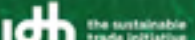
The Little Sustainable Landscapes Book

Achieving sustainable development through integrated landscape management



The Global Canopy Programme is a tropical forest think tank working to demonstrate the scientific, political and business case for safeguarding forests as natural capital that underpins water, food, energy, health and climate security for all. GCP works through its international networks – of forest communities, science experts, policymakers, and finance and corporate leaders – to gather evidence, spark insight, and catalyse action to halt forest loss and improve human livelihoods dependent on forests. Visit www.globalcanopy.org for more information.

EcoAgriculture Partners is a pioneering non-profit organization that advances the practice of integrated landscape management and the policies to support it. By facilitating shared leadership and collaborative decision-making by all stakeholders in a landscape, we empower agricultural communities to manage their lands to enhance livelihoods, conserve biodiversity and ecosystem services, and sustainably produce crops, livestock, fish, and fiber. From critical analysis of policies, markets, and land use practices, we generate innovative research, tools and methodologies that help landscape managers and policymakers create and sustain integrated landscapes worldwide.

IDH the Sustainable Trade Initiative convenes public and private partners for joint plans and action to drive sustainable market transformation in 18 international trade sectors. IDH's Initiative for Sustainable Landscapes (ISLA) complements IDH work in supply chain transformation, focussing in on six agricultural commodity producing landscapes. ISLA brings global and landscape based public and private sector actors together to co-invest in a landscape agenda – the sustainable management of natural resources in the area where (agri)commodities are produced, with focus on the business and investment case for various stakeholders. Visit http://www.idhsustainabletrade.com/ for more information.

The Nature Conservancy is a leading conservation organization working around the world to conserve the lands and waters on which all life depends. The Conservancy and its more than 1 million members have protected nearly 120 million acres worldwide. Visit The Nature Conservancy on the web at www.nature.org

The World Wide Fund for Nature is one of the world's largest and most experienced independent conservation organizations, with over 5 million supporters and a global network active in more than 100 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption. Visit http://wwf.org/ for more information.

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The findings, interpretations and conclusions in this book are those of the authors and do not necessarily represent the views of all the organisations listed on this page.

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Sustainable management of landscapes is a local and global necessity. But few landscapes around the world are being effectively managed to balance the competing demands of today, let alone those likely to emerge tomorrow. This leaves billions of people and many economies at risk.

This book seeks to facilitate and advance thinking on how to achieve sustainable landscapes, especially in the context of increasing demands for food, fibre and fuel that may alter landscapes substantially in coming decades. The book is relevant to two major global imperatives – the recently agreed Sustainable Development Goals and the UNFCCC climate agreement to be adopted at COP 21 in Paris. The ideas assembled here also support the agendas of the Committee on World Food Security, the UN Convention on Biological Diversity and the UN Convention to Combat Desertification. They also align with the aspirations of people around the world living in landscapes undergoing, or at risk of, soil, water and forest resource degradation.

The notion of a "landscape approach" is not new, but in recent years has gained in importance and is a major topic of national and international policy discourse, holding out great promise.

The landscape may be the most appropriate scale for action, between national and local scales. We advocate that a landscape approach, using integrated landscape management, can allow stakeholders to decide on land and water use in such a manner that community, commercial and conservation interests are more balanced and sustainable.

Integrated landscape management arose from origins in diverse, innovative strategies – from indigenous territorial development, to integrated watershed management, to landcare. It involves new levels of collaboration through place-based partnerships that are inclusive of communities, governments, businesses, land managers and civil society. Integrated landscape management is now being used around the world to address major natural resource management challenges in landscapes that must meet a range of stakeholder needs for production, livelihood and environmental goals, where these are deeply inter-connected. However, the further development of integrated landscape management has been hampered by a lack of consensus about what exactly is meant when using this term. To address this constraint, our five organisations joined forces to produce ***The Little Sustainable Landscapes Book****, an accessible overview of the concept, its key elements, catalysts and applications around the world. It offers inspiration to help expand our frameworks for analysis and action beyond single issues.*

We have concluded that integrated landscape management is not just this year's buzzword, but an approach to long-term development that is vital for dealing with the pressing challenges of this century. It is here to stay. We hope that the ***The Little Sustainable Landscapes Book*** *will help to focus attention and stimulate further development of this promising strategy for green and inclusive development. Our organisations and partners aim to support that transition.*

HIS EXCELLENCY, ROBERT BOPOLO BOGEZA
MINISTER OF THE ENVIRONMENT, NATURE CONSERVATION AND SUSTAINABLE DEVELOPMENT, DEMOCRATIC REPUBLIC OF CONGO

The landscapes of Africa are legend. The great expanses, people and wildlife of the Virungas, Maasai Mara or the Okovango Delta are some of the world's natural treasures. And so much of Africa is equally rich and beautiful.

However, beneath the beauty remain some very deep challenges. African governments are struggling to bring our people out of poverty and hunger. Our land suffers droughts and floods that ravage our communities and our limited infrastructure. Our wildlife and natural resources are diminishing with little benefit for our populations. And ironically, while we can be least blamed for causing climate change, we will be among those most affected by it. The challenges across this continent seem insurmountable – and especially so here in the Democratic Republic of Congo (DRC).

But the picture moving forward can be hopeful. Our continent has experienced unprecedented growth across a number of indices in the past decade. Our middle class is growing rapidly and we have the chance, and imperative, to design a new future that allows us all to benefit sustainably from our huge natural resource base.

We in DRC are taking up this challenge actively. In October 2011, His Excellency, Head of State, President Kabila confirmed the goal of green development in the DRC by 2035. We are among the leaders in Africa committing to major emission reductions and to developing the policy and monitoring frameworks to make this a reality.

In Mai Ndombe Province we are trialling a landscape approach to green development over an area the size of Greece. With a coalition of government agencies, community groups, companies and donors, we are using climate funds to initiate a jurisdictional model for a new and integrated approach to development. This will not only reduce the pressure on forest resources in the province, but also most importantly, improve the livelihoods of the population. And Mai Ndombe will provide a model for other vulnerable provinces across our country within our national strategy for climate change and green development. More broadly this progress in the DRC will contribute to the African Resilient Landscapes Initiative, endorsed by the African Union, which commits to bringing 100 million hectares of degraded and deforested land under restoration in Africa by 2030 using integrated landscape management.

We welcome the Little Sustainable Landscapes Book as an important gathering of knowledge on how we can all step forward into this green future. Africa is not alone in requiring solutions at a scale. The whole world needs to be finding ways to implement larger visions for restoring land, climate proofing agriculture and forestry, and building richer communities. Sustainable landscapes are one tool towards this. We commend the authors and encourage all to apply its recommendations.

PETER BAKKER

PRESIDENT & CEO, WORLD BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT (WBCSD)

Recent years have witnessed an increasing number of business commitments to sustainable supply chains, such as pledges for deforestation-free products. Working with single commodities, certifications and standards will improve supply chain transparency and help business deliver on these commitments.

Achieving scale, however, requires challenges such as deforestation, overexploitation of natural resources or pollution of fresh water ecosystems to be addressed in a holistic manner. We need to go beyond individual sectors or supply chains to connect all stakeholders within the same landscape and take into account the interrelated effects of policies and actions. Addressing sustainability challenges at a landscape level can help bring together multiple land users, from smallholders, communities and civil society to large businesses and regulators of resources.

Despite the growing number of WBCSD member companies using landscape approaches in the regions where they operate, little opportunity exists to collaborate on a broader global scale. There is a need to develop innovative forms of multi-stakeholder collaboration to share success stories and learn from different experiences. This will allow supply chain-related targets to be translated into transformational change across landscapes.

The Little Sustainable Landscapes Book clarifies what integrated landscape management entails and its related business benefits. Through various examples, it demonstrates how companies can deliver on their sustainable sourcing and production commitments, contribute to improved regulation on natural resource use and invest in multi-purpose land use.

WBCSD, together with the partners of this publication, will build on the experiences compiled in this book to help catalyse business engagement in landscape level initiatives. We can only achieve scale by effectively addressing the complexity of local situations. This is precisely what our collaboration aims to demonstrate and translate into action in years to come.

CONTENTS

GLOSSARY

There are no universally accepted definitions of the terms below. The proposed definitions are the result of extensive discussions amongst the five editorial organisations, and readers may find there are multiple variations in the way they are defined in other relevant literature.

Ecosystem services: Ecosystem services refer to the benefits humans obtain directly or indirectly from ecosystems. They can be divided into provisioning services (food, water, wood, raw materials), regulating services (pollination of crops, flood and disease control, water purification, prevention of soil erosion, sequestering carbon dioxide), cultural services (recreational, spiritual and educational services) and supporting services (nutrient cycling, maintenance of genetic diversity)[1].

Integrated landscape management: A way of managing the landscape that involves collaboration among multiple stakeholders, with the purpose of achieving sustainable landscapes. The governance structure, size and scope, and number and type of stakeholders involved (e.g. private sector, civil society, government) can vary. The level of cooperation also varies, from information sharing and consultation, to more formal models with shared decision-making and joint implementation.

Jurisdictional approach: A jurisdictional approach and a landscape approach are often used synonymously. However, the jurisdictional approach is a type of landscape approach that uses government administrative boundaries, primarily sub-national, to define the scope of action and involvement of stakeholders rather than social (e.g. indigenous community) or environmental (e.g. ecosystems, watershed) boundaries.

Landscape: A landscape is a socio-ecological system that consists of natural and/or human-modified ecosystems, and which is influenced by distinct ecological, historical, economic and socio-cultural processes and activities.

Landscape approach: A conceptual framework whereby stakeholders in a landscape aim to reconcile competing social, economic and environmental objectives. It seeks to move away from the often-unsustainable sectoral approach to land management. A landscape approach aims to ensure the realisation of local level needs and action (i.e. the interests of different stakeholders within the landscape), while also considering goals and outcomes important to stakeholders outside the landscape, such as national governments or the international community.

A landscape approach may be undertaken by one or more stakeholders who engage in actions independently, or by multiple actors as part of a collaborative, multi-stakeholder process. This multi-stakeholder process is referred to as integrated landscape management.

Natural resource management: The process of managing the use and development of natural resources, in both urban and rural settings. It covers all activities concerned with the management of land, water and related resources from both an environmental and economic perspective. It can include ecosystem conservation, farming, mineral extraction, infrastructure development, and the physical planning of towns and the countryside. Landscape management is a form of natural resource management, at the landscape scale.

Land management unit (LMU): Land management unit is a generic term to refer to an area of land that has been identified, mapped, and managed according to its intended use or productive capability, e.g. a logging concession, a private farm, a protected wetland etc. LMUs are components of a landscape. Due to siloed sectoral resource management, LMUs with competing objectives sometimes overlap. For instance, a logging concession may be granted in a protected area.

Sustainable landscape: A sustainable landscape helps to meet the principles of sustainable development as defined in the UN Sustainable Development Goals. These are landscapes that can meet the needs of the present, without compromising the ability of future generations to meet their own needs[2]. Broadly, sustainable development aims to ensure synergies and minimise trade-offs between economic, social and environmental (including climate) goals where these objectives compete. This book focuses on integrated landscape management as a way of achieving sustainable landscapes.

Sustainable land management (SLM): Sustainable land management refers to the process of managing a land management unit — farms, production forests, protected areas — in a sustainable way. Sustainable land management across a range of different land management units is necessary in order to achieve sustainable landscapes. However SLM commonly focuses on the site level and on particular stakeholder groups, rather than on the broader landscape level.

HOW THIS BOOK CAN HELP

The growth in global population and more demanding consumption patterns around the world are placing ever increasing pressures on land and its resources. This is resulting in conflicts and the unsustainable use of humanity's resource base. Households, farms, industry, energy, tourism, and wildlife compete for resources. For example, production agriculture is now such a dominant land use that water recharge in watersheds and the viability of wildlife populations depends critically on how croplands are managed. Agricultural expansion often pushes back the area covered by standing forests, while degraded land that could be restored to production remains unutilised. Playing across this tapestry are the dynamics of human migration, including urbanisation.

International policy dialogues such as the recently announced Sustainable Development Goals (SDGs)[3] and negotiations on a new global climate agreement have highlighted the need for sustainable landscapes as a source of multiple social, economic and environmental benefits.

This book aims to demystify and share best practices of integrated landscape management as a holistic approach to reconcile the sometimes-competing objectives of economic development and environmental sustainability. The book highlights how integrated landscape management can be a useful tool to support local needs and priorities, while also contributing to ambitious global goals, such as the SDGs.

The book outlines the key elements that form the basis of integrated landscape management, and the tools that can be used for its implementation. It examines the broader governance, market and finance catalysts that can help to achieve sustainable landscapes. It concludes with a set of key recommendations for action to advance the effective use of integrated landscape management around the world.

The Global Canopy Programme has partnered with a range of expert organisations including EcoAgriculture Partners, The Nature Conservancy, World Wide Fund for Nature[i] and The Sustainable Trade Initiative (IDH) to deliver the seventh Little Book in the series[ii]. The authors hope this material will help policymakers charged with delivering on the SDGs, and those engaged in the Rio Conventions[iii] negotiations, as well as actors in the private sector, and other practitioners and scholars in this field to better understand and navigate the issues at stake.

i Known as World Wildlife Fund in Canada and the United States.

ii This list refers to the core writing team of this Little Book. However, many more organisations were involved in contributing financial resources and technical expertise to put together this publication (see page 1).

iii The Rio Conventions were adopted at the United Nations Conference on Environment and Development in Rio in 1992, and include the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD) and the United Nations Convention to Combat Desertification (UNCCD).

FRAMING THE ISSUE

THE NEED FOR A MORE HOLISTIC APPROACH TO NATURAL RESOURCE MANAGEMENT

Rising demand from growing populations and economies is putting ever-greater pressure on natural resources[4]. It is expected that by 2050, agricultural output will need to increase by 60% globally, compared to 2005/2007[5], to respond to the demands of 9.7bn people[6]; and that water scarcity will affect 54 countries, home to nearly 40% of the world's projected population[7,8]. Climate change is further multiplying these threats[9].

Other factors such as unclear land tenure rights, unsustainable land management practices and uncoordinated and often competing sectoral policies are contributing to competition and conflicts over land and its resources[10]. At least 40% of all violent conflicts in the last 60 years are connected to natural resource use[11]. In this context, business-as-usual approaches to natural resource management constitute a threat to human well-being, security and sustainable economic growth[12].

Although holistic approaches to natural resource management are far from new, for the last century at least, the typical approach has been to manage different parts of the resource base (e.g. rivers and forests) independently, to meet different sectoral goals (e.g. crop production, watershed protection, production forestry). Given that different land uses often rely on the same resource base, decisions made to improve output in a single sector, without effective coordination with other sectors, can have negative impacts on the overall availability of resources (see page 20). For example, in some countries, the rapid expansion of oil palm plantations has strengthened the national economy and lifted many small producers out of poverty. However, it has also led to high deforestation rates, conversion of peat swamps leading to loss of biodiversity, increased CO_2 emissions and wildfires. It has also had negative impacts on human health and forced migration from affected areas.

Achieving long-term economic, environmental and social goals increasingly depends on understanding and accounting for the impact of land management decisions on ecosystem goods and services, and developing a more coordinated approach to natural resource management on a larger scale[13].

CASE STUDY TOWARDS A MORE HOLISTIC FORM OF NATURAL RESOURCE MANAGEMENT: CHARCOAL PRODUCTION IN NORTHERN MADAGASCAR

In Madagascar, as in most countries of Sub-Saharan Africa, wood is the most important source of domestic energy. With a growing population and increased rate of urbanisation, wood is also an important pillar of energy provision strategies. In urban centres in particular, most households use charcoal for cooking that is produced from charcoal catchment areas.

Agriculture, cattle ranching, logging and non-timber forest product extraction are the most prominent land uses in Madagascar. Due to decreasing forest resources, there is not enough wood to satisfy increasing demand for charcoal. The production of charcoal from natural forests is contributing significantly to forest degradation, resulting in further erosion and loss of soil fertility.

The Government of Madagascar is working to increase sustainably produced charcoal in the country, by encouraging wood energy production outside natural forests. This approach calls for more holistic natural resource management that enables stakeholders to identify appropriate land for sustainable charcoal production within the landscape, and to understand possible synergies and trade-offs with other land uses. The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the Federal Ministry of Economic Cooperation and Development (BMZ), is supporting the Government of Madagascar through the German-Malagasy Environmental Programme. The programme focuses on the creation of an enabling framework for sustainable charcoal production, and the development of the value chain for wood energy, with action at several scales[14].

At the regional level, in the Diana region in the north of Madagascar, the programme elaborated a Regional Modernisation Strategy for the wood fuel sector[15]. This strategy includes proposals for regulatory measures by the forest service in order to limit the unregulated production of wood fuel in natural forests. Its implementation is facilitated by a biomass coordination platform (Plateforme Régionale d'Echanges sur l'Energie de Biomasse; PREEB).

Regional land-use plans (Schéma Régional d'Aménagement du Territoire, or SRAT) with a horizon of 20 years were developed through a multi-stakeholder process[16]. The SRAT aims to introduce coherent spatial planning between the various sectors involved, and thus constitutes an important orientation for the development of the landscape. Wood is acknowledged as an important future energy source.

The programme ensures that afforestation is embedded in land-use planning at the local level (i.e. municipality and local level), a prerequisite for the successful establishment of plantations on degraded lands. The participation of all stakeholders is crucial to guarantee that the woodlots fit into the livelihood system of the local population, without risking future land-use conflicts. The programme promotes tenure security for participating households, which incentivises people to take care of the plantations.

To date, about 9,000 hectares of plantations for wood energy production have been established in the Diana region. These provide sustainably produced charcoal to 40% of the population of the city of Antsiranana. Furthermore, it is estimated that charcoal production in the plantations avoids the deforestation of about 2.200 ha annually. For about 3,000 households from 68 villages, the plantations also provide additional sources of income. Finally, the existence of a legal alternative to deforestation is motivating more charcoal producers to switch to production outside natural forests, further decreasing pressure on this resource.

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INFOGRAPHIC - AN UNSUSTAINABLE LANDSCAPE

Adopting a siloed approach to natural resource management can have negative impacts on other land uses, due to the interconnectedness of issues. This illustration and the explanatory text below highlight in simplified form the links between different land uses, and how one negative action can have a flow on effect that damages the potential for other sustainable activities in a landscape.

Intensive land use (e.g. heavy use of chemicals in agriculture) near the river's edge leads to polluted and sediment-laden runoff water entering water bodies, harming the humans and animals that rely on these water sources.

Poorly managed or overgrazed rangelands lead to soil erosion, increased greenhouse gas emissions from grasslands, and decreased livestock yields, harming human livelihoods, grassland biodiversity, and the climate.

Deforestation, forest degradation, and poor agricultural practices cause erosion into waterways that lead to costly siltation behind hydroelectric dams. Siltation reduces the service life and efficiency of hydropower facilities, hurting growth and increasing reliance on fossil fuels.

