information (data and documents) collected, and field observations made during a two-week mission to China conducted in June 2016, as well as evidence extracted from available program and child projects design, monitoring, completion and evaluation reports. Only the six project covered under the PFD are considered in the case study, as this is what the GEF considers as the PRC-GEF Drylands Partnership as a programmatic approach. Findings are reported according to the six main key evaluation questions investigated through the case studies for the programmatic approaches evaluation.

2. Findings

2.1 To what extent has the child project's participation in the program delivered broader scale and longer term environmental outcomes and impacts as compared to its potential results as a stand-alone project?

The second phase of the Partnership is almost completed. Out of the six child projects included in the PFD, only the ADB Silk Road project is still ongoing. In April 2013, ADB commissioned a quite informative independent review of the Partnership (W. Critchley, 2013). Parallel to – and partly in synergy with – that exercise, SFA commissioned its own assessment report (L. Zhou, K. Shuifa, 2013).⁴⁶ The two reports were issued almost simultaneously, in April-May 2013. Terminal evaluations and/or completion reports have been conducted for all but the Silk Road project. Furthermore, an article on the Partnership experience, co-authored by experts from the University of Gothenburg, ADB and China National Center on Combating Land Degradation (CTCCD) has been published on the peer reviewed journal *Land Degradation and Development*. The article is hereafter referred to using the lead author's last name (Tengberg).⁴⁷ In 2012, the GEF Secretariat conducted a learning mission to gather and disseminate knowledge on the Partnership experience.⁴⁸

At the program level, both Critchley and Tengberg, and the GEF learning mission agree that the partnership has achieved significant results in terms of Global Environmental Benefits (GEBs) in the pilot sites. ADB's Management Project completion report calls for the need for upscaling the results achieved to encourage wider adoption beyond the pilot sites (ADB, 2014). Critchley's final evaluative assessment is that the Partnership has an impressive record of helping to reduce land degradation and improve livelihoods, testified to by various sources, most notably SFA's assessment report, which contains a detailed account of the quantitative and qualitative results achieved. Tengberg concludes that mainstreaming of IEM into relevant policy and development frameworks has been the most effective way of mobilizing funding for the scaling up of SLM. As for the scaling up, she recommends that SLM best practices need to be combined with economic incentives for land users, and pilot demonstrations of SLM need to be integrated into larger investment programs to achieve impacts and economies of scale.

Importantly, national data show a steady reduction in desertification over the last 10-15-year period, as a result of the important injection of funding by PRC through large national programs, including the Natural Forest Protection Program (NFCP), the Sloping Land Conversion Program (SLCP) and the Three North's Shelterbelt Program (TNSP), among others. By 2009, the NFCP and SLCP alone account for a total investment of over US\$50 billion.⁴⁹ The extent to which the Partnership has contributed to these results is not yet well quantified, especially with respect to GEBs. Critchley's main message is to set up a Partnership database for quantifying impact, based on collected or collated basic information from the initiatives underway under the child projects that constitute the implementation engine of the Partnership. The data available from all sources are inadequate to assess the extent that the Partnership has met its targets, or has contributed to reduced desertification in the PRC.

⁴⁶ Ibid.

⁴⁷ A. Tengberg, F. Radstake, K. Zhang, B. Dunn, "Scaling up of Sustainable Land Management in the Western People's Republic of China: Evaluation of a 10-Year Partnership" in *Land Degradation & Development*, 2014, available on <http://wileyonlinelibrary.com>.

⁴⁸ World Bank. 2012. *China - PRC-GEF partnership to combat land degradation in drylands*. Knowledge from the field, 2012. Available on: <http://documents.worldbank.org/curated/en/832791468011756777/China-PRC-GEF-partnership-to-combat-land-degradation-in-drylands>.

⁴⁹ For an account of total funding, see Table 2 in: "Payment for Ecosystem Services in China: An Overview", L. Zhen H. Zhang (2011), available on: <http://lrlr.landscapeonline.de/Articles/lrlr-2011-2/articlese4.html>.

Neither Critchley, nor Zhou & Shuifa, or Tengberg deal with the question of whether delivering IEM through mainstreaming of policies plus pilots and then upscaling through the partnership would have achieved the same results if delivered through a series of unconnected stand-alone projects instead. A difference could pertain to the amount of funding injected. Tengberg analysis shows the significant injection of funding provided from national and provincial budgets, as a result of the partnership mainstreaming efforts.⁵⁰

The Pastoral Project could be considered as a proxy stand-alone project comparison to the Partnership. The GEF Agency, WB, considered it as a stand-alone project. The project ICR doesn't make any specific reference neither to the parallel ADB Capacity Building project, considered the first Partnership phase, nor to the Partnership Phase 2 that started in 2008, when the Pastoral project was still being implemented. The project operated in Xinjiang and Gansu, two of the six Partnership's provinces, from 2004 to 2010. It adopted sustainable natural resource management focusing on dryland pasture areas, establishing improved livestock production and marketing systems that increased the incomes of herders and farmers, applying a bottom up natural resource planning and management approach. Land degradation mitigation, conservation of globally important biodiversity (including the Tianzhu White Yak, the Altay and Baiyinbuluk Sheep and the Xinjiang Brown Cattle) and enhanced carbon sequestration through promotion of IEM were the GEBs targeted by the project. The largest effort was dedicated to the grassland management component.

According to the Pastoral Project ICR, project design was holistic and forward looking, but ambitious in its wide geographic spread, and complex. In terms of complexity, with 26 sub components encompassing 45 activities, the Pastoral Project was comparable to the Partnership. The degree of complexity was very challenging for the provincial teams, especially for M&E. As for the GEBs, almost 22,000 ha of grassland have been brought under integrated grassland management, the double of what was initially planned. More than half was fenced and some reseeded. Demonstration sites supported by the GEF funding component in Gansu included 20 ha of banned grazing, 5,577 ha of deferred or rest grazing and 6,760 ha of rotational grazing. Xinjiang grazing bans covered 5,333 ha in 21 sites and 4,000 ha in 12 rotational systems. The total area established for forage crops including alfalfa, sanfoin, forage maize and Chinese milk vetch was more than 75,000 ha. No aggregate data to compare with these figures are available at

⁵⁰ Quotes from Tengberg article: "... A total of 54 laws and regulations have been formulated and 17 revised at provincial/regional level in support of IEM... Total funding mobilized through mainstreaming of IEM plans into the 11th and 12th 5-year plans of the PRC amounts to \$26-80bn compared with \$840-05m of project funding to the PRC-GEF Partnership."

program level from the Partnership evaluations.⁵¹ However, no evidence is available to suggest that the GEBs achieved by the Pastoral Project would have been different, either in case it was implemented in synergy with the parallel Capacity Building Project, or after, under the Partnership. According to the data and documents collected and the field level interviews conducted during the mission, sizeable environmental change occurred at site levels (see Appendix 1 and Box 1).

GEF Agencies' staffs interviewed in Beijing confirmed the main Partnership achievements in mainstreaming of IEM in provincial level policies and plans. After the IFAD project ended, IEM was integrated in 26 more counties in Gansu, and 6 more National Nature Reserves (NNR) in other provinces. ADB noted that through the Partnership, for the first time an integrated ecosystem approach was introduced in China, pointing at the IEM peculiarity of involving technical and financial resources from different sectors and government ministries and departments at national and local level. Under IEM, a set of principles was developed to involve local stakeholders (local governments, local research institution, and universities) to build capacity to combat land degradation through a bottom-up approach. IEM was mainstreamed into the five-year plans in 4 out of the 6 provinces involved in ADB projects. WB confirmed that participatory natural resource planning and management was introduced and adopted in other projects.

GEF Agencies expressed doubts on whether results would have been different if the same funding was executed through stand-alone projects. However, they recognize that an important value addition brought in by the Partnership is knowledge exchange. While the only information exchange between GEF Agencies happens at design stage and concerns funding and geographic targeting, the actual knowledge exchange on lessons learned happened at local level, between counties.

On the PRC side, SFA confirmed that GEF introduced IEM into China. In 2002, with GEF support, the Partnership started initially with eight departments. Now they are thirteen. The first project, Capacity Building was multifocal to increase funding opportunities, indicating a programmatic thinking since that early stage. Interestingly, while SFA agrees with GEF Agencies that knowledge sharing happens at the project sites/province level, it is limited. SFA as the national lead agency, experienced difficulties in coordinating between different sectors in the government to have them work together under IEM, in a way to foster knowledge sharing among child projects and national executing agencies. During his review, Critchley found no evidence of interaction or

Box 1: Field Observations

In Hezheng County, farmers switched from grazing to planting maize to feed their cows, contributing to reduce the grazing pressure on mountains. The organic fertilizer produced is used in greenhouses to grow fruits and vegetables, as well as in crop fields to fertilize the maize. An interviewed beneficiary said that he was grazing since childhood, but never earned much. Maize and indigenous fruits provide a much higher income now, which is why everybody in the village have switched from grazing to growing maize.

An interviewed village leader said that farmers used to hunt illegally and cut trees in the Taizishan NNR, taking advantage of weak enforcement of protected areas laws. Now they protect the forest to conserve headwaters. Ten years ago, all the land around the NNR was barren, now all is green with trees and crops. Water is cleaner too. However, according to a NNR staff, forest cover would have increased even without GEF. GEF support was mostly normative.

In Longxian County, mulching helps farmers adapt to drought in spring. Before, it took six months to cultivate and then six months to harvest even when the soil was frozen. Now, non-cultivated land has become forest or grassland again. Erosion is reduced when it rains. A walnut farmer said that mulching using maize stalks maintains the temperature and results in bigger walnuts. Terracing has allowed use of tricycle motorbikes. The biggest contribution of the project for them are the solar lamps, which now allow them to walk in the neighborhood at night to visit or work late.

Houzhenzi Forest Farm staffs stated that GEF introduced a model for inter-sectoral working style, leading to synergies. The Forest Experience Centers introduced by the GEF did not exist before. GEF project contributed to awareness raising, cross-sector collaboration, and the forest health center.

⁵¹ SFA's Assessment Report summarizes the results of the Capacity Building, the Management Project and the Pastoral Project, as the other projects were implemented for less than two years at the time of writing that report.

cross-learning between either the child projects under the Partnership or between the GEF Agencies that support those projects.

The Foreign Economic Cooperation Office (FECO) of MEP is convinced that the Partnership made a difference as compared with what would have been the case with a stand-alone project-by-project or sector-by-sector approach. The Partnership stimulated a change towards integration in a situation where MoF needs to balance competing demands from different sectors. Conflicts are often on unclear division of responsibilities and competencies between sectors. And there is competition for funding: on GEF funds, MoF has to share it equally between many demands. FECO agrees that knowledge sharing occurred among child projects. This would not have been possible without the program support, as there is no formal mechanism to share experience between government sectors.

Remote sensing analysis was conducted for the select sites to examine the long-term spatial and temporal patterns of vegetation to assess if project activities had any impact on increase in global environmental benefits in terms of land productivity measured as vegetation productivity. To understand the vegetation trend between 2000 and 2015, the inter-annual variation in vegetation productivity was measured by the Normalized Difference Vegetation Index (NDVI), derived from daily Moderate Resolution Imaging Spectroradiometer (MODIS) satellite observations at 250m resolution. The results for the various project sites are summarized here below, per location.

The vegetation trend for the project “PRC-GEF: An IEM Approach to the Conservation of Biodiversity in Dryland Ecosystems – GEF ID: 2369” at the two project locations shows a consistent increase in vegetation productivity over the period 2000-2015 (Figure 1).

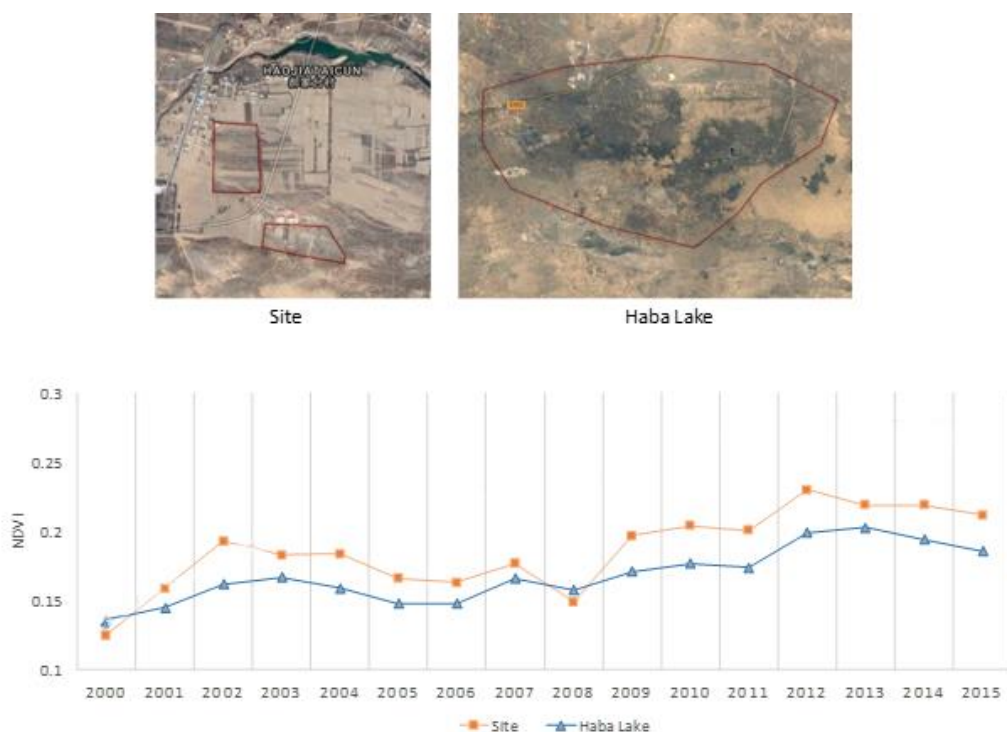


Figure 1 Increasing trend of NDVI have been observed at all the three sites since 2000.

The geospatial analysis for the two project sites for “PRC-GEF Partnership: Sustainable Development in Poor Rural Areas – GEF ID: 3608” the also shows improved vegetation productivity over the period of

2000-2015 (Figure 2). Both sites show strong increase in NDVI from 2000 to 2015, suggesting improving vegetation conditions.

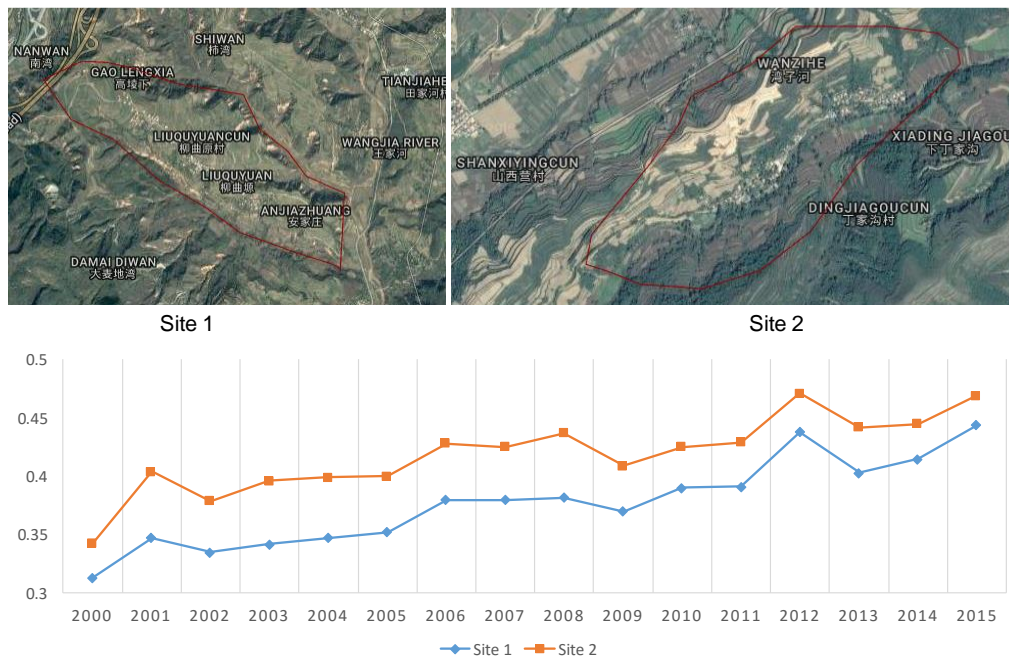
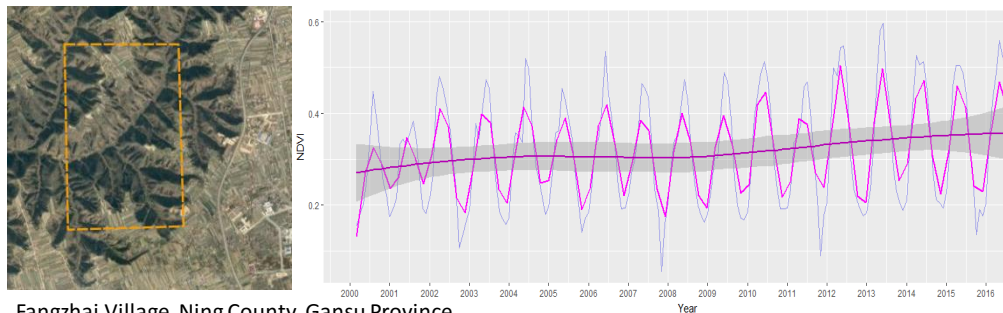


Figure 2: Location and time series of NDVI extracted for two PRC-GEF Partnership: Sustainable Development in Poor Rural Areas sites

A dense time series vegetation productivity analysis of the two sites of the “Forestry and Ecological Restoration project in three North-West provinces – GEF ID: 3483” shows only a slight increasing trend over the last decade (Figure 3).

Laozhuang Village, Yima Town, Qingcheng County, Gansu province



Fangzhai Village, Ning County, Gansu Province

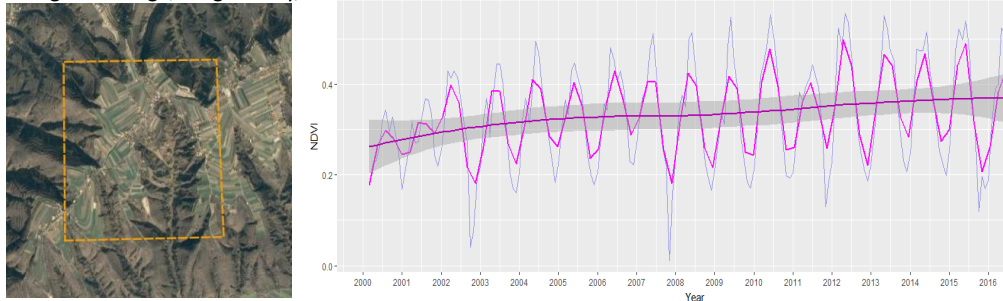


Figure 3 Location and time series of NDVI extracted for two sites in Qingyang, Gansu Province

2.2 To what extent has the program helped the child projects to address the main drivers of environmental degradation in China?

The GEF recognizes four broad human activity areas, which contribute towards environmental degradation: food production/consumption, transportation, construction and buildings, and energy production/consumption. The PRC-GEF Drylands Partnership is primarily concerned with effects from food production activities, notably biodiversity loss and land degradation. The PFD clearly indicates the Partnership focus on mitigating the causes and negative impacts of land degradation on the structure and health of the dryland ecosystems of Western PRC through the promotion of innovative sustainable land management practices for improved agriculture, rangeland and forest management. This focus retroactively refers to sustainable food production as well as fuelwood energy production in fragile ecosystems, i.e. addressing the two main drivers of environmental degradation in Western China.

Recent research seems to confirm the relevance of the Partnership's choice of using the IEM and SLM approaches, focusing specifically on the socioeconomic drivers of desertification in Western China to achieve GEBs in land degradation, climate change and biodiversity. In response to ecosystem degradation from rapid economic development, China began investing heavily in protecting and restoring natural capital starting in 2000. Ouyang et al. report on China's first national ecosystem assessment (2000–2010),⁵² designed to quantify and help manage change in ecosystem services, including food production, carbon sequestration, soil retention, sandstorm prevention, water retention, flood mitigation, and provision of habitat for biodiversity. According to those authors, overall, ecosystem services improved from 2000 to 2010, apart from habitat provision for biodiversity.

Another recently published research on China's desertified areas produced a quantitative assessment of the interaction between the meteorological factors associated with climate change and the human factors associated with human activities, combined with long-term monitoring (1983–2012) on vegetation cover using the Normalized Difference Vegetation Index (NDVI) which decreases with increasing desertification. This analysis found similar effect magnitudes for socioeconomic and environmental factors for NDVI, but different results for desertification: socioeconomic factors were the dominant factor that affected desertification, accounting for 79.3% of the effects. Climate change accounted for 46.6 and 20.6% of the effects on NDVI and desertification, respectively.⁵³

2.3 What factors have influenced China's ownership of the program and has the degree of ownership affected the relevance of the program to China's environment and development needs and priorities?

According to Critchley, the widespread participation of beneficiaries in decision making through Participatory Rural Appraisal (PRA) is a major achievement in that it has instilled a local sense of ownership. The mission observed that provincial teams feel proud ownership of their projects: their enthusiastic presentations and eagerness to share and discuss testify to this. In Beijing, central level stakeholders are somehow distanced from the main Partnership activities, though undoubtedly there is a sense of satisfaction in what has been achieved. Overall, based on perceptions gathered during the various interviews, meetings and field visits, PRC feels strong ownership of the Partnership and its child projects. The GEF learning mission of 2012 concurs with these findings, agreeing that there is strong ownership at all levels. In Gansu, the Provincial Project Management Office (PPMO) stated that the IFAD project sites

⁵² Ouyang Z., et al. "Improvements in Ecosystem Services from Investments in Natural Capital" in *Science*, 17 June 2016 • Vol 352 Issue 6292. Available on: <http://science.sciencemag.org/content/352/6292/1455>.

⁵³ Feng Q., et al. "What Has Caused Desertification in China?" *Sci. Rep.* 5; 15998. DOI: 10.1028/srep15998 (2015). Available on <http://www.nature.com/articles/srep15998>.

were chosen based on those that had an understanding and interest in an integrated ecosystem approach, not just an economic benefit. All stages of the project were designed and executed in a participatory way, to instill greater ownership.

The GEF Operational Focal Point (OFP) indicated that GEF strategies are strongly aligned with China's strategies. Environment protection is included in the 13th PRC Five-year Plan. Since OP 12, the IEM concept has been integrated into policies and laws at different levels, from provincial to national. During the interview, the OFP was particularly appreciative of the fact that GEF makes different national agencies to work together. This is not limited to the Partnership. A recent example is the collaboration between MoA, SFA and the International Commerce departments on the alien species quarantine GEF-6 projects.

