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# Biodiversity mainstreaming in Global Environmental Facility projects

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A review of current practice

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## Summary

Biodiversity mainstreaming is a multi-layered and dynamic concept with many definitions that have evolved over time, but the overall goal can be synthesised as better non-biodiversity-focused decision making which serves to improve outcomes for biodiversity itself. This is the second of two reports commissioned by the Scientific and Technical Advisory Panel (STAP) of the Global Environment Facility (GEF) that seek to explore the current status of mainstreaming biodiversity into production sectors — in theory and in practice.

In recent years, theories of change (ToCs) have increasingly been recognised as valuable tools for project design, adaptive management and evaluation of impacts. This report reviews a sample of GEF-funded biodiversity mainstreaming projects, with a view to answering the following questions: (1) What ToCs have been developed for biodiversity mainstreaming and what ToCs for key recognised pathways for mainstreaming have been developed? (2) Are there typologies for ordering and understanding the wide variety of entry points, pathways and approaches for biodiversity mainstreaming? (3) Are there positive examples of how co-benefits and trade-offs have been explicitly addressed, managed, accounted for or monitored, or emerging approaches or suggestions for doing this? (4) Are there indications regarding the success of particular causal pathways?

The lack of consistent features across the projects did not allow for categorisation into clear causal pathways or into other typologies of mainstreaming. And while there was a high level of correspondence with the GEF Portfolio ToC and its four high-level pathways, few projects fitted clearly into one pathway.

The report concludes that there is no 'one size fits all' approach to mainstreaming, and this context- and problem-specificity means that there is also no singular theory of change that can be applied to mainstreaming projects. However, the limited experience of developing ToCs within the existing portfolio of mainstreaming projects does seem to imply that even if there is no generic approach, the process of thinking through the ToC has helped some projects better articulate their mainstreaming goals, recognise where additional effort and intervention might be needed, and better understand the process by which mainstreaming occurs.

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## Introduction

This report is the second of two that were commissioned from IIED by the Scientific and Technical Advisory Panel (STAP) of the Global Environment Facility (GEF). The reports seek to explore the current status of mainstreaming biodiversity into production sectors — in theory and in practice. The first report reviewed a number of key concepts of biodiversity mainstreaming and then, through a literature review, explored the following questions:

1. What theories of change for biodiversity mainstreaming have been developed for biodiversity mainstreaming, either generally or in specific sectors/contexts? What theories of change for key recognised pathways for mainstreaming have been developed (eg biodiversity-friendly production systems, biodiversity offsets, accounting and valuation of biodiversity and ecosystem services, spatial/land use planning, PES schemes, reforming policy/regulatory/planning frameworks)?
2. Are there typologies for ordering and understanding the wide variety of entry points, pathways and approaches for biodiversity mainstreaming, either generally or in specific sectors/contexts?
3. Are there positive examples of how co-benefits and trade-offs have been explicitly addressed, managed, accounted for or monitored, or emerging approaches or suggestions for doing this?
4. Are there indications regarding the success of particular causal pathways?

In this report, we review a sample of GEF-funded mainstreaming projects. In a previous GEF mainstreaming review in 2014, Huntley and Redford identified 327 mainstreaming projects financed by the GEF at a total cost of US\$1.6 billion (grants only, co-financing sums not reported). By 2018, the number had risen to 471 projects totalling \$2.34 billion in grants and \$12.73 billion in co-financing, as reported by the GEF Independent Evaluation Office (IEO) in 2019. Of these, many are still only in the early stages of implementation (or just in early stages), so it is not yet possible to determine their impact or effectiveness. Nevertheless, the growth of the portfolio indicates that this is an opportune time to take stock of some lessons learned.

The review is based on set of 21 projects from the GEF mainstreaming portfolio, selected by the GEF Secretariat and STAP as being illustrative of a typical mainstreaming project. Details of the projects are provided in the Annex.

# Theories of change supporting biodiversity mainstreaming in GEF projects

In the past five years, theories of change (ToCs) have been increasingly recognised as valuable tools for project design, adaptive management and evaluation of impacts (eg Valters, 2015).

The GEF has developed a ToC for its mainstreaming portfolio (Figure 1). The GEF ToC identifies four high-level pathways for mainstreaming (summarily described in the outputs section of the ToC diagram):

1. Spatial and land use plans
2. Sustainable production systems that are biodiversity-friendly, PES, offsets and financial mechanisms
3. Valuation of (and accounting for) biodiversity and ecosystem services
4. Policy, regulatory and planning frameworks that govern management of landscapes and seascapes



Figure 1: GEF portfolio-level theory of change (Source: [GEF Secretariat \(2016\) Biodiversity Mainstreaming in Practice: A Review of GEF Experience. GEF](#). © Global Environment Facility)

A recent GEF Independent Evaluation Office report notes that “[t]he GEF’s theory of change for mainstreaming biodiversity is validated by the empirical experience of projects and provides a sound conceptual basis for their design and evaluation”. But it also notes that it has “not been systematically applied in project implementation” (GEF IEO 2019). It recognises that the portfolio-level ToC could be used as a reference, but that project-specific ToCs would require incorporation of complex contextual conditions and dynamic feedback loops. From sixth replenishment of GEF (GEF-6) some Implementing Agencies such as UNDP and UNEP made it mandatory to include a ToC in PIFs and ProDocs (ie in the design stage). There was, however, no prescriptive format required and so there can be huge variability between projects. Furthermore, not all implementing agencies require a ToC and so there is no standard model across the portfolio.

Our review of projects found that most did not have an explicit ToC. Some projects have an *implied* ToC in the narrative description of the project strategy, risks and assumptions, but do not explicitly use the term or a graphic. In some cases, there might be ProDoc sections which reflect a process of the project designers considering alternative interventions before deciding on the project’s proposed approach as most suitable within the context. The Guyana Gold Mining (GEF ID 5846) ProDoc, for example, weighed up different approaches to the problem of the mining industry contributing to deforestation and forest degradation and associated biodiversity loss, and indicated that it was most strategic to focus enforcement and capacity-building efforts on small and medium-scale miners, thus implying some kind of logic assessment or ToC process had been undertaken.

Seven of the 21 projects reviewed had developed an explicit ToC at some point during the project process. Four of these included a ToC within (or alongside) their PIF or ProDoc; one designed a ToC at the inception stage (and updated it at mid-point); one developed a ToC after its mid-term review (MTR) and another developed it at mid-point, but not due to the MTR. A further two projects have been evaluated using a ToC approach, although the projects themselves do not have an explicit ToC. These are summarised in Table 1.

Table 1: GEF projects reviewed with an explicit ToC

Project	GEF ID	Stage at which ToC developed
Mainstreaming biodiversity into mountain agricultural and pastoral landscapes of relevant ecosystems in Eastern Cuba (Eastern Cuba Project)	10400	Within (or alongside) PIF or ProDoc
Conserving Biodiversity through Sustainable Management in Production Landscapes in Costa Rica	9416	Within (or alongside) PIF or ProDoc
Incorporating Multiple Environmental Considerations and their Economic Implications into the Management of Landscapes Forests and Production Sectors in Cuba (Cuba Landscapes and Forests Project)	9429	Within (or alongside) PIF or ProDoc
Amazon Sustainable Landscapes Program (many child projects include mainstreaming)	9272	Within (or alongside) PIF or ProDoc
Unlocking Biodiversity Benefits through Development Finance in Critical Catchments (South Africa Water Security project)	9073	Designed at the inception stage and updated at mid-point
Biodiversity and Land Use project, South Africa	5058	Develop at mid-point
Mainstreaming Biodiversity Information into the Heart of Government Decision Making (CONNECT Project)	5730	Developed after MTR
Cape Action for People and the Environment (CAPE) Biodiversity Conservation and Sustainable Development Project, South Africa (GEF ID 1516)	1516	An evaluation of the project used a ToC approach but the project itself does not have one

Project	GEF ID	Stage at which ToC developed
Mainstreaming Biodiversity Management into Production Sector Activities, Seychelles	1620	An evaluation of the project used a ToC approach but the project itself does not have one

The majority of the projects reviewed (13 out of 21) could be situated within the GEF Portfolio ToC — ie their causal pathways, whether explicit or implied, correspond to at least one of the GEF high-level pathways (see summary table in the Annex for details of which projects correspond to which pathways).

In December 2019, a Primer on Theory of Change was released by GEF STAP setting out key steps for developing a ToC (Box 1). Active use of the primer (for all projects, not only biodiversity mainstreaming) should help improve the quality and consistency of ToC's over the whole portfolio.

### Box 1: Clear steps in the ToC for a GEF project

Before: Be clear on the purpose(s) of the ToC, the purpose of the intervention, who is involved, etc

Set up potential impact pathways:

1. Confirm problem and goal
2. Work backwards from goal through outcomes to outputs
3. Define causal pathways and assumptions
4. Explore barriers and enablers
5. Check evidence, adequacy and plausibility
6. Define activities and complements

Monitor, review and summarise

7. Identify what to monitor for evaluation and learning (MEL)
8. Summarise and explain your theory of change

After: Review ToC quality, develop other representations, consider iteration/revision at inception and ongoing basis

Source: GEF STAP (2019: 15-18)

In the remainder of this section, we explore the ToCs for the seven projects that have explicitly articulated them. We initially sought to introduce these according to the high-level pathway they correspond to in the GEF ToC. However, most of these projects have adopted multiple pathways, and so instead we discuss them project by project and describe — where possible — what causal pathways are employed and how these correspond or not to the GEF's four high-level pathways and to an additional pathway — biodiversity information provision — identified in the literature review discussed in the first report. We then identify any additional causal pathways that are project-specific.

## Eastern Cuba Project

The ‘Mainstreaming biodiversity into mountain agricultural and pastoral landscapes of relevant ecosystems in Eastern Cuba Project’, or Eastern Cuba Project (GEF ID 10400), is the only project in the sample which uses the term ‘causal impact pathways’ (Figure 2). The impact pathways involved in the project are defined as:

- **Impact Pathway 1:** Implementation of integrated management of mountain and pre-mountain landscapes
- **Impact Pathway 2:** Strengthening governance, the policy framework and capacity building
- **Impact Pathway 3:** Strengthening sustainable value chains

The terminology used does not correspond well to the high-level pathways in GEF portfolio ToC but the description of the some of the pathways does. For example, Impact Pathway 1 clearly aligns with the GEF output on sustainable, biodiversity-friendly production systems, while Pathway 3 aligns with the valuation pathway. A weakness is that there is no clarity on what ‘pathway’ leads to what outcomes. Furthermore, the pathways are not further disaggregated with more detail about interventions and which ones contribute to the various outcomes, or with risks and assumptions. The project is, however, at a very early stage and may update its ToC at mid-term, as other recent projects have done.

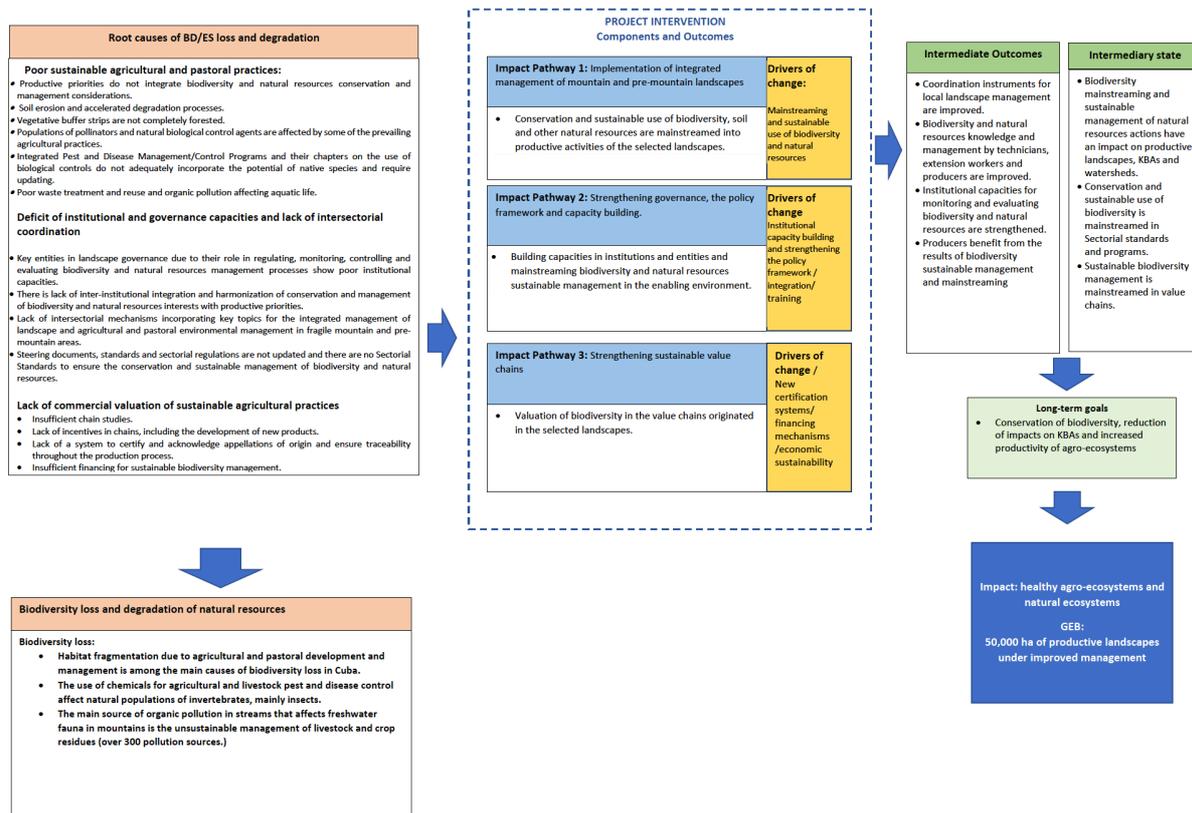


Figure 2: Impact pathways identified in the Eastern Cuba Project (Source: [FAO \(2015\) Project document for mainstreaming biodiversity into mountain agricultural and pastoral landscapes of relevant ecosystems in Eastern Cuba: Theory of Change PIF Cuba](#). © Global Environment Facility)

## Amazon Landscapes Programme

The World Bank (with UNDP and WWF) Amazon Landscapes Programme (GEF ID 9272) provides an example of a ToC which was developed for a large, comprehensive programme on which individual ‘child projects’ were built (Figure 3). The programme ToC is different from the GEF portfolio ToC in that it incorporates protected areas, regional cooperation and mutual learning, none of which is explicitly mentioned within the GEF ToC. It does, however, include a strong focus on spatial and land use planning (GEF Output 1) as well as biodiversity-friendly production systems (GEF Output 2) and policy and regulatory reform (Output 4).