The uncontrolled logging of primary forests for timber or agricultural expansion threatens the livelihoods of people who depend on the forest for their survival. It also causes heavy erosion that can lead to landslides and flooding.

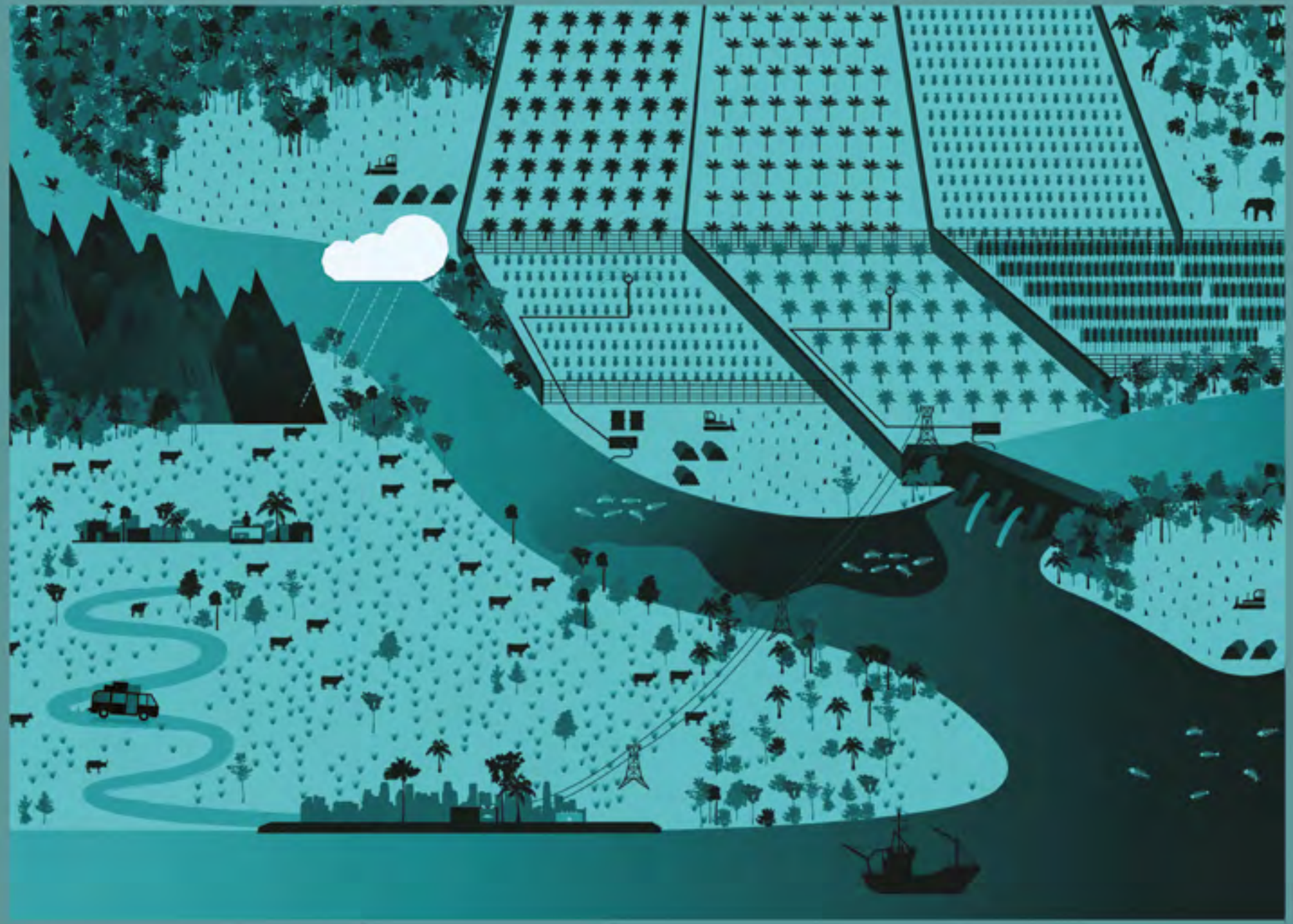
Deforestation contributes to loss of biodiversity by destroying the habitat of a range of species; it accelerates climate change by releasing CO_2 stored in trees and healthy soils; and reduces the capacity of the soil to retain water. Forests are invaluable to humanity in that they provide economic goods (such as food, timber and fuel wood), and ecosystem services at local, regional and global scales.

Siltation, pollution, acidification and destruction of riparian vegetation lead to a loss of healthy habitat for fish to spawn and grow. This leads to collapsing riverine and marine fisheries upon which the food security of millions depend.

Land degradation, lack of electrification and other services, and insecure tenure contribute to tenuous rural livelihoods, forcing people to move to the city to find jobs. Rapid and unplanned urbanisation leads to negative social, health and environmental consequences for all city dwellers.

Large barriers to wildlife movement through the landscape, both ecological (e.g. chemical-intensive monocultures) and physical (e.g. fences), lead to declining biodiversity and loss of ecosystem services for agriculture, such as pollination and pest control.

View infographic →



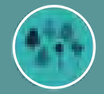
INFOGRAPHIC - TOWARDS A SUSTAINABLE LANDSCAPE

The interconnected elements of a landscape can be managed to meet the full range of needed goods and services. This illustration and the explanatory text below show the links between different land uses, and the importance of taking a holistic view while developing approaches for the sustainable management of natural resources.


Agroforestry systems like shade coffee, cocoa and tea, and multi-story annual-perennial systems, preserve both agricultural diversity and biodiversity, while improving the food security, resilience, and livelihoods of farmers and their neighbours in cities and downstream.


Appropriate livestock density, rotational grazing, and stock diversity protect rangelands from degradation; increase the production and value of pastoral products from dairy and wool to meat and hides; and increase carbon storage in the soil.


Efficient and fish-friendly hydropower production, protected from upstream erosion and pollution, renewably powers cities and rural communities and can regulate flooding.


The sustainable management of forests preserves biodiversity and secures the long-term wellbeing of people who rely on timber and non-timber forest products for income and cultural traditions. Trees also help stabilise microclimates and reduce CO_2 emissions, and can therefore help people mitigate and adapt to climate change.


Holistically managed landscapes protect water resources that fish and other aquatic species rely on. They also protect the livelihoods of people who rely on the fish for food security and income.


Biodiversity-friendly products from the landscape are exported internationally (e.g. coffee beans), and transported to local or regional markets (e.g. local fruit) leading to economic growth, rural opportunity, and food security.


A riparian buffer zone helps prevent soil erosion and siltation of the watercourse, and protects important fish habitat, improving fishery production. It also provides corridors for wild animals to move between non-agricultural areas, potentially reducing human-wildlife conflict.

View infographic →

THE LANDSCAPE AS A KEY SCALE FOR ACTION

This book examines how a more holistic form of natural resource management can be achieved by looking at the landscape as the appropriate scale of action.

Increasingly, private farmers, forest owners and public agencies are finding it difficult to meet their own sustainable resource management objectives, without the cooperation of others[17]. Additionally, local decisions to manage land sustainably may not be developed in coordination with broader national strategies. Coordinated action among groups of land users offers the potential to reconcile competing objectives at different scales. Such action is required to address challenges to sustainable development such as the depletion of underground aquifers, wildlife habitat loss, water pollution or adaptation to climate change.

Looking at the broader landscape scale offers the opportunity to address a far greater composite of factors across sectors and stakeholders from the outset, which should increase the probability of successful outcomes.

DEFINING SUSTAINABLE LANDSCAPES

A landscape is a socio-ecological system that consists of natural and/or human-modified ecosystems, and which is influenced by distinct ecological, historical, political, economic and cultural processes and activities (see page 27). The spatial arrangements and governance of a landscape contribute to its unique character.

Within a landscape, there can be various land use types, such as agriculture, forestry, biodiversity conservation, and urban areas. The actors managing these land use types have different objectives, e.g. biodiversity conservation, agricultural productivity or livelihood security.

A landscape should be defined by stakeholders at a scale that is small enough to maintain a degree of manageability, but large enough to be able to deliver multiple functions to stakeholders with different interests. Its boundaries are set by the stakeholders involved in landscape management, and may correspond to, or be a combination of, natural boundaries, distinct land features, socially defined areas such as indigenous territories, and/or jurisdictional and administrative boundaries. The boundaries of a landscape can cross several countries (see pages 32-33).

Although there is no universally agreed definition for a sustainable landscape, the authors define it as a landscape that supports the United Nations Sustainable Development Goals and can "meet the needs of the present, without compromising the ability of future generations to meet their own needs"[18]. Broadly, sustainable development aims to ensure synergies and minimise trade-offs between economic, social and environmental (including climate) goals, where these objectives compete.

A sustainable landscape will simultaneously meet a full range of local needs (e.g. ensuring water availability for households, farms, businesses and wildlife; biodiversity for crop pollination and local wildlife tourism; local food security and income), while also contributing to national commitments and global targets (e.g. net reductions in land-based greenhouse gas emissions; the Aichi targets for biodiversity conservation; providing rural employment; generating power from renewable resources; supplying surplus agricultural production to feed urban dwellers).

Working towards sustainable development at the landscape scale therefore means looking beyond the scope of a single sector and stakeholder group and the scale of a land management unit so as to meet the needs of diverse stakeholders and sectors.

DEFINING INTEGRATED LANDSCAPE MANAGEMENT

Efforts to achieve sustainable landscapes may be undertaken independently, by a single stakeholder, or collaboratively, by multiple stakeholders. We advocate the latter as being more effective.

A single stakeholder committed to sustainability, such as a government agency or conservation organisation, can seek to drive the implementation of a landscape approach. For instance, that single actor may seek to balance different objectives and may even consider the interests of other stakeholders, but do so autonomously, without any significant consultation with them. The most obvious example is when a central government controls major resource decisions. This will still imply managing synergies and trade-offs and conflicts between its own agencies.

However, in practice, this model has encountered difficulties in implementation when other stakeholders have different priorities or they are using management practices that undermine the single stakeholder's decisions. In most cases, some level of cooperation or coordination amongst stakeholders within a landscape is necessary in order to ensure long-term viability.

Integrated landscape management is a term used to describe multi-stakeholder approaches to landscape management. The level of cooperation within integrated landscape management varies from information sharing and consultation to more formal models, with shared decision-making and joint implementation. Finding the most appropriate level of cooperation is an important part of integrated landscape management (see page 60). The governance structure, size and scope, and the number and type of stakeholders involved (e.g. private sector, civil society, government) in integrated landscape management vary.

The authors consider that this integrated management approach is more likely to lead to sustainable landscapes in the long term, by explicitly addressing trade-offs and synergies among stakeholders and between different parts of the landscape, and by building collaborative relationships. We outline the elements required to set up and sustain integrated landscape management (see page 50), as well as the catalysts that can help scale up implementation (see page 100).

INTEGRATED LANDSCAPE MANAGEMENT AS A MEANS OF IMPLEMENTING THE SUSTAINABLE DEVELOPMENT GOALS

In contrast to the Millennium Development Goals[19], which focused almost exclusively on developing countries and largely promoted sector-specific approaches, the Sustainable Development Goals (SDGs), newly adopted by the United Nations General Assembly, apply to all countries equally and recognise the underlying importance of ensuring environmental sustainability.

The SDGs are linked and inter-dependent, such as those related to poverty eradication; sustainable agriculture; food security and nutrition; water and sanitation; health; sustainable cities and human settlements; terrestrial and marine ecosystems and biodiversity; climate adaptation and mitigation; clean power generation; social stability and security; and sustainable production and consumption[20,21]. Moreover, states have increasingly acknowledged that the SDGs are indivisible and should be implemented in an integrated manner[22]. As efforts are made to pursue these goals, it will be critical to manage the potential competition among them for natural resources, and avoid over-exploitation.

Because of these interlinkages and the complexity and interrelated nature of current global challenges, integrated landscape management can significantly contribute to implementing the SDGs[23]. Adopting a landscape approach that systematically considers multiple sectors and diverse stakeholder needs can help generate solutions that simultaneously achieve multiple objectives. For example, a cross-sector programme for watershed restoration can spur economic activity, improve agricultural productivity, foster biodiversity, and contribute to climate change mitigation and adaptation, as well as improving water availability and quality. Furthermore, by coordinating strategies and encouraging synergies between national, sub-national and local governments, integrated landscape management can create cost efficiencies at multiple levels. Given that integrated landscape management supports an inclusive, participatory process that engages all stakeholders in collaborative decision-making and management, it can also help to empower communities. Finally, as a natural resource management strategy, it can enhance regional and transnational cooperation across ecological, economic and political boundaries[24].

CHALLENGES TO MORE INTEGRATED FORMS OF NATURAL RESOURCE MANAGEMENT: INTEGRATED WATER RESOURCE MANAGEMENT IN LATIN AMERICA

Water is a finite resource with multiple users; actions by one user can affect another. For example, hydroelectric power can affect water flows for downstream irrigation, while agricultural irrigation and chemical pollution affect the availability and quality of water for other users.

Integrated Water Resources Management (IWRM) is designed to address competing water demands in an equitable way that meets the needs of people, industries, and ecosystems. Many IWRM partnerships adopt other goals beyond water management, and are thus a type of integrated landscape management.

IWRM is particularly well established in Latin America, both in national water agencies and in local watershed management. The challenges to implementation in this region offer useful insights for integrated landscape management more broadly.

Integrating land use management across sectors and scales: The landscape for implementing IWRM is often the watershed. However, watersheds do not often align with the political landscape, leading to governance gaps. Furthermore, the fragmentation of water policymaking leads to coordination challenges between central water agencies and sub-national actors such as River Basin Organisations. For example, in Peru there are 13 central agencies involved in water policymaking and 10 in water regulation.

Additionally, whilst a multi-sector approach is central to IWRM, engaging with powerful water-dependent actors outside the watershed and/or water community remains a major challenge. This is particularly evident for the energy sector, where decisions are driven by energy security needs at the national level. These decisions, such as those that pertain to new energy infrastructure, can have significant impacts on local watershed resource management, and can conflict with decentralised water policymaking at the jurisdictional and watershed level.

Ensuring all relevant stakeholders are on board: For different interest groups to come together in a multi-stakeholder process involving compromises and trade-offs, a clear articulation of the benefits of participation is essential. Furthermore, marginalised actors, such as indigenous communities, and unorganised actors, such as irrigators, need to be empowered to meaningfully participate in these negotiations.

However, even when relevant stakeholders are on board, reaching consensus may be challenging and time-consuming.

Incentivising desired behaviours: Incentives are essential to create a shift towards more efficient resource-use. Low water tariffs and subsidised energy costs (the dominant cost in water distribution) promote inefficient water use in Latin America and do not incentivise investment in improving infrastructure. Examples of more progressive approaches to water pricing include a rebate for efficient use in Peru and variable pricing according to regional water availability in Mexico. However, even in Mexico, there is no tariff for irrigation within water-use concessions and the low tariff for exceeding water-use limits in concessions does not vary by zone.

Accounting for ecosystems in risk management: Similarly, there is a need to understand and account for the role of ecosystems in water management. For example, the severe drought in the south-east of Brazil in 2014 that affected 4 million people and led to conflicts between different water users including Brazil's 3 largest states of Sao Paulo, Rio de Janeiro and Minas Gerais, was exacerbated by local environmental degradation of riparian areas. Recognising and accounting for environmental externalities, such as the erosion of ecosystem services is vital in improving risk management strategies. Whilst Latin America and the Caribbean is a global leader in the development of Payment for Ecosystem Services (PES) programmes[iv], which represent a step towards recognising the value of ecosystems and the costs of environmental externalities, a systemic shift is required to internalise these externalities in the costs of resource use[25].

Helen Bellfield
The Global Canopy Programme

iv Including Socio Bosque in Ecuador, Mexico's Payment for Watershed Services, and The Latin America Water Funds Partnership.

CASE STUDY INTEGRATED LANDSCAPE MANAGEMENT IN THE KAILASH SACRED LANDSCAPE

Mount Kailash, in the Tibetan Autonomous Region of the People's Republic of China, has for thousands of years been a sacred site of supreme importance for Buddhism, Hinduism, Jainism, Sikhism and Bon. Every year 100,000 pilgrims visit this sacred mountain and its surrounding sites in remote western China.

Mount Kailash region is the source of four major river systems for South Asia including the Indus, the Karnali/Ganges, the Brahmaputra and the Sutlej. These water sources are used for multiple purposes, including irrigation and hydropower generation, and are a source of life for millions of households downstream in neighbouring Nepal and India. The region is characterised by various ecosystems ranging from subtropical in the south to temperate alpine and cold, high altitude deserts in the north, with high biodiversity of flora and fauna.

In recent years, traditional livelihoods dependent on agriculture and the harvesting of forest products have been threatened by changes in rainfall patterns and the degradation of natural resources. Emigration in search of employment and education (mainly by men) is on the rise, with women, elders and children left behind in the villages.

The governments of China, India and Nepal, as well as local communities, are aware of the diverse ecological and cultural wealth of the region. They are also aware of future challenges linked to climate change, the interface of upstream-downstream disasters and knowledge gaps on long-term climate, ecological and other data. However, their different interests in and approaches to these challenges have long hindered collaboration.

In 2005, with the encouragement of the International Centre for Integrated Mountain Development (ICIMOD), China, India and Nepal agreed to take an integrated holistic approach towards conservation and development within this unique landscape.

The Kailash Sacred Landscape, covering 31.000 km^2, was defined on the basis of cultural and ecological criteria, watershed boundaries, common livelihood practices and administrative frontiers. The area includes parts of the south-western Tibetan Autonomous Region, China, north-western Nepal, and north-eastern Uttarakhand State, India.

Initially, the focus of the project was to agree a common approach to landscape management, considering the different interests of the stakeholders involved, and the varied national policies and capacities of the partner institutions. The process started in 2005 with an inception meeting to identify the stakeholders to engage with, and continued with a series of negotiations to agree on shared objectives (see below). Several frameworks and strategies were developed to guide long-term cooperation, clarify ways of working together, which methodologies to use, and the modes of implementation. Discussions amongst stakeholders led to a series of key documents, including feasibility assessments, a regional cooperation framework, a regional conservation and development strategy, and a regional communication and knowledge management strategy. The participation of the communities was ensured through participatory assessments and planning processes in each country. The implementation started in 2011 and the current phase will end in 2017.

During the collaborative planning process, the partners agreed on five overarching objectives for the Kailash Sacred Landscape: developing improved livelihood systems, improved eco-system management for sustainable services, access and benefit sharing, long term socio-ecological monitoring, and regional cooperation, enabling policies and knowledge management systems.

In addition to specific activities designed to achieve these objectives, partners agreed to organise regular workshops and forums to exchange information and to build the capacity of stakeholders on all levels. Partners also worked to ensure that project plans were linked to national plans in each country. The nomination of the Kailash Sacred Landscape as a transnational World Heritage Site by UNESCO[v] is under discussion. This will help to cement future cooperation at the landscape scale between the three states.