The strong relevance to the national policies and plans for combating desertification in Western China contributes to strong ownership of the Partnership. The shift towards China's heightened interest in environmental projects started as a consequence of the 1998 long-term flood in the Yangtze River, which affected millions of people. In 1999, a policy was implemented to return converted croplands to grasslands and forests. In 2005, chemical pollution in the river prompted a Regional Environmental Assessment. Today, China focuses on air, soil and water quality, which requires different sectors to work together. The Partnership operated in strong alignment with an enabling national policy context.

Critchley's assessment of strong relevance both to the GEF as well as to China, and the strong degree of ownership China has demonstrated at provincial as well as national level is confirmed in all the child project terminal evaluations, completion reports and ICRs reviewed for this case study. Notably, the IFAD Project terminal evaluation roots the strong national relevance and ownership of the project to the fact that it was designed under the auspices of the PRC-GEF Partnership, which also included a suite of GEF funded projects linked with ADB, IFAD and WB (IFAD, 2016). The Partnership concept was owned because it was in line with the change from the 1990s' top-down land degradation control plans and programs, characterized by uncoordinated efforts in tackling cross-cutting sectoral issues, to the bottom-up approach that integrated IEM concepts and principles in rural development and environmental protection, a concept that emerged in the government environmental strategies of the early 2000s. The country commitment and ownership is also demonstrated by the significant level of co-financing and integration of planning tools with other National and Provincial programs.⁵⁴

SFA has strong ownership of the Partnership. However, both ADB and Critchley's review question whether SFA is the most appropriate national lead agency. The Partnership is quite integrated and multi-sectoral, while SFA focuses on forests and land degradation. Furthermore, the voice of SFA is not as strong as the one of the National Development Reform Commission (NDRC), or the Water Resources Department (WRD), in terms of influence on the government. For an eventual Partnership follow-up phase, Critchley recommends any future CPMO to function more clearly as a coordinating nexus, be smaller and comprise higher qualified staff.

2.4 To what extent have child project objectives been coherent with and integrated in the program's objectives?

The PFD clearly states the Partnership overarching goal of reducing land degradation and restoring dryland ecosystems in the western region of the PRC, and through this to further the goals of protecting drylands ecosystem biodiversity. The specific purpose is to introduce IEM and mainstream it in policies and programs in order to maximize the ecosystem benefits investments in the Partnership region. Child

⁵⁴ As also reported in Tengberg, 2013.

projects objectives and components, summarized in a table annexed to the PFD and in Table 2 in this report, broadly align with these overarching objectives, each of them contributing in different yet interconnected ways. The PFD integrates in its overall strategy the objectives of both GEF-3 ongoing projects (the Capacity Building and the Pastoral project) and the six proposed child projects to be funded in GEF-4. This was justified by the fact that the Partnership was designed as a continuation/expansion of a programmatic investment that was already established and piloted through the CPF in 2003.

Interviews with GEF Agencies in Beijing broadly confirmed the alignment and coherence between the PFD and its child projects, explaining that it was a specific requirement at the design stage. ADB, IFAD and WB agreed that the PFD is an additional step required if one wants to access GEF programmatic funding. Additional efforts are needed in terms of staff and funding to process programs as compared to stand-alone projects. In describing how the idea of the Partnership came about in 2002, ADB notes that the programmatic concept is very much embedded at the design stage. However, after several years of implementation, projects were implemented as stand-alone. Collaboration among GEF Agencies involved in the Partnership is not strong, not programmatic, and is limited to rare round-table meetings.

While WB interviewees confirmed that child projects are aligned by design with the Partnership PFD, the Poverty Project ICR does not make any mention of the Partnership, or what did the project contribute to it in terms of GEBs. The ICR does not mention IEM either, and refers to the GEF only to report on use of its funds to implement the Sustainable Land Management Assessment (SLMA) component, as a means to achieve climate change adaptation and poverty reduction objectives (WB, 2016). Although it can be said that the project SLMA component objectives are aligned with the Partnership climate change aims, it is clear that the WB hasn't considered the Poverty Project as part of the Partnership as strongly as ADB and IFAD. Hence, it can be assumed it has not contributed to synergy, coordination and M&E at program level.

2.5 To what extent have the program governance, management and coordination influenced its performance?

The PFD describes the Partnership coordination structure as one having been set since the CPF time. This coordination structure has been built up at both the central and provincial levels. At the central level, a Steering Committee (SC) initially comprised representatives from ten ministries/agencies both the national legislative and executive branches.⁵⁵ The CPCO is housed in MoF, while the CPMO is hosted by at SFA. Headed by the Vice Governor/Chairman in charge of the agricultural sector, Provincial Project Coordination Offices (PPCOs) and PPMOs have been set up in each of the six participating provinces and/or autonomous regions. In addition, specific task forces have been established by the provinces to undertake project activities under the Partnership/CPF. The PFD further describes the coordination structure, which reflects the multi-disciplinary and multi-sectoral features of the Partnership, by introducing the expert groups, established to guide and advise the Partnership's implementation on specific themes. These groups are: (i) Legal and Policy Expert Advisory Group (LPEAG); (ii) Institutions and Planning Expert Group (IPEG); (iii) Land Degradation Monitoring and Evaluation Expert Group (MEEG); and (iv) IEM Expert Group.

Coordination of the Partnership at the national level is still kept active by SFA. The Partnership website is still active and reports on international missions as well as participation to conferences and symposia.⁵⁶ SFA provided the mission with an example of SC meeting minutes.⁵⁷ At that meeting, it was acknowledged

⁵⁵ The mission was given an example of SC meeting minutes dated November 5, 2014, which enlists thirteen agencies.

⁵⁶ <http://www.gefop12.cn/index.php?styleid=2>, accessed on January 4, 2017.

⁵⁷ Ibid.

that most child projects under the PRC-GEF Partnership have been completed successfully (from 2003 to 2012). Opening the meeting, the SC Deputy Chairman introduced the “Sustainable and Climate Resilient Land Management in Western PRC” project, symbolizing the start of the follow-up phase of the partnership (2014-2023). That project (GEF ID 5142) was submitted as a full-size project by ADB to the GEF in 2014, and is showing as GEF CEO Endorsed in the GEF Project Management Information System (PMIS). The total project budget is US\$23 million, of which US\$ 5.2 million of GEF grant. ADB co-finances only up to US\$0.4 million and PRC national and provincial governments provide the bulk of co-financing, US\$18.4 million, a further confirmation of continuing PRC commitment to IEM despite overall downscaling of external funding to the partnership. To note, ADB confirmed during interviews that no further projects beyond GEF ID 5142 will be submitted in China for GEF-6 because the process is too difficult, and ADB has to spend extra resources just to get projects approved. CPMO’s Deputy Director presented the “Integrated Strategy for Sustainable Land Management in Western China (2014-2023)” to SC members. This strategy document – approved by the SC – includes the project submitted to the GEF, the ongoing IFAD and ADB Silk Road projects, an ongoing ADB project, the “Shaanxi Weinan Layang Integrated Saline and Alkaline Management Programme” (GEF ID 4633), plus the Qinghai Integrated Land Resource Management Project (GEF ID 6950), the latter showing as ‘dropped’ in PMIS. The Partnership Phase 2 Strategy also includes four 100% government funded projects totaling USD 9,358 million. To date, besides ongoing projects, the only GEF-funded project in Western PRC showing in PMIS is the above-mentioned “Sustainable and Climate Resilient Land Management in Western PRC” (GEF ID 5142).

While acknowledging that coordination in the Partnership is no simple task, Critchley’s report is somehow critical on the Partnership institutional setup. According to him, CPMO in SFA has been unable to establish a comprehensive database or to manage adequate cross-learning between projects. As mentioned earlier, Critchley suggests a stronger coordinating role for CPMO, which as seen earlier should be smaller and comprise higher qualified staff. The CPMO could be led by an M&E expert, and make use of more input from short-term consultants and representatives from the PPMOs. Another important issue raised in Critchley’s report concerns cross-learning between child projects, which needs a stronger coordination role by CMPO. This was not new. The completion report of the Capacity Building project mentions weaknesses in coordination among partners involved. These meetings were too few and too widely dispersed to be able to effectively provide information on current opportunities to support mainstreaming of IEM and SLM through the PRC-GEF Partnership (ADB, 2010). During the mission the team observed that coordination and knowledge sharing happened naturally and were quite common within a province between child projects led by different Agencies. Cross-province coordination between child projects was less frequent and effective.

GEF Agencies concur on the fact that program coordination is heavy. IFAD goes further and indicates that the Partnership was designed more to share the available financial envelope, rather than to coordinate projects. SFA was quite active in coordinating with other government ministries and departments the projects falling under its responsibility. For other projects, MoF was more active. As for the Partnership as a whole, there was no formal arrangement of coordination, but a few meetings have been organized by the government. ADB confirmed that the Partnership had no funds specifically earmarked for coordination.

Interviews and field observations in Gansu and Ningxia confirmed what the mission found and heard in Beijing on stronger coordination and knowledge exchange at province level. The IFAD national coordinator in Gansu stated that IEM means coordination between sectors, topics and tight cooperation between them. In Ningxia, the mission was informed about synergies/knowledge sharing occurred between ADB and IFAD project teams. Experts from ADB contributed to the IFAD project.

2.6 What role has M&E played in the program's adaptive management for the attainment of its expected outcomes and impacts?

The PFD does not explicitly describe the Partnership M&E system, and limits itself to mention, as seen earlier, the establishment of the MEEG expert group. A little more information on program level M&E is found in Annex 1 to the PFD, describing the setting up of a data collection and sharing system on land degradation. This was to be managed through a network of provincial IEM Information Centers under the guidance and advice of the six provincial MEEG expert groups. At that time, in 2008, the system was being set up. Annex 1 indicates that the provincial IEM Information Centers were soon to be inaugurated. Host agencies for each of the IEM Information Centers had been identified along with their staffing, hardware and software requirements. Land degradation data banks in each province were under construction, and necessary procurement for the IEM Information Centers was underway.

The Partnership has been evaluated both at the program (by ADB and SFA) and at the child projects level (by ADB, IFAD and WB). However, as seen earlier, no program level aggregation of child projects M&E data was done beside in the SFA Assessment Report. At the child project level, several completion reports, ICRs and evaluations point at the weaknesses in land degradation monitoring and assessment. The completion report of the Capacity Building Project notes the need to streamline the monitoring and financing mechanisms for more effective monitoring of land degradation (ADB, 2010). Efficiency of project M&E could have been improved had there been a clearer delineation of responsibilities in monitoring arrangements between CPMO and PPMOs. The Capacity Building completion report also indicates a need for strengthening and improving coordination and cooperation with other ongoing programs and agencies for monitoring of land degradation, highlighting that this is one of the priority issues that are to be addressed by the follow-up Management Project. The completion report of ADB Management Project rated the 'Comprehensive land Degradation monitoring and assessment' component as moderately satisfactory, based on the insufficient knowledge on: (i) LD monitoring and assessment; (ii) the concepts of GEBs; and (iii) the ways and means of how best to upscale initiatives. Although a land degradation M&E indicator system has been produced with support of this project, and the six provinces/autonomous regions have established corresponding multi-scale and cross-sector land degradation M&E indicator systems involving agriculture, forestry, water and grassland sectors, these systems have yet to be implemented (ADB, 2014). The IEM Information Centers and the MEEGs have not functioned as expected. Interestingly, that same completion report refers to the inadequate calculations in the SFA Assessment Report concerning carbon sequestered through afforestation and grassland management, and improved stoves, because they omit the carbon sequestered through land brought under SLM practices.

As seen earlier, Critchley's main recommendation calls upon more efforts in documenting the Partnership impact, through systematic collection of hard data and participatory impact assessment tools, and use of specialized technical inputs. His review highlights that SFA Assessment Report is the first concrete attempt to provide such data. However, data consistency problems are found in that report too, which, according to Critchley, is "is still unclear in several aspects, and incomplete in others". The mission was given an updated version of the same Excel table –the Partnership database – that was provided to Critchley at the time of its review. This table provides quantified activities and outputs, including extent of area put under SLM as well as area with protected biodiversity. It also has a column for tons of carbon sequestered through SLM activities, which is empty.

In the terminal evaluation of the IFAD project, M&E Design and M&E Implementation were rated as Moderately Satisfactory, and M&E financing as Satisfactory (IFAD, 2016). The TE team spent many hours reviewing and discussing the indicators and found that, in several instances indicators had been

interpreted differently from what was intended. Additionally, some indicators seemed too easy, and others too challenging. There also seemed to be some repetition of indicators in different parts of the framework. That evaluation does not make reference to production of indicators and M&E data to be provided to SFA for Partnership-level M&E.

The interviewed IFAD country office staff told the mission that CPMO in SFA used to ask child projects to provide data/indicators for aggregation at the program level, but these are not shared back with IFAD. According to ADB, there is no clear linkage between Project Implementation Reports (PIRs), GEF Tracking Tools and the project results frameworks. ADB periodically asks SFA to fill in the Partnership Excel table, but SFA faces challenges, especially in collecting data and information from other government institutions.

While obviously there hasn't been program level adaptive management, several examples of child project level adaptive management have been mentioned during the field visits to Gansu and Shaanxi. These would most probably have occurred were the project executed as stand-alone ones. In Gansu, the ADB Silk Road Project midterm review recommended revising the initial design, changing the crop from pepper to walnuts due to the complicated labor efforts and increased labor costs. In Shaanxi after the midterm review conducted in 2015, the ADB Forestry project adjusted a few targets, i.e. the economic plantation at 19,600 ha, or the 4 fruit storages. In the Heihe National Forest Park site, due to delay in implementation, the midterm review assessed that the carbon market was not as viable as initially thought. More advanced technologies than the ones originally proposed became available. This led to funds being shifted to the Education Center, the Forest Experience Center and the Forest Health Center.

Appendix I: Data and indicators collected during the field mission

GEF	Project Title	Provin	Project Sites	Environmental monitoring indicators	Socioeconomic monitoring indicators	Data source
2369	IFAD – An IEM approach to the conservation of biodiversity in dryland ecosystems	Gansu	Taizishan National Nature Reserve (NNR), Guanghe County, Hezheng County	Environment indicators: 1. more than 50% of tree species in project area are endemic species; 2. incidence of illegal harvesting of firewood, grazing and collection of herbal medicine decrease to 25%; 3. scorecard of PA increase 20%; 4. no loss of key PA species population. Estimated Benefits: 1. Forests of Taizishan NNR can help prevent about 900,000 tons of soil loss. The value of soil conservation amounts to RMB 10.8 million per year based on the estimation of nutrients restored in soil. 2. it is measured that a forest with high canopy density will release 2.025 tons of oxygen and will absorb 2.805 tons of carbon dioxide and 9.75 tons of dust per hectare per year. With this being considered, oxygen released by the forests of Taizishan NNR is worth more than RMB 23 million per year. 3. According to the agriculture and forestry law enforcement agencies, illegal logging, grazing and herbal medicine capturing have been significantly reduced from 34% in baseline survey to 4% by the time of project completion. Among them, illegal logging and herbal medicine capturing have been completely eliminated. Grazing without permission happens occasionally. 4. according to the calculation of the scorecards used in the reserve, the management efficiency of the NNR area has increased 30% in the past five years. According to the bureau of agriculture and animal husbandry in the County, grassland degradation has slowed down from 28% to 22% in the past five years.	Population of villagers participating in environment publicity activities increase by 50%. As of March 31, 2016, a total of 161,020 people benefited from the project, among which 40,255 (25%) are direct beneficiaries, and 120,765 (75%) are indirect beneficiaries. A total of 20281 women directly benefited from the project, accounting for 50% of the total direct beneficiaries. The number of villagers involved in environmental campaigns in the project area has increased by 55%. various training programs for rural household have raised the environmental awareness of farmers.	Hand-outs from project briefing meeting
		Ningxia	Haba lake NNR, Yanchi County	Environment benefits: vegetation cover in project area increased 8.83% from 2010 to 2014; wild bird species increased from 92 in 2011 to 120 in 2015; wild plants in Haba lake NNR increased from 368 (before project started) to 371; 166 newly found insect species; 16 newly found Zooplankton and 34 newly found Phytoplankton. Desertification land in Yanchi county decreased 28,300 hectares from 2009 to 2014, with an annual decrease of 5,700 hectares. Desertification land in Haba lake NNR decreased by 8,359 hectares. "Best practices" of IEM was adopted in 3 NNRs in Ningxia province, and was replicated in two other IFAD projects (one in Qinghai province, one in Jiangxi province). Awareness raised: in 2015, 10,061 villagers participated in environmental events, increased 224% comparing to 3,106 villagers in 2012.	Poverty population in Yanchi county decreased from 40,580 in 2012 to 34,046 in 2015. Per capita income in Yanchi county increased 60.1%, from 4,793 in 2012 to 7,674 in 2015, annual increase is about 12% (after adjusting for price inflation). Animal husbandry has decreased while planting (i.e. Licorice) has increased.	Hand-outs from project briefing meeting; Chinese version TE (only for Ningxia project sites)
3483	ADB – Forestry and ecological restoration project in three northwest provinces	Gansu	Fangzhai Village, Ning County. Laozhuang Village, Yima Town, Qingcheng County. Shuantong Village, Xifeng District	1. In Qingyang, ecologically sensitive ecosystem protected area increased 51,720 hectare by Dec 2015. The target is to increase 130,000 by 2020. 2. 9,000 hectares of degraded land is recovered in Qingcheng County, 53,900 hectare recovered in Ning County, 7,000 recovered in Xifeng District. The target is to reduce the degraded land by 10% from 3.5 to 3.15 million hectares by 2020. 3. From 2010 to 2015, trees planting in Qingyang increased 4970 hectare in total, including 1,095 in Qingcheng County, 1,089 in Ning County, 1,187.5 in Xifeng district. 4. Carbon Sink from economic plantations (target is to store 368,600 tons in 3 provinces by 2016): 677 tons in Qingcheng County, 735 tons in Ning County, 630 in Xifeng County. 6. Ecological plantation on steep slopes: In Gansu province, from 2010 to 2015, Qingyang city finished ecological plantation of 215 hectare, including 60 hectares in Qingcheng County, 75 hectares in Ning County, and 80 hectares in Xifeng County. 80% survival rate.	In Qingyang city, on average, per capita income of participants increased 36.69% (from RMB 3004 in 2010 to RMB 4114.2 in 2015). Specifically, Ning county achieved increase of 76.6%, Qingcheng county 18.1%, Xifeng district 21.4%. 766 jobs have been created from 2010 to 2015, including 200 in Qingcheng county, 170 in Ning county, 180 in Xifeng county.	For project sites in Gansu, data source used to fill out this sheet includes hand-outs from project briefing and field visits; monitoring data spreadsheets shared by ADB
			Kongtong District of Pingliang City.	1. In Kongtong district, ecologically sensitive ecosystem protected area increased 3,418 hectares to 20,200 hectares (Jan 2016). 2. Forest cover: forest area increased from 30,120 hectares in 2010 to 314,500 hectares in Jan 2016, forest cover rate increased from 17.5% in 2010 to 21.83% in Jan 2016. 3. Economic plantation increased by 955 hectares. 4. Ecological plantation on steep slopes increased 480 hectares.	1. Income: in Kongtong district, per capita income has increased 67.2% from RMB 4,029 in 2010 to RMB 5,990 in Jan. 2016. 2. Number of jobs created: 8,200 jobs created in Kongtong district by Jan. 2016.	Gansu PMO.
			Daping village, Shifo Township, maiji District, Tianshui city	Established economic forest for 17,977.5 ha (apple, walnut, apricot, cherry, ginkgo), which has 85% survival of 19k ha, 8 fruit storage and one processing plant (loan and co-financing). Forest cover increased 0.5%	Increased income 20-30%.	
		Shaanxi	Heihe national forest park	Establishing 23 economic plantation farms covering 15,048 hectares; Improving the facilities and infrastructure of national forest farm; institutional capacity building. GEF supported Carbon sink research, forest experience and education center, capacity building.		Project briefing material
3608	WB - Sustainable development in poor rural areas	Shaanxi	Longxian county. Chencang district. Ansai County. Wuqi County. Yichuan County. Jiaxian County. Wubu County. Dingbian County	1. Land management: anti-slope terrace (7 ha); 98,000 m ² sumps constructed on slope of 25 degree and above, 24 ha of horizontal band constructed on slope below 25 degree; increased vegetation cover. 2. Straw mulching in walnut orchard (3 ha); plastic film covering in apple orchard (39.4 ha); mulching in cornfield (81 ha). 3. Protective forests for roadbed protection: planted 31,800 seedlings. 4. Green energy: 20 solar insecticidal lights in Apple orchard; 50 solar street lamps; 20 solar water heaters; 229 solar stoves; 31 biogas digester. All of these activities contribute to carbon emission reduction (no specific data available). The application of solar insecticidal lights got replicated in non-project villages. 5. economic plantations: new walnut variety (48 ha); Chinese honeysuckle (10 ha); new potato variety (7.3 ha), apple trees (4.9 ha).	1. increased income from economic plantations in 11 villages (6,084 beneficiaries): walnuts (an increase of RMB 565,500 per year); Chinese honeysuckle (an increase of RMB 750,000 per year); potatoes (an increase of RMB 26,400 per year), apple trees (an increase of RMB 55,500 per year). 2. 4,600 villagers benefited from land management activities, which contributed to income increase of RMB 1.4 million in total. 3. economic benefits from disaster (hail, frost) prevention interventions: prevented economic loss of RMB 48,000 per year in apple orchards. 4. solar energy activities saved expenses on fuel and pesticides: solar insecticidal lights can save RMB 72,000 pesticide expense per year; solar street lamps can save RMB 18,000 fuel expense per year; solar water heaters can save RMB 16,000 fuel expense per year; solar stove can save RMB 13,740 fuel expense per year; biogas digester can save RMB 18,600 fuel expense per year. 5. Straw mulching in walnut orchard provides annual income increase of RMB 20,000; mulching in cornfields contributed to annual income increase of RMB 437,800.	Third party evaluation report done by local University

CASE STUDY: India GEF Coastal and Marine Program (IGCMP)

1: Introduction to the IGCMP

As presented in its Program Framework Document (PFD), the India Biodiversity: GEF Coastal and Marine Program (IGCMP, GEF ID: 3661), is composed of the following child projects:

- IND-BD Mainstreaming Coastal and Marine Biodiversity Conservation into Production Sectors in the Godavari River Estuary in Andhra Pradesh State (GEF ID: 3936)
- IND-BD Mainstreaming Coastal and Marine Biodiversity Conservation into Production Sectors in the Malvan Coast, Maharashtra State (GEF ID: 3941).