The programme ToC suggests that ‘if’ a number of project outputs are delivered, ‘then’ the overall programme objective will be attained. It notes that, in the context of the specific root causes and threats (ie deforestation and degradation of the Amazon), there are four key barriers to action:

- Ineffective management of protected areas
- Poor management of competing land uses
- Inappropriate policies for protected and productive landscapes
- Lack of capacity building and regional cooperation.

The four components of the programme are designed to address each of these barriers. These entail the following:

- **Component 1:** Integrated Amazon Protected Area — this component is intended to increase conservation and protection of biodiversity through the implementation of ARPA-like initiatives, which are initiatives for protected areas creation, improved management and sustainable financing at the system-wide level.
- **Component 2:** Integrated Landscape Management — this component aims to contribute to climate change resilience and enhance sustainable land use by improving forest and land management and reducing carbon emissions from deforestation in the respective child-project areas.
- **Component 3:** Policies for Protected and Productive Landscapes — this component is intended to incorporate conservation and sustainable use of biodiversity principles and biodiversity management principles into selected government sectors that are drivers of deforestation (ie agriculture, extractive industries and infrastructure) through sectoral agreements and/or instruments.
- **Component 4:** Capacity Building and Regional Cooperation — this component is designed to complement the national projects and provide opportunities for South-South learning, foster intergovernmental cooperation, use M&E tools and geospatial services, apply best practices and peer review and develop portfolio-wide training and communication strategies.

Program Objective: To protect globally significant biodiversity and implement policies to foster sustainable land use and restoration of native vegetation cover.

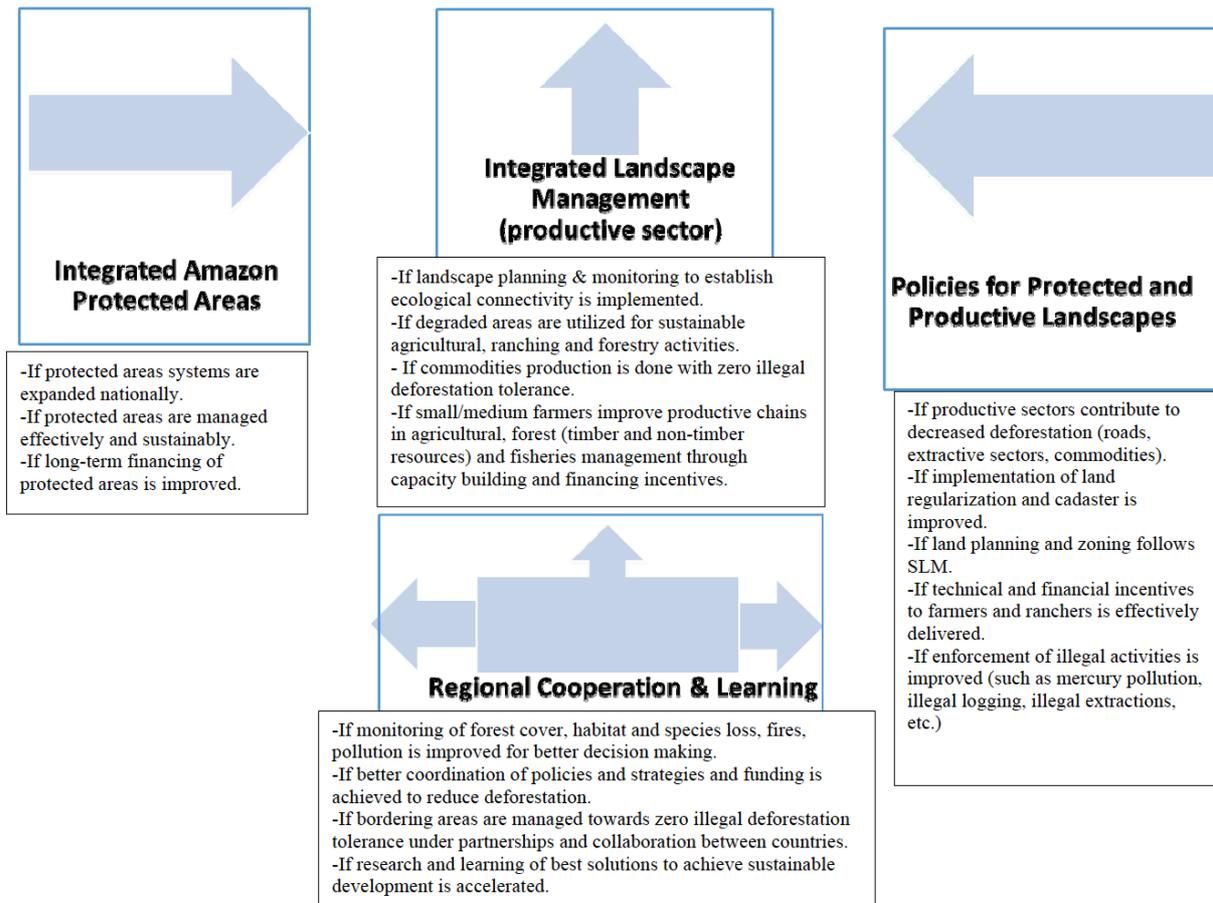


Figure 3: ToC for the Amazon Landscapes Programme (Source: [World Bank \(2015\) Project Document for Incorporating Multiple Environmental Considerations and their Economic Implications into the Management of Landscapes Forests and Production Sectors in Cuba: GEF-6 Program Framework Document](#). GEF, Washington D.C. © Global Environment Facility)

The causal pathways adopted by the project for the mainstreaming elements (Components 2–4) are detailed in Table 2. The project’s sustainable production systems pathway incorporates spatial planning (GEF Output 1) as well as biodiversity-friendly production systems (GEF Output 2). The policy and regulatory reform pathway corresponds to GEF Output 4. The project also adopts a strong capacity development pathway, corresponding to one of the critical inputs in the GEF ToC rather than an output.

The ToC is described at the programme level and it is recognised that for each country there will be context specificity and more nuanced actions that reflect this specificity. The different contexts relate to different drivers of deforestation but also to differences in shortcomings of the policy frameworks to support sustainable development in various sectors and value ecosystem services, weak governance of some institutions and governmental entities to establish and enforce legislation for nature conservation and other sustainable development policies, and lack of appropriate land use planning.

Table 2: Detail related to causal pathways extracted from the ToC from Components 2–4 of the Amazon Landscapes Programme (9272)

Context	If		Then			
<b>Pathway 1: Sustainable Production Systems</b>						
<i>Specific root causes and threats</i>	<i>Barriers &gt;</i>	<i>Interventions to address barriers (outputs) &gt;</i>	<i>Assuming &gt;</i>	<i>Outcomes &gt;</i>	<i>Indicators of success &gt;</i>	<i>Impacts</i>
Deforestation and degradation of the Amazon Biome	Poor management of competing land uses	Varies by country	Varies by country	Innovative mechanisms to reduce the loss and promote sustainable management of native forests  Integrated management practices and restoration plans to maintain forest ecosystem services	Number of hectares with use capabilities defined to facilitate the application of sustainable integrated natural resource management and production practice  Number of hectares of areas of forest or other ecosystems of high environmental/biological sensitivity and/or connectivity identified for special management measures	Global environmental benefits (GEBs) delivered
<b>Pathway 2: Policy and Regulatory Framework Reform</b>						
<i>Specific root causes and threats</i>	<i>Barriers &gt;</i>	<i>Interventions to address barriers (outputs) &gt;</i>	<i>Assuming &gt;</i>	<i>Outcomes &gt;</i>	<i>Indicators of success &gt;</i>	<i>Impacts</i>
	Inappropriate policies for protected and productive landscapes	Varies by country	Varies by country	Sector policies and regulations are increasingly favourable for the reduction of deforestation through an integrated landscape- and sector-based approach	Number of hectares of forest under restoration  Deployment of low GHG practices	GEBs delivered
<b>Pathway 3: Capacity development</b>						
<i>Specific root causes and threats</i>	<i>Barriers &gt;</i>	<i>Interventions to address barriers (outputs) &gt;</i>	<i>Assuming &gt;</i>	<i>Outcomes &gt;</i>	<i>Indicators of success &gt;</i>	<i>Impacts</i>
	Lack of capacity building and regional cooperation	Varies by country	Varies by country	Improved national and regional inter-agency coordination on efforts to maintain forest resources and protect biodiversity	Increased uptake of lessons and cutting-edge knowledge,  Improved capacity of key stakeholders to maintain forest resources and protect biodiversity Program monitoring system successfully developed and supporting implementation of child projects	GEBs delivered

## Landscapes, Forests and Production Sectors in Cuba

The Landscapes Forests and Production Sectors in Cuba project (GEF ID 9429) provides an example of a ToC covering a number of production-sector interventions in a single landscape (Figure 4). The overall project objective is to promote the generation of multiple environmental benefits based on an integrated economic valuation of ecosystem goods and services, as a tool for decision making at different levels.

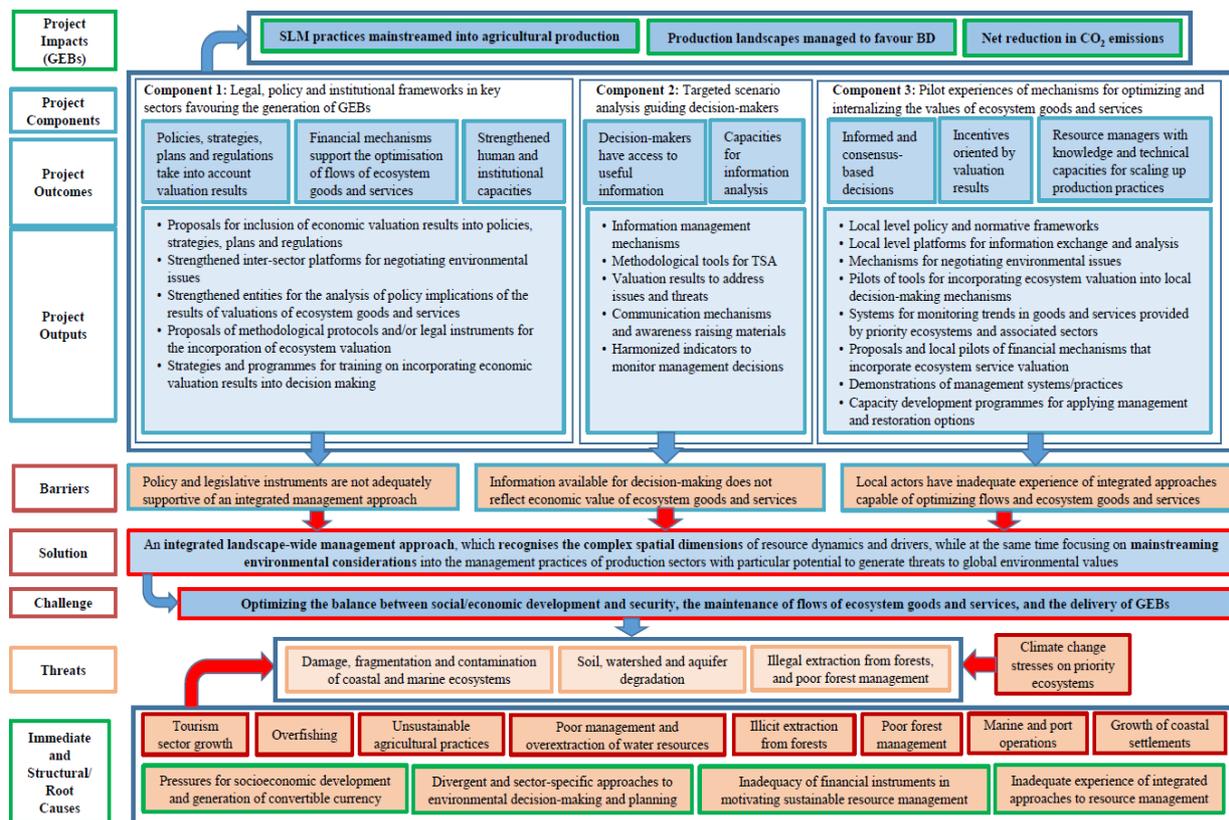


Figure 4: ToC for the Cuba Landscapes Forest and Production Sectors Project (Source: [UNDP \(2018b\) Project Document for Incorporating Multiple Environmental Considerations and their Economic Implications into the Management of Landscapes, Forests and Production Sectors in Cuba](#). © UNDP)

The ToC suggests that, in the *context* of the growth of tourism, overfishing, and unsustainable agricultural practices, there are three key *barriers* to action:

1. Policy and legislative instruments are not adequately supportive of an integrated management approach
2. Policymakers, planners and other decision makers only have access to qualitative information that does not reflect the economic value of ecosystem goods and services
3. Local actors have inadequate experience of integrated approaches capable of optimising flows and ecosystem goods and services.