Despite the challenges faced, the project has already achieved significant impacts in terms of improving regional cooperation and collaboration between the various stakeholders in the field (including tourism, through the development of guidelines for pilgrims). For the first time, tour operators and other tourism stakeholders in China, India and Nepal are working together to achieve more sustainable tourism in the Kailash Sacred Landscape.

Corinna Wallrapp
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

ICIMOD serves as a transnational coordinator and facilitator of the Kailash Sacred Landscape Conservation and Development Initiative, with the respective national nodal ministries and their designated national institutes as implementers. The initiative receives financial contributions from the Department of International Development (DFID) of the United Kingdom and, has been supported since 2012 by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry of Economic Cooperation and Development (BMZ).

v UNESCO refers to the United Nations Educational, Scientific and Cultural Organisation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CASE STUDY MULTI-STAKEHOLDER ACTION TO REDUCE ILLEGAL DEFORESTATION IN SÃO FÉLIX DO XINGU MUNICIPALITY, BRAZIL

In the span of a few years, Sao Felix do Xingu Municipality transformed from a top target of the Brazilian Government's anti-deforestation enforcement programmes to a powerful example of the effectiveness of combining multi-level command and control systems, multi-stakeholder agreements, and multi-sector green growth programmes.

Sao Felix covers an area of 8.4 million hectares, an area roughly the size of Portugal, around 75% of which is forested. The municipality has the largest cattle herd in Brazil (2.2 million animals), and beef is the largest industry for the 106,000 residents. Indigenous reserves and two protected areas together cover around 6.1 million hectares, with private lands covering the remaining 2.3 million hectares. From 1999-2008, deforestation averaged 108,000 hectares per year, mainly on large-scale private ranch land that left farmers out of compliance with Brazil's strict "forest code", which requires 80% of farms to be maintained as natural forest.

In the mid to late 2000s, a series of high-impact campaigns about Amazon deforestation, particularly in the soy and beef sectors, helped to catalyse intensive efforts by government and leading industry actors to end illegal deforestation. In 2008, Sao Felix was number two on the Government's first "blacklist" of municipalities with the highest deforestation, a key part of Brazil's national strategy for reducing deforestation in the Amazon. Blacklisted jurisdictions faced an embargo on the sale of goods produced on illegally deforested areas, reduced access to credit for farmers from the Bank of Brazil, and active enforcement by IBAMA (the agency responsible for issuing environmental fines). With their economy severely threatened, stakeholders in Sao Felix were ready to work together to find ways to build the economy without relying on large-scale forest clearance.

A Pact for the End of Illegal Deforestation was signed in São Félix do Xingu in August 2011 by more than 40 entities: local, state and national governments; producers unions; community associations; NGOs; and others. A Commission of 22 entities was created to oversee the implementation of the Pact. It meets at least every two months to coordinate the land registration process, deforestation monitoring and reporting, and sustainable development activities. The Pact is part of a state-wide "Green Municipalities" programme.

Rural registry. A key strategy was to register private land on the Cadastro Ambiental Rural (CAR – the rural registry), so that specific property owners could be held accountable for deforestation. The Nature Conservancy (TNC) led the mapping and registry of 87% of the eligible lands in the pilot area; the Ministry of Environment will complete the remaining 13%. (São Félix has therefore satisfied the requirement that 80% of eligible lands be registered in CAR before it can be removed from the blacklist). The State of Pará also established a Green Value Added Tax in 2013 to incentivise the registration of properties. Tax revenues are now allocated partly on the basis of existing forest area, percentage of CAR registration, and deforestation trends. This source of additional revenue provides further incentives to reduce deforestation.

Sustainable intensification of cattle production. São Félix do Xingu has developed a strategy around intensification of cattle production, the biggest driver of deforestation in the municipality. Standard practices for both small- and large-scale cattle production are low intensity and highly degrading to the landscape, requiring new forest to be cleared every seven years. Through the programme, cattle producers receive support to implement more efficient practices that avoid soil degradation and allow more cattle to be raised on the same amount of land, reducing the need to clear forest. Commitments from corporations to support elimination of deforestation from beef supply chains (e.g. critical support by Walmart and Marfrig) have aided in promoting these more sustainable practices.

Indigenous lands. Indigenous lands cover much of the municipality and there is relatively low deforestation. However, encroachment is a source of both forest loss and conflict. The programme has accelerated development and implementation of Territorial and Environmental Management Plans by indigenous communities.

Cacao. Sustainable cacao fruit production is being promoted among smallholders. Since cacao is a shade-grown crop, its production serves as a driver of reforestation on previously degraded lands. Additionally, it provides smallholders with an alternative to unsustainable cattle production. Partnerships have been formed with local cooperatives and corporations such as Cargill, who are interested in purchasing cacao produced in São Félix do Xingu, creating increased demand for this sustainable alternative.

Deforestation and associated carbon emissions in the municipality of São Félix do Xingu have dropped 85% percent - from the 1999-2008 average of 108,000 hectares per year to 15,000 hectares in 2014. More than 87% of rural properties have been registered in the CAR. Traceable, legal "Xingu Beef" is now available in Brasilia. More than 80 farms have piloted sustainable cacao practices, a model that can be replicated broadly in the Amazon. Success in Sao Felix has contributed to overall success in reducing forest loss in the Amazon, which in turn has triggered payment of nearly USD 1 billion in results-based climate finance from Norway to Brazil. The finance will help maintain ongoing investment in key green growth initiatives throughout the Amazon, including in Sao Felix. While programmes to maintain and accelerate economic growth with limited environmental impact are still being brought to scale, results to date are encouraging.

Lex Hovani
The Nature Conservancy

TRENDS IN INTEGRATED LANDSCAPE MANAGEMENT

NATIONAL POLICY DEVELOPMENTS

Integrated landscape management has been accelerated by recent developments that have made it easier to work at landscape scale. This page highlights a number of national policy developments that are making integrated landscape management more feasible.

Increased recognition of the importance of multi-stakeholder participation in natural resource management: Multi-stakeholder processes are a key element in integrated landscape management (see page 63). There is increasing experience with and recognition of the benefits, of multi-stakeholder participation in land use policy in many countries, with non-governmental actors and the private sector becoming key players in decision-making processes. For example, under the EU's Forest Law Enforcement Governance and Trade Action Plan (FLEGT), Voluntary Partnership Agreements (VPAs) developed the first trade agreements through inclusive multi-stakeholder processes that have had impacts on decision making in the forest sector[26]. As part of the design and implementation of REDD+[vi], many countries have been undertaking multi-stakeholder processes[27].

Decentralisation of natural resource management: Many developing countries around the world are taking steps to decentralise some aspects of their natural resource management[28]. Decentralisation means the central government formally transferring planning, decision-making and management powers to sub-national or local institutions. Although it is challenging, decentralisation in general, and of natural resource management in particular, can help create the institutional basis for more participatory natural resource management. It can therefore provide a significant boost to efforts at managing natural resources in a more integrated manner and at a landscape scale.

Strengthened local tenure and resource rights: Since the adoption of the Rio Conventions[vii], the number of laws recognising or strengthening the land and forest rights of Indigenous Peoples and local communities has increased dramatically around the world — over 50 such laws have been enacted since 1992. In addition, the global area of forest recognised as owned or controlled by Indigenous Peoples and local communities has increased, particularly in Latin America. This recognition is fundamental to effective participation in integrated landscape management, even if it is not yet always fully respected (see page 109)[29].

vi REDD+ stands for reducing emissions from deforestation and forest degradation, the conservation and enhancement of forest carbon stocks, and the sustainable management of forests. The UNFCCC states that when undertaking REDD+ activities (i.e. those activities referred to in Paragraph 70, Decision 1/CP.16), the Cancun safeguards should be promoted and supported. Cancun safeguard (d) calls for the full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities, in actions referred to in paragraphs 70 and 72 of Decision 1/CP.16.

vii The Rio Conventions were adopted at the United Nations Conference on Environment and Development in Rio in 1992, and include the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD) and the United Nations Convention to Combat Desertification (UNCCD).

INTERNATIONAL POLICY DEVELOPMENTS

International funding that can incentivise integrated landscape management approaches: Funding for climate change mitigation initiatives such as REDD+ can catalyse transitions to integrated landscape management, as it encourages the development of multi-stakeholder processes, cross-sectoral coordination and efforts to maximise both carbon and non-carbon benefits. Over a billion dollars are being invested at jurisdictional scales including through the World Bank's Carbon Fund, and BioCarbon Fund Initiative for Sustainable Forest Landscapes, the Global Environment Facility, and the United Nations Convention to Combat Desertification's Impact Investment Fund for Land Degradation Neutrality. It has been estimated that climate funds could deliver between USD 20-30 billion in the coming years.

International commitments to sustainable development: In recent years, greater understanding of the scale and complexity of drivers of unsustainable resource use, and of threats such as climate change, has expanded interest in landscape approaches as a way of managing and balancing competing pressures at different scales. United Nations member states will be expected to use the SDGs to frame their agendas and political policies over the next 15 years. Developing landscape approaches could be an effective means of implementing a majority of the SDGs[30] (see page 29).

Global climate negotiations: Debates under the United Nations Framework Convention on Climate Change have triggered a major discussion among governments on landscape-wide action as a means to reduce greenhouse gas emissions and increase carbon sequestration at scale, including for REDD+ and climate-smart agricultural landscapes[31].

The New York Declaration on Forests: Many governments and multinational commodities producers that have recognised the limits of supply chain approaches to sustainability, have made high profile pledges to manage natural resources in a more holistic way.

The Bonn Challenge: Through this international initiative, countries, companies, institutions and individuals have committed to restore 150 million hectares of degraded lands by 2020, including agricultural land, using a multi-functional landscape approach[32].

CASE STUDY JURISDICTIONAL REDD+ AS A DRIVER FOR COMMUNITY INVOLVEMENT IN INTEGRATED LANDSCAPE MANAGEMENT

Jurisdictional approaches to REDD+ and green development have emerged in many countries as an important approach to achieving multi-objective landscape management. One key challenge is linking approaches to improving site-level management with jurisdictional policy reforms. This is most acute when land tenure of communities is unclear. Early experiences are demonstrating that it is not only possible for REDD+ to systematically support community-oriented solutions, but that doing so can accelerate overall solutions in landscapes.

In Berau district, in East Kalimantan, as in many other rural areas in Indonesia, villages lacking clear land tenure generally have limited economic opportunities, and relatively low capacity to engage with other landscape actors, including the private sector and local government.

As the Indonesian Ministry of Forestry and Berau Government, along with other stakeholders, began developing a jurisdictional REDD+ programme in 2009, engaging the community surfaced as a clear challenge. Given the lack of formal tenure, recognition and influence of land use and financing decisions, how could the programme use the available financing mechanisms to systematically improve the security, opportunity, and empowerment of local people, while also contributing to jurisdictional green growth objectives?

The 2.2 million hectare district of Berau, home to around 107 villages, has experienced dynamic landscape and cultural transformation over the past 15 years. Traditional Dayak approaches to shifting cultivation continue, but are increasingly being displaced by industrial-scale logging, plantations, and mining, as permits are given to private companies to utilise what is officially government land.

In this context, the stakeholders developed SIGAP (an acronym for 'inspirational communities' action to affect change' in Bahasa), which seeks to achieve agreed multi-stakeholder plans at village scale, leverage financing for implementation of the plans from diverse sources, maintain accountability for adherence to the plans, and catalyse a gradual but decisive shift in the role of local people in landscape management.

The approach includes a Free, Prior and Informed Consent (FPIC) protocol, participatory mapping of rights and village boundaries, identification and mapping of community 'assets', development of a common vision and land use plan, formulation of village development plans, identification of funding sources and follow-up with relevant government agencies, a community resolution and incentive agreement, a monitoring programme for implementation, and an approach to results-based finance.

The approach explicitly focuses on aligning financing from multiple sources. This includes donor 'readiness' funding for the REDD+ programme, performance-based finance to catalyse contributions to jurisdictional emission reductions and economic development targets, government development financing, and financing linked to partnerships with neighbouring private sector firms.

By basing the approach firmly in the existing legal framework in Indonesia, and by supporting villages to take a central role in implementing this integrated approach to village-level green growth, it has been possible for model villages, where the approach was originally developed and demonstrated, to secure government endorsement of land use plans and development of financing plans, secure land use agreements from private sector companies operating nearby, secure licenses for long-term management of national forest areas, and shape the permitting and licensing processes for palm oil, a fast-expanding sector in Berau. The approach is now being implemented in over 25 villages in Berau, and is being scaled up elsewhere in the province.

By first empowering local communities, and supporting their vision and planning, it was possible to achieve agreed multi-stakeholder management plans at village scale. SIGAP villages have been leading participants in a district-wide Community Forum to share experiences and, at a later stage, enable villages to have stronger influence in the overall direction of the district programme.

Lex Hovani
The Nature Conservancy

CASE STUDY THE GLOBAL ENVIRONMENT FACILITY'S STRATEGIC APPROACH TO LANDSCAPE MANAGEMENT

The Global Environment Facility (GEF) has long-standing experience promoting landscape approaches to meet multiple land management objectives[33]. For example, between 2007 and 2013, one of the GEF's programmes focused on integrated approaches to address land degradation in production landscapes. Almost USD 500 million was delivered to over 100 projects, which in turn, mobilised over USD 2 billion in co-financing through country programmes, as well as regional and global initiatives in the developing world[34].

A recent review of lessons learned from GEF projects found that prioritising production sectors in national development is key to promoting integrated approaches, as is financing that stimulates cross-sectoral activity.

GEF's experience highlights the importance of ownership by all stakeholders at local level through participatory planning in community level development including grassroots empowerment, in creating platforms for integrated approaches in production systems and generating global environmental benefits. Drawing from these lessons, the GEF developed a new Integrated Approach Pilot programme for 2015-2019 that focuses on sustainability and resilience for food security in 12 countries of Sub-Saharan Africa[35].

Mohammed Bakarr
The Global Environment Facility

TECHNICAL DEVELOPMENTS

Eco-friendly agricultural production systems: Integrated landscape management is facilitated by the recent proliferation of innovative farm, grazing and forest production systems and practices that generate synergies or reduce trade-offs among different land use objectives (see page 46). For example, hillside farmers who adopt agroforestry systems that stop downstream soil erosion and enhance rainfall infiltration become allies, rather than problems, for watershed managers.

Advances in landscape science: In the past two decades scientific advances have deepened understanding of landscape processes and the potential for systematic interventions[36, 37, 38]. There is now a stronger foundation to support stakeholder negotiations and innovative, multi-functional landscape interventions. For example, new biophysical and socioeconomic modelling tools enable scenario development for complex land and resource use systems (see page 83).

Green infrastructure technologies: There has been significant progress in the development of green infrastructure technologies, e.g. green roofs, rain gardens, and bioswales that remove silt and pollution from surface runoff water. For example, New York City's Green Infrastructure Program prevents storm water runoff from entering the sewer system, while contributing significantly to the city's air and water quality[39].

Remote sensing and geographic information systems: Geographic information systems (GIS) and remote sensing of land use and management support more effective landscape planning, while simultaneously reducing costs and improving transparency and accountability to stakeholders. For example, Global Forest Watch[40], an interactive mapping platform, has improved understanding of patterns of deforestation and forest restoration, and has the potential to track land use change on the ground.

GIS, which capture, check, and display data on a map, can help communities manage their resources, and play an important role in developing, managing, maintaining, and analysing the data required for integrated planning at both local and landscape scales.

Communication technologies: The internet and mobile phones have improved access to information for remote communities. GCP has pioneered the use of mobile phones to monitor landscapes in the North Rupununi district in Guyana, a process now being scaled up to other areas[41].

AGRICULTURAL INNOVATIONS THAT SUPPORT INTEGRATED LANDSCAPE MANAGEMENT

In recent years, a range of technical innovations in the agricultural sector have been developed or adapted from indigenous practice, which can contribute to achieving multiple landscape objectives, in addition to food production. These improved methods enable farmers to manage soil, water and vegetation in ways that mimic the functions of natural ecosystems and improve the ecological value of productive farmlands. Agroecological farming relies on biologically based, integrated soil-plant-animal cropping systems to help supply clean water, reduce pollution and protect biodiversity, in addition to producing crops, trees and livestock on a sustainable basis[42].

Agroforestry in Malawi, for example, has increased maize yields by about 50% when nitrogen-fixing Faidherbia albida trees were planted in farms. In Senegal, nitrogen-fixing shrubs in fields have increased nutrient use efficiency and helped create 'islands of fertility' that have greater soil organic matter, nitrogen and phosphorous concentrations under canopies than in open areas. At the same time, the trees in these fields improve rainfall infiltration and storage, provide wildlife habitats and sequester carbon from the atmosphere to mitigate climate change.

In Zambia, maize yields in **conservation agriculture** systems with crop rotations have been 50% higher than yields under conventionally tilled maize, as well as reducing soil erosion, chemical inputs, and energy use. Farmers in Burkina Faso have doubled grain yields using rainwater harvesting techniques such as stone bunds and planting pits[43]. Practised at community scale, **rainwater harvesting** can recharge underground aquifers and restore streamflow[44].

Other examples of agroecological farming practices with multiple benefits include holistic grazing systems, which time grazing to maximise fodder plant productivity and biodiversity benefits[45]; and the system of rice intensification whereby farmers time planting and irrigation, and reduce the space between crops in order to raise yields. This also greatly reduces agrochemical inputs and irrigation water use[46].

Such farming practices can have landscape scale benefits through coordination between resource users situated in different parts of the larger landscape. The creation of biodiversity reserves, habitat networks, and watershed protection areas in and around farms can further magnify the impacts of coordinated action in productive landscapes.

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CASE STUDY TOWARDS LANDSCAPE AGROFORESTRY FOR LIVELIHOODS OF SMALLHOLDER FARMERS IN NORTHWEST VIETNAM

In Northwest Vietnam, rain-fed crop cultivation is dominated by monocultures of maize, upland rice and cassava on sloping lands. The loss of top soil during the rainy season leads to reductions in nutrient and crop yields. The farmers have to invest heavily in chemical fertilizers for the maize to remain productive. Harsh weather conditions also reduce yields or lead to the loss of crops and make soil and water conservation even more difficult.

In order to tackle these problems, the Australian Centre for International Agricultural Research (AGIAR) and the Consortium of International Agricultural Research Centres (CGIAR) are working to introduce agroforestry techniques into mono-cropped landscapes at the farm level. The aim is to reduce dependence on annual crop production by diversifying income through tree products and livestock. Several tree species (timber: teak, acacia; fruit: 'son tra', late longan, plum, mango) and fodder grasses are being tested in ten different agroforestry systems to evaluate their suitability to three ecological zones across three provinces: Dien Bien, Yen Bai and Son La. The sites are being monitored and regularly evaluated to identify improvements in the availability of high-quality tree germplasm; enhanced market access; and the degree of policy integration for successful scaling up.

The project also focuses on providing techniques for the successful expansion of agroforestry from the plot to the landscape scale, in order to allow more people to benefit from such systems. The techniques include training of trainers, championing farmers, organising farmer field days and setting up community tree nurseries.