The overall financing allocated to the program is as shown below:

	Total Program	Total Project Amount + PPG included in the work program**	Agency Fee
GEF	10,476,000	9,523,636	952,364
Co-financing	27,900,000	27,900,000	
Total	38,376,000	37,426,000	950,000

The program commenced in 2009 and was scheduled for completion in 2014 but has been extended following Mid Term Reviews of the two projects. The main objective of the (originally) 4-year program is to demonstrate multi-sectoral approaches to mainstreaming biodiversity conservation objectives into economic activities in two marine eco-regions of the country. By piloting the mainstreaming of biodiversity conservation objectives into production sectors of the coastal zone through 2 projects, it is envisaged that the program will provide a broader set of experiences than can be obtained from individual projects for further replication by the government.

The program's strategy for mainstreaming consists of three components, as follows:

- At the systems level, to promote mainstreaming of coastal and marine biodiversity conservation into sectoral policies and a knowledge management system through the identification and/ or development of the necessary information, tools and mechanisms to promote multi-sectoral coordination and ensure the integration of biodiversity values into land use planning and decision-making in relation to India's coastal and marine ecosystems.
- At the institutional level, to promote institutional capacity development by strengthening human resource capacities (skills, knowledge) of individual government departments and private sector companies for integrated planning and management of economic activities to minimize adverse environmental impacts on coastal and marine ecosystems.
- At the community level, to promote sustainable community livelihoods and natural resource use in the buffer zones of marine protected areas and other areas of high biodiversity value by developing appropriate incentive structures and local capacity.

The testing of different mainstreaming approaches at each of the selected sites is pursued as sub-projects under this program, with each sub-project sharing the same 3 components. Each sub-project is based on the specific nature of threats to biodiversity and barriers to mainstreaming. This approach aims to demonstrate how changes in production activities near ecologically important areas can benefit biodiversity conservation, thus providing a diverse set of experiences with mainstreaming for further replication in other critical areas along the coast. A replication strategy will be embedded in the program and sub-projects.

A National Steering Committee (NSC) was established as the executive body with overall responsibility for meeting the program outcomes. The NSC is chaired by the Additional Secretary, Ministry of Environment and Forests (MOEF) with representatives from the two project states (Maharashtra and Andhra Pradesh), UNDP, a technical/scientific advisor and social scientist/policy advisor. Representatives from relevant departments, agencies and production sectors may also be invited to the NSC meetings. One of the main responsibilities of the MoEF is to facilitate inter-sectoral coordination with other relevant ministries and departments at all levels. The NSC is supported by a Program Management Unit (PMU), which is the administrative hub for the program. The PMU is based in Delhi and headed by a Project Manager who has day-to-day responsibility for project implementation and management.

Two state level Project Steering Committees (PSC) are constituted in Andhra Pradesh and Maharashtra to oversee project implementation and management at the state levels. The state PSCs are supported by the State-level Project Management Units (PMU) based in Andhra Pradesh and Maharashtra.

In order to support coordination across the two projects under the program, some resources (approximately US\$ 0.45 million) have been dedicated to coordination of the overall program and knowledge management. These resources are included under Component 1 (Systems 1) of the larger of the two projects (Godavari River Estuary) and include activities such as establishing a joint database, M&E system, as well as joint outreach and communication activities. This is intended to facilitate sharing and dissemination of experiences from both the Godavari River Estuary and Malvan Coast for eventual replication of successful strategies in other coastal areas facing similar challenges. Specific knowledge products and tools are to be developed for government and private sector decision-makers to demonstrate the economic value of mainstreaming biodiversity conservation principles into sector growth strategies.

The Counterfactual Project: GoMBR

As part of this case study, a completed stand-alone project was included as a counterfactual to the IGCMP. This was the “Conservation and Sustainable Use of the Gulf of Mannar Biosphere Reserve’s Coastal Biodiversity” (GEF ID: 634) in Tamil Nadu State. This project was selected as a counterfactual because it had similar objectives to the later program, implemented by the same agency and operated in a similarly significant area of coastal biodiversity for India. Its Global Environmental Objective was “to conserve the Gulf of Mannar Biosphere Reserve’s (GoMBR) globally significant assemblage of coastal Biodiversity and to demonstrate, in a large biosphere reserve with various multiple uses, how to integrate Biodiversity conservation and sustainable coastal zone management and livelihood development”. It aimed to operate at several levels, including through State Government, through development of a Trust with access to long-term funding and through raised village level institutional capacities to manage livelihoods in a manner which conserved biodiversity resources. It therefore anticipated several of the key approaches of the Coastal and Marine Program. Since the project was completed in 2012, it gave the opportunity to assess the extent to which initial results had been sustained and/or scaled up, to provide

a valuable comparison with the objectives, design and progress of the child projects under the later program. As with the child projects, the counterfactual was assessed through documentary review, field visits and interviews with key stakeholders.

2: Activities of the Child Projects and the Counterfactual Project

IGCMP has two child projects, described in the following sections together with the counterfactual project.

2.1 Mainstreaming Coastal and Marine Biodiversity Conservation into Production Sectors in the East Godavari River Estuary, Andhra Pradesh (hereafter referred to as the EGREE Project)

Habitat destruction, pollution and over-exploitation of coastal and marine resources pose major threats to the biologically and economically important East Godavari River Estuarine Ecosystem (EGREE). EGREE includes the Coringa Wildlife Sanctuary (CWLS), the second largest extension of mangroves on the Indian coast of the Bay of Bengal; as well as a fast-growing development hub, including numerous manufacturers from different sectors, and offshore oil and gas exploration ventures, centered on the city of Kakinada, in the immediate vicinity of the mangrove area.

EGREE ecosystem services directly provide livelihoods to around 100,000 people, who inhabit 44 villages surrounding the Coringa Sanctuary. Major activities include fisheries, aquaculture and agriculture. The total population of the project area is of the order of 1 million people, which includes the city of Kakinada.

The goal of the EGREE Project is to promote and enable a governance environment that prevents further degradation of coastal and marine ecosystems, allowing the continuous flow of ecosystem goods and services, such as coastal protection and fisheries, as well as preserving an ecosystem of unique biological value. This is to be achieved through facilitating the mainstreaming of biodiversity into sector plans of key public and private organizations, as well as developing cross-sector institutional mechanisms to harmonize development and conservation of biodiversity.

The GEF-funded, UNDP-supported full size project has a reported total cost of \$24,023,636. This includes a GEF trust fund grant amounting to 6,023,636 USD (differing slightly from the original PFD allocation) and co-financing by the Government of Andhra Pradesh and the Government of India valued at \$18,000,000.

2.2 Mainstreaming Coastal and Marine Biodiversity Conservation into Production Sectors in the Malvan Coast, Maharashtra State (hereafter referred to as the Malval Coast Project)

The Sindhudurg Coastal and Marine Ecosystem (SCME), located on the west coast of India (Maharashtra) is one of the 11 ecologically and economically critical habitats identified along the Indian coast. Due to its high ecological importance, 29.12 sq. km within the SCME was designated as the Malvan Marine Sanctuary (MMS) in 1987 and is one of seven marine Protected Areas in India. SCME also has enormous economic significance as one of the major fish landing centers and as a rapidly emerging tourism destination.

Fisheries and associated activities are the principal economic resource of communities along the Sindhudurg coast. Although most the fish catch is taken by mechanized fishing vessels, non-mechanized (using both motorized vessels and traditional practices) fishing continues to play an important role, particularly for the poorer communities. Fishing is primarily undertaken by men, while almost all post-

catch work is undertaken by women, giving women a key role in fishery-related decision-making and in social organization.

Tourism is considered a high potential economic activity and Sindhudurg was declared a 'tourism district' in 1997. For example, the recorded number of visitors to the Sindhudurg fort grew from 100,000 to 700,000 between 2006 and 2010. Further inland beyond the coastal area, agriculture (including forestry and horticulture) is the principal economic sub-sector. There are also minor mining and industrial activities.

The immediate objective of the project is *"to mainstream biodiversity conservation considerations into production sectors that impact the coastal and marine ecosystems of the Sindhudurg Coast of Maharashtra"*.

Hence the Project strategy was to impact and influence the production sectors in and near to the Sindhudurg coast so that they would impact biodiversity in a less negative, or more positive, way. The key production sectors targeted were fisheries and tourism. The approach set out in the Project document consisted of data collection, analysis, scientific studies, planning (involving consultation and participation) followed by training and on-the-ground action. The actions identified included regulatory measures as well as the modification of production process.

2.3: Counterfactual Project: Conservation and Sustainable Use of the Gulf of Mannar Biosphere Reserve's Coastal Biodiversity - Tamil Nadu (hereafter referred to as the Gulf of Mannar Project)

This project was completed in the Gulf of Mannar in Tamil Nadu, which is within the Eastern India marine eco-region. Approved by the GEF in 2001 this project, which was implemented through UNDP, aimed to demonstrate in a large biosphere reserve with various multiple uses, how to integrate biodiversity conservation, sustainable coastal zone management and livelihood development. The design and initiation of this project pre-dated the programmatic approach under review and efforts were made to integrate its lessons within the national programmatic framework for coastal and marine biodiversity conservation.

A mid-term review of the Gulf of Mannar project was undertaken in the first quarter of 2008 and its results were considered in the design of the current IGCMP and the constituent projects. Financing of this project was as follows:

- GEF funding (including PPG): \$7.65 m
- UNDP: \$1.05m
- Government: \$10.6 m (as against \$16.98m proposed at endorsement).

3: Findings

Question 1: To what extent have the different typologies of GEF programs delivered the intended results in terms of broader scale and longer-term environmental outcomes and impacts compared to stand-alone projects?

EGREE Project

The project has made very important advances in terms of support for conservation and development of capacities. It has set the stage for the establishment and consolidation of multi-sectoral mainstreaming of biodiversity conservation in a critical industrial and biodiversity area by creating the EGREE foundation, an institution with a multi-stakeholder governing board.

The biological monitoring activities supported by the project report current stability of populations of critical species (including marine turtles, smooth-coated otters and fishing cats); which indicates the strengthened protection of the Coringa Wildlife Sanctuary and adjacent areas, to which the project has contributed.

The project has demonstrated that coastal and marine Protected Area conservation requires a multi-sectoral approach. Terrestrial and coastal PAs are very different, with varying law enforcement challenges between terrestrial (fenced, boundary) and marine protected areas (not clearly-defined compartments). The latter heavily depend on community level interventions and multi-stakeholder approaches.

Although progress toward the project objective has been made, full mainstreaming of biodiversity in the production sector in the EGREE region would need the adoption by a broadly representative body (e.g. EGREE foundation) of a landscape management plan that accounts for all significant impacts on biodiversity from production sectors. This has not yet been achieved.

The Godavari experience suggests that policy level escalation can happen more efficiently through a Programmatic Approach rather than through isolated project/site level interventions. For example, during project implementation, the team became aware that the national Wildlife Action Plan (WAP) had no chapter on coastal and marine PA conservation. The project brought this to notice at the National level, arguing for the inclusion of a chapter on Coastal and Marine PA Conservation in the WAP 2016-2030. This was possible because of the program's national-level connections through the inter-connected State and National Steering Committees, which give access to high level policy makers.

Remote sensing analysis was conducted to examine the long-term spatial and temporal patterns of vegetation to assess if the EGREE project activities in the Godavari estuary had any impact on the local ecosystem (Figure 1). To understand the vegetation trend between 2000 and 2015, the inter-annual variation in vegetation productivity was measured by the Normalized Difference Vegetation Index (NDVI), derived from daily Moderate Resolution Imaging Spectroradiometer (MODIS) satellite observations at 250m resolution. The results suggest that the vegetation in the project area reached a higher level (+0.04) for the project period 2011-2015 when compared to pre project period 2007 – 2009. Figure 2 shows the spatial distribution of vegetation index around the project area. Compared to 2009, the vegetation condition for 2015 show improvement likely due to denser vegetation inside the project site.

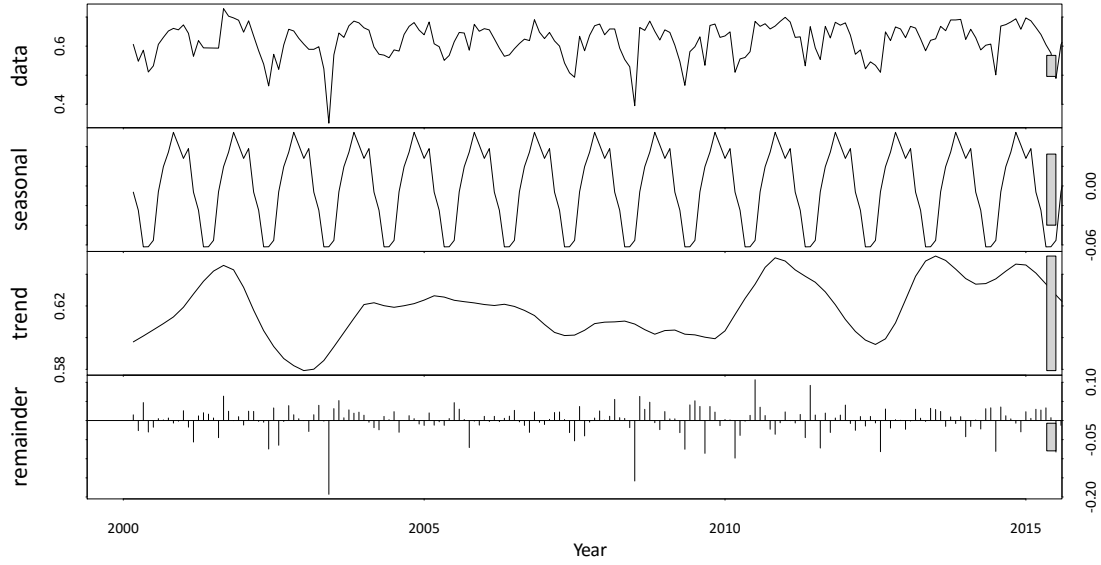


Figure 2 Decomposed inter-annual vegetation index from the MODIS observed NDVI from 2000 to 2015, Godavari Estuary.



Figure 2 Satellite image and NDVI for the Godavari Estuary, 2015.

Malvan Coast Project

The Project has undertaken much site level mainstreaming of biodiversity into production sectors and has thereby demonstrated how this can be achieved, particularly in the fisheries and tourism sectors. For example, oyster farming has introduced biodiversity considerations into local rural development, whilst training for fishermen and demonstration of by-catch reduction devices has introduced them into local fishing activities, while snorkeling training has helped to promote biodiversity in tourism activities. The PIR 2015 reported that a total of 1600 local people have received training and other benefits. New technologies have been successfully demonstrated and a good dialogue with local communities has been established.

Less progress has been made at the sector or institutional level – here used to mean to all activities in the concerned sector across the entire District coast. To achieve such mainstreaming, the Project would need to strengthen institutions, or revise plans, legislation or regulation (with enforcement), or to replicate site level success at a broader scale. In many cases, given the administrative structure and the importance of State level institutions, many of these activities would have to be at the State level or with State level actors.

Little has been done directly to strengthen management effectiveness of the Malvan Marine Sanctuary. Much of the data collected under other activities will help when attempts are made to strengthen MMS management. Many local activities have started building trust and these activities have somewhat changed attitudes of local people towards conservation. However, the remaining opposition to the Sanctuary means that this activity must be undertaken very cautiously.

Coast-wide sustainability requires a long-term vision, supportive stakeholders who are willing to invest the necessary resources and coast-wide institutions that can operationalize the steps towards the vision. The Project has already established parts of these requirements. For example, there is high level support in State level government agencies and the District government has expressed its willingness to support the Project. The Project is supporting developments towards other components: notably the local stakeholder Cross-Sectoral Committee and the Coastal and Marine Biodiversity Conservation Foundation. However, all the tools and mechanisms required for this coast-wide sustainability are not yet present.

The experience in Sindhudurg suggests that programs provide more synergies than disconnected projects. For example, the Godavari child project started earlier and the Sindhudurg team could exchange ideas and share experiences with them to help deal with some similar challenges. It also demonstrates that being part of a program helps innovate and reach out to a bigger audience and gather more support. Further, it is easier to get heard at the National Government level and there are therefore more chances of affecting national level policy. For example, the Marine Protected Area law has been changed partly due to this project, aided by its broader contacts and connections through the program.

In the case of the Malvan Coast project, the decomposed inter-annual vegetation index at the project site in Sindhudurg shows relative stable vegetation conditions before 2011 and a successive improvement in vegetation condition since 2012 (Figure 3).

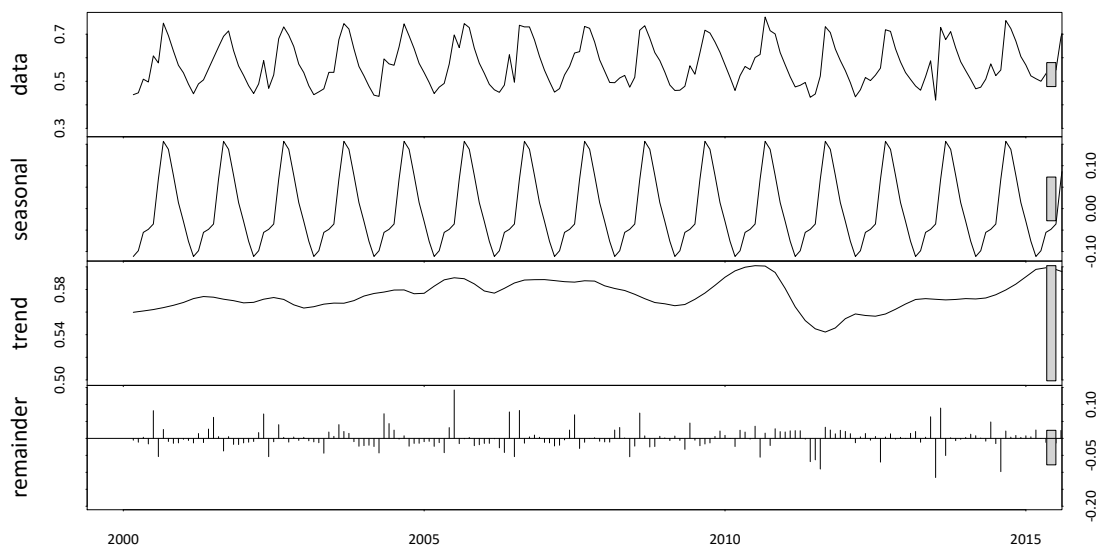


Figure 3 Time series decomposition of inter-annual trend of daily NDVI showing the overall vegetation trend, 2000 – 2015, Sindhudurg.

Counterfactual: Gulf of Mannar Project

The immediate objective was the “establishment and effective participatory management of the Gulf of Mannar Biosphere Reserve (GoMBR) through the application of strengthened conservation programs in the Park core area and enabled sustainable livelihood development in the Reserve as a whole”.

To reach this objective specific Government and village-level institutional capacities were to be strengthened, stakeholders would apply sustainable livelihood approaches and an independent statutory Trust would ensure effective inter-sectoral cooperation in the sustainable conservation and utilization of the GoMBR’s biodiversity resources.

The first meeting in 2002 of the Gulf of Mannar Biosphere Reserve Trust’s (GoMBRT) Board of Trustees changed the project’s implementation strategy to concentrate on awareness raising and livelihoods development for the coastal village communities. However, they did not change the log frame, budget or timetable.

This led to an unbalanced project strategy, with conservation management actions ignored in favour of concentrating on the more easily implemented actions relating to enforcement and livelihoods. The resulting approach to conservation of the Biosphere Reserve was not cohesive and comprehensive. The GoMBR Trust was formed, but because of this change in strategy it did not become a strong decision-making body as initially planned. It was limited to awareness raising and research functions instead of being a conservation body. Its independent long-term financing was not capitalized, even though the Government agreed to fund it after project completion. This change in strategy also had an impact on policy and institutional reforms that were largely ignored. A Management Plan was developed for the Reserve but was weak on prescription and recommendations. Moreover, it was hardly used for day-to-day management.

The “socio-economic” actions were successful. The protection of Biosphere Reserve was strengthened by the creation of a Wildlife Crime Control Bureau (WCCB) office. Awareness programs were very useful; coastal fishers are now aware of the need for conservation, sustainable utilization of marine resources, operation of eco-friendly fishing gears, banning destructive fishing practices and village conservation measures. A Village Marine Conservation and Eco-Development Council was developed in each of the 248 villages. Microcredit programs resulted in team work among communities, and the members earn a decent pay and are able to educate their children. An interpretation center has been set up to portray the diversity in the Gulf, the role of the Trust and its activities, achievements, pollution hazards and the need for conservation.

The TE assessed institutional sustainability as moderately unlikely. The main concern in terms of sustainability was seen as the institutional framework and governance. The GoMBR Trust had been established with support from the State Government. However, weaknesses were identified in its functioning. It had no specific home. Within the government, it was seen as an independent body, while in the NGO/community it was seen as part of the government. Moreover, its coordination committee did not meet frequently and there were questions about its effectiveness. Finally, its scope of action was reduced from the original intentions and related only to conservation awareness-raising. These weaknesses were identified as significant risks to the long-term sustainability of the Trust.

By closure, there had been no replication or scaling-up of any aspect of the Project, and no visible attempt to do so at either national or State level, although the UNDP-CO notes that the Project has “*contributed to the larger policy processes in the country, including the Coastal Regulation Zone Notification that tries to balance conservation and development in the coastal region*” (TE, pg.63). The main catalytic role was at the demonstration level, where a range of innovative approaches were piloted successfully and might prove replicable, although in many cases they themselves were replications of models used widely with the GEF portfolio.

Overall, State ownership originally misdirected the project to focus almost entirely on community social and economic development. After external funds were phased out, there was little ownership left and only disconnected activities were continued, with limited funding and human resources. The absence of connections to national level programs, networks and resources proved a strong disincentive to sustainability.

For the GoMBR project, the decomposed inter-annual vegetation index shows variation in the vegetation condition in Ramnad, but no significant trend observed since 2005 (Figure 4). The time series analysis therefore, shows that there was no significant improvement in the vegetation productivity during the project period.