These barriers are addressed by three key interventions:

1. Development of supportive legal, institutional and policy frameworks in key sectors for the generation of global environmental benefits
2. Targeted scenario analysis guiding decision makers on the implications of different courses of action in the target sectors that could affect natural resources and global environmental values

3. Pilot experiences generating, validating and demonstrating mechanisms for the optimisation and internalisation of values of ecosystem goods and services in the target sectors and associated landscapes

The causal pathways pursued focus on legal, policy and institutional frameworks, valuation and improved access to information, corresponding well to the GEF ToC and to the information pathway identified in the literature review. Table 3 provides further details. As with many of the projects reviewed, without more contextual information it is not possible to determine if the assumptions and assertions are correct and thus whether the approach adopted will serve to deliver the anticipated outcomes.

Table 3: Detail related to pathways extracted from the ToC for the Cuba Landscapes, Forests and Production Sectors Project (ID 9429)

<b>Context</b>		<b>If</b>		<b>Then</b>		
<b>Pathway 1: Policy and Regulatory Reform (plus financial instruments and capacity development)</b>						
<i>Specific root causes and threats</i>	<i>Barriers &gt;</i>	<i>Interventions to address barriers (outputs) &gt;</i>	<i>Assuming &gt;</i>	<i>Outcomes &gt;</i>	<i>Indicators of success &gt;</i>	<i>Impacts</i>
Growth of tourism Overfishing Unsustainable forms of agricultural production Poor management and over-extraction of water resources Poor forest management, forest Climate change	Policy and legislative instruments are not adequately supportive of an integrated management approach	Proposals to integrate economic value Inter-sectoral platforms Capacity development on valuation	Economic conditions determining the funding of economic instruments remain favourable  Policy environment remains supportive of application of economic instruments based on the results of economic valuation of ecosystem goods and services	Policies, strategies, plans, etc take into account valuation results  Financial mechanisms support the optimisation of flows  Strengthened human and institutional capacity		GEBs delivered via integrated economic valuation of ecosystem goods and services, as a tool for decision making at different levels
<b>Pathway 2: Information</b>						
<i>Specific root causes and threats</i>	<i>Barriers &gt;</i>	<i>Interventions to address barriers (outputs) &gt;</i>	<i>Assuming &gt;</i>	<i>Outcomes &gt;</i>	<i>Indicators of success &gt;</i>	<i>Impacts</i>
	Policymakers, planners and other decision makers only have access to qualitative information that does not reflect the economic value of ecosystem goods and services	Mechanisms for the management of and access to information Methodological tools in support of Targeted Scenario Analysis (TSA) Economic valuations to address priority issues and threats in the target sectors Communication mechanisms and awareness raising materials	Policy environment remains supportive of the application of economic instruments based on the results of economic valuation of ecosystem goods and services	Decision makers have access to useful and relevant information allowing policy formulation and decision making that optimises the generation of global environmental benefits in the target sectors	Level of access to useful and relevant information	

<b>Context</b>	<b>If</b>		<b>Then</b>			
<b>Pathway 3: Valuation (plus capacity development)</b>						
<i>Specific root causes and threats</i>	<i>Barriers &gt;</i>	<i>Interventions to address barriers (outputs) &gt;</i>	<i>Assuming &gt;</i>	<i>Outcomes &gt;</i>	<i>Indicators of success &gt;</i>	<i>Impacts</i>
	Local actors have inadequate experience of integrated approaches capable of optimising flows and ecosystem goods and services	Local-level platforms for information exchange and analysis  Strengthened local mechanisms for negotiation of environmental issues and conflicts  Pilots of methodological tools ecosystem valuation  Proposals of financial instruments  Demonstrations of new/improved management practices  Capacity development programmes	Target areas are not affected by extreme natural phenomena during the project period  Economic conditions determining the economic viability of production and resource management systems remain favourable	Informed, consensus-based decisions  Financial incentive schemes  Production systems and conservation areas in target localities with improved management and protection	Degree to which the results of valuations are reflected in decisions with environmental implications	

## Costa Rica Production Landscapes project

Like the Cuba Landscapes Project, the Costa Rica Production Landscapes project (GEF ID 9416) articulates a set of key threats — in this case, the expansion of unsustainable agricultural practices, especially cattle ranching and cash crops — and the barriers to addressing these, which it identifies as:

1. Ineffective use of environmental information to enforce environmental regulations and promote sustainable practices
2. Lack of collaboration between public, private and civil society sectors to address drivers of habitat loss
3. Lack of a mechanism to share best practices and lessons learned on biodiversity conservation, and sustainable forest and land management.

The project is a very specific sub-set of the global challenges addressed by the GEF portfolio ToC, and hence is quite specific to the circumstances.

The ToC diagram (Figure 5) is complex and does not highlight clear causal pathways from input to impact, but overall, it maps onto the GEF high-level pathways of sustainable production system and policy and regulatory reform. It also uses capacity development as a key mechanism to drive these two pathways, similar to the Amazon Landscapes Programme. Table 4 provides more detail on each of the pathways.

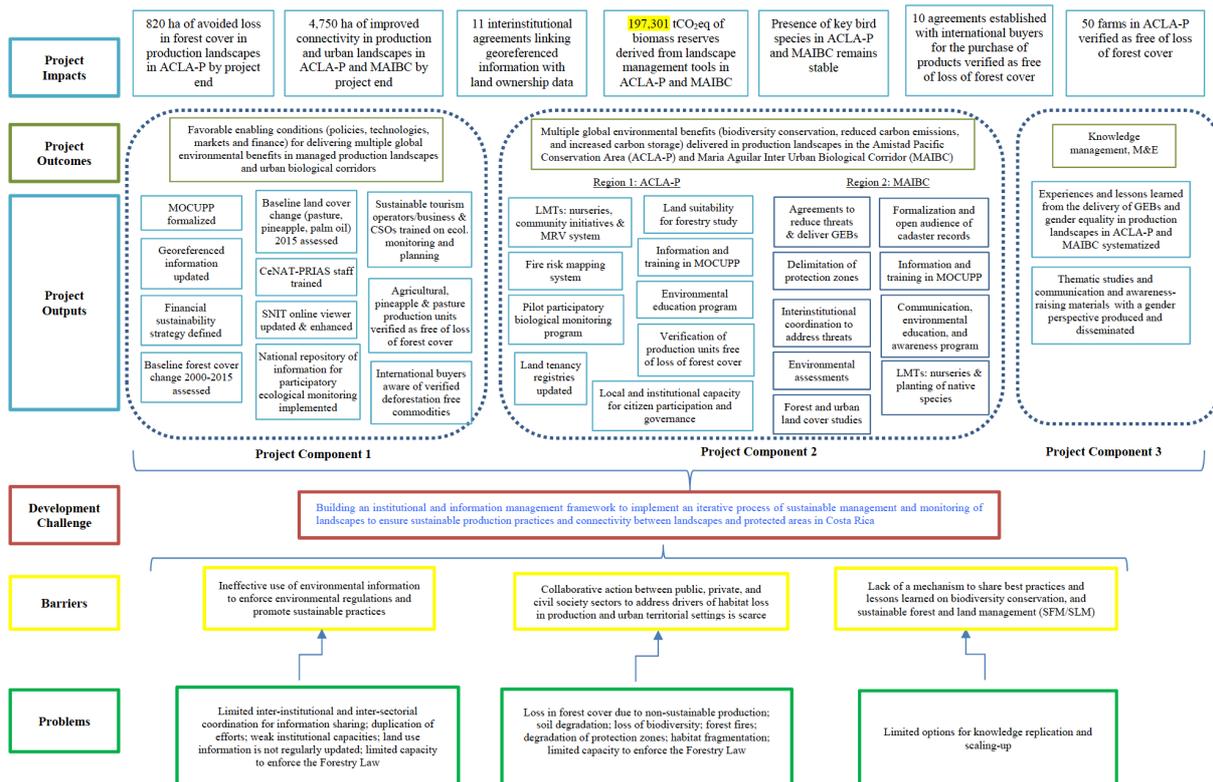


Figure 2. Theory of Change

Figure 5: ToC for the Costa Rica Landscapes Project (Source: UNDP (2018a) [Project document for Conserving Biodiversity through Sustainable Management in Production Landscapes in Costa Rica](#). GEF, Washington D.C. © Global Environment Facility).

Table 4: Detail related to pathways extracted from the ToC of the Costa Rica Landscapes Project (9416)

Context		Then				
<b>Pathway 1: Regulatory reform (plus sustainable production practices and information)</b>						
<i>Specific root causes and threats</i>	<i>Barriers &gt;</i>	<i>Interventions to address barriers (outputs) &gt;</i>	<i>Assuming &gt;</i>	<i>Outcomes &gt;</i>	<i>Indicators of success &gt;</i>	<i>Impacts</i>
Expansion of unsustainable agricultural practices, especially cattle ranching and cash crops  Uncontrolled urban growth and land use change  Forest fires  Loss of forest cover and degradation of forests and mangroves due to conventional production practices	Ineffective use of environmental information to enforce regulations and promote sustainable practices	Formalisation of relevant institutions to monitor forest cover change and land degradation within agricultural and inter-urban landscapes  Formal agreed data provision protocols  Financial strategy development  (7 more interventions are identified, 10 in total in this component)	Willingness of stakeholders to incorporate environmental objectives in production landscapes  Willingness by international buyers to enter into business agreements	Favourable enabling conditions (policies, technologies, markets and finance) for delivering multiple global environmental benefits in managed production landscapes and urban biological corridors	Intersectoral agreements formalised  Agreements established with international buyers for deforestation-free products	GEBs delivered via 820 ha of avoided loss in forest cover in production landscapes and 4,750 ha of improved connectivity in production and urban landscapes
<b>Pathway 2: Sustainable production systems</b>						
<i>Specific root causes and threats</i>	<i>Barriers &gt;</i>	<i>Interventions to address barriers (outputs) &gt;</i>	<i>Assuming &gt;</i>	<i>Outcomes &gt;</i>	<i>Indicators of success &gt;</i>	<i>Impacts</i>
	Collaborative action between public, private, and civil society sectors to address drivers of habitat	Many, including:  Institutional strengthening  Tree nurseries  Community enterprises	There are no substantive changes in land use/cover  Verification process is optimal	Many, including:  Connectivity and conservation between production landscapes and PAs increased over 700 ha of	Increase in biomass reserves (tCO <sub>2</sub> eq)  Reduction in CO <sub>2</sub> e emissions in prioritised farms	GEBs delivered

Context	If	Then
	loss in production and urban territorial settings is scarce Monitoring Risk Mapping to prevent forest fires Information exchange platform Land tenancy registries Land suitability for forestry study for public lands Environmental education Joint municipal action plans Demarcation of Protected Areas Protocols for waste disposal and illegal construction	Willingness of farmers to participate in the verification process micro corridors and 2,000 ha of silvopastoral systems Increase of forest cover and carbon storage within in the buffer zone farms Reduction in CO <sub>2</sub> emissions Improved presence of key bird species (820 ha of avoided loss in forest cover Change in annual income per initiative Presence of key bird species Number of farms verified as free of loss of forest cover Change in annual income per initiative

**Pathway 3: Improved access to information and capacity development**

<i>Specific root causes and threats</i>	<i>Barriers &gt;</i>	<i>Interventions to address barriers (outputs) &gt;</i>	<i>Assuming &gt;</i>	<i>Outcomes &gt;</i>	<i>Indicators of success &gt;</i>	<i>Impacts</i>
	Lack of a mechanism to share best practices and lessons learned	Experiences and lessons learned systematically collected in guideline documents and toolboxes. Thematic studies and other knowledge documented Communications and public awareness material produced	Wide and timely Dissemination Optimal sampling	Ten documents on successful experiences Improvements in indices about Knowledge, Attitudes, and Practices	Indicator 16: Number of documents Change in the indices of knowledge, attitudes, and practices (KAP)	GEBs delivered

## South Africa Water Security project

The South Africa Water Security project (GEF ID 9073) builds on very detailed previous studies and practical efforts which have examined different pathway options and tested them empirically.<sup>1</sup> This project has the most advanced example of a detailed ToC that was developed at the inception stage of the project (SANBI, 2016b) and then updated at mid-point as a living management tool (Rosenberg et al., 2020). The project has developed multiple ToCs for different components and sub-components reflecting the real-world, complex circumstances in which the project operates. Further, a consultative process has succeeded in bringing stakeholders together to co-create a robust project strategy that lends itself to updating as conditions dictate (Rosenberg et al., 2020).