Agroforestry is being scaled up in two landscapes in Na Ban (Son La) and Sung Pao (Yen Bai) in collaboration with provincial governments and local farmers. The governments and farmers are highly appreciative of the project not only because of its potential to diversify income for farmers, but also because it will provide important environmental services at the landscape scale, such as reduced pressure on forests for timber, reduced soil erosion and protection against storms.

Nguyen La
The World Agroforestry Centre (ICRAF)

The project, "Agroforestry for Livelihoods of Smallholder Farmers in Northwest Vietnam," is a five-year project funded by ACIAR and- CGIAR (2011-2016). The project focuses on improving the availability of good quality sources of germplasm, improving market access and providing extension methods for successful expansion of agroforestry systems. The aim is to improve the performance of smallholders' farming systems through agroforestry by increasing the productivity of associated crop and livestock systems, leading to more diverse and sustainable production systems and better income from tree products.

THE PROLIFERATION OF LANDSCAPE APPROACHES AROUND THE WORLD

A wide range of **non-governmental organisations (NGOs)** are increasingly recognising the needs of people within the landscape by providing facilitation and technical support to landscape management initiatives. **International conservation oriented organisations** working in this field include the African Wildlife Foundation's African Heartlands Programme, which uses a landscape approach to conservation that improves the livelihoods of local people who live with wildlife; and the International Union for Conservation of Nature (IUCN)'s Livelihoods and Landscapes Strategies, which address human and environmental needs in large areas of land with special emphasis on the sustainable use of forests.

Local NGOs or civil society are also recognising the importance of integrated approaches to natural resource management. For example, the Succulent Karoo Ecosystem Programme (SKEP) is a bioregional conservation and development programme initiated by Conservation South Africa. As the initiative evolved, the SKEP coordinating unit became embedded within the South African National Biodiversity Institute (SANBI), a parastatal entity.

Additionally, a number of international networks have emerged, such as the Landscapes for People, Food and Nature (LPFN) Initiative, a collaborative initiative of 70 organisations worldwide that promotes and supports integrated landscape management approaches to sustainable development. The initiative facilitates knowledge sharing and capacity development; provides technical support to landscape initiatives in Africa, Asia, and Latin America; and facilitates regional and national landscape learning networks in East Africa. Another example is the International Partnership for Satoyama Initiative comprising 172 member organisations, working to help maintain and rebuild more than 65 socio-ecological production landscapes and seascapes (SEPLS) in at least 30 countries.

Regional and international programmes, include TerrAfrica and the Great Green Wall Initiative, which support numerous African countries to sustainably manage natural resources using integrated approaches[47,48]. In 2015, the African Union launched the Resilient Landscape Initiative to mobilise and support communities and leverage national, regional and global partners to restore some 100 million hectares of land in African landscapes by 2030, led by the New Partnership for Africa's Development (NEPAD). Since 2010, ECADERT[viii] has supported rural territorial development in low-income regions in Central America and the Dominican Republic through coordinated participatory local action and policy, linking public agencies and civil society organisations involved in agriculture, environment and health[49]. The United Nations Environment Programme (UNEP)'s Ecosystems Management of Productive Landscapes programme seeks to catalyse the adoption of landscape approaches for water, energy and food security in Africa, Latin America and Asia Pacific. A key focus of the project is to improve the knowledge base and build capacity among decision-makers and other stakeholders to understand trade-offs and identify synergies in designing more sustainable food production and water-energy management systems.

On the ground, government programmes are working towards more integrated forms of natural resource management. For example, the Governor of Laikipia County in Kenya is pulling together stakeholders to develop a county development plan that emphasises sustainable landscape management.

Some governments are also working together at the regional scale to manage **transboundary landscapes**. For example, the five governments of Austria, Croatia, Hungary, Serbia and Slovenia established the Danube-Drava-Mura Biosphere Reserve in 2011, the largest riverine protected area in Europe. The shared goal is natural conservation, but also river management, rehabilitation of wetlands, responsible tourism development, and sustainable economic initiatives across 700 km of river and 800,000 ha of land[50].

Municipalities are beginning to consider integrated landscape strategies for managing resources in city regions, reshaping urban-rural linkages to ensure food security, economic development, ecosystem services and resilience. For example, in Canada the Calgary EATS! initiative has made concrete commitments to achieve a more sustainable and resilient food system for the Calgary region by 2036[51].

A number of **indigenous, local or community-led** integrated landscape management initiatives have emerged. The Potato Park in Pisac, Peru is an Indigenous Biocultural Heritage Territory, where indigenous communities manage some 12,000 ha and aim to protect the ecological and cultural diversity of the whole landscape. This endogenous, dynamic conservation approach to diversified farming respects traditional production practices, laws and indigenous values[52].

The private sector is recognising the need to take sustainability into account in global sourcing for supply chains, both to minimise reputational, regulatory and operational risks, and to open up new markets[53]. For example, Finlays Ltd and Unilever, convened by The Sustainable Trade Initiative (IDH), have joined forces with three district governors, hydropower operators and community stakeholders in Kenya to develop an action plan to reduce negative impacts on the local forest, because the changing microclimate caused by deforestation is affecting their tea yields (see pages 70-71).

viii ECADERT stands for Estrategia Centroamericana de Desarrollo Rural Territorial; in English, the Central American strategy for rural territorial development.

CASE STUDY GREEN ECONOMY IN ACRE, BRAZIL

The Brazilian state of Acre was once notorious for the murder of environmental activist and rubber tapper leader, Chico Mendes. Today it stands out for its ground-breaking green economy initiative.

Since 1999, the Acre government has established state-wide payments for environmental services (PES) and REDD+, which coincide with many of the principles of integrated landscape management. At the core of this system is the Acre State System for Environmental Services (SISA) [ix] which aims to reduce deforestation rates by 80% by 2020, and remove up to 133 million tons of CO_2 emissions from the atmosphere between 2006 and 2009[55,56].

The Acre green economy approach also values other environmental services, such as biodiversity and freshwater. Since most deforestation drivers stem from sectors outside forestry, the premise is that REDD+ works best within a wider set of incentives for low carbon sustainable development, including best agricultural practices and land use intensification, but also sound forest management at scale.

Designed through consultations by a multi-stakeholder team, SISA has already engaged more than 5,000 families in a broad participatory process. During Phase 1, producers received financial incentives and technical and marketing support for sustainable livelihoods in return for protecting forests. Participatory zoning focused on conserving the most threatened areas, with protected areas now covering half of the state, and recognising indigenous territories. In phase 2, which started in 2014, SISA will register all 40,000 rural properties in the state to confirm their compliance with the Brazilian forest code, while extending incentives and marketing support for the sustainable production of forest and agricultural goods.

The structure of the state secretariat has been modified to better implement SISA. A state company dedicated to carbon commercialisation was established, and an agency was set up to monitor land use changes. As a result, Acre has attracted significant financial support from national and international entities - such as the Brazilian National Bank for Economic and Social Development (BNDES), KfW and the InterAmerican Development Bank (IDB) - that will help to advance social and environmental safeguards and build a green economy.

Acre is a pioneering example of PES/REDD+ implementation, but major challenges remain. The first Amazonian state-wide discussions are now underway on decentralised energy and adaptation to climate change. Acre needs to harmonise the Brazilian forest code implementation to SISA. A great challenge - but still a fair match for the state where Chico Mendes was born.

Marco Lentini
WWF Brazil

ix SISA is the acronym in Portuguese for Acre state system for environmental services incentive.

INTEGRATED LANDSCAPE MANAGEMENT IN AFRICA, LATIN AMERICA-CARIBBEAN, AND ASIA

With growing motivation and improved tools available to develop integrated landscape management, more and more integrated landscape initiatives are developing around the world.

The infographics on the next page are based on a review of 357 integrated landscape initiatives in Africa[57], Latin America-Caribbean[58] and Asia[59] conducted by the Landscapes for People, Food and Nature Initiative (LPFN) between 2011 and 2014. A similar study documenting 71 initiatives in Europe is being finalised.

An integrated landscape initiative is defined as “a project, programme, platform, initiative, or set of activities that:

(1) explicitly seeks to improve food production, biodiversity or ecosystem conservation, and rural livelihoods;

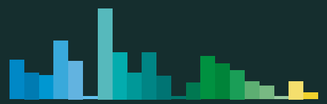
(2) works at a landscape scale and includes deliberate planning, policy, management, or support activities at this scale;

(3) involves inter-sectoral coordination or alignment of activities, policies, or investments at the level of ministries, local government entities, farmer and community organisations, NGOs, donors, and/or the private sector; and

(4) is highly participatory, supporting adaptive, collaborative management within a social learning framework”[60].

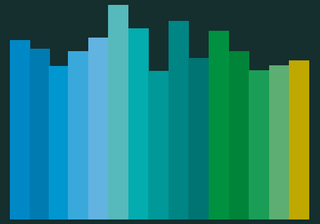
INTEGRATED LANDSCAPE MANAGEMENT IN AFRICA, LATIN AMERICA-CARIBBEAN, AND ASIA

INITIATIVE MOTIVATIONS: PRIMARY/MOST IMPORTANT



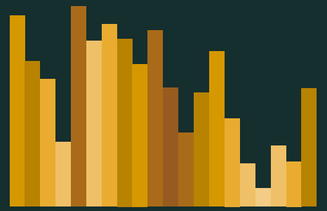
18.2% ENHANCE FOOD SECURITY
11.8% IMPROVE CROP PRODUCTIVITY
10.1% DIVERSIFY FOOD PRODUCTION
24.6% IMPROVE LIVESTOCK PRODUCTIVITY
17.1% REDUCE THE ENVIRONMENTAL IMPACTS OF AGRICULTURE
2.0% IMPROVE FISH STOCK AND FISHERIES MANAGEMENT
39.8% CONSERVE BIODIVERSITY
20.7% CONSERVE SOIL/ INCREASE SOIL FERTILITY
11.5% CONSERVE/INCREASE WATER QUALITY/WATER FLOW
20.7% STOP/REVERSE NATURAL RESOURCE DEGRADATION
10.4% ENHANCE SUSTAINABLE LAND MANAGEMENT
3.9% ECOSYSTEM RESTORATION AND/OR MAINTENANCE
7.8% PROTECT SUSTAINBLY MANAGE FORESTS, REDUCE DEFORESTATION
19.3% INCREASE FARMER INCOMES
15.7% IMPROVE HEALTH/NUTRITION
12.3% CLIMATE CHANGE MITIGATION AND ADAPTATION, OBTAIN CARBON CREDITS
8.4% REDUCE VULNERABILITY TO EXTREME WEATHER EVENTS
6.4% REDUCE POVERTY
1.7% PRESERVING AND USING TRADITIONAL KNOWLEDGE AND CULTURE
8.7% REDUCE RESOURCE CONFLICT
3.9% ENGAGING AND EMPOWERING LOCAL COMMUNITIES

INITIATIVE MOTIVATIONS: ALL



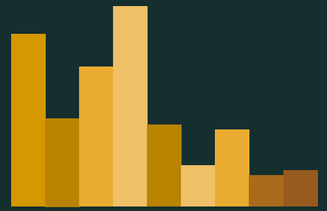
77.0% ENHANCE FOOD SECURITY
73.1% IMPROVE CROP PRODUCTIVITY
66.7% DIVERSIFY FOOD PRODUCTION
72.5% IMPROVE LIVESTOCK PRODUCTIVITY
78.4% REDUCE THE ENVIRONMENTAL IMPACTS OF AGRICULTURE
92.2% CONSERVE BIODIVERSITY
82.8% CONSERVE SOIL/ INCREASE SOIL FERTILITY
74.5% CONSERVE/INCREASE WATER QUALITY/WATER FLOW
86.3% STOP/REVERSE NATURAL RESOURCE DEGRADATION
69.5% ENHANCE SUSTAINABLE LAND MANAGEMENT
81.0% INCREASE FARMER INCOMES
73.1% IMPROVE HEALTH/NUTRITION
84.7% MITIGATE CLIMATE CHANGE/OBTAIN CARBON CREDITS
67.5% REDUCE VULNERABILITY TO EXTREME WEATHER EVENTS
68.6% REDUCE RESOURCE CONFLICT

STAKEHOLDER ENGAGEMENT



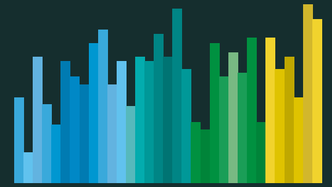
82.4% LOCAL FARMERS'/PRODUCERS' ASSOCIATION
63.6% WOMENS' ASSOCIATION
55.5% INDIGENOUS GROUP
27.7% GROUP REPRESENTING RURAL LANDLESS PEOPLE
86.0% LOCAL GOVERNMENT LEADERS
71.1% GOVERNMENT EXTENSION OFFICERS
77.8% OTHER LOCAL/DISTRICT GOVERNMENT OFFICES/STAFF
72.5% STATE/PROVINCIAL GOVERNMENT OFFICES/STAFF
61.1% NATIONAL MINISTRIES/GOVERNMENT STAFF
76.2% LOCAL NGO
52.1% SUB-NATIONAL/NATIONAL NGO
31.1% INTERNATIONAL AGRICULTURE ORGANISATION
48.7% INTERNATIONAL CONSERVATION ORGANISATION
66.1% LOCAL/NATIONAL UNIVERSITY/RESEARCH CENTRE
37.0% FOREIGN/INTERNATIONAL UNIVERSITY/RESEARCH CENTRE
19.9% IN-COUNTRY AGRIBUSINESS
9.2% FOREIGN AGRIBUSINESS
14.6% LOGGING/FOREST PRODUCTS INDUSTRY
19.1% MINING, OIL, GAS, OR OTHER INDUSTRY
51.0% DONOR(S)

SECTOR ENGAGEMENT



73.4% AGRICULTURE
38.1% LIVESTOCK
60.8% FORESTRY
86.3% NATURAL RESOURCES, CONSERVATION, OR ENVIRONMENT
34.5% TOURISM
18.5% HEALTH
33.3% EDUCATION
13.4% ENERGY
15.1% ROADS, TRANSPORTATION, OR INFRASTRUCTURE

LANDSCAPE INITIATIVES MAKING THE FOLLOWING INVESTMENTS



IN AGRICULTURE

37.8% PROMOTION/INTROD OF NEW CROPS/VARIETIES
12.0% CROP INTENSIFICATION W/MORE MECHANIZATION, FERTILIZERS, PESTICIDES
54.9% CROP INTENSIFICATION WITH AGROECOLOGICAL METHODS
33.1% LIVESTOCK INTENSIFICATION WITH AGROECOLOGICAL METHODS
25.2% ESTABLISHMENT/IMPROVEMENT OF IRRIGATION SYSTEMS
52.9% ADOPTION/EXPANSION OF AGROFORESTRY
46.2% PROGRAMS TO ADOPT/IMPROVE HOME GARDENS
43.4% EFFORTS TO REDUCE THE ENVIRONMENTAL IMPACTS OF AGRICULTURE
60.2% IMPLEMENTATION OF SOIL CONSERVATION PRACTICES
67.5% TRAINING/CAPACITY BUILDING TO SUPPORT AGRICULTURE
41.7% ESTABLISHMENT OF NEW SUPPLY CHAIN/MARKETING FOR AGRICULTURAL PRODUCTS
51.0% PROMOTION OF NATIVE FOOD SPECIES & AGRICULTURAL BIODIVERSITY

IN FORESTRY, CONSERVATION AND NATURAL RESOURCE MANAGEMENT

35.3% NEW PROTECTED AREAS ESTABLISHED
54.8% NEW MANAGEMENT PLANS FOR EXISTING PROTECTED AREAS
53.5% OTHER NEW RESERVES/COMMUNITY-BASED CONSERVATION AREAS
65.3% OTHER COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT ACTIVITIES
55.5% IMPROVED FORESTRY MANAGEMENT
76.2% TRAINING/CAPACITY BUILDING PROGRAMS TO SUPPORT NATURAL RESOURCE MANAGEMENT
49.6% WATERSHED MANAGEMENT ACTIVITIES

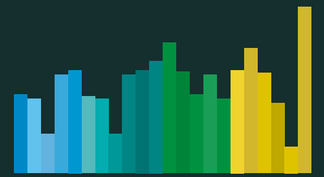
INVESTMENTS IN LIVELIHOODS

28.8% PROGRAMS TO REDUCE MALNUTRITION AND HUNGER
23.5% PROGRAMS TO IMPROVE HEALTH
60.5% PROGRAMS TO IMPROVE GENDER EQUALITY
45.7% PROGRAMS TO HELP SECURE LAND TENURE & RESOURCE ACCESS RIGHTS
56.3% PRESERVATION OF TRADITIONAL KNOWLEDGE/VALUES/CULTURE
47.9% ACTIVITIES TO SUPPORT ENTERPRISE DEVELOPMENT, SAVINGS & INVESTMENT, OR FINANCIAL EDUCATION
63.0% ACTIVITIES TO PROMOTE INCOME GENERATION & DIVERSIFICATION OUTSIDE OF AGRICULTURE/FORESTRY
28.3% EFFORTS TO REDUCE MIGRATION OUT OF THE LANDSCAPE

INVESTMENTS IN INSTITUTIONAL PLANNING AND COORDINATION

61.1% ACTIVITIES TO STRENGTHEN EXISTING COORDINATION BODIES
49.3% CREATION OF NEW LANDSCAPE COORDINATING BODIES
54.9% DIALOGUE & MEDIATION OF CONFLICTS AMONG LOCAL COMMUNITIES/RESOURCE USERS
39.2% DIALOGUE & MEDIATION OF CONFLICTS BETWEEN LOCAL COMMUNITIES & EXTERNAL STAKEHOLDERS
77.6% CAPACITY BUILDING & TRAINING ACTIVITIES IN INTEGRATED LANDSCAPE MANAGEMENT
70.9% TECHNICAL ASSISTANCE TO SUPPORT INTEGRATED LANDSCAPE MANAGEMENT

LANDSCAPE INITIATIVES REPORTING THE FOLLOWING OUTCOMES



AGRICULTURE OUTCOMES

34.7% AGRICULTURAL YIELD PER UNIT OF LAND AREA INCREASED
33.3% AGRICULTURE BECAME MORE PROFITABLE
18.8% TOTAL AREA UNDER AGRICULTURE & PASTURE INCREASED
42.6% ENVIRONMENTAL IMPACTS OF AGRICULTURE WERE REDUCED
44.8% AGRICULTURAL BIODIVERSITY WAS PROTECTED/ENHANCED