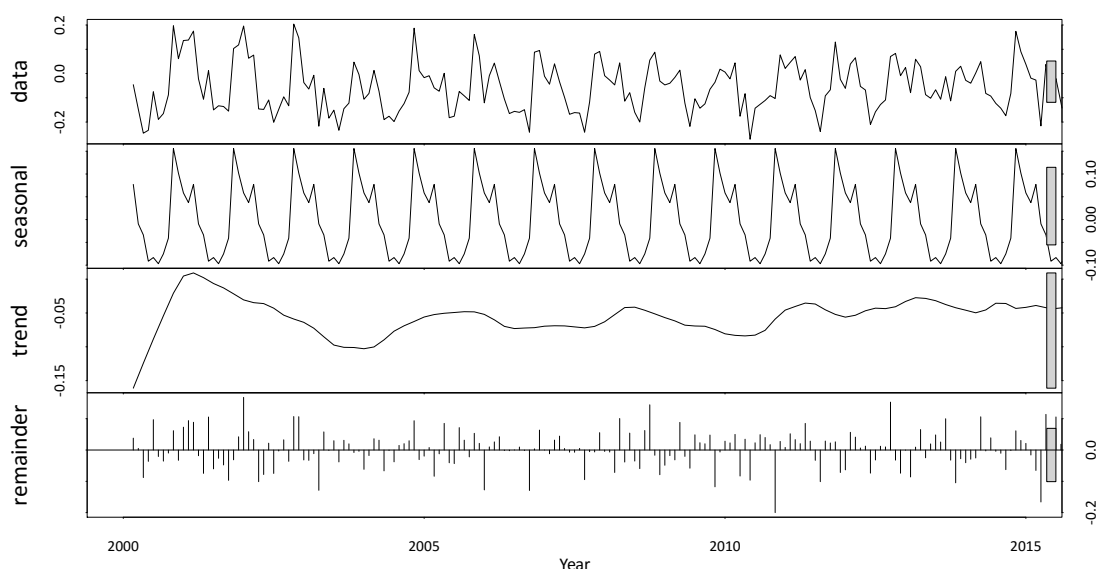


Figure 4 Time series decomposition of inter-annual trend of daily NDVI showing the overall vegetation trend, 2000 to 2015, Ramnad.

Question 2: To what extent have GEF programs addressed the main drivers of environmental degradation?

EGREE Project

The project catalysed the creation of the EGREE Foundation, which is working in several major production sectors, which contribute to major drivers of environmental degradation. Work with GMR in the energy production sector has been discussed from a results perspective above. The Coromandel Chemicals company has also upgraded its environmental response to reduce its potential contribution to environmental degradation, through such measures as the creation of Green Belts around its gypsum plant.

Malvan Coast Project

For State level line departments and the District administration, environmental sustainability is important, but they informed the mission that people are not interested in changing their traditional practices. It is only when livelihood improvements can be shown that measures to address environmental degradation can be widely adopted, as in the case of the System of Rice Intensification. Similarly, the change to improved fishing nets showed a reduction in the number of young fish caught, which in turn led to increased fish prevalence in later years, with no reduction in usable catch. This was recognized by fishermen, who soon began to request the new nets, thereby reducing degradation caused by poor fishing practices. Tourism is potentially another driver of environmental degradation, but the District alternative tourist destination project is seeking to reduce adverse effects by promoting eco-friendly tourism and raising local capacity to deliver this.

Counterfactual: Gulf of Mannar Project

The Gulf of Mannar project attempted to integrate biodiversity conservation and sustainable coastal zone management with livelihoods development. Communities were lectured on pollution, but responded that big business is the source of pollution, through power stations, factories, etc. These big polluters are left untroubled, while poor communities are told to stop their activities. From this perspective, although the project targeted sources of environmental degradation including food and energy production, it did this at the wrong level.

Question 3: What factors have influenced program ownership by participating countries and in turn the relevance of those programs to national environment and development needs and priorities?

EGREE Project

The project has realized several important gains from being part of a national program. The Program National Steering Committee has key national figures on it, who feed its experiences into high level policy discussions. These have even covered India's international obligations, for example with regard to the CITES. The GEF OFP heads the Pollution Control Board of India and can feed lessons from the program into this forum. So, through the program, local actions feed into national policies and then even into international fora. For example, the program's effects on shark populations are reported on to the CBD COP. The EGREE Foundation is taking the lead on several key international obligations and has become an important channel for funding for the environment.

Also, the project has demonstrated capacity to generate synergies and strategic alliances with a number of actors, both direct stakeholders and external to the project, which has succeeded in mobilizing a significant amount of additional funding, amounting to nearly \$0.3 million. EGREE Foundation had start-up funds from the project, matched by State Government, but by the time of the Program Evaluation mission it had already raised Rupees 8 Crores from the private sector. Its funds are already sufficient to pay salaries from the interest. This is seen as very different from the situation in Malvan, where the Mangrove Cell is by far the major funder. EGREE Foundation already has strong sustainability.

National ownership needs to be strong at all levels. A project which is part of a major national program, feeding up to Delhi is a strong incentive to cooperation of the District Collector, who is an essential stakeholder to ensure progress at field level. At State level, the Special Chief Assistant Secretary is head of the Steering Committee and the Governor has picked up on some of the project elements, such as tree planting.

Malvan Coast Project

The Project has demonstrated good national ownership, since the National, State and local governments are all involved. The Project design is in line with national priorities, notably addressing one of the five most important marine and coastal areas in the country. The Minutes of the NPSC and SPSC clearly demonstrate that the Project is nationally owned and in line with national and local priorities. The Project design is also focused on improving the livelihoods of the rural poor in Maharashtra, in line with national priorities. Finally, the Project includes specific activities to implement the CBD in India, through its support to the State Biodiversity Management Board and to the establishment and operations of biodiversity management committees in over 50 villages.

The project has attempted to develop trust and a common understanding and a basis for reducing community opposition to its objectives. The slow project start-up and opposition by local communities

to the Sanctuary were the main reasons why there was little on the ground activity in the first 18 months. After this period, the level of activities and extent of delivery was higher.

The pilot projects have raised confidence in the new approaches adopted and have even attracted private sector interest. In the case of the System for Rice Intensification, there is already national Government funding available, but the approach adopted by the project in this District is much more environmentally friendly and has been adopted widely. The project hopes that its trainees may get preferential treatment for State Government support, which would bring State ownership of the environmental practices introduced. Already, some new State Government programs have followed up on the GEF project approaches – for example, it made square-mesh nets a priority intervention and this was funded. The State Fisheries Department has also adopted these nets as the standard. Many of the ideas promoted by the GEF project have not been new, but the additional funds have enabled them to be more consistently promoted. Neither the State nor the National Government have major environmental protection programs and national funds are far less flexible than the GEF (or other international funders).

Counterfactual: Gulf of Mannar Project

The project involved several organizations and many communities, which brought a strong level of ownership from the stakeholders. However, the Government of Tamil Nadu altered the project's focus to fit its own ideas of what was needed. The TE suggests that this was due to a lack of consultation with the government at the time of project design. As stated in the TE, during implementation, the Government of Tamil Nadu decided to emphasize "the livelihood and protection aspects at the expense of the higher-level policy and institutional changes that were necessary and expected, and the management actions that could have encouraged the sustained use of marine resources have been largely overlooked". (P64)

After project closure, the Government of Tamil Nadu provided continuation funding of about \$0.5m per annum plus some staff costs. There was no plan for activities of the Directorate and, although some funding proposals were made to the State Government, little attempt has been made to attract national Government funds. There are minimal continuing contacts with either national Government or UNDP. Some research activities are continuing, the Board is occasionally meeting and limited community activities continue at District level. A few field staff are continuing monitoring activities and some Zonal and Sub-Zonal officers remain. Some joint patrols by Customs and Forestry take place, but are not integrated into systematic environmental management activities. There is an Interpretation Centre on the coast, but it is struggling to continue without Government funding and manpower, with an NGO trying to keep it functioning. The Marine National Park now receives only 0.7 Crore of its intended 2.5 Crore annual funding, so little can be achieved. The community workers, intended to maintain connections between the Trust and the communities have little funding and vocational training is also greatly reduced. The micro-credit funds have increased in scale and continue to function although the businesses supported are not necessarily linked to environmental management. After State Government took over from the project, there were drastic staff reductions. As staff were promoted or moved, they were not replaced, so that the overall complement is less than 50% of that intended to follow up on the project.

Most of the issues, which the project was intended to address remain; including pollution, over-exploitation of the habitat and overdependence on marine resources. The time-scale of the project was insufficient to allow any real community ownership to be generated. Neither the funds nor the degree of cross-departmental coordination achieved was sufficient to continue the work effectively.

Question 4: To what extent have child project level objectives been coherent with and integrated in the program level ones?

EGREE Project

The project objective, *to mainstream coastal and marine biodiversity conservation into production sectors in the East Godavari River Estuarine Ecosystem* is to be achieved through the formation of a governing structure with multi-sector participation (EGREE foundation). This should direct a cross-sector analysis of biodiversity impacts and mitigation measures (i.e. mainstreaming biodiversity) and its implementation through a landscape wide plan for the project area (Coringa Wildlife Sanctuary, Kakinada Bay and adjacent area) and sector plans. This objective directly reflects the program objective.

Malvan Coast Project

The ultimate problem to be addressed by the project was the ongoing depletion of the coastal and marine resources along the Sindhudurg coast and the associated loss of globally significant biological diversity. The project objective was to be achieved through three outcomes:

- Cross-sectoral planning framework that mainstreams biodiversity conservation considerations
- Enhanced capacity of sector institutions for implementing biodiversity-friendly fisheries management plan, ecotourism management plan and MMS management plan
- Sustainable community livelihoods and natural resource use in the Sindhudurg coast and marine ecosystem.

The project objective and outcomes are therefore coherent with those of the overall program

Counterfactual: Gulf of Mannar Project

Since the Gulf of Mannar was a stand-alone project, the coherence question does not apply literally. However, according to the original project concept, it did intend to provide lessons for scaling up and sustainability of environmental results, as well as to influence Government, particularly at State level. The stated GEF priority was the creation of an independent statutory Trust with management powers and sustainable funding to ensure inter-sectoral cooperation. Sustainable livelihood development for local stakeholders was seen as a key approach necessary to generate support for strengthened environmental management. It can therefore be stated that the project objectives are consistent with those of the later program. Indeed, the Program Document confirms that the Gulf of Mannar experience was reviewed and provided inputs into the program formulation and design.

Question 5: To what extent have the governance, management arrangements and coordination influenced the performance of GEF programs?

EGREE Project

The project is being implemented under the National Implementation modality (NIM) of the UNDP. Under NIM, the project is part of a program implemented by the Ministry of Environment, Forest and Climate Change, (the executing agency in GEF terms) of the Government of India, and executed at field level by a Responsible Agency, namely the Government of Andhra Pradesh.

The executing (MoEFCC and Government of Andhra Pradesh) and implementing agencies (UNDP) have provided adequate support to project implementation both in administrative and technical terms.

The steering committees at national (program) and state (project) levels include representation of relevant stakeholders, particularly at the level of government organizations and have been providing adequate and timely response to implementation challenges. The National Steering Committee of the program was very important during preparation of this child project, but during implementation the State has gradually taken over. Its oversight of finances has been very important.

The EGREE Foundation is now seen as working effectively and has sufficient operating funds. It is engaged in long-term plans for different sectors associated with the environment and is collaborating with the private sector in this work. At the commencement of the project business leaders refused to even talk to the Foundation, but they are now beginning to be substantially involved, following the example of the early adopters, such as GMR and Coromandel.

The Foundation has established strong working relations with some private sector bodies, such as the GMR Foundation in the energy sector, which are conducting trades and skill training in coastal communities. It has also brought together several major private industrial stakeholders into a confederation, which has raised its profile and influence among environmental stakeholders, including the important private sector.

Malvan Coast Project

Given the federalized nature of India it seems appropriate that, as part of a national program, the project has important management functions at both National and State level, as well as some functions at the level of the Project intervention (i.e. the landscape level). The management arrangements in the Project document therefore appear appropriate.

The initial periods of the Project were difficult. The opposition of local people to the Sanctuary, and therefore to the Project objectives, rapidly became evident; to such an extent that the Project could not be implemented as planned with any form of local ownership. The Maharashtra State Forest Department (MSFD) lacked the confidence and skills to engage with the stakeholders and took time to establish the Project implementation framework. As a result, very few ground level activities took place during the first 18 months.

Despite these difficulties, during this initial period most Program and Project-related institutional mechanisms become operational and the following key management actions were taken:

- MSFD established the 'Mangrove Cell', housed in Mumbai and gave it direct operational responsibilities for the Project. Although formally established in early 2012, the Cell took more than one year to become staffed and fully operational
- The National Program Steering Committee (NPSC) and the State Project Steering Committee (SPSC) were established in April and July 2012 respectively. Two meetings of the National Program Steering Committee were held (May 2012 and January 2013) and three meetings of the State Project Steering Committee (August 2012, April 2013 and November 2013)
- The head of the Mangrove Cell became the Nodal officer for the Project with delegated powers
- The Project's Landscape Level Management Unit (PMU) was established, with staff in Mumbai and in Malvan.

The Project also took steps to create two new institutions intended to support the cross-sectoral, conservation and development of the Sindhudurg coast over the long term. First, it has established a local cross-sectoral Stakeholder Committee, which has met 3 times. Although currently driven by the Mangrove Cell and the Project, this Committee has the potential to anchor the Project's ultimate objective within local people, local decision-makers and local forces. Second, the Project has taken steps to establish the "Coastal and Marine Biodiversity Conservation Foundation of Maharashtra" (hence forth referred to as simply the 'Foundation'). The Project has secured high-level state support for this Foundation and has initiated the process to its formal establishment. This Foundation, if well-conceived and funded could provide cross-sectoral support to biodiversity conservation along the Maharashtra coasts, including Sindhudurg.

Finally, the Project has also taken steps to amend relevant state and national regulations and legislation. The Project identified gaps in the Wildlife (Protection) Act pertinent to conserving the SCME and proposed amendments, which are now under official review. These are to ensure that the Act adequately covers marine and coastal wildlife and that it can allow for the establishment of protected areas beyond the 12 nautical mile limit for territorial waters. The Project has also proposed modifications to the Maharashtra Marine Fishery Regulation Act (MMFRA), and is facilitating their adoption. This is to ensure that the MMFRA incorporates biodiversity concerns, and incorporates the best practices identified under the Project related to net meshes and juvenile exclusion.

The District government sees the key role of the project as demonstrating that environmental sustainability can be effectively mainstreamed into livelihood improvement strategies. This must be linked with State Government policies, to ensure better approaches in future. The project had no strings attached to the funding and allowed experimentation at District level. According to Government officials interviewed, India already has the policies and expertise, but not the willingness to try innovation. The GEF project benefitted from not having to stay within existing Government approaches. The District would like to build on this to enable all stakeholders interested in the new approaches to be able to obtain funding, so that the level of local community knowledge will reach a level where people can sustain better practices on their own. However, funding is much more available for livelihoods activities than for the introduction of scientific knowledge and practices.

Counterfactual: Gulf of Mannar Project

As a stand-alone activity, the Gulf of Mannar project lacked any higher-level management and coordination structure. This meant that its challenges were not routinely raised and addressed. Only at specific moments, such as the MTR, were they raised, but without significant effect on project processes and progress.

A major issue with UNDP-CO implementation raised by the TE is that the GEF money was provided for conservation actions to "*catalyze the sustainability of protected areas*" and not undertake a social development project. The TE states that "the UNDP-CO should have reminded the State Government that it signed a contract with GEF to that effect and taken steps to reorient the Project back to its original concept at a much earlier stage".

Throughout its ten years of implementation, the project lacked a proper log frame. Overall, the quality of execution was mixed. The management team produced good results on the ground where it was enabled to work, but at the State level, the Government changed the project's emphasis to fit its own ideas of

what was needed and therefore, environmental results were inadequate. The project intention was to establish a singular coordinating structure for the Biosphere Reserve along with a sustainable funding mechanism to enable it to undertake conservation activities. However, the project concentrated on the livelihood and protection aspects at the expense of the higher-level policy and institutional changes that according to the TE “were necessary and expected, and the management actions that could have encouraged the sustained use of marine resources have been largely overlooked” (TE, P.64).

Project oversight was confused and generally poor. The risk-averse strategy negatively impacted the project, by not taking innovative steps on institutional and policy reform, going instead for more easily implemented activities on protection and socio-economic development.

Overall, governance and management structures and systems have not survived the transition from project to National, State and District ownership and the evaluation mission did not see evidence of coherent continuation of work towards the project’s objectives.

Question 6: What role did M&E play in programs’ adaptive management for the attainment of expected outcomes and impacts?

EGREE Project

Monitoring is being conducted by each of the three specialists of the project implementation unit and consolidated and reported in a comprehensive manner by the project coordinator. Additionally, the project documents provide a great variety of relevant data, including biophysical parameters of the area and socio-economic data relevant to communities and private sector.

Whereas an individual project can easily go off track, (for example, under pressure from the State Government or District Collector’s Office) the National Steering Committee (NSC) has the authority to ensure that program components meet their objectives. An Agency such as UNDP does not have the network to ensure performance, only high level contacts with Central Government can do this. The NSC is the main body that ensures that there is regular monitoring and the projects are open to effective scrutiny.

Malvan Coast Project

The MTR observes many good examples of adaptive management. The first, and most significant, relates to the overall Project strategy. The Project document describes a classic implementation strategy of data collection, studies, planning and training followed by the implementation of site level actions and multi-level capacity building. Under the guidance of the Mangrove Cell, the Project adopted a different strategy. Due to the opposition from local people, it was felt that the Project should first focus on establishing and fostering a dialogue with communities and building community trust. Hence, the focus has been more on site level livelihood and conservation interventions, with a strategy of building dialogue around these. Only after these steps would it make sense to undertake strategic planning and institutional capacity building. This was a major change in Project strategy and a good example of adaptive management. However, it is not documented in the records of management meetings.

Overall, there is little evidence of the Project logical framework being used as a management tool. Activities were mostly identified from the bottom up and then discussed, appraised and approved on a one-by-one basis by the EC, SPSC and NSPC. The minutes of the EC, SPSC and NSPC show that the merits

of each activity were thoroughly discussed, but their alignment to the Outcomes, Outputs and indicators in the Project logical framework is not mentioned, nor is their alignment to the Annual Work Plan (AWP). By contrast, the AWP priorities are based almost entirely on the logical framework in the Project document. The two sets of priorities are very different. The AWP priorities are closely linked to the results framework of the Project document, whereas the SPSC priorities are clearly linked to site level needs and opportunities.

Although Progress Reports provide a list of achievements and PIRs to GEF, there is little evidence of detailed monitoring at the Project Outcome level. Adaptive management has been good, but planning has been driven more by ground realities than the Project Document. The formal documenting of management discussions and decisions is incomplete.

Coordination of the two projects is intended to be undertaken utilising a budget of \$0.45m under the Godavari project. Since this budget is intended to cover a broad range of activities, such as establishing a joint database, M&E system, outreach and communication activities, it is clear that these areas are unlikely to be very substantial. They do not appear at all in the Mid Term Review of the Godavari project, although they are funded from this source and there is no MTR of the program as a whole.

As noted above, the National Program Committee has responded to progress and challenges of the two projects on the basis of reports presented to it directly, rather than by any systematic use of M&E data. There is no evidence from documentary sources or project level interviews that the intended program M&E system is functional and certainly, it has not been used either nationally or by UNDP.

Counterfactual: Gulf of Mannar Project

Overall, M&E implementation was moderately unsatisfactory. Good progress was made on monitoring, including strong internal activity monitoring, but this had limited impact on project implementation and there were considerable issues with the log frame and adaptive management. Although the project was approved in 1999, it only started in 2002. Despite this gap, there was no inception workshop and therefore the log frame was not revised. During the first meeting of the Project Board of Trustees in 2002, the implementation strategy was fundamentally changed to concentrate only on awareness raising and livelihoods development for the coastal village communities; but the logical frame work, budget and timetable were not changed. Even by the time of the MTE in 2008, this major change had not been formally approved and although the log frame was revised in 2006, none of the changes were ever formally endorsed for management purposes.

The MTE made it clear that the project was substantially off-track, in that it was not connecting its community-based socio-economic support activities with the intended increase in local environmental protection commitment. However, this message was ignored and the same judgement was made strongly in the TE. It can therefore be said that the M&E system had little or no effect on the project's adaptive management.

4: Overview of Differences between Programmatic and Stand-alone Projects

A summary of the main differences emerged by comparing the EGREE and Malval Coast programmatic projects to the Tamil Nadu counterfactual project is provided here below.

- i. The objective of the programmatic approach promoted child projects, which had a similar design to the much earlier counterfactual project. All projects recognize the need to address institutional,

systems and community level dimensions of environmental management. The main objective of the 4-year program is to demonstrate multi-sectoral approaches to mainstreaming biodiversity conservation objectives into economic activities in two marine eco-regions of the country.

By piloting the mainstreaming of biodiversity conservation objectives into production sectors of the coastal zone through 2 projects, it is envisaged that the program will provide a broader set of experiences than can be obtained from individual projects for further replication by the government.

The program's strategy for mainstreaming consists of three components, as follows:

- At the systems level, to promote mainstreaming of coastal and marine biodiversity conservation into sectoral policies and a knowledge management system
- At the institutional level, to promote institutional capacity development by strengthening human resource capacities
- At the community level, to promote sustainable community livelihoods and natural resource use in the buffer zones of marine protected areas and other areas of high biodiversity value.

These program objectives and strategies are similar to those of the much earlier Gulf of Mannar counterfactual project, but have greater emphasis on the systems and institutional levels.

- ii. The management structure of the program, with both National and State Steering Committees, gave its projects supervision and support to keep on track to meet their environmental objectives, despite local level pressure to focus on livelihood improvement as an objective in itself. The counterfactual project virtually abandoned its environmental objective from an early stage under guidance of its State Steering Committee and became a socio-economic development project with minimal environmental interests. The absence of National level supervision and guidance offered by a program structure was a decisive dimension the project's failure to meet its original objectives.
- iii. In terms of delivering broader scale and longer-term environmental outcomes compared with stand-alone projects, both child projects have made progress towards stronger institutional and systemic frameworks for environmental management, whereas the stand-alone project did not. In Godavari, the EGREE Foundation has had substantial success in bringing private sector bodies into the environmental protection arena, whilst the Coastal and Marine Biodiversity Foundation of Maharashtra is less advanced, but expects to target similar stakeholders. In the counterfactual project area, the Gulf of Mannar Biosphere Reserve Trust was established, but has not played a strong role in environmental management and has been ineffective since project closure. Both the child and stand-alone projects have devoted much of their attention to strengthening community level livelihoods, but the counterfactual project has not gone far beyond this while both child projects have focused on a broader range of stakeholders in the production landscape.
- iv. Both programmatic child projects have informed national policy actions. The Godavari project promoted the inclusion of a Chapter on Coastal and Marine Protected Area Conservation in the national Wildlife Action Plan (2016 – 2030), while the Malvan project influenced changes in the Marine Protected Area Law. This ability to influence national level instruments is attributed to the ability to escalate knowledge of project approaches and results through influential members of the National Steering Committee. UNDP CO claimed that the counterfactual project "contributed to larger policy processes," but is not specific as to how or in what manner.