The ToC for the overall project argues that historic policies in South Africa have resulted in an extremely unequal society with very significant rural and urban divides. This is manifested in unequal and limited supply of water (a recurring subject of social protest in South Africa). The specific root causes and threats within the scope of the whole project are:

- Institutional and regulatory flux
- Institutional fragmentation of responsibilities in the water value chain
- Under-capacitated institutions responsible for managing water resources and infrastructure, exacerbated by declining capacity and skills in the institutions
- Weak regulation, monitoring and enforcement
- Lack of integrated ecological and socioeconomic data
- Funds not being allocated to manage ecological infrastructure to maximise water outcomes
- Failure to integrate non-market services (ecological infrastructure and biodiversity) into the planning, design, financing and operations of water infrastructure (short, medium and long term)
- Failure to adequately include the costs of ecological infrastructure related catchment management into the Water Resource Management Charge
- Failure also speaks to the challenges of how decision makers make choices that factor ecological infrastructure into the management of water resources
- The failure to integrate consideration of the value of biodiversity and ecological infrastructure to water security is, however, not solely as a result of lack of information.

The barriers are:

- Weak institutional capacity, poor alignment and co-ordination between institutions along the water value chain
- Lack of sustainable financing for managing ecological infrastructure in catchments for water security outcomes
- Natural capital accounts related to catchments and ecosystems are not regularly produced and linked to socioeconomic information, and therefore do not support planning, policy and decision making and investments in favour of ecological infrastructure for water security.

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<sup>1</sup> Described in Manuel et al. (2016: 13): "The uMngeni Ecological Infrastructure Partnership (UEIP) ... resulted from a long and unplanned progression of other projects. It finds its origins in the concept of Payment for Ecosystem Services (PES). PES had proven to be an effective mechanism to raise finance for ecosystem restoration in other developing countries (eg Costa Rica; Gómez-Baggethun et al., 2010), and through its biodiversity mainstreaming projects, SANBI set up a number of pilot projects to test its effectiveness in South Africa. These PES projects focussed most often on water resources, as these have the most direct link between ecosystem health and ecosystem services. However, the pilot projects encountered a number of difficulties including buyers unwilling to enter into complex agreements to pay for services, regulatory issues, complicated supply chains and poor communication. Ultimately, the potential buyers of services were unwilling to enter into long-term payment contracts with an uncertain return on investment. In parallel, SANBI embarked on a series of dialogues aimed at improving the communication of the essential PES messages [described in Maze et al, 2016]. The concept of 'ecological infrastructure' was developed."

The interventions are as follows:

1. Enabling environment is strengthened for improving water security through the integration of biodiversity and ecosystem services in the water value chain
2. Application of policies and financial mechanisms in the water value chain improves water security in critical catchments.
3. Social learning, credible evidence, and knowledge management improves the integration of biodiversity and ecosystem services into the water value chain

Figure 6 shows the ToC for a sub-component of the project on natural capital accounting (NCA) and Figure 7 shows the ToC for the component on financial mechanisms. In both diagrams, the orange boxes represent outcomes, the yellow arrows are mechanisms and the blue boxes are contributions to the overall project vision. The red stars in Figure 7 represent tensions and contradictions.

Both components clearly correspond to the valuation pathway in the GEF ToC. They are interesting, though, in that they have a very strong focus on social learning as a key mechanism for change. Other GEF projects tend to have learning highlighted in a component (for example UNDP projects often have a knowledge management component) but not necessarily with the social learning approach throughout as a core element of the project, as it is in this case. Tables 5 and 6 provide more detail on the project pathways.

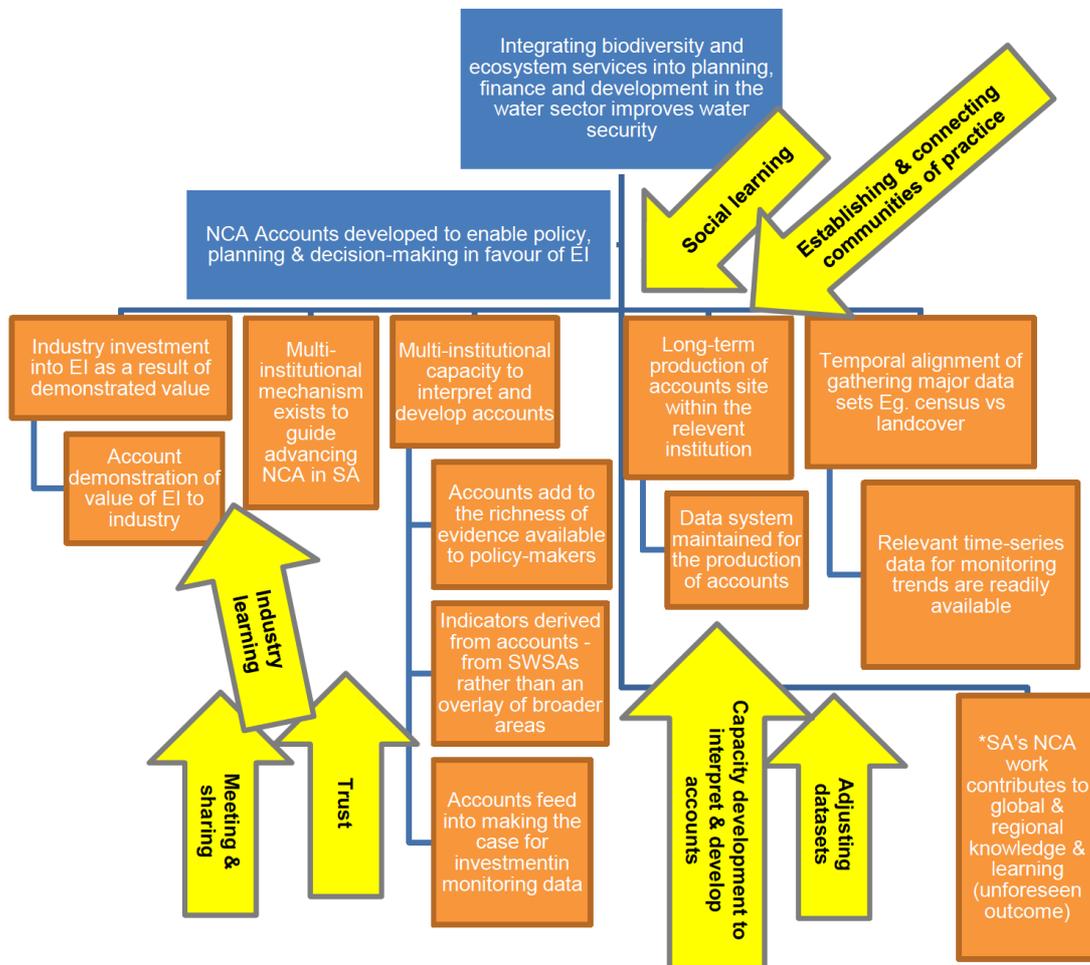


Figure 6: ToC for the South Africa Water Security project (GEF ID 9073) NCA component (Source: Rosenberg, E, Cockburn, J, Le Roux, L and Hiestermann, M (2020) Supporting Social Learning and Knowledge Management within the Ecological Infrastructure for Water Security Project: Theory of Change Report and Workshop. Water Research Commission, Pretoria. © Water Research Commission).



Figure 7: ToC for the South Africa Water Security project component on financial mechanisms (Source: Rosenberg, E, Cockburn, J, Le Roux, L and Hiestermann, M (2020) Supporting Social Learning and Knowledge Management within the Ecological Infrastructure for Water Security Project: Theory of Change Report and Workshop. Water Research Commission, Pretoria. © Water Research Commission).

Table 5: Detail related to pathways extracted from the ToC for the natural capital accounting component of the South Africa Water Security project (GEF ID 9073)

Context	If	Then				
<b>Pathway 1: Valuation</b>						
<i>Specific root causes and threats</i>	<i>Barriers &gt;</i>	<i>Interventions to address barriers (outputs) &gt;</i>	<i>Assuming &gt;</i>	<i>Outcomes &gt;</i>	<i>Indicators of success &gt;</i>	<i>Impacts</i>
Complex, relating to institutional, regulatory, planning, economic and social issues	Limited integration of biodiversity into national accounting systems	Natural capital accounts are developed and tested at national and catchment levels  Capacity and institutional  Strengthening to deliver national capital accounts	Relevant data available in time series to produce accounts	Natural capital accounts developed and informing policy, planning and decision making in favour of ecological infrastructure	Published national ecosystem accounts  Published catchment-level ecosystem accounts	GEBs delivered, as demonstrated by mainstreaming two water catchments

Table 6: Detail related to pathways extracted from the ToC for financial mechanisms component of the South Africa Water Security Project (9073)

Context	If	Then				
<b>Pathway 1: Valuation – financial mechanisms</b>						
<i>Specific root causes and threats</i>	<i>Barriers &gt;</i>	<i>Interventions to address barriers (outputs) &gt;</i>	<i>Assuming &gt;</i>	<i>Outcomes &gt;</i>	<i>Indicators of success &gt;</i>	<i>Impacts</i>
Failure to integrate ecological infrastructure and biodiversity into the planning, design, financing and operations of water infrastructure  Failure to adequately include the costs of ecological infrastructure into Water Resource Management Charge	Lack of sustainable financing for managing ecological infrastructure in catchments for water security outcomes	Incorporation of management ecological infrastructure into the cost of catchment management  Tools developed for the finance sector to strengthen assessment and management of environmental risk	Water Pricing Strategy approved and gazetted  Ability to retain funds raised through tariff realised at relevant institution level  CMAs willing to integrate management of ecological infrastructure into basis of costing.  Finance institutions willing and able to use tools	Downstream municipalities invest in catchment mgmt.  Banks use env risk to inform investment  Private sector invests in ecological infrastructure  Maintenance costs are built into grey infrastructure investments  CMAs prioritise ecological infrastructure	Completion of foundational work in catchments to enable operationalisation of ecological infrastructure components of the Water Pricing Strategy  Tool/method implemented to strengthen the assessment and management of environmental risk within investment decision making	GEBs delivered via integrating biodiversity and ecosystem services into planning, finance and development in the water sector, which improves water security and, in doing so, supports development and human wellbeing

## UNDP-GEF Biodiversity and Land Use project

The UNDP-GEF Biodiversity and Land Use project (GEF ID 5058) in South Africa has an ambitious mandate for mainstreaming across a number of landscapes and municipalities, five provinces and at the national level and in key sectors such as mining and agriculture through water scarcity, in a dynamic political landscape. The project did not develop an explicit ToC with a graphic at the design stage as it was (and is still not) a requirement, and at that time not necessarily common practice amongst project developers. At the mid-point of the project, however, it was clearly deemed to be beneficial to clarify the ToC in order to link the challenges that the project faced with the specific project outputs. These challenges included poor linkages between the different project components and poorly articulated connections between investment in biodiversity and improved human wellbeing outcomes (Kotschy et al., 2019). The development of the ToC in a participatory manner was significant in bringing project stakeholders together in a shared understanding of what the project was trying to achieve in a challenging context (Kotschy et al., 2019). It also brings some coherence to the discussion of when adaptive changes need to be made in response to changing external circumstances. What is arguably missing from this ToC is a demonstration of how the various levels — national, provincial, municipal and site-specific — interact together, given that the project works at so many scales.

The ToC suggests that the root causes of biodiversity loss are:

- High poverty, inequality and unemployment and a strong political imperative to address these
- Low awareness of the benefits of biodiversity for human wellbeing and sustainable development among decision makers
- Weak capacity for and coordination of land use regulation and management, with biodiversity poorly integrated into municipal land use planning and management
- The amount of critical biodiversity that is on privately or communally owned land where there is a weak stewardship ethic
- Biodiversity-unfriendly production processes and unsustainable use of natural resources.

It identifies two main barriers to action which it seeks to address: (1) weak capacity and poor coordination at the municipal scale, and (2) inadequate mechanisms and incentives to engage private and communal landowners in biodiversity-friendly land use practices. The interventions thus focus on regulatory reform and enforcement, as well as biodiversity-friendly production practices. A recent review (Kotschy et al., 2019: vi) found that “[t]he project design is sufficiently robust to be able to achieve the desired outcomes even under the increasingly fluid and uncertain political, social and governance context”.