CONSERVATION OUTCOMES

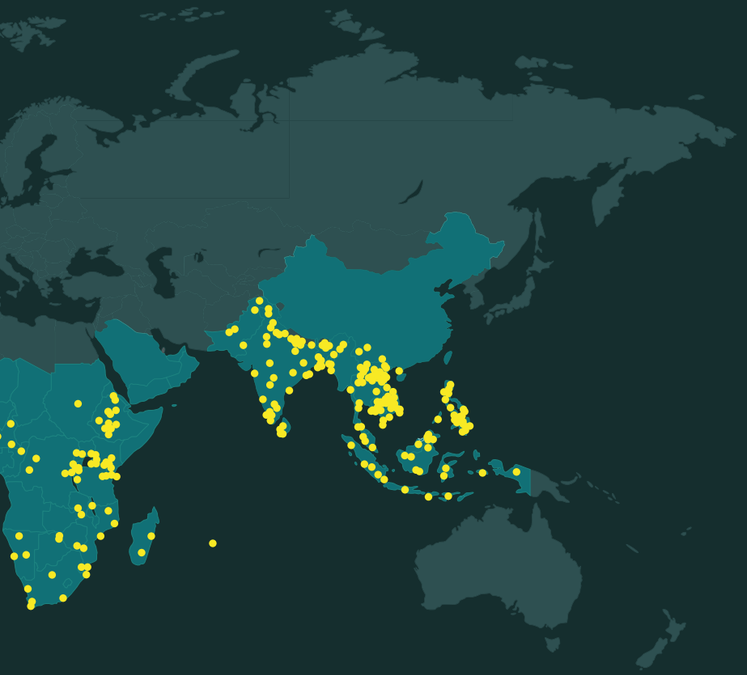
34.7% THREATENED/ENDANGERED SPECIES WERE BETTER PROTECTED
33.3% OVERALL BIODIVERSITY OF THE REGION WAS BETTER PROTECTED
19.8% THE AMOUNT/CONNECTIVITY OF NATURAL HABITATS INCREASED
42.6% WATER QUALITY/QUANTITY/REGULARITY IMPROVED
44.8% ECOSYSTEM SERVICES THAT SUPPORT AGRICULTURE WERE RESTORED/PROTECTED
48.2% OTHER ENVIRONMENTAL SERVICES WERE RESTORED/PROTECTED

LIVELIHOODS OUTCOMES

57.1% FOOD SECURITY/NUTRITION IMPROVED
42.1% HOUSEHOLD CASH INCOME INCREASED
34.5% NON-CASH LIVELIHOOD IMPROVEMENT
42.0% COMMUNITIES BECAME LESS VULNERABLE TO SHOCKS & DISASTERS
32.2% ACCESS TO HEALTH SERVICES IMPROVED

GOVERNANCE, INSTITUTIONS AND SOCIAL CAPITAL OUTCOMES

44.0% LOCAL COMMUNITIES GAINED CAPACITY TO SUSTAINABLY MANAGE AGRICULTURE & NATURAL RESOURCES
54.3% LOCAL COMMUNITIES EMPOWERED TO NEGOTIATE & PARTICIPATE IN POLITICAL DECISIONS
43.4% COORDINATION & COOPERATION AMONG STAKEHOLDERS IMPROVED
30.0% COORDINATION & COOPERATION AMONG SECTORS IMPROVED
12.0% WOMEN GAINED POWER/CAPACITY TO IMPROVE THEIR WELL-BEING
72.0% TRADITIONAL & LOCAL KNOWLEDGE ON AGRICULTURE & NATURAL RESOURCES WAS PRESERVED & USED



INTEGRATED LANDSCAPE MANAGEMENT INITIATIVES

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CASE STUDY THE POTENTIAL FOR TRANSFORMATION: AGRICULTURAL LANDSCAPE RESTORATION IN TIGRAY, ETHIOPIA

In the Tigray highlands of Ethiopia, droughts, population pressure, and poor land management created a crisis of land degradation, hunger and poverty. In 2002, after decades of dependence on conventional food aid despite numerous small, uncoordinated sustainable land management efforts, the Government of Ethiopia, the World Food Programme, local non-governmental organisations and communities began a systematic collaborative programme to restore watersheds, agriculture and resilience in the region.

Over 48 activities, planned in close collaboration with the community, mobilised local investment in restoration in exchange for food aid. Most activities focused on erosion control, rehabilitation of degraded soils, tree planting and water capture and control, implemented in a strategic and spatially coordinated way. The landless were given rights to use forested land in exchange for their labour. High-quality technical expertise was provided to communities to design large-scale water harvesting. Once the natural resource base was stabilised and enriched, diverse agricultural development activities started to bear fruit[61].

Since 2002, this integrated programme has had impressive results: 400,000 ha of degraded land have been rehabilitated in 451 sub-watersheds and 125,000 people have directly benefitted, of whom 40% are female. Crop production increased 200-400% due to improved irrigation and soil organic matter. The number of households dependent on food aid during droughts was reduced from 90% to 10%. A 2012 impact evaluation found that nearly two-thirds of chronically food-insecure households involved in the programme reported a significant increase of income, largely due to increased agricultural production and productivity from improved land management. Promoting revegetation, terracing and community/farm water harvesting helped to restore vital water services, including improved groundwater resources, water available for farm activities, and healthy streams, which also restored biodiversity. The project has also contributed to climate change mitigation, thanks to the planting of thousands of trees and shrubs at a landscape scale and the steady increase in soil organic matter[62].

THE ELEMENTS OF INTEGRATED LANDSCAPE MANAGEMENT

INTRODUCTION TO THE FIVE ELEMENTS

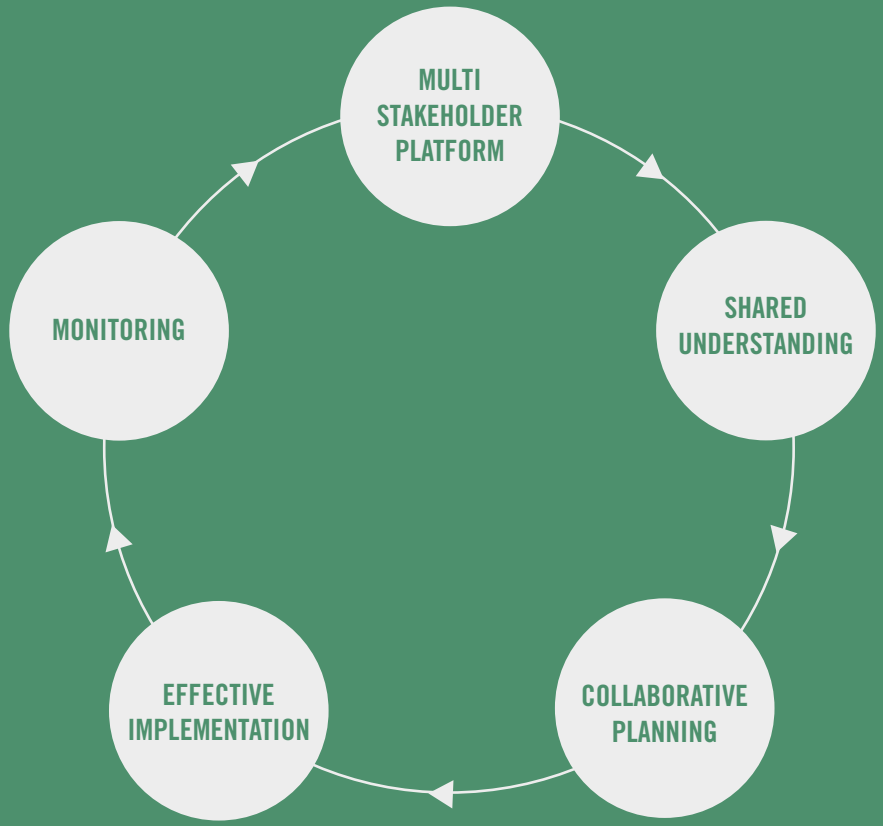
In order to better understand the setting up and implementation of integrated landscape management, a framework comprising its five key elements is presented in this chapter. The Little Book consortium[x] identified these elements through literature review[63] and discussion with their own organisations and partners in the field.

This chapter provides an overview of each element, considerations for putting this in practice and examples of the tools that can support its implementation. Drawing on numerous case studies, the aim is to illustrate emerging ideas, best practices, and innovative ways of thinking about and developing integrated landscape management.

Engaging in integrated landscape management can take different forms and there is no single way of designing and implementing it. The stakeholders involved will vary, as will the level of cooperation, depending on the landscape dynamics and objectives of the multi-stakeholder process. We identify three levels of cooperation amongst stakeholders in a landscape: high, medium and low (see page 61). It is important to remember that each element may be carried out according to different levels of cooperation, e.g. a multi-stakeholder platform may refer to stakeholders coming together for dialogue and negotiations in an ad hoc manner, or it may refer to the setting up of a more formal structure with designated stakeholder representatives and agreed processes for decision-making.

Finally, it is important to recognise that integrated landscape management takes place within wider economic and political contexts. These contexts may facilitate or hinder the development and implementation of the five elements. In turn, integrated landscape management initiatives can contribute to changing the economic and political context. For example, the development of a multi-stakeholder platform could catalyse wider improvements in governance, by getting various stakeholders to engage in discussions and creating momentum for long-term collaboration. Changes in governance, markets and finance offer pathways for scaling up landscape management. These catalysts are described in the next chapter (see page 100).

x By consortium we mean the five organisations involved in drafting this publication, namely the Global Canopy Programme (GCP), EcoAgriculture Partners, The Nature Conservancy (TNC), the World Wide Fund for Nature (WWF) and the Sustainable Trade Initiative (IDH).



Interested stakeholders in the landscape come together for cooperative dialogue and action in a **multi-stakeholder platform**. They undertake a systematic process to exchange information and discuss perspectives to achieve a **shared understanding** of the landscape conditions, challenges and opportunities. This enables **collaborative planning** to develop an agreed action plan. Stakeholders then **implement the plan**, with attention to maintaining collaborative commitments. Stakeholders also undertake **monitoring for adaptive management and accountability**, which feeds into subsequent rounds of dialogue, knowledge exchange and the design of new collaborative action.

SPECTRUM OF COOPERATION IN INTEGRATED LANDSCAPE MANAGEMENT

There are different levels of cooperation within integrated landscape management, and the right level will vary depending on the circumstances. In general terms, the extent to which a participant in integrated landscape management is likely to commit time and effort towards genuine cooperation will depend on whether they perceive a potential gain or feel threatened by the status quo. For example, government agencies, large companies and other powerful players are especially unlikely to agree to a high level of cooperation unless they recognise the failure of current natural resource management.

For each of the individual elements of integrated landscape management described in this chapter, varying degrees of cooperation, with varying degrees of formality, are possible. The more informal the cooperation, the lower the level of individual responsibility and accountability placed on each stakeholder.

At one end of the cooperation spectrum, the main goal of an integrated landscape initiative is to enhance shared understanding at the local level, with the expectation that better knowledge and relationships will influence stakeholder decisions and catalyse new partnerships within the landscape that will advance action toward agreed objectives. Such initiatives may emphasise creating dialogue, collaborative analysis, and accurate monitoring of landscape dynamics, requiring only informal processes. They can easily be facilitated by non-governmental organisations, or other actors with influence and convening power, but not necessarily economic or political power.

At the other end of the spectrum, integrated landscape initiatives seek to achieve specific landscape outcomes and put in place enforcement mechanisms or conditional incentives that are rigorously monitored and generate real pressure for various landscape actors to change. For example, Brazil's 'black list' of municipalities with high levels of illegal deforestation is motivating municipalities to put stronger programmes in place to reduce deforestation (see pages 36-37). Such goals demand high investments in all elements of integrated landscape management, in order to ensure appropriate participation and agreement, the development of a coherent and realistic plan, and a strong accountability framework. In this case, strong government institutions are likely to play a central role in managing the process.

EXAMPLES OF DIFFERENT LEVELS OF COOPERATION BY ELEMENT

The following table highlights the range of options within the spectrum of cooperation, according to the five key elements of integrated landscape management.

LEVEL OF STAKEHOLDER COOPERATION	MULTI STAKEHOLDER PLATFORM	SHARED UNDERSTANDING	COLLABRATIVE PLANNING	EFFECTIVE IMPLEMENTATION	MONITORING
LOW	AD HOC CONSULTATIONS / MEETINGS	PUBLIC INFORMATION FROM LANDSCAPE STAKEHOLDERS ORGANISED; EASILY ACCESSIBLE	AGREED LANDSCAPE VISION DOCUMENT	LANDSCAPE ACTORS CONSIDER COLLABORATIVE PLANS WHEN MAKING INDIVIDUAL DECISIONS	HIGH-LEVEL MONITORING; PUBLIC REPORTING
MEDIUM	MULTI-STAKEHOLDER DIALOGUE AND REGULAR MEETINGS COMMITMENT BY EACH ACTOR TO CONSIDER AND RESPOND TO INPUTS FROM OTHER LANDSCAPE STAKEHOLDERS	ABOVE + DETAILED INFORMATION ON LAND MANAGEMENT PROVIDED TO OTHER LANDSCAPE STAKEHOLDERS	ABOVE + DETAILED LANDSCAPE STRATEGIC PLAN/ PROGRAMME OUTLINING JOINT ACTIVITIES	ABOVE + SPECIFIC COMMITMENTS / CONTRIBUTIONS TO ACHIEVING AGREED LANDSCAPE OBJECTIVES	ABOVE + SPECIFIC COMMITMENTS / CONTRIBUTIONS TO ACHIEVING AGREED LANDSCAPE OBJECTIVES
HIGH	ABOVE + FORMAL MECHANISMS FOR STAKEHOLDER REPRESENTATION, FORMAL RULES FOR DECISION-MAKING	ABOVE + MECHANISM FOR REQUESTING INFORMATION FROM OTHER LANDSCAPE STAKEHOLDERS	ABOVE + CLEAR ACCOUNTABILITY FRAMEWORK FOR ACTOR COMPLIANCE WITH LANDSCAPE PLANS IS MONITORED AND SANCTIONS EXIST FOR NON-COMPLIANCE	ABOVE + DETAILED REPORTING ON THE IMPLEMENTATION OF THE COLLABORATIVE PLAN ON INDIVIDUAL DECISIONS OF RELEVANCE TO COLLABORATIVE PLANS	DETAILED MONITORING AND EVALUATION STRATEGY DELIVERED; CONDITIONAL POSITIVE INCENTIVES; AND NEGATIVE SANCTIONS

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ESTABLISHING A MULTI-STAKEHOLDER PLATFORM

Multi-stakeholder platforms (MSPs) are a useful tool for bringing different stakeholders together in a decision-making body to address resource management problems. As decision-making bodies, MSPs are commonly used for conflict resolution (e.g. conflicts over access to resources), democratisation (e.g. to give stronger voices to minority groups), or to develop pre-competitive strategies to address landscape-wide problems or opportunities[64].

In the case of integrated landscape management, MSPs provide a space for stakeholders to share information, develop a common understanding of problems, negotiate outcomes, and collaboratively decide and implement action plans to sustainably manage the resources in a given landscape. MSPs can vary hugely in terms of their mandate (e.g. voluntary or statutory), institutionalisation, and scope. MSPs are generally initiated by one or two stakeholder groups and along one or more key themes, but often develop to cover a range of purposes[65]. Their leadership may change over time.

Through provision of a dedicated space for discussion and information sharing, MSPs can help build trust between different stakeholders, contribute to addressing power imbalances, and facilitate collective learning. For example, members of local communities, representatives of local governments, civil society organisations, and the private sector recognised that trust built over the past eight years through their participation in the New Generations Plantations platform[xi] was crucial to initiate a dialogue where stakeholders were open to listening and learning from each other, and thinking about solutions that benefit them all. Without this trust, agreeing on decision-making mechanisms and reaching consensus can be challenging.

Setting up a legitimate multi-stakeholder process is essential before goals are set and landscape management plans developed (see page 80). Otherwise, there is a risk that the process becomes one of consultation rather than collective decision-making, or that excluded stakeholders will block action plans.

Challenges to effective MSPs include ensuring the meaningful participation of all stakeholders, and involving powerful stakeholders who may have little incentive to join, even though their participation is essential for the effective implementation of a management plan. Marginalised (e.g. indigenous communities, women) or unorganised actors (e.g. local farmers) may need support and capacity building to engage in discussions. Maintaining momentum and political will, and managing the differing expectations of participating stakeholders may also present challenges; so competent leaders and skilled facilitators are critical for effective MSPs.

xi As an example of a sectoral multi-stakeholder platform, the New Generation Plantations dialogues have stimulated integrated management in plantation landscapes in Brazil, Chile, South Africa and China. WWF set up the NGP Platform in 2007. NGP brings together leading plantation companies, some government agencies that manage and regulate plantations and some local communities that live in and/or from the forest. The platform seeks to influence other companies and governments to make environmentally and socially responsible decisions on their plantation management. See http://newgeneration-plantations.org/

CASE STUDY THE DEVELOPMENT OF A MULTI-STAKEHOLDER PLATFORM IN KENYA'S LAKE NAIVASHA BASIN

Lake Naivasha is Kenya's second largest freshwater body and supports a booming horticulture industry, representing about 70% of Kenya's cut flower exports and 2-3% of the country's GDP[66]. The lake supports a fisheries industry, a growing tourism and holiday homes sector, as well as dairy and beef industries. Geothermal energy production has grown rapidly and contributes 280 MW to the country's energy grid[67]. The lake's catchment area is predominantly under smallholder agriculture that collectively produces large quantities of fresh produce for the local Kenyan markets[68,69]. The population of the basin has grown rapidly, with 650,000 people in 2009, and a current estimated growth rate of 13% over this decade[70]. The basin is rich in biodiversity, comprising a Ramsar site, an International Bird Area, a key water tower and national park.

The diversity of stakeholders, ecological zones and economic activities, the interconnectivity of the upper and lower catchment areas, and the unpredictable climatic conditions make this relatively small basin (3,400 km^2) complex and prone to conflicts over natural resource access and quality. A severe drought in 2009 catapulted the need for an integrated approach to natural resource management into action.

Formerly antagonistic stakeholders came together to develop a common vision for the Lake Naivasha Basin, and this process was supported by political commitment at the highest level[71]. Together, these positive changes resulted in the gazettement of the Imarisha Lake Naivasha Management Board in May 2011[72].

The Imarisha board is a public-private partnership (PPP), appointed by the Government of Kenya for a three-year term. The board comprises members from various government sectors including water, forestry, livestock, at both local and national scales, and from the private sector (e.g. from the horticulture, business and tourism sectors), pastoralists, civil society organisations, and community groups (e.g. the Water Resource Users Association, Lake Naivasha Riparian Association, Community Forest Association, and the Beach Management Units Association). The chairperson is appointed by the government.

In 2011, the board's first order of business was to set up the secretariat commonly known as Imarisha Naivasha, which is tasked with: enhancing collaboration between all stakeholders, coordinating activities and interests within the basin, monitoring compliance with laws and regulations governing the environment, and developing and enforcing codes of conduct. The board also developed and executed a Trust to receive financial resources from within and outside Kenya to enable implementation of Imarisha's mandate.

In 2015, Imarisha was given special programme status directly under the Ministry of Environment and Natural Resources. Imarisha's PPP structure, its position as a special programme within the government's structure, and its function as a monitoring and coordinating body for a landscape, makes it a unique entity in natural resource management.