- v. The child projects both targeted key drivers of environmental degradation directly. Godavari had a particular focus on private sector industry (energy and agriculture related), while Malvan targeted agriculture, fisheries and tourism. The counterfactual project targeted community level food and energy production activities, but did not interact with the important industrial level stakeholders in these sectors.
- vi. The National Steering Committees for the program child projects have not only linked them up to national level institutions and policies, but have also given great visibility at District level, which has been instrumental in generating support from key officials, such as District Collectors. Ownership has therefore been strong at several key levels. For the counterfactual, the State Government established ownership, but did so by focusing on livelihoods benefits to the virtual exclusion of the project's environmental objective.
- vii. Both of the program's child projects had objectives which were coherent with the overall program direction. The earlier counterfactual project had similar objectives and provided some inputs relevant to the later program design.
- viii. Governance and management of the child projects have been overseen by the National Steering Committees, which have helped to ensure that they continue to focus on their environmental objectives and that they feed into broader national processes. This strong support has promoted District level participation in governance, which has been particularly important for field level delivery. The counterfactual project lacked an over-arching higher level management and coordination structure and did not address the challenges raised, for example by its Mid Term Review, leading to its overall poor performance in terms of the original environment objectives, which attracted GEF funding.
- ix. For the child projects, monitoring and evaluation information is reported to the National Steering Committees, which have played an important role in keeping them on-track. It appears that progress and results of activities are considered in terms of their contribution towards broad project objectives, rather than through consistent use of the project log frames or documents. The counterfactual project was governed at State level through a Project Board, which paid little attention to either the original project document or to the Mid Term Review. As a result, the project deviated substantially from its original intentions and did not deliver its environmental objectives.
- x. Overall, child projects under the India GEF Coastal and Marine Program have performed substantially better in terms of meeting their environmental objectives than did the counterfactual project. The most important factor in this has been the attention of high level National Steering Committees, which have helped the projects to stay on track and have linked their successes to national level arenas, including policy and strategy formulation. In comparison, the counterfactual project was taken over by State Government and was effectively re-oriented to become a livelihoods project with minimal environmental linkages or results. It can also be observed that the presence of these National Committees has raised the importance of the projects with the GEF Agency, as compared with the counterfactual project that (according to its TE) received inadequate Agency supervision, which allowed it to divert away from its GEF objective and outcomes.

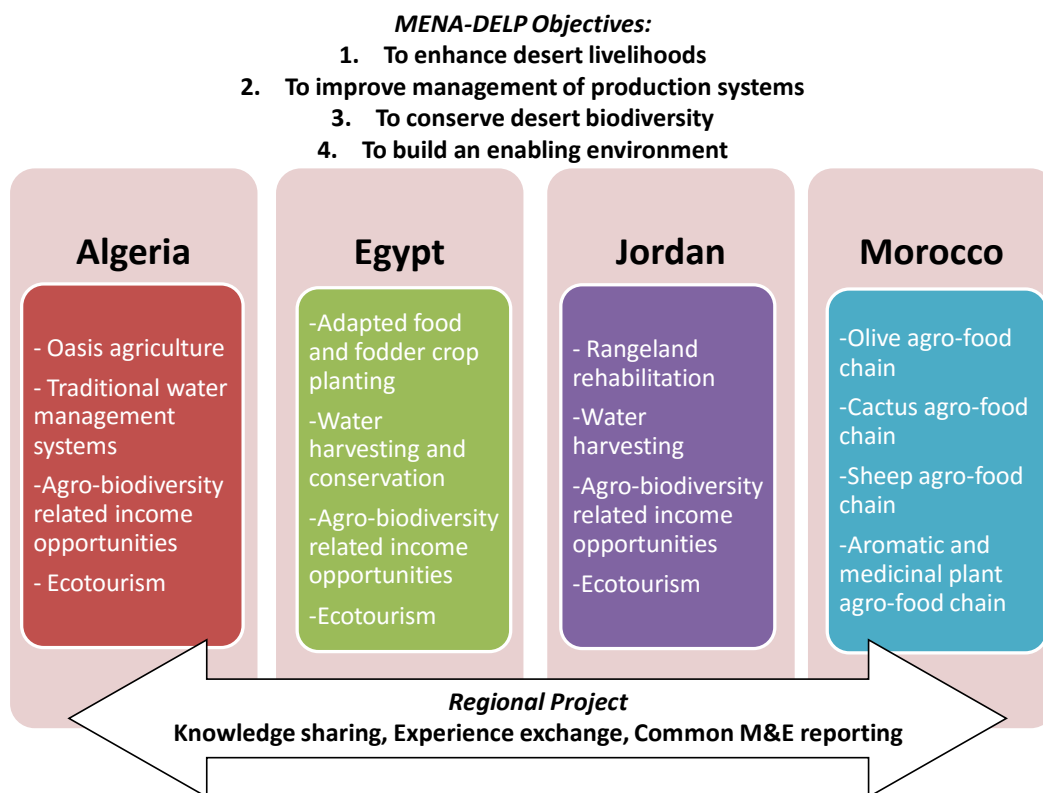
CASE STUDY: MENA-Desert Ecosystems and Livelihoods Program (MENA-DELP)

1: Introduction to the MENA-DELP

According to the Program Framework Document (PFD), the goal of the MENA-DELP is to contribute to the enhancement of livelihoods in desert ecosystems by harnessing their value in an environmentally and socially sustainable manner so that the flow of desert goods and services can be optimized. According to the PAD, “GEF financing leveraged through the MENA-DELP will enable interested countries in the region to operationalize their existing or planned investments in desert ecosystems”.

The program originally consisted of five projects, as shown in Figure 1 below. The MENA-DELP programmatic approach included the themes of the four participating country projects and of a regional project.

Figure 1. MENA-DELP Programmatic Approach



The program is multi-country and multifocal, with an original total of \$20,191,360 of GEF funding, which was mainly based on activities intended to take place in Algeria and Egypt. It was intended to be the pilot phase of a larger program, with a probable ten-year duration. The World Bank is its Implementing Agency. A regional umbrella project, designed with a budget of \$1 million (at the recommendation of GEFSEC), is intended to enhance knowledge and experience sharing on opportunities for enhancing desert livelihoods among the participating pilot countries. This will include dissemination of lessons learned from select

pilots in each country, the development of a visiting professors program, and the organization of workshops to bring together desert institutes, government and other key stakeholders from the participating countries to facilitate the development of related policy guidance on integrating biodiversity management and SLWM dimensions into respective production sectors.

The MENA-DELP was not implemented as designed, since Algeria, which played a leading role in its design process, dropped out of the program before it started. Another of the intended participants, Egypt, also did not take part. To retain the regional nature of the program, the WB introduced two projects in Tunisia, which were not included in the original PFD. Since the goal of MENA-DELP is very broad, it did not prove difficult to incorporate these new activities.

2: Activities in the Main Participating Countries

2.1: Jordan – Badia Ecosystem and Livelihood Project (BELP)

The project is financed through a GEF grant totaling US\$3,330,555. Co-financing is to be provided by the Government and other bodies up to an expected total amount of US\$11.348 million.

The Jordan Badia comprises 80 percent of the country's territory and is divided into northern, middle and southern regions. The southern and northern Badia, which are included in the project, provide the main source of livelihood for about 240,000 people⁵⁸, including nomadic, semi nomadic and settled communities who largely depend on raising livestock for a living.

The Project Development Objective is to support sustainable livelihoods and enhance ecosystem services through participatory approaches in selected areas of the Jordan Badia. The approaches adopted are substantially different between the northern and southern Badia areas covered.

The three GEF-supported components of BELP are as follows:

- Adaptive Rangeland Management and Alternative Livelihoods Support in the Southern Badia \$1.43m
- Community-Centered Ecotourism in the Northern Badia \$1.47m
- Project Management and Monitoring and Evaluation \$0.43m.

The intended relationship between BELP and the MENA-DELP is not very explicit in the PAD, which states that “the project task team will collaborate with the other task teams to maximize the synergies between the project and the overall program.”

2.2: Solidarity-based Integrated Agriculture in Morocco (ASIMA)

GEF financing of \$7 M was committed to the project as follows:

- Land degradation focal area: \$ 3.7 M
- Biodiversity focal area: \$ 3.3 M

⁵⁸ Hashemite Fund for the Development of the Jordan Badia and 2007 Census

The Project Development Objective (PDO) is to increase the implementation of land and biodiversity conservation measures in selected projects directed to small farmers located in targeted marginal areas. The project objective is to promote the mainstreaming in the *Plan Maroc Vert* of an approach based on solidarity among small farmers and horizontal integration among agro-food chains, in marginal arid and semi-arid regions of Morocco

Regarding the olive agro-food chain, the ASIMA will finance the construction of state-of-the-art drying pits to avoid loss of wet pomace (residues) in the water bodies. In the spirit of horizontal integration among agro-food chains, the pomaces, once dried and treated, could be used as fertilizer, animal feed, and combustion. The ASIMA will cover the incremental costs for the construction of the transformation units, as well as for the capacity development of adequate technical know-how at a local level. In addition, to promote the conservation of the scarce water resources in the arid and semi-arid regions, the ASIMA will finance water saving technologies like deficit irrigation and rainwater harvesting.

Concerning the cactus agro-food chain, the ASIMA will finance the construction of transformation units for the use of the plant beyond the traditional fruit production. The cactus plant can be used to produce animal feed, cosmetic products, and combustion.

For the sheep agro-food chain, the ASIMA will finance the production of highly nutritious, locally produced animal feed taking advantage from the horizontal integration with olive and cactus agro-food chains. Within a sustainable grazing and rangeland management framework, this will reduce the grazing pressure, the risk of erosion and desertification.

Regarding the aromatic and medicinal plants agro-food chain, the ASIMA will finance the cultivation and the transformation units for local typical plants. The transformation units (i.e. drying units) could take advantage of the use of cogeneration opportunities resulting from the olive and cactus agro-food chains. The reduced grazing pressure resulting from the use of by-products for the feeding of the animals can alleviate the pressure on natural biodiversity. The development of an agro-food chain which typically involves women can support a more social integration.

2.3 Projects in Tunisia

The original PFD did not propose any projects for Tunisia. However, with the withdrawal of Egypt and Algeria from the program and the location of the regional project in Tunisia, the opportunity was taken to include two activities.

The two projects, which are now part of the MENA-DELP program, are the Conservation of Oases Project and the Ecotourism in Protected Areas Project.

The Conservation of Oases Project received \$5.7m from GEF. It promotes the sustainable use of natural resources and improvement of livelihoods in all four regions of the country, through one pilot oasis in each (except that one region has 3 pilots, since there are three oases in one ecosystem). GEF financing is as follows:

Component Name	Cost (\$ million)
Strengthening capacities for sustainable management of oasis ecosystems	1,306,830
Support the implementation of oasis participatory development plans	4,674,000
Project Coordination and Management	357,900

The second project is the Ecotourism and Conservation of Desert Biodiversity Project. This has a total GEF funding of \$4,270,000, for the following components:

- Promoting enabling conditions for PA management, SLM scale up and ecotourism development:(Cost \$1.56 M)
- Supporting the implementation of INRM in targeted NPs and their adjacent areas:(Cost \$2.51 M)
- Project Management:(Cost\$0.20 M)

The project PAD places it in the context of the earlier GEF-WB MENARID Program; whilst mentioning “linkages to” MENA-DELP, mainly in terms of knowledge sharing. WB PIRs do not focus at all on the project’s relationship to MENA-DELP.

The evaluation mission was informed that the Oasis Project has made more substantial progress than the Ecotourism intervention and its discussions therefore focused on the more active project, to understand its relationship to the MENA-DELP.

2.4 Regional Project: MENA-Desert Ecosystems and Livelihoods Knowledge Sharing and Coordination Project

The proposed regional project objectives are two-fold:

1. to ensure program level coordination, including tracking the delivery of measurable project and program outcomes and results, and
2. to promote knowledge and experience exchanges through organized workshops between different projects under the Program.

The umbrella project, designed for a budget of \$1 million (at the recommendation of GEFSEC and drawn from a Land Degradation set-aside), aims to enhance knowledge and experience sharing on opportunities for enhancing desert livelihoods among the four participating pilot countries. This will include dissemination of lessons learned from select pilots in each country, the development of a visiting professors program, and the organization of workshops to bring together desert institutes, government and other key stakeholders from the participating countries to facilitate the development of related policy guidance on integrating biodiversity management and SLWM dimensions into respective production sectors. This regional project would also build the capacity of one institute to take a leadership role on program level information flow (including M&E), so that replication potential of good practices is enhanced. At the time of the PFD, this institution had not been selected.

3: Findings

Question 1: To what extent have the different typologies of GEF programs delivered the intended results in terms of broader scale and longer-term environmental outcomes and impacts compared to stand-alone projects?

Program

The original program concept did not have specific focuses, for which a region-wide approach was to be adopted and monitored. Rather, Jordan and Morocco fed into the MENA-DELP projects, which had already been designed as part of their national environmental activities. Tunisia, which was not specified in the

original program design, was chosen to coordinate the regional program through a regional umbrella project. With assistance from the World Bank, the country devised two national projects to be included as part of MENA-DELP. These were not in the original program and are not recorded in the GEF database as part of the MENA-DELP.

Overall, the MENA-DELP is a collection of individual national projects, loosely related to each other through a regional umbrella project. Their coherence in the program in terms of environmental objectives is very generic – they are all attempting to harness an arid or semi-arid landscape for environmentally sustainable development. There is no evidence that there are any multiplicative benefits from their participation in the regional program. The outcomes and potential impacts of MENA-DELP are therefore not different from those of the national projects, apart from some aggregate M&E data and experience sharing and lesson learning among the program participants, often including the two countries which dropped out of implementation before the program started.

Overall, the results of MENA-DELP are not demonstrably broader scale or longer term than they would have been through the implementation of a set of stand-alone projects.

BELP

The MTR for the Jordan Badia project assesses that sustainability of its results seems likely due to the institutional measures that have been put in place. Specifically, the Royal Society for the Conservation of Nature (RSCN), which is implementing eco-tourism in Northern Badia, is a recognized national and regional leader in ecotourism, and in accordance with its mandate, it is expected that it will successfully operate the Azraq-Burqu corridor for the foreseeable future, in the same way as it currently operates other ecotourism interventions that it has established across the country.

The RSCN has a history of collaboration with GEF through stand-alone projects, which have played an important role in helping it to scale up its conservation approaches and make them sustainable.

RSCN has a project manager running its BELP component, which is integrated with its broader work in the country. The only significant difference from its other activities is that it must use World Bank financial and reporting procedures. Although BELP is a sub-project of DELP, RSCN treats its BELP component as a stand-alone project, for which it is responsible. Further, RSCN sees the Northern Badia activity it is implementing as completely different from the rangeland management and hafirs work under BELP in the Southern Badia. So it does not see the BELP as a coherent package – even the types of communities involved in its two regions are completely different.

In the South Badia project component, ownership and responsibilities for the hafirs (reservoirs) and range reserves have been defined and framed in water use and grazing agreements signed by the communities. The accompanying management plans for these agreements will define in more detail the modalities for the management and maintenance of these assets. So, the World Bank MTR anticipates that this part of the Badia project will also generate sustainable benefits.

Overall, Government sees GEF as supporting national commitment to environmental management by acting as a funder of new ideas, which can be tested before other donors come in, once they see that there are good results. A regional approach needs very different thinking and a new perspective, but from the Government's perspective, DELP seems to be a set of single countries re-piloting activities, which have already been done.

To assess the environmental change resulting from project activities on the local ecosystem, a geospatial analysis was conducted for three of the four Badia project sites, investigating spatial-temporal patterns of vegetation. The results for the Bayer Reserve, the Al Hashemiah Reserve and the Al Huseinieh Reserve show a significant increase in vegetation cover since 2013 (Figure 5).

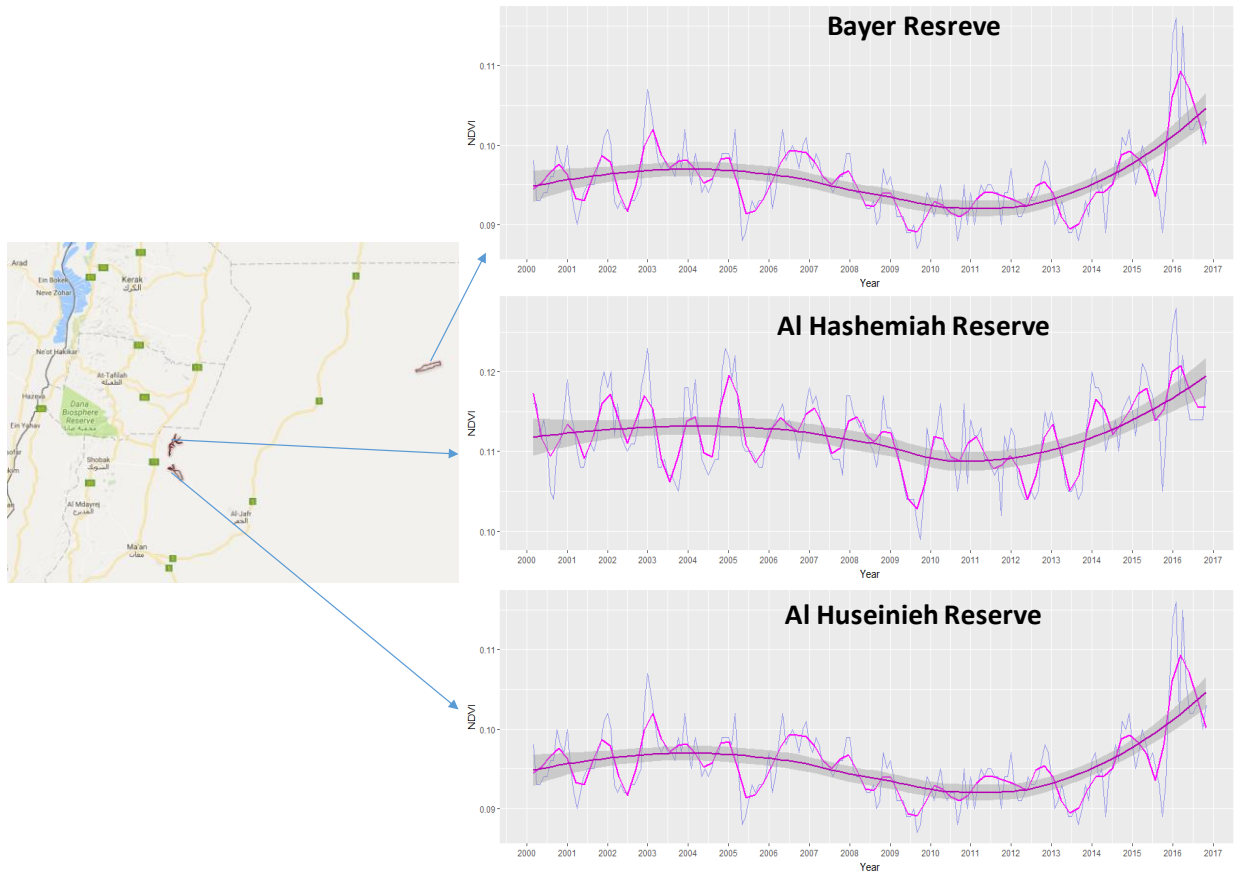


Figure 5 Daily NDVI of the Bayer, Al Hashemiah and Al Huseinieh reserves from 2000 - 2016.

Figure 6 presents the inter-annual vegetation trend Normalized Difference Vegetation Index (NDVI) decomposed from daily Moderate Resolution Imaging Spectroradiometer (MODIS) satellite measurements at 250m resolution observed for the Al Hashemiah Reserve. The average summer vegetation index in 2015 increased about 0.01 since 2012 for the three reserves altogether.

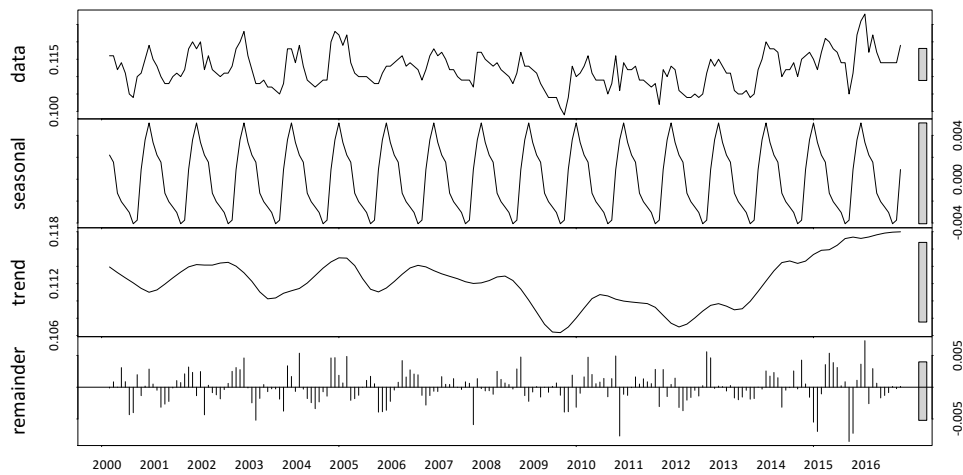


Figure 6 Time series decomposition of inter-annual trend of daily NDVI showing the overall vegetation trend for the three reserves.

Due to lack of counterfactual sites, the vegetation productivity inside the three reserves was compared to the adjacent areas outside of the reserve boundary and results show that vegetation significantly improved inside the range reserve. Figure 7 shows the change occurred in the Al Hasemiah Reserve.

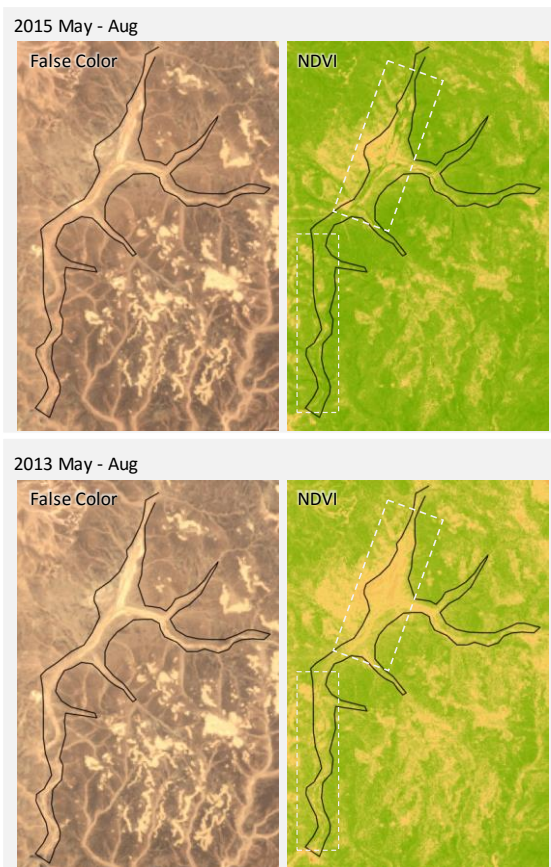


Figure 7 Comparing the average May-Aug NDVI for the Al Hashemiah Reserve between 2013 and 2015.