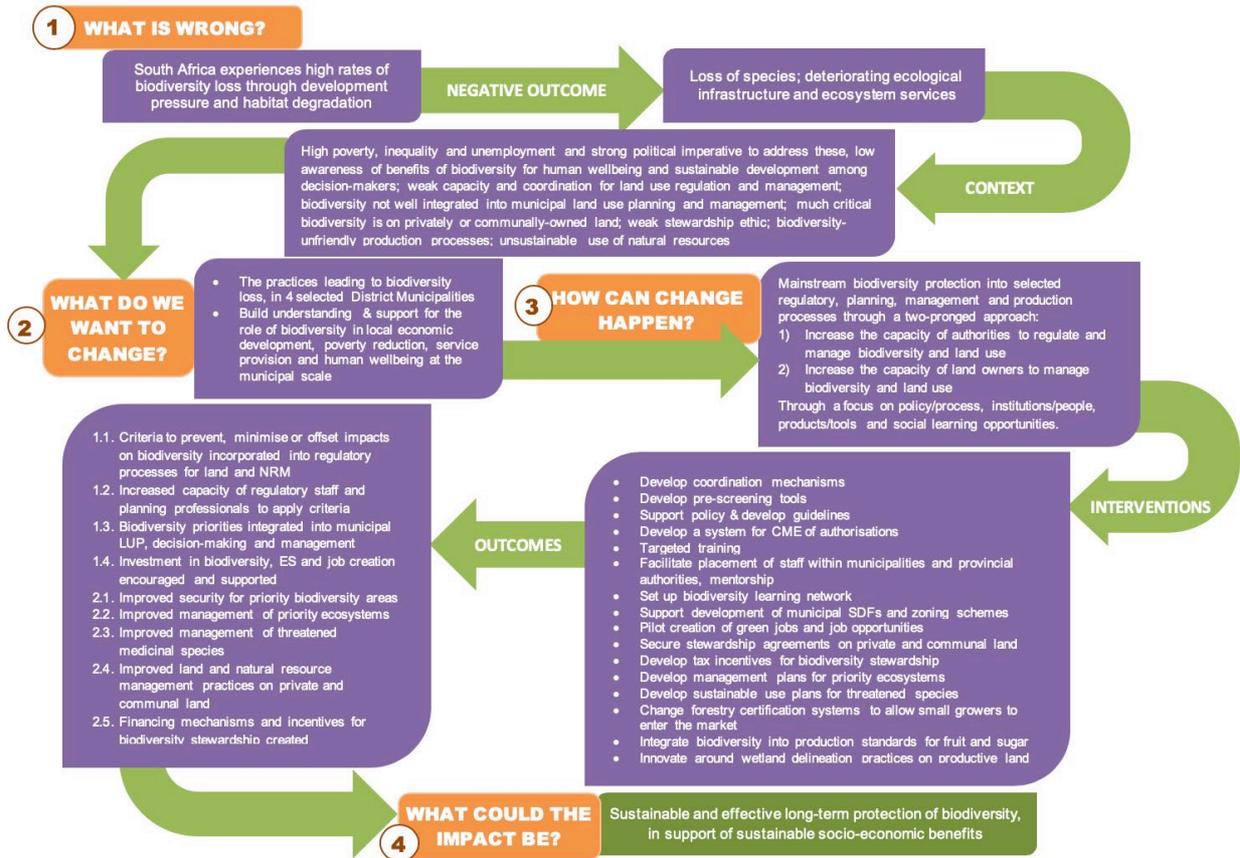


Figure 8: ToC for the UNDP-GEF Biodiversity and Land Use project, South Africa (Source: Kotschy, K., Bredin, IP, and Dickey, M (2019) A Theory of Change for the Biodiversity and Land Use Project. South African National Biodiversity Institute, Pretoria. © Institute of Natural Resources)

The high-level pathways evident in the ToC correspond to three of GEF’s global ToC pathways: sustainable production systems, valuation (in this case, with a particular focus on tax credits) and policy and regulatory frameworks. Details of the pathways are provided in Table 7.

Table 7: Detail related to pathways extracted from the ToC of the UNDP-GEF Biodiversity and Land Use project (5058)

Context	If	Then				
<b>Pathway 1: Policy and regulatory (and valuation – financial mechanisms)</b>						
<i>Specific root causes and threats</i>	<i>Barriers &gt;</i>	<i>Interventions to address barriers (outputs) &gt;</i>	<i>Assuming &gt;</i>	<i>Outcomes &gt;</i>	<i>Indicators of success &gt;</i>	<i>Impacts</i>
High poverty, inequality and unemployment Low awareness of biodiversity benefits Weak capacity for and coordination of land use regulation and management Biodiversity not well integrated into municipal land use planning and management	Weak capacity and poor coordination at the municipal scale	Many, including: Establishment of coordination mechanism for compliance monitoring Policy support provided and guidelines to ensure biodiversity priorities integrated into decision making Capacity development and training Biodiversity integrated into Protocols for Spatial Planning and Land Use Management Act Public sector funding mechanisms that increase resource allocation to biodiversity management are investigated and piloted and the case for them is made to national treasury	Willing champions are acceptable to all stakeholders Effective comms to make the case for biodiversity Institutional readiness to implement projects Mobilisation and participation in learning networks Good governance in place to minimise institutional risk	Improved (biodiversity-friendly) regulatory processes Improved capacity of staff of regulatory authorities to apply mitigation hierarchy Integration of biodiversity in municipal land use planning, management and decision making Enhanced financial mechanisms and incentives encouraging greater investment in biodiversity and ecosystem services and supporting job creation and sustainable economic development	Biodiversity criteria in regulatory processes Improved skills and knowledge of key personnel Biodiversity criteria in municipal land use planning frameworks At least one new funding mechanism in place, increasing resource allocation	GEBs delivered via mitigating multiple threats to biodiversity by increasing the capabilities of authorities and landowners to regulate land use and manage priority biodiversity at the municipal scale

**Pathway 2: Sustainable production systems**

<i>Specific root causes and threats</i>	<i>Barriers &gt;</i>	<i>Interventions to address barriers (outputs) &gt;</i>	<i>Assuming &gt;</i>	<i>Outcomes &gt;</i>	<i>Indicators of success &gt;</i>	<i>Impacts</i>
	Inadequate mechanisms in place to engage private and communal landowners in land use practices that protect critical biodiversity, and lack of incentives for private landowners to convert to biodiversity friendly land use practices	Many, including: Biodiversity management plans that include sustainable use and harvesting thresholds developed and tested Better land and natural resource management practices implemented by private and communal land Biodiversity considerations integrated into national or international codes of conduct/production standards/certification systems for the fruit, sugar and forestry sectors Innovative funding models piloted (including tax incentives) Capacity development	Project partners will work together effectively with one another and key stakeholders to meet objectives Willing champions of projects will be acceptable to all stakeholders Individual projects will be successful in 'making the case' for biodiversity	Improved security for biodiversity priority areas Biodiversity management plans that reflect appropriate norms and standards Pressure on biodiversity is reduced through better land and natural resource management practices implemented by private and communal landowners	New biodiversity stewardship agreements Biodiversity management plans Biodiversity considerations in production sector standards At least one funding mechanism or tax incentive in place for biodiversity stewardship	GEBs delivered

## CONNECT project

The UNEP-GEF Connect project (global plus three countries in Africa; GEF ID 5730) is focused on improving the availability and quality of biodiversity information and understanding the political economy of decision making in order to target that information at key development sectors. It takes an experimental hypothesis approach in a small number of carefully selected pilot countries to:

- Clearly understand the in-country demands for, and the barriers to using, biodiversity information within government decision making, including clarifying the format, timing and packaging required
- Mobilise and repackage existing biodiversity data and information from a range of sources (national and international) to meet a number of the above demands
- Strengthen the connection between government decision makers and biodiversity and ecosystem services data providers in order to sustainably provide policy-relevant, spatially explicit information to meet ongoing national needs.

The project components are explicitly designed around the ToC. Component 1 (Demand) is based on country-specific, cross-sectoral government information needs for decision making. Component 2 (Supply) involves each pilot country developing and trialling innovative mechanisms for re-packaging existing biodiversity information into the appropriate formats. Component 3 (Sustain) focuses on embedding and integrating biodiversity information into cross-sectoral government systems and processes now and into the future.

At the mid-term review (Brann, 2020), the evaluator recommended a number of improvements to the ToC to further reflect the complexity of engaging at national level. The evaluator emphasised the importance of focusing on those “impact drivers” which “*are within the ability of the project to influence*” (Brann, 2019: 37, quoting the GEF ‘Review of Outcomes to Impacts’ methodology handbook). The evaluator suggested an updated ToC for the project (Figure 9) and further recommended that each participating national partner should develop their own national-level ToCs that reflect any specific impact drivers and assumptions related to their own national context for biodiversity mainstreaming in their target sector (national-level ToCs were not available to review for this exercise).

The revised project-level ToC reflects well the guidance from the GEF-STAP ToC primer (GEF-STAP 2019), with specific links from barriers to specific outputs to outcomes, noting what needs to be achieved (ie potentially monitorable indicators of success, here called ‘impact drivers’) and recognising the boundary of the sphere of influence. Some explicit assumptions are provided which could be tested by the project (no details are available as to whether these assumptions have been tested).

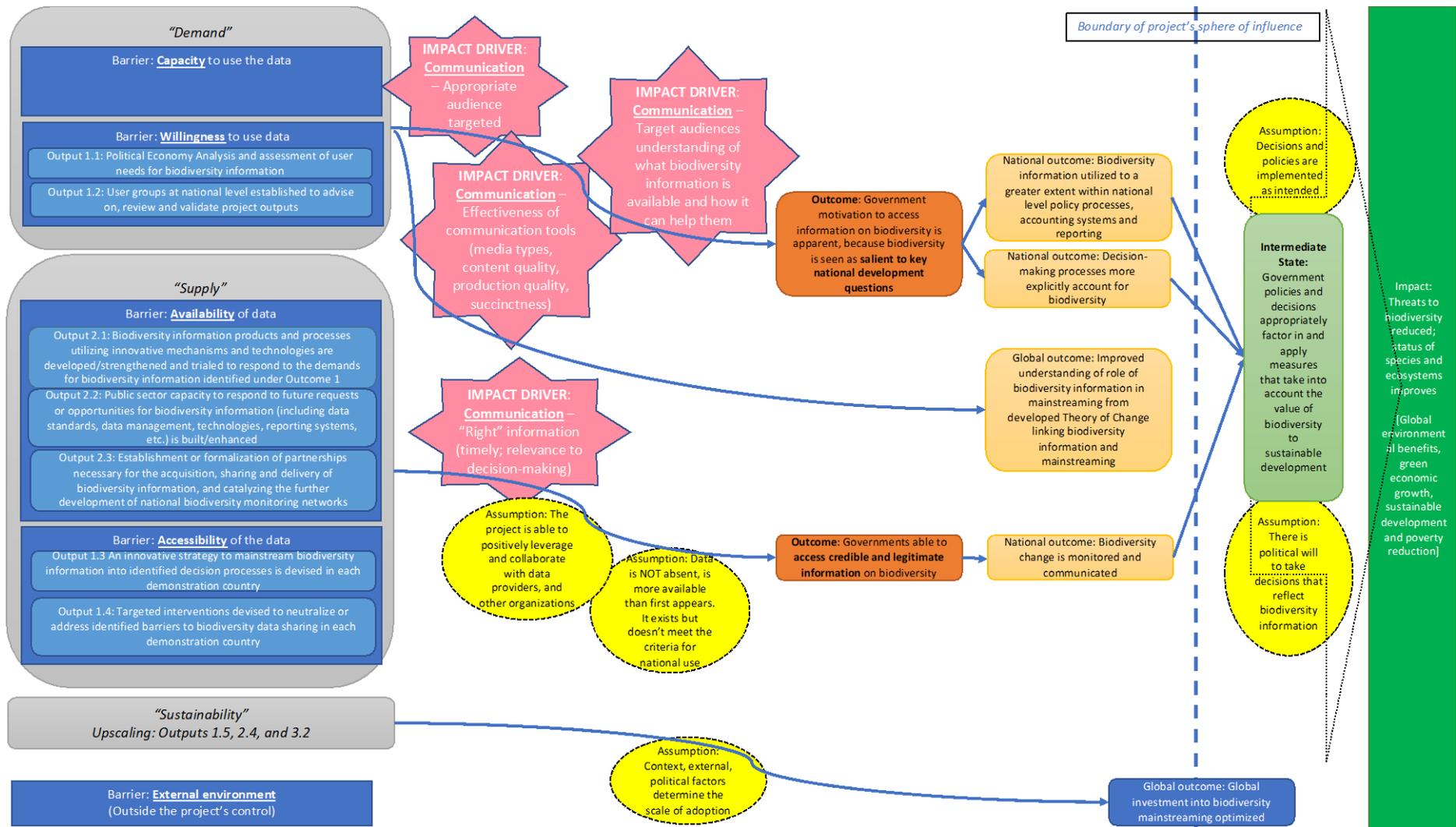


Figure 9: ToC for the UNEP-GEF Connect project (GEF ID 5730) (Source: Brann, J (2020) Mid-Term Review – Connect: Mainstreaming Biodiversity Information into the Heart of Government Decision Making. UNEP and UNEP-WCMC, Nairobi/Cambridge. © UN Environment Programme)

The *context* of the specific root causes and threats is global biodiversity loss and the recognition that achieving long-term sustainability will require fundamental change in the operation and management of several primary sectors of the global economy, including agriculture, forestry, fisheries, extractive industries, energy and water and sanitation.