The Sustainable Development Action Plan 2012-2017, developed by the Imarisha board, guides the activities of the PPP. It focuses on four outcomes considered most critical for environmental restoration and sustainable development in the basin namely: management of the riparian zones, management of the wider catchment, strengthening of water resource institutional functions and management of urban development, and strengthening of Imarisha's institutional capacity and visibility[73].

During the period between 2012 and 2013, when the new constitution of Kenya required major government restructuring, Imarisha went through a period of uncertainty. At this time, the presence of the Trust and the partnerships within the basin enabled Imarisha to continue to leverage funds from UK retailers and other development partners. It also partnered with a multi-partner programme called the Integrated Water Resources Action Plan (IWRAP), led by WWF-Kenya and funded by the Embassy of the Kingdom of the Netherlands.

IWRAP incorporates all four outcomes of the Sustainable Development Action Plan. As such, Imarisha was able to strengthen its human resource capacity, develop a communication strategy, upgrade its website, begin publication of a quarterly magazine, and hold annual stakeholder meetings for sharing of activities and lessons. Imarisha has also developed a biodiversity monitoring strategy within the basin, and a stakeholder-validated Lake Naivasha Riparian Management Plan (under the stewardship of the Governor of the County of Nakuru, in which Lake Naivasha lies). New partnerships are being developed, for example linking up various international development and conservation organisations for increased impacts. It is now in the process of creating a sustainable financing mechanism to support the long-term goals of the initiative.

A stronger Imarisha Naivasha means better coordination and monitoring of activities and hence, a greater likelihood of fulfilling the basin stakeholders' vision of a clean, healthy, and productive environment, and of sustainable livelihoods for present and future generations.

Sunita Sarkar
WWF Kenya

CASE STUDY BRAZIL'S ATLANTIC FOREST RESTORATION PACT

Brazil's Atlantic forest is one of the highest priority regions for conservation in the world. The forest supplies crucial environmental services on which much of the regional economy depends. However, because of past land clearing for commercial agriculture and human settlements, less than 15% of the original forest remains intact. Large-scale forest and ecosystem restoration is required to maintain these ecosystem services and accomplish the long-term goals of diverse stakeholders in the region, including enhancing the water supply, controlling flooding, complying with Forest Code regulations, and creating jobs[74].

The Atlantic Forest Restoration Pact (PACT) was formally established in 2009 as a network of national and international NGOs, research institutions, government agencies and private companies to coordinate and integrate the activities and resources of diverse stakeholders with the goal of restoring 15 million ha of forest land by 2050. PACT currently includes more than 270 signatory organisations, including farmer and community organisations, which collectively promote, facilitate and carry out restoration projects across 17 Brazilian states[75]. Approximately 60,000 ha have been restored so far. PACT's commitment as part of the Bonn Challenge is to restore 1 million hectares by 2020 (see page 41).

PACT is governed by a central steering committee, which includes representatives from academia, the private and public sector, and NGOs, an Executive Secretariat, and five working groups[76]. Partner organisations fall into two broad categories: supporting partners, who are not directly involved in restoration projects, but provide expertise and funding; and executive partners, who execute restoration projects according to an agreed framework[77,78].

The first step PACT took was creating a map of priority areas for forest restoration and assessing which types of investments would maximise restoration outcomes. As a result, PACT prioritised natural regeneration, bringing landowners into compliance with existing legal codes, and incentivising actors to adopt restoration activities in the most strategic areas. For example, in Espirito Santo the Reflorestar programme incentivises landowners to comply with the law through a PES (Payments for Ecosystem Services) mechanism[79].

Miguel Calmon
International Union for Conservation of Nature (IUCN)

WHAT TO CONSIDER WHEN ESTABLISHING A MULTI-STAKEHOLDER PLATFORM

This section highlights some considerations for multi-stakeholder platform conveners and identifies some tools to facilitate the process.

Understanding whom to engage: Multi-stakeholder platforms ideally need to engage all relevant stakeholders, including those involved in external processes and plans, which may impact the landscape in question (e.g. national government departments). Stakeholder mapping is a useful tool to identify which stakeholders need to engage in the landscape management initiative to reach a particular set of goals, and what support they need in order to meaningfully participate. Identifying hidden actors, such as corporate actors further down complex supply chains, or absentee landowners, is a particular challenge.

There are many examples of stakeholder mapping tools. EcoAgriculture Partners' Institutional Performance Scorecard offers a methodology and activities to help leaders of a landscape management initiative identify, inter alia, the organisations that need to be engaged in the landscape management process[80]. The International Institute for Environment and Development's stakeholder influence mapping tool provides a clear method for displaying different actors' relative influence over decision-making[81]. The Centre for Development Innovation of Wageningen University has compiled existing tools for stakeholder and power analyses to enable the selection and adaptation of tools relevant to a project's specific needs[82].

Understanding stakeholder 'entry points' to effectively engage relevant actors: Understanding the motivations or 'entry points' of different stakeholder groups is key for landscape conveners to effectively make the case for long-term participation in a multi-stakeholder platform (see pages 70-71). When setting up the platform, outreach events which aim to stimulate engagement should therefore be tailored to relevant stakeholders. An example of an activity undertaken to explain the landscape partnership concept and to make the business case for engagement is the African Business Engagement Road Show developed by partners of the Landscapes for People, Food and Nature Initiative[83].

Understanding the legal context in relation to public participation: When establishing a multi-stakeholder platform, it is important to understand the legal context of the country and state in which stakeholders are operating. This means being aware of the rights enjoyed by specific stakeholders. For example, in countries where the principle of Free, Prior and Informed Consent (FPIC) is enshrined in law, MSP conveners have a higher duty of care to ensure that indigenous peoples are effectively participating[84]. This may mean tailoring information so it is technologically and culturally appropriate, engaging in outreach activities, and recognising traditional decision-making structures.

Procedural considerations for conveners of the platform: In addition to understanding stakeholder motivations for participation, landscape conveners should consider procedures that facilitate setting up a multi-stakeholder platform. Starting with a small, motivated coalition is more likely to help determine the (initial) focus of the multi-stakeholder process and maintain energy levels. Referral from an initial group of willing, influential stakeholders is helpful to expand the coalition. Organising bilateral meetings with each stakeholder group, before bringing them together, helps to ensure meetings are more effective and to build trust. These procedural tips and tricks, as well as general guidelines to facilitate dialogue between stakeholders, are outlined in IDH ISLA's practical guide for landscape conveners[85] and Wageningen University's MSP Guide[86].

CASE STUDY PRIVATE SECTOR ENGAGEMENT IN LANDSCAPE PLATFORMS, SOUTH WEST MAU FOREST, KENYA

Kericho, in the South West Mau landscape in Kenya, is one of the largest tea production areas in the country, where large companies like Unilever and James Finlays Ltd. produce a significant amount of their tea. However, deforestation is causing changes in rainfall patterns and in the microclimate that are negatively affecting tea yields of estates and smallholders, and causing challenges for other stakeholders. In order to reverse this trend and move towards more sustainability in the landscape, stakeholders need to work together to move away from the current model.

In response to this, the Sustainable Trade Initiative (IDH)'s Initiative for Sustainable Landscapes (ISLA), with KPMG, has developed a landscape investment model to quantify the costs and benefits of landscape investment scenarios. The model was applied in the South West Mau forest landscape, looking at the effect of deforestation on five main stakeholder groups, namely the tea estates, the smallholders, surrounding communities, the hydropower company and the government. The exercise aimed to identify how these stakeholder groups would be affected by breaking away from the business-as-usual scenario. The modelling exercise calculated the net present value to each stakeholder group of an investment scenario that envisaged reduced deforestation and forest degradation over a business-as-usual scenario.

The results showed that there would be positive returns for all stakeholders in an investment scenario with reduced impacts on forests. These positive returns would allow the more powerful stakeholders to support smallholders and surrounding communities; for example, by funding agricultural intensification as compensation for the fact that their access to the forest would be limited.

However, a positive business case is not sufficient to guarantee that businesses within a landscape will agree to take action. The investment scenario is competing with more attractive and better documented opportunities that may offer higher returns in shorter timeframes. The value of the investment modelling in the case described above is that it strengthened the case for stakeholders to take leadership in their organisations and make resources available for a joint approach to solve the problem of deforestation.

Since then, the stakeholders have established a board, and have taken the first joint actions.

Many landscape initiatives lack private sector engagement. Engaging companies in a meaningful way is difficult because landscape challenges may be perceived to have limited urgency, and there can be reluctance to join time-consuming multi-stakeholder processes.

IDH ISLA works in six landscapes where production of agricultural commodities for international supply chains is the dominant economic activity. ISLA aims to address ecosystem challenges in these landscapes and mobilise government action and investments towards improved landscape management by leveraging the influence of large economic players. ISLA's assumption is that when government, private sector and communities align and act together, this leads to more effective management of land and water.

In the six landscapes in which IDH's ISLA is active (including the South-West Mau Forest landscape), private sector entry points relate to:

- The need to address water risks threatening production;
- The opportunity to deliver on corporate commitments, such as commitments to zero deforestation supply chains;
- The need to adapt to, or mitigate, changes in the micro-climate;
- Having a licence to operate, e.g. reducing social risks to business operations by improving relations with other stakeholders in the landscape;
- The need to become legally compliant.

Additional factors that ISLA recognises as helpful to mobilise private sector stakeholders are signals from buyers and neighbouring companies that the initiative is of importance; organising practical and 'business-like' meetings; creating exposure opportunities; and including 'quick win' joint activities, such as a tree planting days.

In the six landscapes, ISLA also found that engaging the government was challenging because of the fact that often different government departments are responsible for different aspects of the landscape, with limited coordination between national and regional government. The landscape conveners carefully considered which government institutions and individuals to invite to the table. Because the initiative targets high-level buy-in and participation, the 'pitch' to government needed to be well prepared. This pitch included evidence that a landscape approach can work and aimed to build momentum, based on understanding the incentives for different governmental departments.

ISLA found that government entry points for engagement in multi-stakeholder platforms included:

- Improving or securing government revenues;
- Achieving domestic policy objectives, such as those set out in a green growth or climate change strategy;
- Making the landscape or jurisdiction attractive to companies sourcing globally and to investors with a green agenda;
- Electoral considerations and opportunities to show success and leadership.

For the majority of ISLA landscapes, mobilising the government is best done by building on existing relationships to identify and approach individual champions in the government who can push the landscape agenda forward.

Nienke Stam
The Sustainable Trade Initiative (IDH)'s Initiative for Sustainable Landscapes (ISLA)

SHARED UNDERSTANDING

Shared understanding in the context of landscape management means that members of a multi-stakeholder platform (see page 63) understand their roles within the broader landscape. They also have sufficient information to negotiate and make informed decisions when agreeing on a collaborative resource management plan (see page 80). This includes understanding the interests, needs and capacity of the other stakeholders involved. It may also include understanding the interests and needs of stakeholders who are external to the landscape, but may be affected by the group's activities.

It is important to understand spatial relationships in the landscape; for example, how upland resource management affects water flow and quality downstream, or which areas of the landscape are critical sources of food or water for wildlife. Understanding the landscape also implies awareness of the reasons for historical landscape change, e.g. high rates of deforestation due to high demand for timber; the ecological context, e.g. the range of ecosystem goods and services produced within the landscape; and the socio-economic and political situation, e.g. key sources of income for different groups and existing rules of resource tenure. It is essential for stakeholders to understand the consequences of maintaining a business-as-usual trajectory by carrying out assessments considering factors such as population growth, climate change, new infrastructure plans, and anticipated economic developments. This can help stakeholders understand the scale of the challenges ahead, and strengthen their commitment to the multi-stakeholder platform.

It may also be important to consider key policies and official development strategies, including policy targets that a country may have signed up to under international agreements. Stakeholders may need to look at the legal frameworks in the landscape, as well as broader national laws and regulations that may have an impact on the landscape. It is important to understand rights (e.g. ownership and access rights) and responsibilities (e.g. respecting pollution standards) over certain resources.

As disagreements arise between stakeholders in their analysis of landscape problems and opportunities, it is important to clarify whether this is a disagreement about facts (e.g. farmers think most pollution comes from local industrial plants, while the industries think farm runoff is the main culprit), or a disagreement about values (e.g. the Chamber of Commerce values the potential economic growth from an infrastructure project, while local communities more highly value the cultural heritage of landscape beauty in the planned site). Differences in values need to be aired and taken into consideration in the next phase of negotiation (see page 80). To address disagreements about facts, special studies can be commissioned to ensure that dialogue is evidence-based. For example, business actors may want to see quantitative analyses of how seriously water problems might affect their incomes. Conservation actors may want to assess the actual impact of farming practices on biodiversity. Farmers may want to see more compelling evidence that their agricultural practices are actually the cause of problems downstream.

Reaching shared understanding is challenging for several reasons. First of all, different stakeholders may have difficulty understanding particular problems or the evidence about them. Initially, it is likely that stakeholders will have very different perceptions, perspectives and even language. It may be important to bring in experts who can undertake quantitative and qualitative situation analyses. Results of research and assessments undertaken by experts need to be translated into information that is meaningful to the broader group or to specific stakeholders.

Whilst not every stakeholder can have a deep understanding of all issues, the key is for all stakeholders to have enough information to adequately negotiate and protect their interests within the collaborative plan, that they are heard despite power differences, and for facilitators to advance the process with an agreed evidence base. Challenges of funding, time and capacity arise when information is less directly accessible and requires analysis. Getting agreement on the kind of information to gather, on the techniques to gather that information, as well as access to the right tools and the capacity to use them, is an important part of the process.

WHAT TO CONSIDER TO REACH SHARED UNDERSTANDING

Understanding spatial relationships within a landscape: It is important to understand the spatial relationships among land uses and land users in the landscape, e.g. how upland resource management affects water flow and quality downstream.

One way of doing this is through participatory mapping, where the diverse stakeholders visually represent information in a geographical context that is relevant and important to them. This process enables participants to display information usually excluded from mainstream maps by presenting social, cultural and historical knowledge, as well as the associations between the land and local communities. These maps can especially empower local communities to communicate spatial knowledge to other stakeholders, allow them to record and archive local knowledge, and help strengthen claims to customary tenure rights in the case of resource-related conflicts.

Several methods exist to implement participatory mapping, depending on the technical capacity and goals of stakeholders, including: using scale maps and images, participatory 3D modelling, geographic information systems (GIS), and multimedia and internet-based mapping[87]. Moabi is helping to pioneer mapping of natural resource threats in the Congo Basin. This involves collecting information such as mining permits and community land rights and making it available online. The Moabi mapping tool for the Democratic Republic of Congo (DRC) allows users to add layers to a map relating to indigenous lands, hydroelectric power, REDD+ projects, oil concessions, agricultural concessions, and so on[88].

Understanding stakeholder perspectives: Conflicts over resources in landscapes are commonly exacerbated by ignorance or misunderstanding of the perspectives and motivations of other stakeholders' resource management or claims on resources. Without clarifying these issues, it is difficult to have fruitful negotiations and collaborative planning of interventions in the landscape. At the same time, most stakeholders are only familiar with particular parts of the landscapes, or with particular resource uses, and do not understand the wider landscape conditions or processes. Many existing tools can help stakeholders appreciate the perspectives and actions of other stakeholders, in order to facilitate collaborative planning and action and soften pre-existing antagonism. For example, stakeholders can take 'study tours' together along carefully selected transects, observing the landscape and taking turns to explain what, how and why they behave as they do. The New Generation Plantations (NGP) platform organises annual meetings where participants explore a plantation landscape. The one-week study tours enable participants to share experiences about good plantation and other land use management. They seek to positively influence land management by bringing together people of various backgrounds with different values, perspectives, knowledge and experiences. This stimulates participants to critically reflect on their understanding of common challenges and questions.

Understanding the environmental and socio-economic context: It is important for stakeholders engaging in integrated landscape management to have a good understanding of the environmental and socio-economic context of the landscape in which they are operating. Existing datasets can often provide the necessary information. For example, information to better understand natural systems can be found in the High Conservation Values (HCV) assessments required by many certification schemes, such as the Forest Stewardship Council (FSC) and the Roundtable on Sustainable Palm Oil (RSPO). HCVs are biological, ecological, social or cultural values, which are considered significant or critically important at national, regional or global levels. For socio-economic data, local government or trade associations may provide relevant information such as income, agricultural production, exports, access to markets, and so on.

Understanding the institutional context: Understanding the institutional context includes identifying the institutional arrangements within a landscape and examining the relationships and power dynamics between institutions, as these may impact on the success of joint activities and the implementation of integrated landscape management. Wageningen University's institutional landscape analysis tool offers a framework for asking critical questions about institutions within a landscape, and their interactions[89]. Its aim is to allow stakeholders to analyse relevant institutions, and identify the institutions that need reinforcement or change. The analysis aims to inform a stakeholder dialogue on the needs and potential for institutional change at the landscape level.

COLLABORATIVE PLANNING

Collaborative planning serves to lay out the roadmap for implementing integrated landscape management. It is a way for participants in the multi-stakeholder platform (see page 63) to agree on how best to work together to address problems and their root causes. This involves agreement on a common vision, objectives, results, responsibilities, and clear indicators of progress towards agreed objectives.

Collaborative planning involves discussions and negotiations on how to align activities and coordinate or integrate collaborative actions within existing mandates. The key is for stakeholders to be open to exploring new ways of achieving their desired outcomes, which differ from business-as-usual. For example, once there is a shared understanding of landscape dynamics (see page 74), stakeholders can search for solutions that provide multiple benefits. These may include setting up agroforestry tree crop systems within watershed protection areas, as the crop system can also protect the watershed; or co-locating programmes of water quality improvement and local fisheries development, instead of siting them in distinct parts of the landscape where water quality improvements have minimal economic benefits, or where fisheries are suffering low productivity because of poor water quality (see page 82).

Once options for action have been identified, stakeholders need to evaluate the pros and cons and consider ways to improve their design for broad buy-in. If sufficient financial and technical resources are available, it can be useful to use scenario or simple modelling or mapping tools to project the impacts and costs of alternative solutions (see page 83).

Additionally, stakeholders need to determine the type of agreement they are working towards. Options range from high-level, aspirational goals (e.g. a framework agreement) to more specific operational agreements, (e.g. draft regulation, spatial planning reforms, or voluntary corporate commitments) (see page 61). The level of detail within a plan and the number of agreements reached varies depending on the objectives and context of the landscape management initiative. For example, the Kailash Sacred Landscape management process led to the development of several agreements, including a regional cooperation framework, a regional conservation and development strategy, and a regional environmental monitoring strategic plan (see pages 32-33). Plans should be phased, and evolve over time, as the needs of stakeholders evolve.

Challenges to reaching a collaborative plan include ensuring that all stakeholder groups agree with the goals and objectives and on the choice of implementation options and prioritisation. Skilled facilitators are important to secure stakeholder buy-in to the process. Striking the right balance between taking concerns into account and coming up with something feasible and manageable is challenging. Although synergies may have been identified, trade-offs are sometimes unavoidable, and part of the plan may involve those benefitting from an action to compensate those who are harmed by it.