Positive environmental changes are attributable to the BERP project. However, without a suitable counterfactual it's not possible to assess whether the BERP would have achieved the same or lower results if it would have been implemented as a stand-alone project. As a matter of fact, based on the experience to date, the evaluation finds that BERP's participation in MENA-DELP has made at best a marginal contribution to delivering longer term and broader scale environmental outcomes and impacts than those that would have been generated from a stand-alone project. The scaling up intentions are already built into existing Government approaches, as well as those of its national implementing partners, in a broad range of nationally-sponsored activities, some of which are substantially larger than MENA-DELP in the country.

ASIMA

The ASIMA project has faced many constraints. In particular, delays in release of the budget by Government made it difficult to get started. ASIMA has 8 sub-projects, mainly in regions with scarce land availability and many poor people. The construction of product processing units was often held up because no land was available and, in any case, the project had no budget to purchase land. There were major issues around land acquisition and procurement for construction; so, the early focus was very much of awareness raising. This has become a big strength.

National agencies implementing the project had weak capacity, particularly in procurement, which caused long delays. WB had frequent contact with these agencies and the fiduciary team based in Rabat conducted much training in Morocco. Project Implementation Units needed support and follow up from Government. The Mid Term Review led to development of a comprehensive action plan.

Since December 2017 is the scheduled closure, many olive and cactus processing units will have been operational for only one year by then, so results may not be as high as expected. However, outputs in the Olive industry could be scaled up throughout Morocco.

According to the national Agriculture Development Agency, MENA-DELP has enabled sharing experience of managing desert areas. The projects have different approaches to M&E, but the program should be able to use the knowledge gathered overall to promote better ownership by civil society and beneficiaries, which could in turn generate bigger results.

The national implementing body sees the main difference between a program and a project as the possibility to avoid mistakes others have made, by knowledge sharing and lesson learning.

The ASIMA project in Morocco is part of the huge Plan Maroc Vert and its main implementing and reporting responsibilities are within the context of the Plan. There is no evidence of major impetus to results from participation in MENA-DELP.

Tunisia projects

Tunisia developed two projects to fill the gap created by the absence of Algeria and Egypt, which had both played a major role in MENA-DELP design. The projects are both self-contained and do not appear to have derived significant benefits from participating in the program, which might help generate more substantial or durable results. The mission focused on the Oases project, which has made more progress than the Eco-Tourism project.

The Oases project is focused on sustainable development of oases in Tunisia. It organized workshops with residents of oases and helped build a national strategy from the communities up. This was validated by a three-day workshop. Six oases are serving as pilots. The national Implementing Agency is not leading implementation, which is being managed by NGOs, in collaboration with the local administration. Local Ministry of Agriculture units collaborated and oversaw what the local population chose to implement. Under this approach, NGOs, communities and local units of Ministries work together at a decentralized level, with decentralized procurement. Now the national Ministry wants to develop a national oasis project based on the WB decentralized model. The Tunisia 5-year Action Plan now includes an Oasis program, which builds on the MENA-DELP project, which has rebuilt trust between local communities and the Ministry. This does not adopt an Income Generating Activity approach, but a Value Chain one. It is not enough just to raise skills – need to identify the market first and then raise the capacity of farmers to meet what it needs. The private sector has been engaged in advising on initiatives and as a co-financier.

The approach of national projects plus an umbrella project brings some advantages: including improved M&E, communications, experience exchange and backstopping.

Many Mena-DELP activities have been effective and could be used to provide best practices, for use in the design of any future M-D Phase. The regional dimension is important, because it provides the possibility of making changes based on experience. However, in the case of M-D this was not well-realised, because the projects were mainly dissimilar from each other – some focussed on CC adaptation, others on ecotourism and so forth. Overall, there has not been much opportunity for direct learning from experience were quite few. Furthermore, the timing of programs has varied – some were finished, while others have just begun and some were not implemented at all. This was another negative. If there were another M-D, participants feel that it should focus on a common area, such as water resource management, so that there could be more direct sharing of experience and lessons.

Question 2: To what extent have GEF programs addressed the main drivers of environmental degradation?

Program

The main drivers recognized by the GEF are food production, building, transportation and energy sectors. Insofar as the MENA-DELP addresses these, only the food production sector is a major focus. In Morocco, olives and cactuses are addressed through a value chain approach in the ASIMA project. Tunisia has some focus on food production and by-products through the Oasis project, while the Jordan Badia project targets benefits for the livestock sector through better water management. Both Jordan and Tunisia have an ecotourism focus, although it is not clear where this fits in the GEF classification of drivers.

In terms of child project design, the drivers addressed are those recognised as most urgent in each country and/or those which are regarded as inadequately addressed to date.

BELP

In the context of drivers of environmental degradation, Jordan would like to use its GEF funds to seek an integrated solution to the management of arid landscapes, combining water harvesting and rangeland protection. Although the practice of protecting rangeland areas is common in Jordan, the BELP has brought larger areas under such management.

Climate change, which is a major external driver of land degradation, is not directly a project focus; but the issues, which the project addresses, such as water shortage and heat waves, result to a large extent from Climate Change.

Although BELP is consistent with the outcomes expected of MENA-DELP, it would not be accurate to say that the program has played a major role in shaping the BELP approach. Rather, this approach reflects continuing national development priorities, to which a range of internal and external stakeholders have contributed. The historical GEF activities in Jordan have been supportive of this process and have contributed towards it, but there is no evidence that MENA-DELP has played a major role.

ASIMA

The country's Plan Maroc Vert sets targets for production by commercial and small-scale farmers. However, it does not deeply address environmental issues, especially, for example, those associated with waste from olive production. The WB country team noticed weaknesses in the environment approach and that the Value Chains did not deal with waste management aspects of businesses promoted. When they pointed this out to Government, there was great interest, which supported the development of the ASIMA project.

Tunisia projects

Tunisian stakeholders reported that experience has been shared from the various study tours and workshops of MENA-DELP and other regional programs. Thus, it has become clear that countries are facing similar problems, which need local action informed by broader and coherent regional approaches. However, the generation of an approach to addressing the environmental degradation associated with farming came from in-country discussions, with little input from the MENA-DELP concept.

Question 3: What factors have influenced program ownership by participating countries and in turn the relevance of those programs to national environment and development needs and priorities?

Program

MENA-DELP participating countries have a modest degree of ownership of the program, claiming benefits from participating in international workshops (particularly on M&E, tracking tools of the GEF system and income generating approaches in participant countries) and from shared experiences generated by study tours. Although the programs are relevant to national needs, this derives from their original design processes as national projects, rather than from any direction generated by the program. In the case of Jordan, for example, the Badia project was already designed as part of a much larger Government program and was later fitted into the MENA-DELP on request of the World Bank.

BELP

The Badia project MTR concludes that the project's Development Objective remains relevant and achievable. The Programmatic Approach sought to establish in detail the level of ownership and relevance of the MENA-DELP in Jordan. In relation to this, the country mission was informed that the Focal Point's office tried to receive funding for the BELP as a stand-alone project but was advised "by GEF" that it should be included in a regional program. Accordingly, the World Bank devised a Regional Program and the Government of Jordan had to find ways to implement its project in such a way that it met national

priorities, whilst conforming with the program. Government therefore tailored some elements of its original national project design to fit with the program structure. The program element has not been important from the perspective of the office of the Operational Focal Point and this office does not have substantial interaction with MENA-DELP activities or processes. Although the Jordan Operational Focal Point is Chair of the Steering Committee of BERP, the Government does not feel that the project has a strong emphasis on regional interaction. There would need to be much more focus on regional elements and cooperation if BERP were intended to be fully integrated into a programmatic approach.

From the perspective of the Royal Society for the Conservation of Nature, a major national implementing partner, there was considerable confusion over how its engagement would work. It initially believed that it would have a direct funding link to the World Bank to implement the activities outlined in its proposal to participate. It was later told that its proposal was included in the BERP, as part of MENA-DELP. RSCN planned a four-year project input, but this initially lost one year due to WB start up processes and it was told that there could be no extension to allow this time to be replaced.

RSCN is mandated to protect biodiversity and has plans to fulfil this role, which are independent of BERP and still more so of DELP. BERP had to be shaped to fit national priorities and not the other way around. The sustainability of BERP results in Northern Badia will come from the extent to which they fit in with RSCN's long term plans. To some extent, the World Bank project design team took account of the long-term plans of the Jordan partners in putting BERP together. Although there was a notional connection between BERP and MENA-DELP at the preparation stage, RSCN regards this as completely lost during implementation. RSCN appointed a Focal Point to work with DELP, but it reports that there has been virtually no connection with it. The only connection recalled is that RSCN made a presentation to visitors from Tunisia and Morocco as part of a DELP workshop. RSCN was just emailed to make the presentation, but received no feedback whatsoever from DELP afterwards. During the program design phase, RSCN had understood that the program would develop a support network for implementers, but this has not appeared at all. RSCN submits data to the BERP PMU, as part of its obligation to DELP, but it has no idea what the data are used for and receives no feedback.

The case study therefore finds that there is little national ownership in Jordan of the MENA-DELP. This is because the outlines of the BERP project were largely already designed before it became part of the MENA-DELP and the program did not introduce any significant changes to the project. The program is relevant to the BERP, but only in the sense that the intended outcomes of the two entities are consistent. Implementation delays and complexities introduced by participation in the MENA-DELP have, if anything, reduced the possibility of national ownership of the program and have encouraged components of the BERP project to proceed independently, to maximize their possibilities of delivering as intended.

ASIMA

The multifocal nature of the ASIMA project has made it relevant, because both biodiversity and land degradation present major challenges to the country. The WB country team noticed weaknesses in the Government's approach to environmental management and that the Value Chains did not deal with waste management aspects of businesses promoted. When the Bank pointed this out to Government, it became very interested. Since Morocco is hosting COP 22, the environment has now got high priority. The ASIMA intention to act as a pilot for new approaches has enabled it to focus on different challenges to agriculture and the environment in the country. It has therefore attracted good national ownership and Government has already requested the World Bank to consider potential GEF follow-up projects. The relevance of the

project is very loosely related to the overall program, since this basically provides a very broad framework, into which almost any environmental activities could be fitted.

Tunisia projects

Since the national projects use STAR funds, they must be a national priority. On the other hand, the regional project is only \$1 million. It was intended to be \$12 million, but kept getting cut. There is not enough money to do anything substantial with the regional project. Although the country sees that there could be advantages from a regional program, they still work based on national priorities. Regional activities must use other funds, in which case the country gets the advantages of a project, plus some program synergies. However, since the regional program has no separate funds, it is not likely to have a major role in national commitment.

There were problems when the national projects in Algeria and Egypt were dropped. The program had to adapt and added in two projects in Tunisia – Eco Tourism and an Oasis Project. Morocco and Jordan stayed in. GEF insisted that there should be five projects in the program.

Regarding the experience and lesson learning activities organized under the regional project, it is the national implementing agencies that are responsible for contacting and inviting key national stakeholders relevant to the workshop themes, such as M&E or desertification. This is not working well. For Egypt and Jordan, the same person has come to all the meetings, even when they are not involved with the topic. Further, the participants do not share the knowledge gained with key people in their countries.

The OSS, which implements the regional project, invites the Executing Agencies in participating countries to propose the workshop topic for each coming year, but it gets few responses. The topics are not always well chosen. For example, this year's workshop on remote sensing seems unnecessary, because few countries will need a high level of expertise in this area. The World Bank TTL would prefer if the project held workshops on themes that are directly relevant to the program; such as the specific desertification challenges facing participating countries and on exploring a range of concrete suggestions, which could address the main challenges.

The MENA-DELP was approved before the child projects, which are now in it. But it was not clear how the program would work and changes in WB staff dealing with MENA led to delays. In the meantime, Jordan went ahead and designed its project unilaterally. There was not a strongly designed programmatic approach – it is mainly just an exchange of experiences. So far, the experience shared by Morocco has been important to some other projects. The program is vulnerable, since it is largely dependent on the participation of national projects, which are managed by national bodies, which have many other activities. So, there is a danger that some national inputs will not be strong. There is not much possibility to develop strong relationships between the program and projects, because it is mainly the same top managers who go to all the meetings.

A program should promote active collaboration between the national projects, but it is largely a travel agency for senior managers. The OSS runs another GEF regional project (BRICKS), which has worked out the same way. The program has no opportunity to impact national projects and can only try to influence them through knowledge sharing. On the other hand, there was also no concept of how national projects could shape a genuinely regional program.

WB MENA management is not happy with how the GEF works in the region. A \$200 million Bank loan for forestry in Morocco has the same preparation requirements as a small GEF project within a program. Also, there is no coordination with bigger WB efforts. For example, in Tunisia the OFP has used GEF money for a UNDP \$6 million forest project, when the WB is preparing a \$200 million project in forests. What is the value of these small stand-alone projects? The Ministry of Agriculture is the main player in Forestry in the country, so Environment is not centrally engaged in the sector. It seems that the Ministry of Environment wants the small project because it has little funding and this is one of the few chances it has to implement an activity.

MENA-DELP has operated in a flexible manner and its projects do not need to have a strong implementation relationship with each other. It imposes no major obligations but plays a useful role in terms of making experience and advice available. But even within Tunisia, the relationships between the two MENA-DELP projects are not close and their teams do not routinely meet. Even though they are within the same Ministry, they do not regularly collaborate and often have to be pushed to meet by the program manager in the WB.

Question 4: To what extent have child project level objectives been coherent with and integrated in the program level ones?

Program

The MENA-DELP outcome level objectives are broad and comprehensive, including the following:

- Improved agricultural management
- Sustained flow of services in agro-ecosystems
- Increased investments in SLM
- Increase in sustainably managed landscapes and seascapes that integrate biodiversity conservation
- Promote investment in renewable energy technologies
- Reduced vulnerability to climate change in development sectors.

It has therefore been possible to integrate objectives of the child projects into those of the program in a coherent manner.

BELP

The regional project seeks to strengthen networks and communities of practice by sharing experience and knowledge on key desert ecosystem management issues. However, the BELP Project Manager has no important routine interaction with the DELP and it is therefore difficult to see any value added by DELP to the BELP project as implemented. From the BELP management perspective therefore, if there was a useful idea in the program approach, it has not been delivered.

Although ideas from other projects may in principle be useful, it is clear that the country projects are quite different from each other, so that the extent of cross-fertilization is small. The evaluation found no evidence that the BELP objectives would have been different if it were not in the DELP program.

ASIMA

ASIMA's project objectives fit within the country's major Plan Maroc Vert initiative, of which it forms a small part. World Bank inputs helped shape the specific form of the project, with a focus on value-chains for key agricultural products, but this focus is not specifically derived from MENA-DELP objectives. The project is therefore coherent with program level objectives, which are themselves only loosely integrated internally or with the country-level projects.

Tunisia projects

The Tunisia Oasis Project is just like any other national project under the GEF country program, but has been placed under the M-D umbrella. It deals with national priorities and was selected as a priority both for use of GEF funds and the WB. It was not originally conceived as part of a regional program, but since its objectives fit well with the M-D program, it became a strong candidate for inclusion within it. The project PAD places it in the context of the earlier GEF-WB MENARID Program; whilst mentioning "linkages to" MENA-DELP, mainly in terms of knowledge sharing. WB PIRs do not focus at all on the project's coherence with MENA-DELP.

Question 5: To what extent have the governance, management arrangements and coordination influenced the performance of GEF programs?

Program

The program has a Steering Committee with representatives from each of the national implementing institutions. There is relatively little need for operational coordination, since the child projects are nationally managed and have no specific relationship to each other. Further, there are no regional program funds, which might need coordinated management.

The program is almost entirely a collection of very loosely related national projects and performance is therefore managed at country level. In terms of performance delivery, there is little role for management at program level, while routine management is ensured through the World Bank project management system.

BELP

The DELP suffered from what the Focal Point's Office sees as a fundamental challenge with regional programs; namely that it took a long time for countries to endorse it. In fact, this and other institutional issues caused nearly a year's delay in start-up of the BELP and the project was informed by the World Bank that there could be no extension beyond 2017 to compensate for the time lost due to the complex program structure.

As against these intentions of the program, the BELP Project Management team does not feel adequately engaged in MENA-DELP activities. It reported that its members are not routinely invited to or informed about DELP meetings in the region. The BELP team does not receive significant levels of information through DELP knowledge sharing and does not perceive that DELP supports the BELP project in any significant way.

The BELP Project Manager (PM) (in NCARE) receives technical reports from implementing team members and collates these into a report for the World Bank. However, it is not clear whether this material is sent to DELP and the BELP PM is unaware of any efforts by DELP to aggregate data from different projects. The

BELP Project Management Unit has not been involved in regional meetings or knowledge sharing. This means that, although the project has outputs that would be of interest to other countries in the region, it is not substantively engaged in the knowledge sharing process.

The evaluation has found that governance, management and coordination have been major areas of activity within the BELP, which has a relatively complex institutional structure, with several implementing partners. However, these aspects of the parallel DELP structure have had little effect on the BELP, which is largely independent of the program and would be little different without it. From the perspectives gathered in Jordan, the purpose of the DELP is not very clear. Indeed, it seems to have been added on to convert a potentially self-contained project into part of a larger entity to conform with perceived GEF funding preferences. It has not effectively delivered a “glue” function between the projects, since these are at best loosely related and, from the perspective of the BELP, its performance is not affected by any information received from or shared with the program.

ASIMA

Morocco and WB procurement procedures could not be easily reconciled, leading to major delays. The ASIMA Mid Term Review recommended some restructuring of the project; particularly of its Results Framework, which originally included all the benefits of Plan Morocco Vert, which is a \$35m project, while ASIMA is only 6m.

The national bodies involved in implementing have could share their experiences with other programs in the region tackling similar issues. Also, there have been some MENA-DELP updates from the regional project. However, overall the project has not been greatly influenced by any broader governance or management aspects of the program.

Tunisia projects

The regional project is only \$1 million. It was intended to be \$12 million, but kept getting cut. There is not enough money for any major activities and the national projects do not relate closely to it.

GEF money is used for regional activities, with STAR allocations kept for national projects. Fund disbursement for the national projects is not streamlined because of its participation in a program. For procurement, the national committee must approve, even if the WB has already cleared it. Ministries will not risk cutting out the national committee on procurement. So, this adds three to six months to every consultant appointed, leading to substantial delays.

Among the WB MENA countries, the WB country project TTLs do not organize meetings or seek program funding support for any coordination efforts. When the regional project institution OSS sends emails about MENA-DELP, all WB TTLs of individual projects are copied in, but the regional TTL rarely gets any response from them. They are all working on their own projects and there is no awareness of the additionality of the program. Further, the WB TTL for MENA-DELP is not expecting that will be evaluated as a program. The child projects, including the regional project, will be assessed individually.

The WB does not have any concrete commitment to deliver specific regional program results. It was the regional project that developed a results framework, not the regional program. To have program results would mean changing the pre-existing individual project results frameworks. So, circumstances do not allow a strong programmatic approach and results framework. OSS has two log frames – one for the

program and one for the project, but it is difficult to persuade the child projects to keep the monitoring information up-to date.

There is national ownership but no national commitment as to who must do what – it does not permeate the national institutions. Programs need to be much more specific on national commitment in practical terms. The Directors of the national institutions have no ownership of the regional dimension – they are just treating it “like a travel agency”, according to regional program/project managers.

No-one contributes from the projects to the MENA-DELP website. The WB national TTLs do not contribute, still less the national institutions. The Operational Manual specifies that meeting participants should communicate what was learned from workshops – but no-one does this now.

The OSS does not have any role to make system wide observations and feed this back to M-D or to the BRICKS program, which should be more closely related. Even though OSS is now gathering data, it does not send out any periodic reports or analysis of what is observed. It is acting as a bureau for separate national studies rather than as its intended regional observatory function; which could enable it to influence regional policies, etc, based on information gathered. This fragmentation means that the real value of the regional program is not achieved or available to GEF and WB. The Observatory function of collecting satellite data and making broad brush interpretation is not being delivered. It is more associated with individual projects. Trust Funds could be used to finance broad regional data analysis, but these strategic functions are missing.

Regional programs do raise awareness of results at higher levels of national Governments, which cannot be generated by individual projects. The program enables contacts with many people at low cost, which will be especially true at the Marrakech COP, at which MENA-DELP will have a side event.

The Regional Project Steering Committee has met regularly, although frequent substitutions of members have caused problems. But this Steering Committee does not meet with the individual project SCs. The Coordinators of national projects are in principle members of the Regional Program Steering Committee, but it does not work the other way around, and the Regional Project is not represented at the national committees.

Question 6: What role did M&E play in programs’ adaptive management for the attainment of expected outcomes and impacts?

Program

There is no evidence of systematic use of M&E for management purposes at program level. Project M&E systems are focused on reporting to national systems and to the WB/GEF as individual projects. The regional project has devised a program M&E system to which the individual projects should contribute. To date, there has been little enthusiasm from projects to regularly input data into this system; and it is not clear how aggregation of data from a limited set of small projects around a vast region will generate information, which could be useful for management purposes.

Projects are subject to regular World Bank management missions and reporting, including Mid Term Reviews and eventually GEF Final Evaluations. However, review of documents to date shows that each project is assessed as an individual entity and that there is no monitoring or reporting on how it has

contributed to the program or vice versa. There appears to be no provision in the standard World Bank progress reporting TORs to assess the role of projects in programs.

BELP

The BERP M&E officer attended a workshop on Tracking Tools, where participants emphasized the need to ensure that biodiversity indicators were included. The BERP M&E officer has provided monitoring data to DELP, but BERP management is not informed as to how this is used by DELP and claims to have received no feedback on it.

The balance of participants at workshops has not reflected which countries are actively implementing. As MENA-DELP has been implemented, the Jordanian team reports that available program funding has steadily reduced, leading to declining regularity of Steering Committee meetings, M&E events and workshops to share experiences.

Monitoring and Evaluation has largely been generated and used by BERP for its own purposes and shared directly with World Bank project management. Although data have also been sent to the DELP, it is not clear to the BERP whether or how these have been used and there has been no useful feedback from them. So, from the perspective of Jordan BERP participants, it is not clear the MENA-DELP has made any use of M&E to adapt the program to better achieve its outcomes and impacts. Indeed, it is not clear that there are any tangible program level outcomes above those generated by the individual projects.