The barriers are related to governments not being able to easily access relevant information about potential threats to, and changes in, biodiversity and the supply of ecosystem services. It is hypothesised that this information needs to be timely, of good enough quality and presented in an accessible way such that it can be used routinely within the decision-making process. The ProDoc identified five main types of barriers to the uptake of biodiversity information in sectoral decision making:

1. Barriers to do with ACCESS
  - a. Poorly targeted information initiatives
  - b. Limited understanding of how biodiversity information can help address the priorities of end users, and what biodiversity data are required for their decision-making processes
  - c. Lack of robust information sharing policies
2. Barriers around WILLINGNESS
  - a. Government ministries have competing priorities
  - b. Insufficient political will
  - c. Lack of inter-ministerial collaboration
3. Barriers around CAPACITY
  - a. High turnover of government staff
  - b. Countries not sharing experiences, lessons, good practices, tools, etc
  - c. Inefficient systems do not facilitate integration of biodiversity information in regular work
4. Barriers to do with DATA
  - a. Inaccessible data
  - b. Inconsistent data monitoring and analytical methods
  - c. Data not communicated in a timely or relevant manner
5. Barriers to do with the EXTERNAL ENVIRONMENT
  1. External barriers cannot be dealt with by the project, but an awareness of these barriers provides a useful context to the intervention — for example, national crises may pull decision-making attention away from longer-term development planning processes and that priorities in government change rapidly due to external events (eg currency fluctuations, trade agreements, natural disasters)

The mid-term evaluator noted that the project's overall strategy is valid, but the project design and workplan may not foresee sufficient time and attention for the concrete steps and necessary process for the development and the uptake of useful biodiversity information products that is needed to lock in a sustained mainstreaming process.

## Summary

Our review of the seven projects with an explicit theory of change shows a high degree of correlation with the GEF's high-level pathways, particularly around sustainable production systems, valuation and regulatory reform. Only one project — the Amazon Landscapes Programme — used spatial planning as an explicit pathway to change. But across the projects there was also an emphasis on capacity development and improved access to information as additional key pathways for mainstreaming. Table 8 summarises the correlation with the GEF pathways of the seven projects; Table 9 summarises the

findings across the 21 reviewed projects, including those with an implicit rather and explicit ToC. Overall, we found that the most commonly used pathways were sustainable production systems and regulatory/policy reform. It should be noted, however, that there is a high degree of overlap between pathways and many projects employed pathways that involved a mix of regulatory reform, sustainable production practices, capacity development and so on. The Connect project pathways, for example, focus around improved access to and provision of information, but they also depend on capacity development (one of the moderators of success in the GEF ToC) and may involve information relevant to valuation. It is therefore difficult to precisely categorise projects according to their causal pathways.

Table 8: Causal Pathways identified in project ToCs

Project	Spatial planning	Sustainable production	Valuation	Regulatory	Information	Capacity
Amazon Landscapes	X	X		X		X
Cuba Landscapes			X	X	X	
Costa Rica Production Landscapes		X		X	X	X
South Africa Water Security			X	X	X	
UNDP-GEF Biodiversity and Land Use (South Africa)		X	X	X		
Eastern Cuba					X	
Connect					X	X

Table 9: Summary of pathways across the reviewed projects

GEF ID	Project name	Causal pathway in explicit ToC	Causal pathway inferred (not in a ToC)
1516	CAPE Biodiversity Conservation and Sustainable Development Project	Sustainable production systems Policy and regulatory	
1620	Mainstreaming Biodiversity Management into Production Sector Activities, Seychelles	Sustainable production systems Financing and incentives	
2615	National Grasslands Biodiversity Program	Sustainable production systems, Policy and regulatory	
3590	Mainstreaming Biodiversity in the Coffee Sector in Colombia	Sustainable production systems PES	
4207	Sustainable Production Systems and Biodiversity Project	Sustainable production systems Valuation — market incentives	
4792	Conservation of Coastal Watersheds to Achieve Multiple Global Environmental Benefits in the Context of Changing Environments		Sustainable production systems — PES
5058	Mainstreaming Biodiversity into Land Use Regulation and Management at the Municipal Scale (BLU) South Africa	Sustainable production systems Policy and regulatory Valuation — financial Incentives	
5560	Forest Conservation and Sustainability in the Heart of the Colombian Amazon	Sustainable production systems - PES, Policy and regulatory	
5730	Mainstreaming Biodiversity Information into the Heart of Government Decision Making		Biodiversity information
5846	Enhancing Biodiversity Protection through Strengthened Monitoring, Enforcement and Uptake of Environmental Regulations in Guyana's Gold Mining Sector		Policy and regulatory
9059	Promoting Sustainable and Resilient Landscapes in the Central Volcanic Chain		Production systems — PES for water
9070	Food-IAP: Fostering Sustainability and Resilience for Food Security in Sub-Saharan Africa - An Integrated Approach (IAP-PROGRAM)		Policy and regulatory Valuation — incentives
9073	Unlocking Biodiversity Benefits through Development Finance in Critical Catchments (aka Water Security project)	Valuation — natural capital accounts, valuation Policy and regulatory Information	
9272	Amazon Sustainable Landscapes Program	Spatial planning Sustainable production systems	
9416	Conserving Biodiversity through Sustainable Management in Production Landscapes in Costa Rica	Sustainable production systems Policy and regulatory Information Capacity development	
9429	Incorporating Multiple Environmental Considerations and their Economic Implications into the Management of Landscapes Forests and Production Sectors in Cuba	Valuation Policy and regulatory Information	
10371	Biodiversity Conservation, Restoration and Integrated Sustainable Development of Lower Mangoky and South-Mananara watersheds		Policy and regulatory Valuation

GEF ID	Project name	Causal pathway in explicit ToC	Causal pathway inferred (not in a ToC)
10390	Integrated Forest Landscape Management for Strengthening the Northeastern and Eastern Forest Corridors		Spatial and land use plans Sustainable production systems Policy and regulatory
10400	Mainstreaming biodiversity into mountain agricultural and pastoral landscapes of relevant ecosystems in Eastern Cuba	Sustainable production Valuation	
10574	Mainstreaming Biodiversity in Rural Landscapes of Mexico		Spatial planning Policy and regulatory
10578	Mainstreaming biodiversity conservation in the tourism sector of the protected areas and strategic ecosystems of San Andres, Old Providence and Santa Catalina islands		

## Typologies (or dimensions) of efforts to mainstream biodiversity

The literature review conducted for this assignment and presented in Report 1 provided a framework for understanding the typologies (or dimensions) of efforts to mainstream biodiversity. The framework illustrates how these dimensions can be used to better categorise mainstreaming projects for improved comparability. The review of literature found no ‘standard models’ of mainstreaming projects — each is by definition uniquely designed around its particular circumstances, which will vary in place and time. In contrast, with non-mainstreaming projects (such as Protected Area projects), a suite of similar interventions is often found which have common entry points and activities. Within groups of mainstreaming projects, projects may be similar in some dimensions but vary wildly on others, making mutual learning and comparison challenging.

Our review of GEF projects revealed no obvious typologies of mainstreaming or mainstreaming pathways beyond those identified in the GEF ToC. Most projects align with one or more of the GEF pathways, with the notable additions of information and capacity development as key additional pathways (both of which are also moderators of success in the GEF ToC). We did not find sufficient insights or consistency amongst projects to, for example, categorise them by land use intensity and then to assess whether different approaches apply to different intensities, especially as only a limited number of projects had clearly articulated ToCs and, within those, clearly articulated pathways to change.

Table 10 is an example of attempt to categorise the GEF projects according to the typology developed in the literature review. Four different projects are presented as an example only of the kind of coding that could be undertaken to assist with more detailed portfolio-level analysis and comparison.

Table 10: Typology/dimensions of mainstreaming applied to projects in Thailand, Cuba and South Africa and one global project

Typology (dimensions)	Forest Landscape Management, Thailand (GEF ID 10390)	Landscape Forests and Production, Cuba (GEF ID 9429)	Biodiversity and Land Use, South Africa (GEF ID 5058)	Connect biodiversity information, global (GEF ID 5730)
Economic and production sectors	Forestry	Forestry, tourism, oil and gas, industry, agriculture, transportation	Mining, agriculture, water, forestry	Oil and gas, agriculture, mining
Scale	Sub-national (northern and eastern)	Landscape-wide	National, provincial and municipal levels	National, regional and global
Institutional	Mix of: Silos — policy framework Synergies — use of ecosystem valuation	Mix of: Silos — policy framework Safeguards — forestry, industry Synergies — use of ecosystem valuation	Mix of: Safeguards — water Synergies — agriculture, mining, forestry Full integration — paving way for this through job creation, tax incentives, etc	Synergies and aiming for full integration

Typology (dimensions)	Forest Landscape Management, Thailand (GEF ID 10390)	Landscape Forests and Production, Cuba (GEF ID 9429)	Biodiversity and Land Use, South Africa (GEF ID 5058)	Connect biodiversity information, global (GEF ID 5730)
Process entered	Entry points mentioned but not defined	Entry point not clearly defined	Several, including: Review of the national spatial and land use policy framework EIA and development approvals Institutional re-structuring in provinces Budget-setting at treasury	Entry points clearly defined based on in-depth analysis in each country case
Public policy process	Policy and regulatory frameworks Plans (spatial, land use, development, etc) Management regimes and production practices Financial mechanisms	Policy and regulatory frameworks Plans (spatial, land use, development, etc) Financial mechanisms	Policy and regulatory frameworks Plans (spatial, land use, development, etc) Management regimes and production practices Financial mechanisms	Defined in each country as relevant
Policy instruments	Policy harmonisation, incentives, regulation	Policy harmonisation proposed	Taxation (incentives), regulation	
Reciprocal			Yes — job creation and community development via stewardship	
Maturity of institutions	Towards synergies	Breaking down silos, Sensitisation to biodiversity in other sectors	Towards synergies and systematic change	Towards synergies and systematic change

## Co-benefits and trade-offs from biodiversity mainstreaming

The majority of the projects in the review (17 out of 21) identified co-benefits. These varied hugely, with the most common being economic benefits but also including carbon, security, health and food security. These are summarised in Table 11. Only two of the 21 projects — the Cuba Landscapes and Forest project and the South Africa Water Security project — mention trade-offs, with very little detail provided. Passing reference is often made to the existence of trade-offs between biodiversity and development at different scales, but then this is not further elaborated and not addressed as part of the core of the project design. There was no specific evidence uncovered on where these have been addressed, managed, accounted for or monitored. We therefore do not present any examples of projects addressing trade-offs.

Table 11: Types of co-benefits identified in reviewed projects

GEF ID	Title	Headline co-benefits	Targets or quantification
1516	CAPE Biodiversity Conservation and Sustainable Development Project (ended 2010)	Economic benefits	Expand the number of jobs directly associated with conservation and nature-based tourism in intervention areas by 20%
1620	Mainstreaming Biodiversity Management into Production Sector Activities	Economic benefits	Benefit not quantified but target percentage of tourism operations that complete qualifications and receive the sustainable tourism label (which could presumably allow them to charge a premium/increase margins and income)
2615	National Grasslands Biodiversity Program (ended 2013)	Economic benefits	No specific target, though within market-based mechanisms incorporate biodiversity management objectives for red meat production (which could presumably allow them to charge a premium/increase margins and income)
3590	Mainstreaming Biodiversity in the Coffee Sector in Colombia (ended 2014)	Economic benefits	Several in ProDoc, eg:  Average net income increases by as much as 10% by project end in farms with certified and verified coffee, or from non-certified agroforestry products and/or PES  Increase in net income by \$5–6/ha/year, equal to 4–5 tons/ha/year of fixed carbon  Increase in farmers' net income by up to \$2.00 per month resulting from pilot projects for water-related PES and users' willingness to pay  TE reported difficulty with indicators and collecting this data
4207	Sustainable Production Systems and Biodiversity Project (ended 2019)	Economic and food security benefits	Job generation, livelihoods improvement (not quantified)
5058	Mainstreaming Biodiversity into Land Use Regulation and Management at the Municipal Scale (BLU) South Africa	Economic benefits	600 jobs (including temporary and permanent jobs) created in target municipalities to support ecosystem restoration (<5% of these secured by project mid-term)  Five landowners make use of tax incentives