CASE STUDY COLLABORATIVE PLANNING FOR A CLIMATE-SMART TERRITORY IN THE PEÑAS BLANCAS HYDROLOGICAL RESERVE, NICARAGUA

The Peñas Blancas hydrological reserve lies in north-central Nicaragua, within the Bosawas Biosphere Reserve. It provides key ecosystem services such as water for human consumption and hydroelectricity, food, biodiversity conservation and carbon sequestration. Despite the reserve's importance, its management plan is outdated and has been poorly implemented due to conflicts among national and local institutions, including the municipalities of El Tuma–La Dalia, El Cua and Rancho Grande. There is a lack of political will for negotiation and collaboration among stakeholders. Inadequate regulation negatively affects the local population, creating uncertainty that discourages investment and enables the development of illegal and conflicting land uses, deforestation and expansion of agriculture within the reserve.

However, since 2015 close to 70 actors, including representatives of the three local municipalities, have agreed to work together to update the reserve´s management plan and establish collaborative mechanisms that facilitate its implementation, such as the Grupo impulsor para la gestion territorial en Peñas Blancas. Two factors have triggered these actions: the legal mandate to update the plan every five years, and the Tropical Agricultural Research and Higher Education Center (CATIE)'s Mesoamerican Agroenvironmental Programme (MAP) to develop climate-smart territories. MAP has strengthened the capacity of local actors to understand the relationship between climate change, ecosystem services and human welfare, and facilitated the creation of a regional platform where local actors come together to reach agreement. The stakeholder mapping that CATIE carried out in 2014 at the landscape level identified key partners and their capacity-building needs. It has been key to stimulating this process by providing the necessary information to strengthen territorial/local capacities, especially regarding conflict resolution.

With a first draft expected in December 2015, the plan will seek to improve the reserve's management and ensure the continuous provision of ecosystem services as a way to increase the climate resilnce of rural villagers and farmers and to improve their livelihoods and their environment. The new plan will target actors who operate at different geographical scales in a systemic way. For example, it will promote climate-smart agriculture, such as sustainable forestry and agro-silvopastoral systems, which will not only improve productivity but also bring mitigation and adaptation benefits, such as the provision of ecosystem services. It will also include economic incentives, such as payment for ecosystem services. At the same time, it will strengthen forestry and agro-silvopastoral producer organisations and associated value chains in order to open market opportunities. It will propose the creation of a governance body made up of key governmental and non-governmental actors to manage the reserve.

A key challenge going ahead is to continue building capacity among all the actors involved, and to develop participatory mechanisms to ensure that the plan is validated by both regional actors and local/national authorities, thus creating an enabling environment that allows the management plan to be updated, approved and implemented in a collaborative way.

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Tropical Agricultural Research and Higher Education Center, Mesoamerican Agroenvironmental Programme (CATIE-MAP)

CATIE´s Mesoamerican Agroenvironmental Programme (MAP) operates in eight municipalities of Nicaragua, including those where the Peñas Blancas reserve is located. MAP fosters the climate-smart territories approach, which works with multiple actors at different geographical scales to increase the resilience of small landholders and conserve ecosystem services. It fosters agricultural innovations under climate change stressors through the use of farmer field schools. MAP also works at the landscape level to strengthen territorial stakeholder platforms and governments.

AGREED STAKEHOLDER INTERVENTIONS IN AN EAST AFRICAN COFFEE LANDSCAPE PLAN

This page provides an illustrative set of interventions defined in a landscape plan that focuses on increasing farmer incomes and restoring threatened biodiversity (including aquatic biodiversity) in a coffee landscape, using examples from Eastern Uganda. Each intervention generates multiple benefits.

Agriculture, conservation and forest extension programmes of government, NGOs and farmer organisations: Develop joint curricula that align messages for productivity, soil and water conservation, and vegetative cover on farms to support biodiversity.

Coffee processors: Voluntary commitment to recycle biomass waste as fuel rather than deposit in waterways, to improve water quality for habitat, and reduce fuel costs.

District Development Fund: Small one-time grants for riparian restoration by private landowners using native species that improve water quality and can be occasionally harvested for income.

District government plus conservation NGO partners: Participatory plans for restoration and sustainable use of public grazing lands by landless households.

District government: Change local zoning policies and by-laws to align with plan.

Municipality: Investment in constructed wetlands for water filtration to reduce cost of clean water and provide habitat for water birds.

Coffee traders and Chamber of Commerce: Market development for secondary shade and understory species produced in coffee plots.

Community Forestry Associations: Restore degraded native forest fragments and establish new forest corridors to link with Protected Areas.

WHAT TO CONSIDER WHEN UNDERTAKING COLLABORATIVE PLANNING

Setting goals and objectives: Arriving at commonly agreed goals and objectives is an important milestone in designing a collaborative action plan. Objectives should be clearly defined alongside SMART (Specific, Measurable, Achievable, Relevant and Time-bound) indicators that enable progress to be monitored (see page 96).

Developing scenarios: Scenarios that explore the impacts of different implementation approaches under different conditions (e.g. different climate change pathways) can support stakeholders in collaborative planning. There is a range of tools that can support stakeholders in developing alternative scenarios to business-as-usual. Some are qualitative, using systematic assessments of stakeholders, expert opinions and participatory mapping. Others are more quantitative, such as the Integrated Valuation of Ecosystem Services and Tradeoffs (InVEST) tool that enables decision-makers to assess trade-offs of alternative management choices on ecosystem services[90]. The toolset currently includes 16 distinct InVEST models suited to terrestrial, freshwater, and marine ecosystems. Stakeholders develop spatial 'scenarios' of potential future land use/land cover and/or marine habitats and ocean uses, typically in the form of maps.

Spatial planning and zoning: Multi-stakeholder spatial planning is an important part of collaborative planning. Agreeing on different land use types within the landscape and on discrete zones (e.g. for conservation, production or cultural purposes) can help to reduce conflict and safeguard important environmental services and cultural values. The Land Use Planning for Multiple Environmental Services (LUMENS) is a tool for participatory land-use planning that brings together actors in groups to find locally-adapted ways to reduce emissions, improve livelihoods and enhance ecosystem services. This is being trialled by the World Agroforestry Centre (ICRAF) in sixteen Indonesian districts across five provinces[91].

Agreeing on priority interventions: Once the spectrum of promising interventions has been identified, it is important to prioritise what will be implemented depending on stakeholder capacities, interests and expectations. The World Agroforestry Centre (ICRAF) has developed the SHARED tool (Stakeholder Approach to Risk Informed and Evidence Based Decision Making) to enhance landscape governance and support the prioritising of landscape interventions (see page 84). As part of this, actors should also agree on how funding will be allocated across interventions and partners.

Agreeing on roles and responsibilities of stakeholders: An important consideration for avoiding confusion and conflict in the implementation of integrated landscape management is to make sure that all stakeholders have a clear understanding of their respective roles and responsibilities (implementation, monitoring, reporting). One way to achieve this is by developing memoranda of understanding amongst the stakeholders. Specific collaborative agreements among stakeholders (e.g. those involving funding commitments), may take the form of contracts.

CASE STUDY EVIDENCE-BASED AND INCLUSIVE DECISION-MAKING IN TURKANA COUNTY, KENYA

Led by The World Agroforestry Centre (ICRAF), the Stakeholder Approach to Risk Informed and Evidence-Based Decision-Making (SHARED) has been developed to shift decision-making culture at national and devolved levels by bridging sectors and institutions in order to accelerate sustainable development outcomes. This framework brings together processes, evidence and tools to help move decision-making paradigms towards more inclusive, inter-sectoral and inter-institutional integration. SHARED arose from the need for decision-makers and stakeholders from various sectors, levels and affiliations to have a 'space' to interact and interrogate evidence, to understand the risks and development implications associated with potential investment options and the outcomes of decisions. SHARED offers targeted facilitation to ensure cohesive communication across multiple institutions, political levels and knowledge systems.

One example of the application of the SHARED process is in Turkana County in Kenya, where responsibility for development plans is devolved to the county level. Turkana County used the SHARED approach to refine its decision-making process while developing its annual County Integrated Development Plan. Working in close partnership [xiii] with UNICEF and ICRAF, the Turkana County Government decided to a) look at data, evidence and trends using the Resilience Diagnostic and Decision Support Tool developed by the ICRAF GeoScience Lab to determine priority landscape and livelihoods investments; b) collectively establish criteria for testing allocations to maximise advances toward the county's development outcomes; and c) develop mechanisms for greater community engagement in data collection, analysis and use in local decision-making. Using the SHARED process, the county is implementing a flagship approach for evidence-based and inclusive decision-making, and setting the benchmark for such decision-making across the 47 counties in Kenya.

The SHARED tool has helped actors understand the inter-connectedness of the socio-economic and biophysical sectors and has supported the development of landscape approaches to decision-making, marking a shift from traditional sector-specific or donor-driven investment allocations.

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xiii The Turkana effort was resourced by USAID through the Technical Consortium for Enhancing Resilience in the Horn of Africa, as well as UNICEF and ICRAF.

EFFECTIVE IMPLEMENTATION

Once stakeholders have agreed on objectives, identified the scale of action, and developed a collaborative plan, it is important to consider how this plan can be implemented effectively[92]. The scope and level of detail included in the collaborative plan will vary. Often an action plan will set out interventions to be carried out independently by different stakeholders (see page 82), as well as some to be implemented collaboratively. Detailed work plans and budgets will need to be developed by those responsible for implementing the relevant interventions.

The stakeholders leading the landscape initiative need to play an active role to make implementation work. Landscape initiatives operate within generational time scales and may face many changing conditions (e.g. social, environmental, economic and institutional changes in the landscape). Some actions may not bear fruit for many years, weakening the impetus for expansion to scale. The successful implementation of collaborative action plans therefore requires efforts to sustain stakeholder attention and maintain momentum (e.g. through effective communication strategies), as well as support to strengthen ties and commitments amongst stakeholders. If problems arise, there need to be ways to resolve conflicts, adapt the plan to new conditions, and retain political support and visibility.

Landscape conveners may need to set up structures to facilitate coordination among stakeholders (e.g. regular meetings), and to track whether planned actions are being carried out effectively in order to achieve what was initially set out (see page 88).

CASE STUDY IMPLEMENTING INTEGRATED LANDSCAPE MANAGEMENT IN LARI, KENYA

KENVO (Kijabe Environment Volunteers), was formed in 1996 by local youth leaders to address accelerating forest degradation in Kijabe sub-district in the Kikuyu Forest Escarpment, one of Kenya's last remaining natural forests. The fledgling community-based organisation (CBO) mobilised communities located adjacent to threatened forest areas to join a grassroots campaign of monitoring, protecting and restoring forest resources. Residents, who appreciated that these resources were vital to their livelihoods, undertook protection and forest restoration. Early successes demonstrated the synergies of simultaneously working toward ecosystem conservation, sustainable production and safeguarding local livelihoods, and highlighted the value of tapping the particular capacities of women and youth.

In 2006, one of KENVO's leaders participated in an eco-agriculture leadership course, which sparked interest in applying integrated landscape thinking to the planning, implementation and evaluation of its programmes. In particular, KENVO began engaging actively with farmers and agricultural market, banking and government institutions. KENVO commissioned a scientist from the National Museum of Kenya to survey native biodiversity in the agricultural production areas of the landscape, which revealed far more than was expected. This generated enthusiasm for the advancement of sustainable practices and market incentives for biodiversity-friendly agriculture. New smallholder activities included agroforestry practices, integrating trees and shrubs into farms for fruit, fuel, fodder and fertility benefits; bee-keeping, investing in improved hives, quality standards and bulking honey to improve market value; zero-grazing livestock; tea production; and local crops with high nutritive value to meet expanding demand in Nairobi. KENVO attracted more partners and generated new funding from diverse sources to support farmers to adopt sustainable practices, open up new product markets, explore payments for ecosystem services, and set up ecotourism activities.

This work is now being scaled up further. KENVO has engaged leaders throughout the landscape to set out long-term aims and develop action plans. KENVO's work in community-based leadership development, including women and youth, now serves CBOs across Kenya. KENVO has enhanced local capacities for integrated landscape management, including the application of planning, management and capacity-building tools. KENVO and their partners have engaged policymakers to help realise the promise of integrated landscape management not only in Kijabe, but across Lari County[93].

WHAT TO CONSIDER FOR EFFECTIVE IMPLEMENTATION

Focusing on 'quick wins': The implementation of integrated landscape management could be carried out through a phased approach. In the short term, the initiative may focus on generating 'quick wins', e.g. through the development of pilot activities in demonstration sites in order to generate interest, communicate successes, increase visibility, and even attract investment. Quick win actions that are part of a no-regrets approach (i.e. that provide short-term positive impacts for most stakeholders, as well as for the overall landscape) can be particularly valuable in initiating strong collaboration. Examples of quick win activities include cleaning up waste in lakes or forests valued by local people for recreation or culture, or identifying and honouring farmers who are using high biodiversity value practices. Taking time to celebrate quick wins can strengthen the collaborative platform. Medium- and longer-term actions may be more complex and expensive, and require sustained engagement.

Developing strong communication strategies: Effective communication can help to ensure that people across the landscape, and even beyond, are aware of ongoing activities. Sharing results widely, through the internet, the media, or community spaces such as municipal centres, provides evidence of collaborative action than can, in turn, strengthen stakeholder buy-in, and attract investment and financial assistance. A communication strategy might include activities such as publishing the key outcomes of meetings between stakeholders in local newspapers to demonstrate ongoing action and invite public participation; sharing technical tools; developing training curricula; and arranging cross-site visits with other organisations in the area in order to encourage them to replicate and adapt innovations across the landscape.

Engaging research partners: It may be important for landscape partnerships to engage research partners in order to deepen understanding of landscape processes and to develop and test improved resource management practices. Engaging with local universities, as well NGOs or government research organisations, can help to answer key technical and institutional questions so that stakeholders can define best practices in the landscape. Conservation Bridge is a tool to connect university researchers and students with the leaders of agricultural landscape partnerships. It is a tool that can help build a long-term relationship between a university faculty and a landscape initiative. Students learn about landscape management through case studies of ongoing initiatives; and at the same time, students provide people in the landscape with data and information to undertake research[94].

Convening regular and well-facilitated meetings: It is important to ensure that adequate resources and time are set aside for regular meetings among stakeholders. This could include regular workshops or forums, both at the landscape scale and locally, to build capacity, exchange ideas and gather feedback. These meetings can maintain momentum for initiatives, cultivate relationships among stakeholders, and gather information for progress. Regular meetings also help to keep stakeholders informed of successes and milestones, as well as to communicate any significant changes to the external environment (e.g. political developments) that may affect relationships within the platform or the viability of the collaborative plan, providing an opportunity for stakeholders to react and adapt.

Maintaining strong leadership: Sustaining momentum in a landscape initiative with many moving parts requires strong leadership. While the multi-stakeholder platform will have a process for selecting representatives from different stakeholder groups, and this group will provide overall leadership for the initiative, it is important to provide opportunities for other actors to play a leadership role. Since landscape initiatives usually need to be long-term to achieve landscape-scale transformations, processes need to be developed which recognise that new types and groups of leaders may be needed to respond to change. Organising roundtables of key groups of leaders to support specific landscape activities can be highly impactful. Such roundtables can tap into informal power networks in areas such as policy mobilisation, investment, and business engagement; but also among educators, farmer organisations, environmental groups, or municipal leaders. Training focused on leadership for collaborative landscape management can be incorporated into workshops and dialogues involving leaders from different sectors and stakeholder groups in the landscape. See, for example, leadership training materials developed for TerrAfrica national partners[95].

MONITORING FOR ADAPTIVE MANAGEMENT AND ACCOUNTABILITY

Integrated landscape management requires practical and transparent monitoring systems, to assess progress made in reaching multiple objectives (e.g. environmental, economic, social goals) against agreed indicators and to hold actors accountable for their actions as agreed under a collaborative plan (see page 80). This on-going evaluation can also help inform assessments of progress towards objectives at larger scales (e.g. progress made towards meeting the SDGs or implementing REDD+). With new financial instruments and external investments for landscape management on the rise, their impact needs to be monitored; particularly in regard to compliance with environmental and social safeguards and/or standards to which a country, company, or project may be committed (e.g. by ratifying an international convention, adopting a voluntary standard, or as part of a contractual obligation to a donor).

Monitoring also supports continual and collective learning, including how to maximise the effectiveness of different management interventions. Monitoring systems are therefore vital for enabling adaptive management, as they can help ensure that the agreed management plan can effectively respond to complex natural resource problems in dynamic contexts, such as changing market forces and the uncertain impacts of climate change.

Measuring progress achieved through integrated landscape management can contribute to generating the evidence required to strengthen or replicate landscape initiatives. It can also demonstrate to policymakers how integrated landscape management can be more beneficial and cost-effective than conventional, sectoral approaches to food production, watershed management, energy generation, infrastructure development, climate change mitigation and biodiversity conservation.

The challenge is ensuring that the monitoring framework assesses progress made towards the realisation of multiple objectives (environmental, economic, social goals) and tracks anticipated (and unanticipated) synergies and trade-offs between different goals. Integrative indicators generate information about multiple functions and goals for landscape performance. Land cover is an integrative indicator. Analysing patterns of land cover change over time can generate insight into conservation, production, livelihoods, and institutional performance, as well as the interconnections between them[96]. Monitoring systems should be set up once collaborative landscape plans begin to be implemented to inform subsequent decisions taken by the group.

Indicators and information flows will likely need to be integrated across a range of scales and actors, such as projects, communities, landscape, and national data. To be sustainable and enable local ownership, indicators must be relevant to all these different scales and actors. A flexible monitoring framework, which allows for indicators to be adapted by different actors, can support this[97].

Funding remains a key barrier to the long-term sustainability of monitoring systems, as are the availability and transparency of data. Relevant actors are not always willing to share information; data-sharing agreements may be useful in this case. Because of multiple objectives, variations across space and time, and interactions among land uses, monitoring can be complex. Methodologies are not yet well developed. Few studies of multi-objective impacts of landscape initiatives have been undertaken, and fewer still have been published in the scientific literature (see page 93).

As a result of global climate change negotiations, countries have started to develop measuring & monitoring, reporting and verification (MRV) systems for REDD+. These systems are being designed to produce information at the landscape scale and to capture socio-ecological information. They will become a key tool in achieving sustainable landscapes.