ASIMA

The Mid Term Review recommended some restructuring (of the project): particularly, the Results Framework, which originally included all the benefits of Morocco Vert, which is a huge \$35m project, while ASIMA is only 6m. So, it was not plausible that it had the same number of beneficiaries. Under the restructuring, beneficiaries were decreased from 12,000 to 8,500. There is no evidence of any effects of program level M&E affecting the ASIMA project.

Tunisia projects

The regional project has \$800,00 for knowledge sharing, \$100,00 for M&E and \$100,000 for management. The regional program M&E tool has provided an approach, which the individual projects are to some extent using as a model. OSS has provided substantial training on this aspect: e.g., for the Tunisia Oasis Project. Project M&E Officers across the countries have widely varying capacity and OSS training has helped bring them all towards the same level.

Because the overall M-D program covers a broad range of issues, the OSS produced a matrix of key domains for M&E and listed indicators that could be used by each project under the key headings. This eventually led to an agreed set of key indicators for each specific domain. The regional program system has national project sections, into which the individual countries can enter data. Often they are too busy to do this and the regional project has had to issue quarterly warnings to encourage participation. The national projects already have their own detailed data sets and do not find the regional overview system very useful, so they are reluctant to participate. However, the intention is that the M-D overview system and data should be available to countries, not just to the projects.

OSS believes the regional project adds value by enabling people from different projects to share experiences and skills. This enables them to save time and money by drawing on what is already working in other countries. Also, comparison between countries raises pride and standards across the countries. However, there is little evidence that the national projects feel these benefits to be substantial or important.

The Oases Project is putting into place its detailed M&E system. Prior to this, the project exchanged information with the MENA-DELP M&E manager to try to harmonize its data with the program system.

CASE STUDY: Rapid Impact Evaluation (RIE) - Reducing Industry's Carbon Footprint in South East Asia Program

1. Introduction to the Program

The overall aim of the Reducing Industry's Carbon Footprint in South East Asia program (GEF ID: 3756) is to assist countries to improve Energy Efficiency (EE) in targeted industrial sectors. Program components have been previously applied and adapted through considerable UNIDO experience with similar programmatic interventions. Reviews of the program at the proposal stage pointed to the knowledge of the IPCC (2007) report covering sectoral targeting, barriers and incentives.⁵⁹

The GEF/UNIDO program is implemented through five child projects in the following SE Asian countries: Indonesia, Thailand, Vietnam, Philippines and Malaysia and has four main components:

- A regulatory framework including national policy addressing ISO 50,000 standards and implementation mechanisms for the policy (regulations, incentives, etc.)
- Tools and training on Energy Management Systems (EnMS) and on energy efficiency in specific system components such as compressed air or chillers and referred to generically industrial system optimization (SO)
- Financial infrastructure supporting energy efficiency projects in industry including building capacities of government, financial institutions and enterprises for energy efficiency lending and supports
- Pilot and mainstream EE projects with national commitments to the number of enterprises adopting EE (250-500) and pilot demonstration projects mainly of SO and enterprise assessment.

The program is homogeneous, i.e. the four components are present in all of the five projects with modest variation and a high level of fidelity to the program. Both countries with child projects selected for this case study – Vietnam and Indonesia – had enacted legislation and regulations requiring high energy consuming enterprises to undertake energy audits every two or three years respectively, and provide documentation of improved energy efficiency. Both countries had also enacted ISO 50,001 and provided the infrastructure for the necessary training and support.

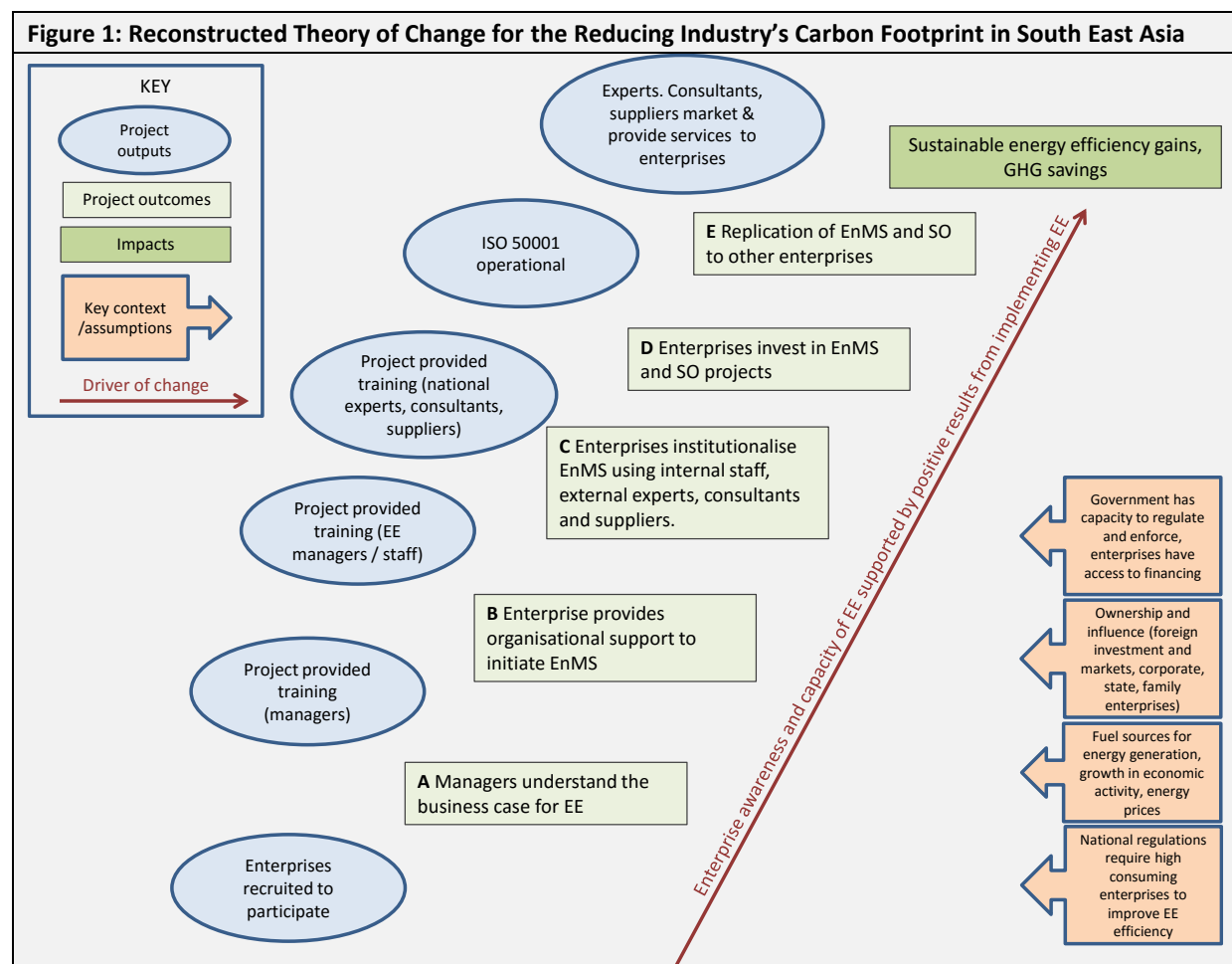
The Vietnam project targeted four sectors: textiles, paper, food processing and rubber; Indonesia targeted chemicals, food and beverages, pulp and paper and textiles. Both are five-year projects; Vietnam started in 2011, Indonesia in 2012. 159 enterprises from the target sectors participated in the training in Vietnam, 238 in Indonesia.

1.1 Program Theory of Change

A theory of change (ToC) was established through several iterations, starting with a review of program documents and briefings from UNIDO staff in Vienna, who helped the evaluation team recalibrate their

⁵⁹ STAP. Scientific and Technical screening of the Program Framework Document (PFD). 2008 (internal document).

initial understanding, field interviews and the country and global expert panel. Figure 1 presents the ToC that was applied in the RIE exercise.



The logic of the outcomes assessed using RIE follows this sequence: (outcome A) enterprise managers (or other senior decision makers) who participate in the first half day training for managers will *accept the business case* for EnMS; with additional training provided to enterprise energy managers and staff (outcome B) managers will agree to support change by *investing in an EnMS*; from which flows (outcome C) *institutionalization of EnMS* in the enterprise, for example, by adapting the organizational structure, staffing the necessary positions and adjusting performance expectations to include energy efficiency. With the EnMS institutionalized the enterprise can be expected to (outcome D) *invest* to improve energy efficiency. At this point the desired effects start to flow, including reducing energy consumption and thereby also reducing GHG emissions, reducing power outages and so on. Training in system optimization is also provided as part of the UNIDO program, for example for systems with compressed air (CASO) or steam (SSO). These system optimization decisions can be separate from or part of an EnMS. The RIE estimates that follow focus on EnMS and include SO decisions only as part of an EnMS process (e.g. replacing a boiler as indicated by application of EnMS). This sequence of outcomes applies to enterprises participating in the UNIDO training. The program includes demonstrations of the benefits of EnMS through pilots and case studies. In each country a small cadre of EE experts were trained as trainers and training materials relevant to the country were developed also provided training to develop a cadre of EnMS experts who will seek to provide energy efficiency services to industry. These

interventions are intended (outcome E) to *replicate energy efficiency* to enterprises that did not engage in the training or progress beyond outcome A and will provide additional energy reduction effects on top of those from direct participants.

The program is one of several influences on energy decisions of enterprises. Others include the national legislation and compliance, energy prices and subsidy levels, behavior of other enterprises, sensitivity of the enterprise to market forces rewarding or requiring sustainability such as through foreign investment or ownership, exporting to markets sensitive to these factors, the nature of ownership, and introduction of ISO 50000, among others. All these factors potentially influence enterprise decisions on whether to pursue or not energy efficiency, including decisions on whether to engage with the intervention, and for those that do so, progress along the pathway described in Figure 1.

Information about enterprise level energy efficiency improvements can be obtained over time through reporting from the legislatively required audits, from enterprise surveys such as those undertaken by UNIDO, from EnMS software and other sources. These can provide an indication of energy consumption and changes in consumption at macro and enterprise levels, and will no doubt prove valuable in assessing policy and program options. However, this information does not enable separation of the contributions of the program from the several other important forces affecting enterprise decisions relating to energy efficiency such as those described above.

1.2 Rapid Impact Evaluation

RIE is an evaluation approach for use in settings where it is challenging to assess impacts. RIE can be used to forecast expected impact, as well as to evaluate impact after implementation (see Appendix 1 for a description of RIE). RIE utilizes the scenario-based counterfactual, a new approach for comparing the intervention to an alternative. For this application of RIE the alternative was business-as-usual, where the existing national legislation, ISO 50,001 and other conditions all continued to apply but the UNIDO program was not offered. The scenario-based counterfactuals for Vietnam and Indonesia were very similar and are provided below in Table 1.

TABLE 1: Counterfactuals for Vietnam and Indonesia	
Vietnam counterfactual	Indonesia counterfactual
<p>High energy consuming enterprises are compelled by law to have an energy audit every two years, submit an energy report and reduce their energy consumption. They can contract project-trained and other energy service providers and have access to the case studies and demonstrations produced by the project.</p> <p>Support to industry continues to be provided by the MoIT via the fourth component of the National Energy Efficiency Program (VNEEP). Support includes training for MoIT and enterprise leaders, energy management models for designated enterprises, and support to energy audits in selected enterprises accompanied by further support to develop and implement energy efficiency projects.</p> <p>ISO 50,001 would have been implemented as would the existing capacity of STAMEQ, the local certification institution.</p> <p>The costs and supply of energy would remain unchanged for the purposes of considering this alternative.</p>	<p>Since 2012 without the project, UNIDO training would not have been provided to enterprise managers and technical staff and to energy service providers.</p> <p>High energy consuming enterprises are compelled by law to have an energy audit every three years, submit an energy report and reduce their energy consumption. Current conditions apply (e.g. current levels of compliance and quality).</p> <p>ISO 50,001 is in place and available to qualifying enterprises. EnMS certification under AEMAS program also continues.</p> <p>The costs and supply of energy would remain unchanged for the purposes of considering this alternative.</p>

Two groups of experts have been asked to provide their assessment of impacts using RIE metrics; the first group are program experts and include representatives of all interests involved in and/or affected by the intervention, the second group are experts in the subject matter of the science or knowledge underlying the intervention. A web-based survey was used to gain inputs from the program experts, a facilitated workshop for the subject matter experts. The impact metrics were also assessed by one or more technical advisors to the evaluation who are themselves experts in one or more of the subject domains and who have gained considerable knowledge about the intervention through their involvement with the evaluation.

2. Results

RIE provides estimates of outcomes A through D attributable to the intervention (Figure 1). Replication (outcome E) is also addressed using RIE metrics and complimented by inputs from a panel of global experts in energy efficiency.

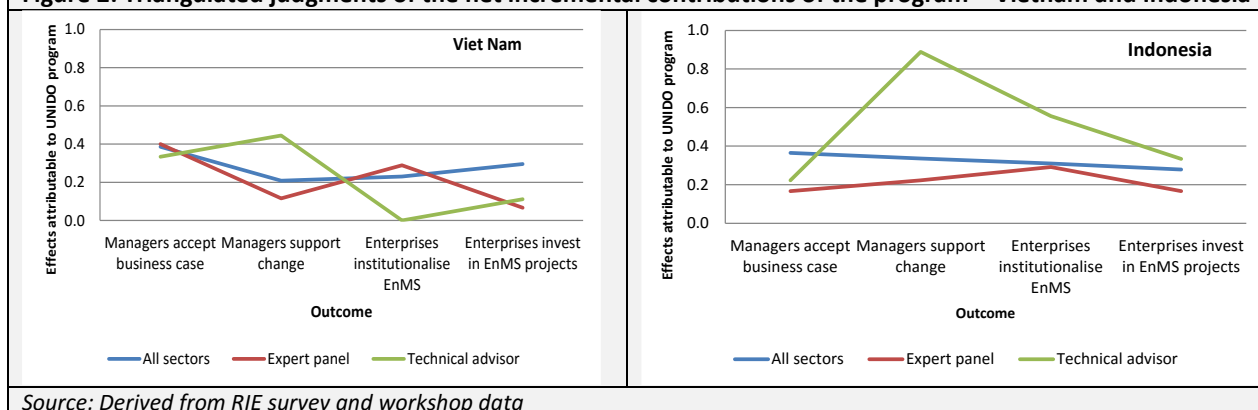
2.1 Contributions to Enterprise Use of EnMS

RIE obtains judgments from the key interests involved in the program; each interest brings their own knowledge and aspirations, leading to variation in their judgements. For any setting, it is not known if one interest is more likely to be right, or the assessments made by individual interests will mirror assessments of the other interests. Rather, by combining the judgments of participant interests involved (e.g. enterprises, experts, government) the bias of particular interests is offset. The combined all sector judgment is taken to represent the judgment of participants in the UNIDO program. The study combined the expert panel judgments after noting that the standard deviations for the panel were quite low. As typically happens with RIE, participants are more optimistic than the expert panel and technical advisors with the expert panel the most pessimistic (Vietnam), however the Indonesian technical advisor was somewhat more optimistic than the program participant group⁶⁰. The results are disaggregated by interest in Appendix III.

Only enterprises whose managers participate in the first training embark on the theory of change at Outcome A, and thereafter there will be attrition through to outcome D. This is reflected in the downward slope for both Vietnam and Indonesia in Figure 2.

⁶⁰ From email 1-8-17 from technical advisor Indonesia: *The survey is for high energy consumption enterprises. The cost effective is one of the major agendas of all high energy consumption enterprises that I know. All of their employees have been challenged to find out anything for cost effective, including in the energy saving. The payback period below 3 years is an accepting level by almost high energy consumption enterprises...The establishment of energy management system shows the seriousness of the enterprises in the energy saving.*

Figure 2: Triangulated judgments of the net incremental contributions of the program – Vietnam and Indonesia



The main outcome of interest is (D). Enterprises invest in EnMS projects, where program participants (all sectors) expect that about 30% of enterprises will achieve this outcome compared to the less optimistic expert panels (judgments ranged from 10-18%) and the technical advisors (10% and 30%). For the purposes of these estimates, we assume about 25% of the Vietnam⁶¹ and about 30% of the Indonesian enterprises will invest to implement EnMS projects as a result of the project.

In addition to the RIE estimate that about 25% or 30% of the enterprises embarking on the UNIDO training will make EnMS investments that are attributable to the intervention, other enterprises will also make EnMS investments. These other EnMS-investing enterprises are influenced by the other energy efficiency initiatives and would likely have occurred without the project; influenced for example by national legislation, ISO 50,001 (to which the project contributed), enterprise priorities (such as social and environmental responsibility, market strategies or foreign investment/ownership), energy prices and supply and other factors.

2.2 Change in energy consumption attributable to the intervention - Vietnam

A number of factors affect energy consumption of an enterprise. The estimation procedures for Vietnam included:

1. Setting an empirical baseline for consumption by high energy consuming enterprises in the targeted sectors
2. Forecasting effect of continued economic and sectoral growth on energy consumption in these sectors
3. Forecasting the level of energy consumption reduced by application of EnMS
4. Estimating, using RIE, the portion of enterprises that will adopt an EnMS as a result of the intervention
5. Apply assumptions about changes in efficiency of energy generation and transmission to the forecasted changes in energy consumption.

⁶¹ eddHOME (2014) Impacts and Results of the Project Training Program found that 77 of 176 (44%) participating enterprises in Vietnam “adopted EnMS plans and implemented operational improvement projects”. This is a total measure and does not identify the portion attributable to RIE. A similar estimate is made using RIE and the estimates provided in the RIE enterprise survey at 40-54% is very consistent with the findings of eddHOME in their evaluation.

Figure 2 (i, ii) applies this approach to estimate total energy saving in the four sectors and attributable to the UNIDO project in Vietnam. The numbers in the left column of Figure 2 refer to the sequence in the estimation process listed immediately above. The two parts to Figure 2 provide estimates first for 2011-2015 and then 2016-2020.

The green shaded rows provide the sum of five years' energy saved and GHG emission reductions in Vietnam attributable to the project for 2011-2015 and 2016-2020. The project is estimated to have saved approximately 340 thousand tons of oil equivalent (TOE)⁶² for the first five years and forecast to save approximately 530 thousand TOE for the subsequent five years (2016-20). This forecast focuses on EnMS which is the main goal of the intervention. These savings in energy consumption will reduce GHG emissions in Vietnam by 1.783 million metric tons of CO₂ 2011-2015 and 3.148 million metric tons of CO₂ 2016-2020.

To understand the significance of this estimate, the 2011-2015 savings are the equivalent of removing 376,629 vehicles from U.S. roads for a year or from burning 1.9 billion pounds of coal. The savings forecast for the 2016-2020 period are the equivalent of removing 664,963 U.S. cars for a year or from burning 3.4 billion pounds of coal⁶³.

Further gains attributable to the project will be obtained from project enterprises that did not adopt EnMS but still implementing systems optimization (SO) such as replacing a boiler.

⁶² The ton of oil equivalent (toe) is a unit of energy defined as the amount of energy released by burning one ton of crude oil.

⁶³ Estimated using the US EPA GHG equivalencies calculator found at <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

Table 2i: Estimated energy saving from the intervention in Vietnam - 2011-2015

Step	Measure	Year(s)	Units	Rubber	Paper	Food processing	Textiles	Targeted sectors
	High energy consuming enterprises	2011		15	32	48	64	159
Potential Energy Saving 2011-2015								
1	Baseline consumption	2011	TOE	64,715	188,494	196,854	321,962	772,025
2	Growth rate (average 2011-15)	2011-15	rate	1.27	2.65	1.65	1.43	
2	Forecast annual consumption	2015	TOE	82,002	500,369	324,910	461,437	1,368,718
3	Potential energy savings from EnMS	annual	%	4.00%	13%	20%	30%	
3	Forecast energy savings from EnMS	annual	TOE	3,280	66,549	64,982	138,431	273,242
4	Energy saving attributable to UNIDO project	annual	25%	820	16,637	16,245	34,608	68,311
4	Total energy saving attributable to UNIDO project	2011-15	TOE	4,100	83,186	81,227	173,039	341,553
5	Convert TOE to terrawatt hours		TKWh	0.05	0.97	0.94	2.01	4.0
5	Emission intensity (based on electricity emission)	constant	MtCO ₂ e/TWh	0.45	0.45	0.45	0.45	
5	CO ₂ savings	2011-15	MtCO ₂	0.021	0.434	0.424	0.903	1.783

Source: Derived from approach developed by Vietnam Technical Advisor

Table 2ii: Estimated energy saving from the intervention in Vietnam - 2016-2020

Step	Measure	Year(s)	Units	Rubber	Paper	Food processing	Textiles	Targeted sectors
	High energy consuming enterprises	2011		15	32	48	64	159
Potential Energy Saving 2016-2020								
1	Baseline consumption	2015		82,002	500,369	324,910	461,437	1,368,718
2	Growth rate (average 2015-20)	2016-20	rate	1.28	1.87	1.49	1.44	
2	Forecast annual consumption	2020	TOE	105,145	933,372	484,337	665,652	2,188,505
3	Potential energy savings from EnMS	annual	%	4.00%	13%	20%	30%	
3	Forecast energy savings from EnMS	annual	TOE	4,206	124,138	96,867	199,696	424,907
4	Energy saving attributable to UNIDO project	annual	25%	1,051	31,035	24,217	49,924	106,227
4	Total energy saving attributable to UNIDO project	2016-20	TOE	5,257	155,173	121,084	249,619	531,134
5	Convert TOE to terrawatt hours		TKWh	0.06	1.80	1.41	2.90	6.2
5	Emission intensity (based on electricity emission)	constant	MtCO ₂ e/TWh	0.51	0.51	0.51	0.51	
5	CO ₂ savings	2016-20	MtCO ₂	0.031	0.920	0.718	1.480	3.148

Source: Derived from approach developed by Vietnam Technical Advisor

2.3 Change in energy consumption attributable to the intervention - Indonesia

In the absence of data that are similar to those available in Vietnam, the estimation extrapolated from actual measurement of energy consumption for 19 pilot project enterprises in Indonesia. From this data it was possible to generate an estimate of the average CO₂ reduction for pilot enterprises in each of the sectors and then extrapolate this estimate to the entire population of enterprises participating in the UNIDO training. The portion of the change attributable to the intervention is then estimated using the factor of 0.3 established in the RIE process. The estimated annual reduction in CO₂ emissions is 0.313 MtCO₂, 1.57 over 5 years, 3.13 over 10 years, both very similar to the estimated levels for Vietnam. Estimations are presented in Table 3.