GEF ID	Title	Headline co-benefits	Targets or quantification
5560	Forest Conservation and Sustainability in the Heart of the Colombian Amazon	Economic, watershed, carbon benefits	Number of persons with improvements in their livelihoods
5730	Mainstreaming Biodiversity Information into the Heart of Government Decision Making	Economic and poverty reduction benefits	None identified
5846	Enhancing Biodiversity Protection through Strengthened Monitoring, Enforcement and Uptake of Environmental Regulations in Guyana's Gold Mining Sector (ended 2017)	Health, water, social benefits	None identified
9059	Promoting Sustainable and Resilient Landscapes in the Central Volcanic Chain	Livelihood and poverty reduction benefits	None identified
9070	Food-IAP: Fostering Sustainability and Resilience for Food Security in Sub-Saharan Africa - An Integrated Approach (IAP-PROGRAM)	Food security and adaptation benefits	Percentage of farmers with increased food access, availability and use
9073	Unlocking Biodiversity Benefits through Development Finance in Critical Catchments (aka Water Security project)	Water security benefits	<p>Implementation plan for the National Water and Sanitation Strategy has ecological infrastructure</p> <p>Water resource development planning and options analysis incorporates ecological infrastructure (evidence in options analysis processes undertaken for particular water infrastructure projects)</p> <p>Mechanisms identified for flow of funds to ecological infrastructure rehabilitation and maintenance. Review of financial flows from water price.</p>
9272	Amazon Sustainable Landscapes Program	Economic benefits	Change in the income of producers resulting from the adoption of environmentally friendly production practices
9416	Conserving Biodiversity through Sustainable Management in Production Landscapes in Costa Rica	Economic benefits	Change in annual income per initiative and disaggregated by gender
9429	Incorporating Multiple Environmental Considerations and their Economic Implications into the Management of Landscapes Forests and Production Sectors in Cuba	Livelihood and economic benefits	None identified
10390	Integrated Forest Landscape Management for Strengthening the Northeastern and Eastern Forest Corridors	Livelihood and economic benefits	Not identified (yet? At PIF stage)
10400	Mainstreaming biodiversity into mountain agricultural and pastoral landscapes of relevant ecosystems in Eastern Cuba	Food security	Not identified (yet? At PIF stage)
10578	Mainstreaming biodiversity conservation in the tourism sector of the protected areas and strategic ecosystems of San Andres, Old Providence and Santa Catalina islands	Tourism co-benefits	Not identified (yet? At PIF stage)

Generating co-benefits is often central to success in biodiversity mainstreaming, and most projects set some kind of targets for securing such benefits — for example, the CAPE project aimed to increase jobs by 20%, while the Amazon Landscapes project and Costa Rica Landscapes project both aimed to increase the income of target producers. While the intent is often written into the strategy of the project, it can be challenging to ensure such co-benefits are delivered in practice. This is often due to flawed assumptions in the project ToC (whether explicit or implicit). An example of this is the UNDP-GEF Colombia Coffee project (GEF ID 3590), which sought to tackle threats to biodiversity through encouraging more biodiversity-friendly coffee production processes. To do this, it sought to encourage farmers to participate in a certification scheme intended to not just ensure improved biodiversity outcomes but also to increase the incomes of the participating farmers. The approach taken was to offer farmers loans for the certification process in order to encourage them to participate. It turned out, however, that the loan scheme was not attractive to farmers — their priorities were to spend any borrowed money not on a long-term certification process but on activities that could generate an immediate return, such as increased fertiliser. They also found that the sales of certified coffee did not cover the costs of the loan. The evaluation of the project suggested that one potential cause of this failure to generate the desired co-benefits was that there was insufficient consultation with the target farmers as to what would be attractive to them. The assumptions made by the project designers in the implicit ToC of the project that the loans would be attractive and would be used for enrolling in the certification programme did not hold true.

In another project — the UNDP-GEF Biodiversity and Land Use project in South Africa (GEF ID 5058) — there was a specific target to create 600 ‘nature-based’ jobs to show how maintenance and sustainable use of healthy intact ecosystems can deliver jobs and economic growth. By the time of the mid-term review of the project, however, there had been no progress against this target and there was a sense of disillusionment that the unemployment challenge in South Africa was too large for the project to be able to make a difference. The findings of the MTR encouraged the project team to develop a ToC for the project that highlighted the inter-connections between different components of the project and the potential for multiple components to contribute to the job creation target, rather than it being seen as something separate from the main aspects of the project (Kotschy et al., 2019: 14).

## Indicators of success

As can be seen from the descriptions of the causal pathways earlier in this report, all the projects are using very specific indicators, many of which are output- or activity-level indicators (for example, the number of guidelines developed or agreements signed). There is, however, increasing evidence of 'SMART' indicators that are better aligned to the desired outcomes rather than the outputs and activities.

The most common indicator for the sustainable production systems pathway is the number of hectares of land either under improved management or reporting reduced forest cover. But indicators also relate to the existence/persistence of key indicator species, increases in biomass and reductions in CO<sub>2</sub> emissions. Also in this category are indicators of uptake by key production sectors — for example, biodiversity considerations being reflected in the sector standards for key production sectors.

Within the regulatory pathway, common indicators are the number of policies, regulations or plans that have integrated biodiversity issues. Also common are indicators that show changes in the level of skills, knowledge and capacity of regulatory and planning authority personnel in terms of their ability to understand, use and sometimes enforce biodiversity commitments.

Spatial planning, valuation, capacity and information pathways have more consistent indicators around the number and area of plans, the number of natural capital accounts, access to information, and the number and types of capacities developed.

In some cases, indicators are even monitored beyond the lifespan of an individual project, where they are 'owned' in government or another entity such as an industry association. An example of this is the UNDP-GEF Biodiversity and Land Use project in South Africa (GEF ID 5058), which successfully achieved industry approval for voluntary standards in both the sugar and agricultural sectors. Other examples include the integration of biodiversity into multi-year municipal or water catchment or sectoral plans and strategies which extend beyond the project life.

South Africa undertook an exercise during 2018 to draw together all of its mainstreaming interventions from GEF-3 to GEF-6 and develop higher-order portfolio indicators. Table 12 shows the desired changes underway linked to mainstreaming interventions, as well as evidence which can be tracked to quantify these. This is perhaps something that might be encouraged in other countries with multiple mainstreaming projects, and then efforts made to explore whether there is any consistency in indicators between countries.

Table 12: Indicators of success and evidence for mainstreaming, South Africa GEF-3 to GEF-6 (source: Smith, 2018)

Level	Indicators of success	Evidence
<b>Longer-term changes</b>	Biodiversity 'increasing' nationally (improved status of ecosystems)	Two headline indicators assessed across all environments in the NBA: ecosystem threat status and ecosystem protection level  Vegetation cover increase/decrease in fragmentation recorded by remote sensing and other verification methods (GEF portfolio indicator) — within NBA indicator
	Biodiversity value widely recognised in political sphere	Presidential speeches, National Development Plan priorities, etc
<b>Intermediate changes</b>	New national investments in biodiversity from domestic budget (and private sector)	Treasury budget — allocation to Programme 5, inc. SANBI

Level	Indicators of success	Evidence
	Institutionalisation 'changing the rules': - Policy - Regulation - Norms	List of policy, regulatory and other norms that include biodiversity appropriately
<b>Shorter-term changes</b>	GEF-supported project approach adopted and replicated and/or supported by other actors/partners	Spread of approaches (eg hectares covered by Biodiversity Stewardship agreements)
	GEF project support to other actors' priorities	Demand-pull for support (eg on Strategic Water Source Areas)
	Initiative attracts other forms of non-GEF funding and investment beyond GEF project lifespans (project sustainability), especially from government and industry	Leveraged co-financing realised

## Conclusions

This review sought to answer a number of key questions about biodiversity mainstreaming — particularly focusing on the ToCs that have been used, and the causal pathways within them, across a sample of GEF projects. This was a challenging exercise given the diversity of projects in terms of context, sector focus and maturity and the information that was available for each. We struggled to identify consistent features across the projects that would enable some kind of categorisation into clear causal pathways or into other typologies of mainstreaming, such as those that were identified in the literature review discussed in the first report. We did find a high level of correspondence with the GEF Portfolio ToC and its four high-level pathways, suggesting that this is perhaps as good a typology as any. Having said that, we found few projects that fitted clearly into one pathway; in many cases, the causal pathways adopted by the projects were a mix of the GEF high-level pathways. Summary answers to the key questions posed in this review are provided in Table 13.

Table 13: Summary findings from a review of GEF mainstreaming projects

Question	Findings
1. What theories of change for biodiversity mainstreaming have been developed, either generally or in specific sectors/contexts? What theories of change for key recognised pathways for mainstreaming have been developed (eg biodiversity-friendly production systems, biodiversity offsets, accounting and valuation of biodiversity and ecosystem services, spatial/land use planning, PES schemes, reforming policy/regulatory/planning frameworks)?	Only seven of the 21 projects reviewed had developed an explicit ToC for mainstreaming. These varied significantly in quality and complexity across the projects, making comparisons between them difficult. Comparing the project ToCs with the GEF ToC highlighted a high level of correspondence with the four high-level pathways for mainstreaming articulated within the GEF ToC. In particular, biodiversity-friendly production systems and reforming policy/regulatory frameworks were common approaches. We also identified improved access to improved information and capacity development as key pathways. In almost all cases, however, projects did not just align with one pathway; the project-specific pathways tended to be a combination of these approaches.
2. Are there typologies for ordering and understanding the wide variety of entry points, pathways and approaches for biodiversity mainstreaming, either generally or in specific sectors/contexts? What are they?	We did not identify any clear typologies for mainstreaming from across the set of projects reviewed. The projects could be mapped against the typologies that were identified in the literature review, but the most obvious typology to use was the causal pathways. However, since the pathways were very project-specific, the easiest way to do this was to compare them to the GEF high-level pathways. The projects generally did not fall into a single category, but this approach helped identify the different elements of the project pathways.
3. Are there positive examples of how co-benefits and trade-offs have been explicitly addressed, managed, accounted for or monitored, or emerging approaches or suggestions for doing this?	We found little or no mention of trade-offs other than passing references. By contrast, the majority of projects either included specific targets for generating co-benefits (most often economic benefits including increased income or job opportunities) or they noted co-benefits having been generated even if these were not a specific focus of the project. Mechanisms for monitoring co-benefits generally was limited to the inclusion of some specific output or outcome indicators, although in some cases the use of the ToC helped project implementers better understand the link between the biodiversity investment and the co-benefits generated, or at least to think about additional activities that might be needed to secure co-benefit targets.
4. Are there indicators regarding the success of particular causal pathways? And what indicators are projects using to track this?	All of the projects reviewed had multiple indicators as part of their monitoring strategies, but a lot of these were output- or activity-based. We found few indicators that were common across projects or across causal pathways. The most common ones we did find related to areas of land under improved management or experiencing reduced biodiversity loss/environmental degradation. This is because Agencies are required to report on this as part of

Question	Findings
	<p>the GEF results-based framework (hectares of area). This is how they are able to aggregate to the portfolio level. We also found some indicators that had a life beyond the project duration when these related to outcomes or outputs that were adopted by external stakeholders, including governments or industry bodies. Examples of this included integration of biodiversity considerations into national and municipal level plans and strategies, and adoption by industry of new sector standards.</p>

Biodiversity mainstreaming involves a diverse and often context- and problem-specific set of activities and interventions. As such, it is difficult to describe systematically even across the project portfolio of a single donor such as the GEF. Furthermore, mainstreaming is a dynamic, ongoing process which often involves political, economic, timescale and other challenges. Those involved need to have a high level of awareness of the political economy of the issues that the project deals with and be a champion for transformative change. As such, it can be challenging to seek to achieve success in mainstreaming within the constraints of a typical project cycle. Table 14 illustrates the operational challenges of applying mainstreaming within the various stages of GEF project development, comparing the ideal conditions for mainstreaming to the real-life ones that are involved in the project development cycle. These challenges are not unique to mainstreaming, but its operation in a dynamic external environment and the need to be reflexive, adaptive and nimble in response to changing contexts probably make these challenges more acute. Some kind of ‘incubator’ for mainstreaming projects at the PPG phase that brings together a facilitator with the project proponents, stakeholders and developer to induct them into the concepts of mainstreaming to and co-create a ToC could be a good step forward in overcoming some of these challenges.

There is no ‘one size fits all’ approach to mainstreaming, and this context- and problem-specificity means that there is also no singular ToC that can be applied to mainstreaming projects. However, the limited experience of developing ToCs within the existing portfolio of mainstreaming projects does seem to imply that even if there is no generic approach, the process of thinking through the ToC has helped some projects better articulate their mainstreaming goals, recognise where additional effort and intervention might be needed, and better understand the process by which mainstreaming occurs. The GEF STAP primer on ToCs will help considerably to bring some consistency to how projects define their ToC. It will also hopefully inspire more projects to develop a ToC and use this both as a design tool and for management and evaluation of impact. Given that it is possible, broadly, to map existing projects against the GEF high-level causal pathways, and that there are at least some indicators that resonate with each pathway, it may be possible to develop ‘guideline’ ToCs for each of these pathways that could then be adapted by specific projects to reflect their specific contexts.

Efforts to aggregate mainstreaming experience at a national level and develop aggregate-level indicators, such as has happened in South Africa, appear to have some promise in terms of highlighting the high-level indicators of success that other mainstreaming efforts could strive for. However, it should be noted that South Africa (along with Mexico and Colombia) is unusual in having a national institution that plays a central coordinating role — the South African National Biodiversity Institute (SANBI) (the Humboldt Institute and CONABIO are the corresponding institutions in Colombia and Mexico, respectively). These institutions appear to play a pivotal role in mainstreaming success (Box 2) but are the exception rather than the rule, suggesting that in the absence of such national institutions, it is even more important that individual projects do have a clearly thought through ToC with clearly articulated assumptions that can be tested on a regular basis.

Despite the complexity and importance of mainstreaming and the large portfolio, no organising forums have taken up the challenge of seeking to systematise it, share learning, develop a community of practice or raise the level of expertise within the sector. In 2014, Child had observed that “the HUGE learning potential from and between [GEF-supported biodiversity mainstreaming] projects, individually and collectively” is not being met. The hypothesis-testing approach recommended in Huntley and Redford (2014) has not been commonly taken up by proponents and authors, as might have been hoped by this stage. Again, several South African GEF-supported projects are highly visible and credit GEF in the literature (eg Manuel et al., 2016; Maze et al., 2016; Holness et al., 2018). The African

Leadership Group on Biodiversity Mainstreaming (IIED and UNEP-WCMC, 2016) cites a number of GEF projects that support their mainstreaming efforts in-country. Some individual corporate publications summarise the results from a number of GEF projects. For example, Mijatović et al. (2018) provide a useful summary of their approach to the corpus and share a rich body of literature summarising results in conservation practices, sustainable production practices, diversification, market access and more.

The NBSAP Forum and the World Commission on Protected Areas (WCPA) are examples of where learning and good practice are shared within the biodiversity community — mainstreaming learning has been more ad hoc. An equivalent organising forum to share learning and good practices would help advance the practice of mainstreaming in the same way as has happened for other conservation practices. Given regional variations, funding a hub in each region to dedicate to leadership would be a valuable approach. A further constraint in terms of sharing experience is that key documents tend to be accessible to project teams but are not necessarily made public and very few experiences are documented in the academic literature (also noted by Huntley and Redford, 2014). To support mutual learning and for the sake of transparency, project materials funded by the GEF could be required to be shared online or via an accessible database.

### **Box 2: SANBI — illustrating the value of a national hub for mainstreaming**

South Africa is widely cited as an example of best practice. Individual research (eg Smith, 2018; Manuel, 2016) covers their case in more detail. A significant factor highlighted by GEF-IEO (2019) is the constant role of the South African National Biodiversity Institute (SANBI), which has been the executing agency for a suite of exemplary (GEF-funded and other) mainstreaming projects. By maintaining a hub for theory and practice on biodiversity mainstreaming, SANBI has enabled each project to build conceptually off the lessons of its predecessors in a strategic way. Within the CAPE project, there was recognition of the need to better engage ‘brown’ sectors of the economy and more systematic, landscape-level upstream planning. For the Grasslands project targeting mining and other landscape threats at an ecosystem scale, finding provincial and municipal capacity were levels of concern. The Biodiversity and Land Use project then targeted capacity building at these levels, but found the need to ‘make the case’ to other sectors in a more pro-active way. The subsequent Water Security project took a critical national issue as its entry point for ecosystem services and biodiversity management. While not always explicit, each project has had a well-considered theory of change. Furthermore, an exercise was undertaken in 2018 to develop a ‘meta-ToC’ for all the projects between GEF-3 and GEF-6. Recent projects have been using ToCs as an active management tool, helping to navigate contextual changes that affects project outcomes while working within hot button political topics of key national relevance — mining, jobs and water.

From an institutional perspective, housing all of the mainstreaming projects at SANBI has meant that there is a career ladder and professional development in this as a discipline. Numerous examples exist of junior staff on one project taking a more senior role on a subsequent one. In this way, in-house knowledge of mainstreaming is further developed rather than lost between projects. On a topic as complex as mainstreaming, this is a critical ingredient of success. Another is the learning approach and active effort at publishing. Individuals are encouraged to publish their efforts, and the largest body of literature looking at mainstreaming practice (reviewed in the first report) therefore comes from SANBI staff members (eg Holness et al., 2018; Maze et al., 2016; Manuel et al., 2016). SANBI’s success has also been ascribed to very good data and spatial mapping capabilities and a science-based approach that has earned credibility, as well as linking to the active development questions of the day (Manuel et al., 2016).

Table 14: Ideal conditions and practical barriers to mainstreaming within the GEF project cycle

Project cycle	PIF	PPG	Inception	Implementation	Terminal evaluation	Ongoing – tracking tool	Overall
<i>Ideal conditions for successful mainstreaming</i>	Project selection and design led by mainstreaming champions and creative individuals with unique skillset who are invested in a successful outcome  Deep reflection undertaken prior to STAR earmarking and PIF development	Budget available to engage stakeholders in a learning process and co-create the project design with their buy-in	Proponents and stakeholders fine-tune the project design and work plans, taking into consideration new entry points, recent developments, etc	The project structure allows for updating dynamically, driven by a project board, who are actively steering towards a shared objective	Learning activity leading to reflection and subsequent actions building on this experience.	Meaningful indicators of mainstreaming linked to the typology of project, relevant for the project and with potential to aggregate	Grant available flexibly/on short notice when opportunities for change arise in the external landscape, and over a circa ten-year timespan  Recognising unique set of circumstances embedded in a dynamic, messy and challenging development context, where non-environment actors have more power  Sharing budget with other sectors and Ministries to support and incentivise them to engage on mainstreaming projects
<i>Practical barriers within an illustrative project cycle</i>	Earmarking of STAR funds not always through a consultative process  Design often led by government with limited in-house staff or a few days of a single consultant  Top-line outcomes and components fixed before project design undertaken at deep levels.	When budget available for studies and consultation, developers tied to top line agreed at PIF stage  Challenge of engaging partners	Project initiation 12-36 months after original PIF developed  Project team differs from project developers, rationale behind some aspects of the project not understood or taken up	Changes permitted but can be administratively difficult to enact, especially if they require updating the components or moving funds between components	Project staffing budget ends before the TE — former staff may likely to be in new jobs when results available  Limited in-house resources for learning and reflection  Normally ministry has new projects beginning and attention shifts to operation of those.	Historically, (GEF-1 to GEF-6), tracking tools were prescribed, which did not fully align with the GEF portfolio ToC nor onward to how the individual project's own performance indicators contributed to an overall impact  From GEF-7, the tracking tools are no longer required	Grant term fixed to under 5 years  Pre-agreed timetable of activities.  Tendency to prefer self-contained activities with deliverables that provide clear evidence as to the use of funds, within domains that are less central to development but more comfortable and easily manageable within the given timeframe  GEF funds are a large source of budget for environment: there is a disincentive to share this with other ministries and sectors who are more resourced and powerful

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## Annex 1: Key characteristics of projects reviewed

NO	GEF ID	Project name	Replenishment	Country/ countries	Implementing agency	Sector	Ecosystem	Scale	Theory of change	Link to GEF portfolio ToC	Co-benefits	Trade-offs
1	1516	CAPE Biodiversity Conservation and Sustainable Development Project (ended 2010)	GEF-3	South Africa	World Bank (with UNDP)	Several (agriculture, tourism)	Fynbos	Landscape	At evaluation - Review of Outcomes to Impacts (ROtI) method	Production systems, Regulatory	Economic benefits	
2	1620	Mainstreaming Biodiversity Management into Production Sector Activities	GEF-3	Seychelles	UNDP	Several (tourism, guano mining, agriculture)	Coastal, wetlands, dunes	Island	At evaluation - Review of Outcomes to Impacts (ROtI) method	Production systems Financing and incentives	Economic benefits	
3	2615	National Grasslands Biodiversity Program (ended 2013)	GEF-4	South Africa	UNDP	Several (mining, forestry, agriculture)	Grasslands	Bio-regional and national		Production systems Regulatory	Economic benefits	
4	3590	Mainstreaming Biodiversity in the Coffee Sector in Colombia (ended 2014)	GEF-4	Colombia	UNDP	Agriculture	Various Andean	Landscape		PES Production systems	Economic benefits	
5	4207	Sustainable Production Systems and Biodiversity Project (Ended 2019)		Mexico	World Bank	Agriculture	Several Meso-American (eg forests)	National		Production systems, Market incentives	Economic and food security benefits	
6	4792	Conservation of Coastal Watersheds to Achieve Multiple Global Environmental Benefits in the Context of Changing Environments	GEF-5	Mexico	World Bank	Several	Coastal	National				
7	5058	Mainstreaming Biodiversity into Land Use Regulation and Management at the Municipal Scale (BLU) South Africa	GEF-5	South Africa	UNDP	Several (agriculture, forestry, mining)	Fynbos and grasslands, other	Municipal, provincial, national	Yes - at project mid-point post-MTR rec	Production systems Regulatory Valuation Financial Incentives	Economic benefits	

NO	GEF ID	Project name	Replenishment	Country/ countries	Implementing agency	Sector	Ecosystem	Scale	Theory of change	Link to GEF portfolio ToC	Co-benefits	Trade-offs
8	5560	Forest Conservation and Sustainability in the Heart of the Colombian Amazon		Colombia	World Bank	Several	Forest	Regional		PES Production systems Regulatory	Economic, watershed, carbon benefits	
9	5730	Mainstreaming Biodiversity Information into the Heart of Government Decision Making	GEF-5	Global	UNEP	Several (oil and gas, agriculture)	Varies	Global and 3 countries	Yes - from design stage		Economic and poverty reduction benefits	
10	5846	Enhancing Biodiversity Protection through Strengthened Monitoring, Enforcement and Uptake of Environmental Regulations in Guyana's Gold Mining Sector (ended 2017)	GEF-5	Guyana	UNDP	Mining	Forests	National		Regulatory	Health, water, social benefits	
11	9059	Promoting Sustainable and Resilient Landscapes in the Central Volcanic Chain		Guatemala	UNDP	Agriculture, forestry, carbon market	Forests	Landscape		Production systems PES for water	Livelihood and poverty reduction benefits	
12	9070	Food-IAP: Fostering Sustainability and Resilience for Food Security in Sub-Saharan Africa - An Integrated Approach (IAP-PROGRAM)		Africa regional (Burkina Faso, Burundi, Ethiopia, Ghana, Kenya, Malawi, Niger, Nigeria, Senegal, Eswatini, Tanzania, Uganda)	IFAD	Agriculture	Various	Regional and national, landscape	Maybe in child projects?	Landscape productivity	Food security and adaptation benefits	

NO	GEF ID	Project name	Replenishment	Country/ countries	Implementing agency	Sector	Ecosystem	Scale	Theory of change	Link to GEF portfolio ToC	Co-benefits	Trade-offs
13	9073	Unlocking Biodiversity Benefits through Development Finance in Critical Catchments (aka Water Security project)	GEF-6	South Africa	DBSA	Water	Wetlands, forests, other	Two landscapes / watersheds and national	Yes - from inception and mid-point update	Natural capital accounts Valuation Planning frameworks Regulatory changes	Water security benefits	Trade-offs noted
14	9272	Amazon Sustainable Landscapes Program (many child projects include mainstreaming)		Amazon Regional (Brazil, Colombia, Peru)	World Bank	Forestry, agriculture (crop and pastoral)	Tropical rainforest	Regional and national plus landscapes	Programme design was based on a comprehensive ToC			
15	9416	Conserving Biodiversity through Sustainable Management in Production Landscapes in Costa Rica	GEF-6	Costa Rica	UNDP	Agriculture, forest	Forest	National and landscape	Yes - good example		Economic benefits	
16	9429	Incorporating Multiple Environmental Considerations and their Economic Implications into the Management of Landscapes Forests and Production Sectors in Cuba	GEF-6	Cuba	UNDP	Agriculture		National and landscape	Yes - good example	Regulatory and policy frameworks Productive landscapes	Livelihood and economic benefits	Trade-offs articulated
17	10371	Biodiversity Conservation, Restoration and Integrated Sustainable Development of Lower Mangoky and South-Mananara watersheds	GEF-7	Madagascar	FAO	Forestry, agriculture, water	Tropical dry forests, wetlands	National, regional, landscapes	Not yet (PIF stage)			
18	10390	Integrated Forest Landscape Management for Strengthening the Northeastern and Eastern Forest Corridors	GEF-7	Thailand	FAO	Forestry, agriculture, water	Forests	National and landscapes	Not yet (PIF stage)	Spatial and land use plans Sustainable production systems Policy and regulatory changes	Livelihood and economic benefits	

NO	GEF ID	Project name	Replenishment	Country/countries	Implementing agency	Sector	Ecosystem	Scale	Theory of change	Link to GEF portfolio ToC	Co-benefits	Trade-offs
19	10400	Mainstreaming biodiversity into mountain agricultural and pastoral landscapes of relevant ecosystems in Eastern Cuba	GEF-7	Cuba	FAO	Agriculture		Landscapes	Yes – with PIF	Legal and regulatory Production systems	Food security	
20	10574	Mainstreaming Biodiversity in Rural Landscapes of Mexico	GEF-7	Mexico	CI	Agriculture		Landscapes	Not yet (PIF stage)			
21	10578	Mainstreaming biodiversity conservation in the tourism sector of the protected areas and strategic ecosystems of San Andres, Old Providence and Santa Catalina islands	GEF-7	Colombia	WWF-US	Tourism	Islands, mangroves, coastal and marine	Landscapes	Not yet (PIF stage)		Tourism co-benefits	

In recent years, theories of change (ToCs) have increasingly been recognised as valuable tools for project design, adaptive management and evaluation of impacts. This report seeks to answer a number of key questions about biodiversity mainstreaming — particularly focusing on the ToCs that have been used, and the causal pathways within them, across a sample of GEF projects. It concludes that there is no ‘one size fits all’ approach to mainstreaming, and this context- and problem-specificity means that there is also no singular theory of change that can be applied to mainstreaming projects. However, the process of thinking through a ToC has helped some projects better articulate their mainstreaming goals, recognise where additional effort and intervention might be needed, and better understand the process by which mainstreaming occurs.



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## Project Materials

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### Biodiversity

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*Keywords:*

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