Table 3: Estimating GHG emission reductions attributable to the intervention – Indonesia							
Estimate average CO2 emission reductions							
	Batch 1	Batch 2	Batch 1	Batch 2	Batch 1	Batch 2	Both batches combined
	Reduction in CO2 (tCO2/y)	Reduction in CO2 (tCO2/y)	Pilot enterprises	Pilot enterprises	Average	Average	Average
Textiles	21,187	18,029	5	3	4237.4	6009.7	4902
Pulp & paper	10,680		2		5340.0		5340
Food & beverages	956		3		318.7		319
Chemicals	845	60,575	1	5	845.0	12115.0	10237
			11	8			
Estimate total CO2 emission reductions attributable to UNIDO intervention							
	Total enterprises taking training	Average reduction in CO2 (tCO2/y)	Mt CO2 reduction per year (tCO2/y)	UNIDO share annual CO2 reduction (tCO2/y)	UNIDO share annual CO2 reduction (MtCO2/y)		
Textiles	41	4902	200,982.00	60,295			
Pulp & paper	33	5340	176,220.00	52,866			
Food & beverages	102	319	32,504.00	9,751			
Chemicals	62	10237	634,673	190,402			
Total	238		1,044,379	313,314	0.313	1.57	
Source: Derived from data files provided by Indonesia UNIDO program 3.3 CO2 Reduction EnMS Ver 0_updated-Oct2015 AIN Des 22-Rev-Aprie_Summary, 2.1							
Summary_TrainingParticipants_EnMS_All_Updated-April2016_April							

Two caveats need to be mentioned. First, the Indonesia estimate does not include provision for growth in energy consumption due to economic and enterprise growth as was done for Vietnam. Second, the pilot companies from which the measurements were obtained received enriched support from the program and so are likely to have been better performing. Each of these factors would have led to an overestimation of emission reductions in Indonesia. The level of overestimation cannot be determined.

2.4 Summary of estimates of energy savings

The estimated savings in energy and reduction in greenhouse gas emission levels are summarized in Table 4. The Program operates in five countries. Table 4 only provides estimates for the two addressed in the case study.

Table 4: Energy saving and GHG emission reduction by enterprises participating in the program in two of the five countries - Vietnam and Indonesia			
	Vietnam	Indonesia	Combined
Five-year energy saving (TOE)	341,553		
Ten-year energy saving (TOE)	531,134		
Five year GHG emission reduction (MtCO ₂)	1.78	1.57	3.35
Ten year GHG emission reduction (MtCO ₂)	3.14	3.13	6.27
Five year GHG emission reduction equivalent to removing this number of US vehicles for a year	376,629	331,637	708,266
Ten year GHG emission reduction equivalent to removing this number of US vehicles for a year	664,963	661,161	1,326,124
<i>Source: Extracted from other Figures</i>			

The Vietnam and Indonesia projects are of similar design and implementation. While the approach to estimating GHG emission reduction was different for the two countries the results for the two countries are strikingly consistent.

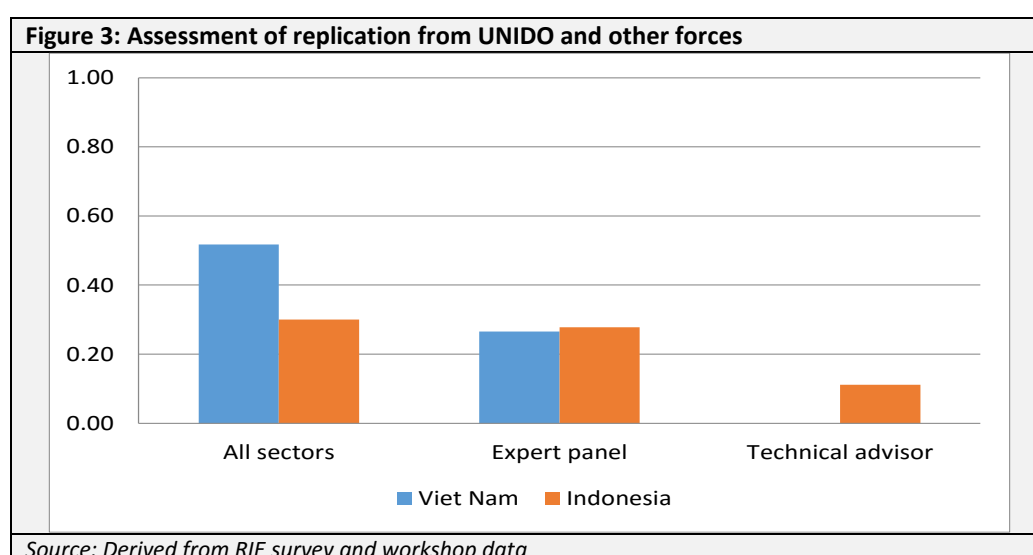
2.5 Long-term project results

The main avenues for the projects to have larger and longer term benefits are: (a) through continued application beyond 2020 of EnMS by the participating enterprises and (b) through replication of the activities introduced by the projects. Several avenues offer prospects for replication such as UNIDO-trained national experts providing training, through the service provision efforts of other project-trained energy efficiency experts and market development efforts of project-trained suppliers. Replication can occur in several locations, those enterprises that participated in the initial training provided by the project might become persuaded of the virtues of EnMS as they comply with the energy audit requirements of national legislation or through observing energy efficiency efforts by their peers as well as the UNIDO pilots and case studies effects of contributions to other enterprises inside and outside the four targeted sectors. Replication can also occur to high energy consuming enterprises outside the four sectors targeted by the projects and to other enterprises not currently classed as high energy consuming within the four targeted sectors. Factors beyond the projects such as national legislation and ISO 50,001 are also very important drivers of increased long term energy saving.

With the RIE estimates that 25-30% of enterprises entering the program will adopt EnMS the remaining not-yet-energy efficient enterprises offer significant replication potential for additional benefits if they were to implement EnMS. The projects include outputs intended to encourage and facilitate this. The underlying assumption is that the forces in favor of energy efficiency and EnMS will continue and potentially grow. Among these, the national legislation and other national and international efforts to promote energy efficiency, the likelihood that energy prices will increase as will market demands for sustainable production. These forces will encourage enterprise managers to look to reducing energy consumption and costs. The projects anticipate this by training national energy efficient experts resourced with nationally-relevant training materials to provide ongoing training per the UNIDO approach though commercial and institutional settings. Importantly, UNIDO has developed a cadre of energy efficiency consultants in each country and supported formation of professional networks on the premise that they will be required as other high energy consuming enterprises recognize the need for energy efficiency complimented by these consultants marketing their services. The projects have also addressed institutional capacities in government and the

finance sector to reduce frictional barriers to enterprises adopting more energy efficient production (Outcome E). Additional gains could be had with the extension of energy saving to small and medium enterprises through EnMS and through systems optimization, for example when replacing equipment such as a boiler.

The surveys and expert workshops in Vietnam and Indonesia only addressed replication of the UNIDO intervention in the context of all of the other forces also encouraging energy efficiency and did not consider the counterfactual without the UNIDO intervention. Replication operates in a very complicated and dynamic environment where it would be too challenging for participants to provide estimates under the counterfactual and through that comparison obtain an estimate of UNIDO's contribution to replication. Figure 3 presents the views of project participants, the expert panel and the technical advisor for Indonesia on replication addressing the question: "How likely is it that these high energy consuming enterprises that were not part of the project but learning of the benefits of energy management systems from national experts or the demonstrations and case studies will implement an energy management system?". The results presented in Figure 3 suggest good prospects for replication to over a third of the remaining high energy consuming enterprises in the targeted sectors which are not-yet-energy efficient. This would have a significant knock-on effect potentially reducing GHG gas emissions by about the same amount as the UNIDO contributions estimated in the previous section. The attribution would be to the entire constellation of energy efficiency efforts including those supported by GEF/UNIDO.

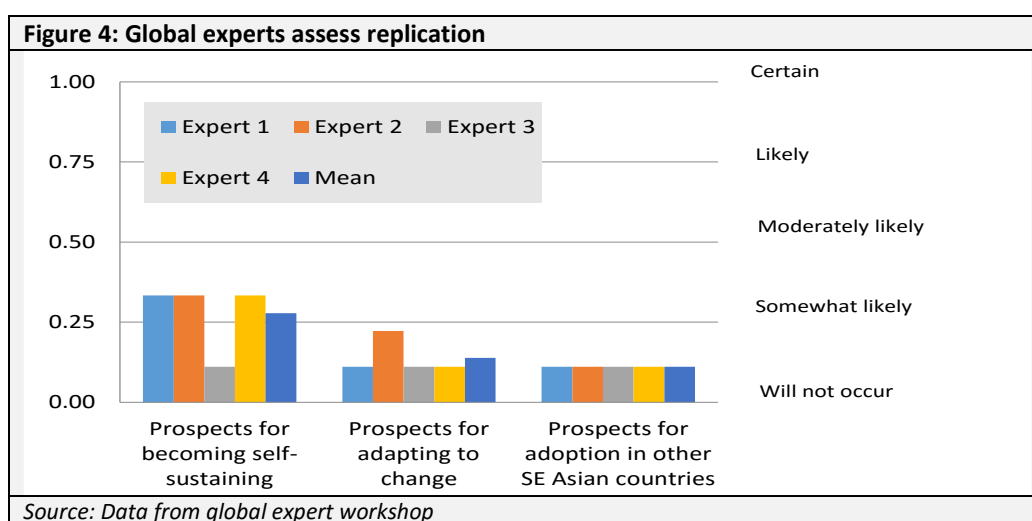


Longer term effects attributable to the intervention are importantly contingent on sustaining the effects of the projects. A panel of leading global experts in energy efficiency was asked to consider prospects for success on this by addressing the question of the portion of the knock-on effects that UNIDO interventions could be credited with achieving. The attribution would be stronger if prospects are strong for sustaining the project gains (a shelf life question) and prospects for the trained service providers to replicate or upscale beyond the first round of adopting enterprises. The global panel were also asked to assess the potential for replication to other countries. The specific outcomes assessed by the global panel were:

- The knowledge and capacity built through the UNIDO training is likely to be applied over a longer time period, and have good prospects of becoming self-sustaining in each participating country

- National experts and others completing the EnMS training are able to adapt their newly acquired knowledge and the training they provide to changing audiences in the 5 participating countries
- There is potential to foster adoption of EnMS in South East Asia industries beyond participating countries, since the scale of awareness and effort is larger and higher profile

The assessments of the individual panel members (Figure 4) were that the shelf life of the GEF/UNIDO-supported efforts to build a continuing infrastructure to support energy efficiency are likely to prove somewhat to moderately positive for the first outcome on the likelihood that the UNIDO training would become self-sustaining in each country. The global panel is quite pessimistic about the adaptive capacity of those receiving UNIDO training and that the existing GEF/UNIDO program could expand beyond the current five countries.



This suggests that the global experts regard replication to other high energy consuming enterprises in the targeted sectors in program countries as a plausible pathway for replication. However, their capacity to adapt on their own is unlikely to prove sufficient should significant changes occur (e.g. in technology). Prospects for expansion beyond the five program countries are also regarded as dim in the absence of targeted efforts such as the GEF/UNIDO program. Together this suggests that the approaches to replication built into the GEF/UNIDO program deserve review. Importantly, the GEF/UNIDO efforts are part of a wider constellation of energy efficiency efforts contributing to improving energy efficiency and sustainable consumption and production in South East Asia.

3. Overall RIE results

The GEF/UNIDO program is leading to quite significant energy saving gains in both countries. These gains are attributable to the program set in the context of national legislation, ISO 50000 and other factors. Total GHG emissions of roughly 1.75 million tons of CO₂ over the first five years in Vietnam and in Indonesia can be attributed to the child projects; and for the following five-year period a further reduction of 3.1 million tons of CO₂ in Vietnam and in Indonesia can be attributed to the program. It is plausible that an important portion of enterprises that did not engage in the initial intervention will additionally undertake EnMS thereby providing further significant GHG savings attributable to the efforts of the program.

Appendix II: Rapid Impact Evaluation

Rapid Impact Evaluation (RIE) is an evaluation approach developed to provide estimates of the impacts attributable to an intervention where for various reasons other existing approaches are not feasible, ethical or plausible. RIE is relatively low cost, flexible and can be applied with limited levels of program and results data. It systematically triangulates judgments of distinct groups with expertise in the design and implementation of the initiative and in the underlying sciences. It rests on new developments in the concept and use of counterfactuals, on greatly simplified impact metrics and on interest-based evaluation. These RIE methods can be applied as part of any or most mixed method evaluations, or they can be applied together as the full RIE approach. That approach rests on and applies good contemporary knowledge about factors that influence use of evaluation and science knowledge.

RIE utilizes the scenario-based counterfactual, a new approach for comparing the intervention to an alternative. The usual comparison is *with and without* the intervention; the scenario-based counterfactual is a way to compare the intervention to a plausible, feasible, ethical and feasible alternative. Normally this will prove to be approaches applied elsewhere and/or seriously considered as an alternative for this setting. For this application the alternative was business-as-usual where the existing national legislation, ISO 50,001 and other conditions all continued to apply but the UNIDO program was not offered. For RIE applications this is a rare instance where the scenario-based counterfactual was *with and without* the intervention. The research and practice base of energy efficiency for enterprises so firmly pointed to UNIDO-type approaches that selecting an alternative approach would be quite artificial. The scenario-based counterfactuals for Vietnam and Indonesia were very similar.

RIE has three distinct phases. The first phase – analogous to a collaborative evaluation design – is critically important where the necessary elements for the impact assessment are identified and specified and there is consensus that these provide a reasonable description of the intervention among all of the key interests involved in the intervention. Structured information gathering including application of the RIE impact metrics is undertaken in the second phase. Two groups of experts are asked to provide their assessment on the impact metrics; the first group are program experts and include representatives of all interests involved in and/or affected by the intervention, the second group are experts in the subject matter of the science or knowledge underlying the intervention. A web based survey is used to gain inputs from the program experts, a facilitated workshop for the subject matter experts. The impact metrics are also assessed by one or more technical advisors to the evaluation who are themselves expert in one or more of the subject domains and who have gained considerable knowledge about the intervention through their involvement with the evaluation. The third phase includes analysis, communications and reporting and quality assurance.

Appendix III: Expert Panel Composition

Vietnam Panel

Mr. Ha Dang Son	Independent Consultant. Mr. Son has been involved in various consulting and policy advisory activities related to energy and climate change. Recently, Mr. Son acted as a certified trainer of the AEMAS program – a regional initiative on promoting energy management standard in the ASEAN region; and in charge as technical advisor for the Clean Production and Energy Efficiency project in Vietnam. Mr. Son also led a team to support the Ministry of Construction in Vietnam on developing the Low Carbon Development Action Plan for the cement sector. Currently, Mr. Son is involved in the Vietnam Low Emission Energy Program funded by USAID to support the Ministry of Industry and Trade of Vietnam with focus on Renewable Energy and Energy Efficiency.
Mr. Mai Van Huyen	Independent Consultant. Mr. Huyen, an MSc. Graduate of the Institute of Sociology of Vietnam National University in Hanoi, has spent seven years working as Communication and Awareness Raising Coordinator for the Ministry of Science and Technology, supporting the industrial energy efficiency efforts in Vietnam. From 2013 to date, Mr. Huyen served as Chief Representative in Hanoi for the Energy Conservation Center (ECC HCMC) and a member of the Vietnam Energy Conservation and Efficiency Association.
Mrs. Pham Thi Hanh Nhan	Independent Consultant. Mrs. Hanh Nhan worked as economic consultant for PECSME project. At present she is working as Project Coordinator for Low Carbon Energy Efficiency (LCEE) Program. Mrs. Hanh Nhan has been lecturing Economics and Development Issues for the last 26 years; Supervising bachelor students in their final thesis; conducting research on economic and financial topics. Her expertise is on financial mechanism and policy related to energy efficiency. Mrs. Hanh Nhan holds a Master Degree on Development Economics from the London University.
Mrs. Tang Thi Hong Loan	Vice Director of EPRO (he attended CASO training course). Ms. Loan obtained a Master Degree in Environmental Engineering and Bachelor Degree in Food Processing at Hanoi University of Technology. Ms. Loan is a founder of EPRO. She has rich experience in cleaner production, information, quality control, monitoring and evaluation. Before joining EPRO, Ms. Loan worked at the Vietnam Cleaner Production Centre and its host organization, the Institute for Environmental Science and Technology, of Hanoi University of Technology.
Mr. Nguyen Xuan Quang	Lecturer at Hanoi University of Technology (he attended EnMS/CASO/SSO training course). Dr. Quang obtained his Ph.D in Chemical technic at Technische Universität Wien, Austria and his Master degree on Energy Technic at AIT. Mr. Quang involved in consultation work related to energy efficiency. His interest research is on Boiler, Energy Efficiency (energy management models, energy saving solutions ...), Biomass Gasification, Technology brick kilns, Optimization of system furnaces, and industrial dryers.

Indonesia Panel

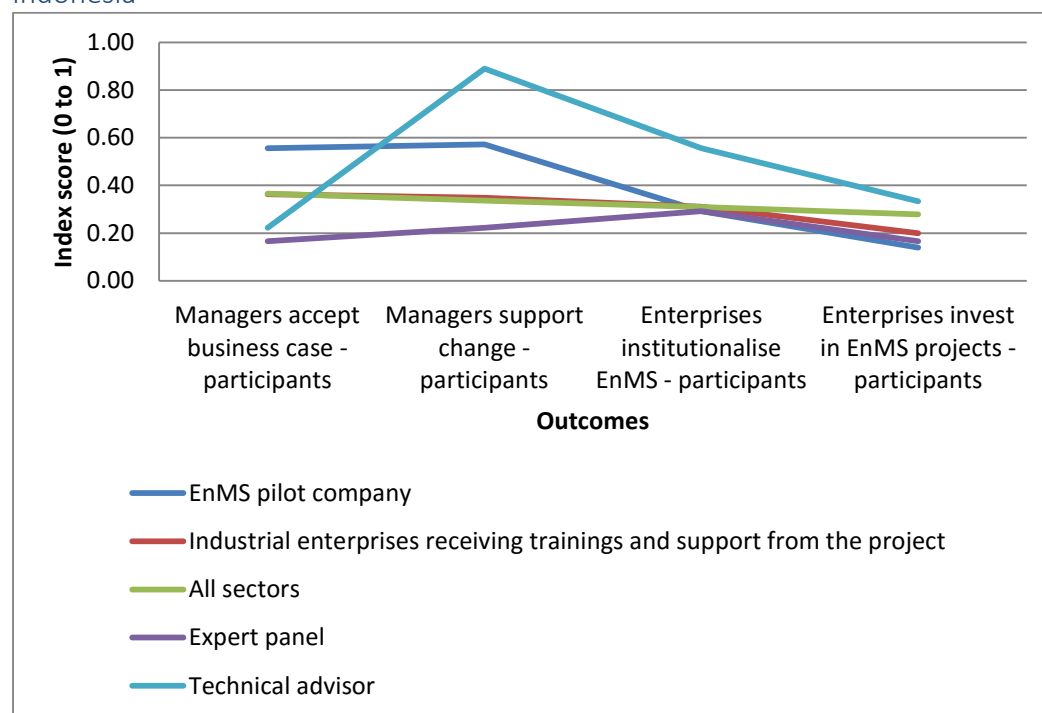
Dr. Chip Rinaldi Sabirin	University of Indonesia and co-founder of Weston Solar Energy
Fabby Tumiwa	Executive Director of Institute for Essential Services Reform (IESR), in Jakarta. IESR undertakes public policy analysis and policy advocacy on the issues of energy, extractive industries and climate change
Parlindungan Marpaung	Director of Certification Body for Professional Engineer (Energy Manager and Energy Auditor)
Herlin Herlianika	Mrs. Herlianka is the manager of National Refrigeration and Air Conditioning Contractor, a firm that offers maintenance and installation on chillers, central air conditioning systems and cold storage in industrial applications. She has more than 12 years as lecturer in Major of refrigeration and air conditioning subjects at Bandung State of Polytechnic in Bandung, Indonesia, and held assignments with international institutions such as ADB and Unilever.
Triyono Adiputra	Mr. Adiputra manages a consultancy company focusing on green building certification, energy auditing and training for energy management system. He also intermittently works in the energy efficiency, renewable energy and construction sectors.

Global Panel

Neal Elliott	Neal Elliott coordinates ACEEE's overall research efforts and leads the Agricultural program. He is an internationally recognized expert and author on energy efficiency, energy efficiency programs and policies, electric motor systems, combined heat and power (CHP) and clean distributed energy, and analysis of energy efficiency and energy markets, plus a frequent speaker at domestic and international conferences. He joined ACEEE in 1993. Prior to joining ACEEE, Neal was an adjunct associate professor of civil and environmental engineering at Duke University and senior engineering project manager at the N.C. Alternative Energy Corp. (now Advanced Energy) where he was founding director of the Industrial Energy Laboratory.
Paul Scheihing	Paul Scheihing is a technology manager within the Energy Department's Advanced Manufacturing Office (AMO) and a recognized expert in industrial energy management. In 2013, the American Council for an Energy-Efficient Economy recognized him with a Champion of Energy Efficiency in Industry Award for "leadership in implementation of industrial energy efficiency, and a career of advocating for energy efficiency within government and industry
Jigar Shah	Jigar Shah is the President and Co-Founder of Generate Capital. Jigar founded SunEdison (NASDAQ: SUNE), where serving as it first CEO where he pioneered "no money down solar" and unlocked a multi-billion-dollar solar market, creating the largest solar services company worldwide. He is the author of Creating Climate Wealth: Unlocking the Impact Economy. After SunEdison, Jigar served as the founding CEO of the Carbon War Room, a global non-profit founded by Sir Richard Branson and Virgin Unite to help entrepreneurs address climate change.
Amit Bando	Amit Bando works on corporate change management issues in Asia, Europe and the Americas designing, financing and implementing market-based, clean energy and urban infrastructure development programs; in the past 5 years alone he has programmed over \$18 billion worldwide. In the U.S., he has helped design the SO2 emissions trading program and the trading framework for the Chicago Climate Exchange (CCX) while also preparing position papers on climate change mitigation. In addition to serving as the Executive Director of the International Partnership for Energy Efficiency Cooperation (IPEEC) where he coordinated sector-specific energy efficiency policies, regulations and standards to promote financing of clean energy initiatives in G-20 member nations, Mr. Bando has served as a Senior Policy Scientist at the U.S. Department of Energy. He has taught at the Universities of Paris, Minnesota, Illinois and Chicago as well as at New Mexico State University.

Appendix IV: Program Expert Panel Assessments – Disaggregated

Indonesia



Vietnam