THE IMPORTANCE OF RIGOROUS LANDSCAPE IMPACT STUDIES IN THE TROPICS

The Center for International Forestry Research (CIFOR) is currently completing a review of scientific literature on landscape approaches in the tropics[98]. Preliminary findings point to significant gaps in the evidence of their efficacy. After screening 13,290 articles published in English in specialist scientific databases, the study found only 82 relevant articles, of which only 47 assessed examples of landscape approach interventions. Of these, 13 reported a measure of success, but only six provided strong data to support the claims of success. Others rely on self-reporting mechanisms and anecdotal evidence. This paucity of evidence in the scientific literature contrasts notably with the evidence on the extent of landscape initiatives and claims of success based on the 'grey literature' described in earlier sections of this book. The authors speculate that the lack of reporting in the scientific literature is related to the lack of a rigorous framework for measuring the effectiveness of landscape approaches, which has also been reported by other scientists[99,100]. This gap in the evidence could be inhibiting decision-making processes, as the necessary linkages between practice, science and policy appear to be lacking.

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LANDSCAPE MEASURES FRAMEWORK

A landscape monitoring and evaluation (M&E) framework (referred to as 'the landscape measures framework'), developed by EcoAgriculture Partners and Cornell University, with some 25 other science and development organisations, was designed to help managers and evaluators determine whether landscape outcomes are moving in the right direction[101]. That is, are the management practices and resulting mosaic of land uses across the landscape yielding progress toward the multiple goals set out, individually and collectively? The Landscape Measures Framework enables stakeholders who have interests in the performance of a particular landscape to set targets and indicators for meeting specific goals.

The framework uses a hierarchical approach. At the highest level, there are four goals and twenty criteria that are considered to be desirable in any landscape worldwide (see page 95). The stakeholder coalition selects the most important ones for them. For example, Conservation criteria C4 expects that 'The landscape provides locally, regionally, and globally important ecosystem services'. The stakeholders must decide which ecosystem services require attention in their landscape. They then select context-specific indicators that are meaningful for the group in tracking whether the provision of those ecosystem services is improving over time. Once indicators are agreed, stakeholders can specify the appropriate means of measure. This process allows monitoring and assessment efforts to be tailored to the conditions and needs of particular places. The discussions required among stakeholders to agree on performance criteria and indicators can help deepen mutual understanding and sharpen the targets for action.

The framework is designed to complement existing project-based M&E. Project-based monitoring typically focuses on the parameters and the spatial scale that will reveal the effectiveness of particular interventions. Supplementing these efforts with periodic landscape-scale assessments can help reveal interactions among multiple interventions, analyse the effects of public policies, and identify important external influences. This information can help contextualise project-based work, thereby informing science-based planning and adaptive management, and allowing project staff to design more effective interventions.

GOALS AND CRITERIA OF THE LANDSCAPE MEASURES FRAMEWORK

1. Conservation Goal The landscape conserves, maintains, and restores native biodiversity and ecosystem services

a. Criterion C1 The landscape contains an adequate quantity and suitable configuration of natural and semi-natural habitat to protect native biodiversity.
b. Criterion C2 Natural and semi-natural habitats within the landscape approximate the composition and structure of the habitats historically found in the landscape.
c. Criterion C3 Important species within the landscape are biologically viable.
d. Criterion C4 The landscape provides locally, regionally, and globally important ecosystem services.
e. Criterion C5 Natural areas and aquatic resources are not degraded by productive areas and activities.

2. Production goal The landscape provides for the sustainable production of crops, livestock, fish, forest, and wild edible resources.

a. Criterion P1 Production systems satisfy demand for agricultural products (crops, livestock, fish, wood) by consumers inside and outside the landscape.
b. Criterion P2 Production systems are financially viable and can adapt to changes in input and output markets.
c. Criterion P3 Production systems are resilient to natural and anthropogenic disturbances.
d. Criterion P4 Production practices have a neutral or positive impact on wild biodiversity and ecosystem services in the landscape.
e. Criterion P5 Species and varietal diversity of crops, livestock, fisheries and forests is adequate and maintained.

3. Livelihoods Goal The landscape sustains or enhances the livelihoods and wellbeing of all social groups who live there.

a. Criterion L1 Households and communities are able to meet their basic needs while sustaining natural resources.
b. Criterion L2 The value of household and community assets increases.
c. Criterion L3 Households and communities have sustainable and equitable access to critical natural resource stocks and flows.
d. Criterion L4 Local economies and livelihoods are resilient to change in human and non-human population dynamics.
e. Criterion L5 Households and communities are resilient to external shocks such as flooding, drought, changing commodity prices, disease epidemics, and others.

4. Institutions Goal The landscape hosts institutions that support the planning, negotiation, implementation, resource mobilisation, and capacity-building needed to realise the goals of integration (conservation and production).

a. Criterion I1 Mechanisms are in place and functioning for cross-sectoral interaction at landscape scale.
b. Criterion I2 Producers and other community members have adequate capacity to learn and innovate about integrated landscape planning and management.
c. Criterion I3 Public policy supports integrated landscapes.
d. Criterion I4 Markets provide incentives for integrated landscapes.
e. Criterion I5 Knowledge, norms, and values support integrated landscapes.

WHAT TO CONSIDER IN LANDSCAPE MONITORING

Determining objectives and indicators for monitoring: The central question for a landscape monitoring system is which aspects of landscape performance are most important to monitor over an extended period of time. Landscape indicators should help test assumptions in the 'theory of change' behind the landscape initiative's collaborative plan. The Landscape Measures Framework (see page 94) suggests one way to develop these indicators. These can be supplemented by short-term monitoring of specific project interventions.

Establishing a monitoring system: In designing an appropriate monitoring system, it is essential to identify which measures will verify whether or not the indicators have been achieved, what is the source of data, who is responsible for collecting this information, and how often data is collected. The ideal frequency of data collection depends upon the rate of change anticipated for the indicator, or the importance of recognising more complex patterns. To reduce costs and ensure monitoring is sustainable, existing data sources should be used where possible, e.g. government statistics. The Landscape Measures Resource Centre provides a wide range of tools, methods and case studies to help define realistic goals, set targets, design viable indicators and cost-effective measurement methods[102].

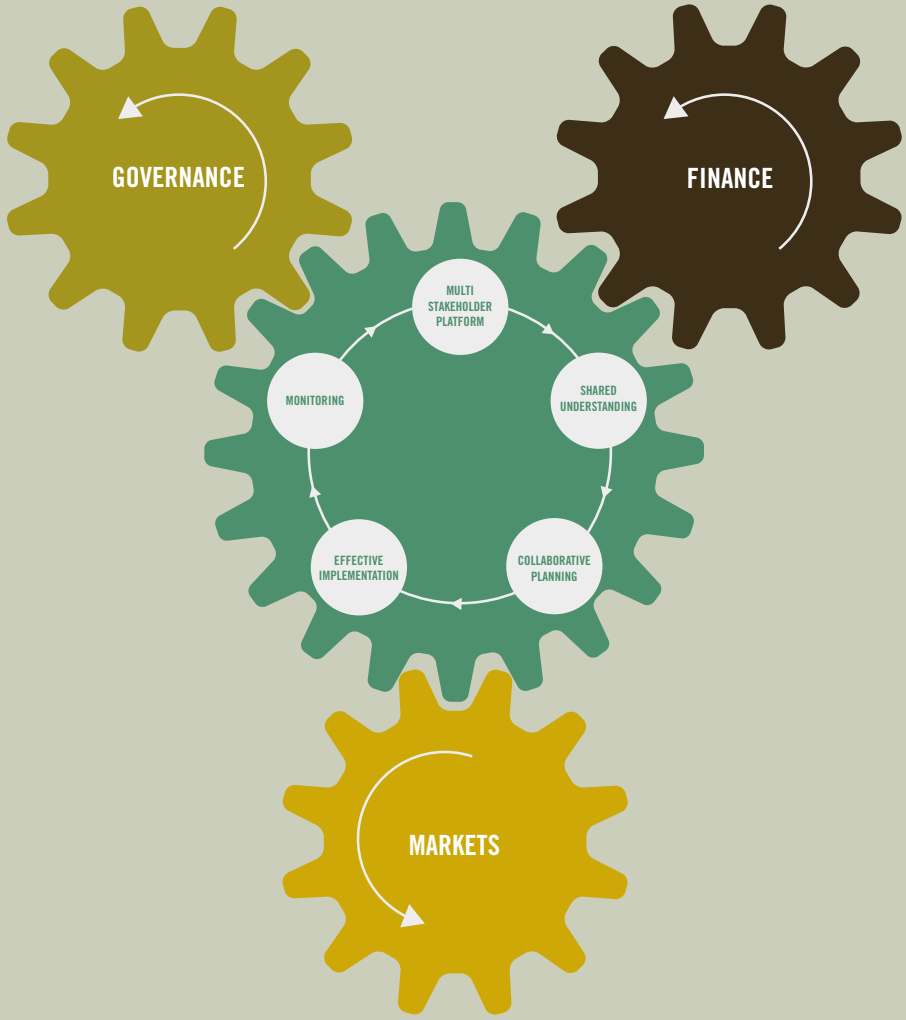
Interpreting the findings for stakeholder learning: To effectively evaluate progress towards the goals of an integrated landscape management plan, the monitoring results from different sources need to be synthesised and translated into a format that can be interpreted in a meaningful way. It is important for stakeholders to have the opportunity to question data collectors and analysts, and to interpret their findings. The results and lessons from monitoring need to be communicated effectively to enable adaptive management. Geographic Information Systems (GIS) can be useful to display multiple sets of data within the same framework, and to analyse their interactions. Vital Signs, a landscape monitoring system set up for research in Africa by Conservation International, is developing a consolidated framework to integrate socioeconomic and geographic datasets[103]. Results of qualitative or decentralised data collection from communities can be reported and synthesized during facilitated group meetings. GIS datasets may not be appropriate communication tools for all stakeholders. Other approaches such as role play or radio may be more useful in some circumstances.

CATALYSTS FOR SUSTAINABLE LANDSCAPES

INTRODUCTION TO THE CATALYSTS

This chapter presents a series of activities, measures and tools that are key to facilitating integrated landscape management and can contribute to improving sustainability within a landscape. We call these activities, measures and tools 'catalysts' as they can be used to catalyse change in how landscapes are managed. These catalysts are divided into three main categories: governance, market and finance catalysts.

Some of these catalysts are geared towards shifting business-as-usual towards more sustainable landscapes; others are more process-oriented and support the implementation of integrated landscape management as a means of achieving sustainable landscapes (see page 29).



GOVERNANCE CATALYSTS

INTRODUCTION

While integrated landscape management may not always be government-led, in most cases the government, be it national or local, is an important stakeholder. Moreover, the effectiveness of many integrated landscape management initiatives will be heavily affected by questions of governance: namely the government's ability to make and enforce policies and rules across its territory in a democratically accountable manner[104]. Supportive laws and policies can facilitate the setting up and maintenance of the structures or processes necessary to implement multi-sectoral and multi-scale approaches to natural resource management within a landscape (i.e. integrated landscape management).

This section looks at different elements of governance and identifies specific catalysts that can facilitate the implementation of integrated landscape management.

COORDINATION AMONG PUBLIC AGENCIES AT DIFFERENT SCALES

Governments can take measures to ensure greater coordination between the different government ministries and agencies responsible for natural resource management at different scales within the national territory; this is the vertical dimension of institutional coordination. The involvement of relevant entities at local, regional/federal, and national levels (i.e. vertical coordination) is important for all involved to gain a common understanding of an integrated landscape initiative's goals, how these goals will be realised in practice, and how the responsibilities for implementation and monitoring will be allocated among different government entities.

Almost all developing countries are undertaking some form of decentralisation (see page 40), often in the context of natural resource management. This creates an institutional basis for more popular and participatory management and use of natural and other public resources[105]. In this context, vertical coordination is intrinsically important, and also provides an enabling environment for integrated landscape management.

Vertical coordination between government agencies, especially in decentralised or federal contexts, does, however, present numerous challenges. Regional, provincial, and district governments often have substantially different priorities, resources, capacities and decision-making processes to those of national governments.

For example, throughout the Mekong River Basin in Southeast Asia there are numerous watershed master plans that lay out pathways for sustainable development. However, implementation on the ground is limited due partly to a lack of buy-in by local government in the design process[106]. In order to facilitate vertical integration, national policies can be designed with sufficient flexibility, so that local governments can adapt them to local circumstances. For example, there was scope for policymakers in the P'uer city-region of Yunnan Province, China to adapt national policies on agriculture green growth to design a provincial 'quality tea' initiative based on its unique tea agroforestry gardens[107].

COORDINATION AMONG PUBLIC AGENCIES ACROSS DIFFERENT SECTORS

In addition to vertical coordination (see page 105), governments can take measures to ensure greater coordination across different sectoral government ministries and agencies that have a role in natural resource management. This is the horizontal dimension of institutional coordination.

There is not always a clear hierarchical distribution of authority between different agencies/ministries. However, historically, governments have often granted preferential treatment to sectors that contribute more to economic development, which has resulted in legal and policy choices that support unsustainable land-use patterns.

There are numerous challenges to promoting horizontal or inter-agency coordination. Staff typically have quite different levels of training, mental models about land management and institutional tools. A 'trade-off' mentality is common, whereby it is assumed that alignment across agencies will result in a weakening of each individual organisation's core mandate (even if, in reality, the opposite is true). Staff may find engagement in multi-agency planning to be a bureaucratic burden, and effective inter-agency collaboration may not be rewarded within institutional incentive systems.

There are however some good examples of how institutional coordination arrangements can be set up to ensure that multiple government agencies with different sectoral roles and priorities can collaborate to tackle natural resource management challenges. For instance, Vietnam's National Strategy for Climate Change[108] defines concrete institutional mechanisms to support and encourage coordination, such as the designation of the Ministry of Natural Resources and the Environment to serve as Standing Office of the National Climate Change Committee. In addition, relevant sectoral ministries and agencies are required by their mandates to take actions to respond to climate change. These two measures provide a legal and institutional basis for inter-sectoral coordination in the area of climate change in Vietnam.

CROSS-SECTORAL LAND-USE PLANNING

In most countries, government ministries or agencies responsible for managing a specific land-use (forestry, mining, agriculture) look at the national territory in a highly siloed manner, and develop their land management plans in isolation from other sectoral agencies or ministries.

The purpose of integrated landscape management is to move beyond this single-sector focus and usher in a more holistic way of looking at natural resource management at a landscape scale so as to balance competing land-uses and manage ecosystems sustainably. It is therefore important for central governments to provide clear leadership and messaging to relevant government ministries and agencies that when land-use plans are being developed within a jurisdiction, these should consider the multiple services and uses derived from the landscape, and therefore should be multi-sectoral in scope.

To realise an integrated land-use planning approach, a change in framework conditions is often crucial. The legislative provisions governing land-use planning are generally dispersed across different sectoral legislation (forest law, agricultural law, mining law etc.), as they are linked to the mandates and powers of individual ministries and their relevant agencies. Ensuring cross-sectoral, jurisdictional land-use planning may require a consolidated or overarching spatial planning law to compel ministries to coordinate their planning activities. The level of political will and time required to reform the legislative land planning framework represent significant challenges. However, new models are emerging to encourage coordination (see page 108).

CASE STUDY FROM RIDGE-TO-REEF: COMPREHENSIVE LAND USE PLANNING IN THE PHILIPPINES

The Philippine archipelago consists of 7,107 islands. Different terrestrial and marine ecosystems are in close proximity and interlinked both spatially and socially. The population is growing fast, as is the demand for land. Agricultural land, fisheries and urban settlements are spreading out, and the choice of sites for settling is often unsustainable. Every year, the Philippines is hit by natural hazards, especially typhoons. This puts additional stress on natural resources and on people's livelihoods. The planning and management efforts of the responsible government units have, so far, not been able to adequately respond to those challenges.

Although cities and municipalities are granted the power to formulate Comprehensive Land Use Plans and manage their entire territory, around two thirds of all municipalities and cities in the Philippines have outdated or no land use plans[109].

The reasons for poor spatial planning and management are manifold. Local governments often lack the capacity and expertise to formulate comprehensive plans. In many instances, spatial plans are externally developed but not used by local governments due to missing sense of ownership and community acceptance or lack of knowledge. Moreover, the legal and institutional framework does not support integrated approaches for local governments. Planning and management of land is usually segmented into three different categories: public lands (forest, mineral), private lands, and the ancestral domain, each with their own managing entity and sectoral priorities.

The national Housing and Land Use Regulatory Board (HLURB), together with other national and local partners, is encouraging local governments to carry out integrated comprehensive land use planning and manage land more effectively, in cooperation with The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). An approach called enhanced Comprehensive Land Use Planning (eCLUP) has been developed[xiv]. This approach recognises that landscapes interact and depend on each other and therefore need to be managed from "ridge-to-reef" – from the central forest areas across the uplands and lowlands to the coastal and marine zones. This approach aims to ensure the integration and harmonisation of land uses for the forest, agricultural, coastal and other sectors into an all-inclusive joint planning document. It encourages local governments to integrate all non-urban areas into their land use plans, as well as climate change adaptation and disaster risk reduction measures.

The eCLUP contains process descriptions, training tools and management instruments for provinces, municipalities, cities and villages (barangays). It provides information on new technical concepts in ecosystem management, such as climate change adaptation measures and disaster preparedness, urban management, biodiversity protection and development control, and urban sprawl. Local planners and facilitators can apply all the tools provided, such as software solutions, guidebooks or ready-to-use facilitation techniques. Around 100 municipalities have used the eCLUP approach in the provinces of Leyte, Southern Leyte, Negros Occidental, Antique, Eastern Samar and Samar, and HLURB has started to roll out the approach nationwide.

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xiv This approach was formerly known as Sustainable Integrated Management and Planning for Local Government Ecosystems (or, SIMPLE)

CLARIFICATION OF TENURE ARRANGEMENTS

Land tenure rights are a set of overlapping and multi-faceted rights, which include ownership, access, use, management, exclusion, transfer, and alienation rights. Several rights-holders may share the same land tenure rights or may have different rights over the same resource[110]. Given this complexity, a single farm may include different sets of rights over its cropland, planted trees, forest, grazing land and water. Within the context of a landscape with a wide variety of land uses and stakeholders, tenure systems can become even more complicated to manage.

Clarifying tenure rights and responsibilities is a central requirement to achieving effective and equitable integrated landscape management. Knowledge of the customary and statutory tenure arrangements within a landscape is essential to identify who the key stakeholders are, who should participate in decision-making processes, and whose approval is needed in order to ensure that any collective plan is implemented effectively. In fact, if stakeholders with tenure rights within a landscape are excluded, their opposition could slow or even block the implementation of any collective plan for the management of the landscape. Conversely, the inclusion of relevant stakeholders with some form of tenure right within the landscape will ensure the legitimacy and sense of ownership of the management initiative. In some cases, a multi-stakeholder platform set up as part of intergrated landscape management may even provide a forum for participants to negotiate or define proposed changes to customary or statutory tenure rights.

Addressing lack of clarity in land tenure means clarifying who is eligible to manage, own and use land and its resources (e.g. associations, companies, communities, and individuals); ensuring a clear process for the registration of land rights; and creating clear and accessible processes for resolving conflicts relating to land. This could involve recognising the authority of traditional courts to map and adjudicate on customary tenure rights.

While clarifying tenure arrangements is crucial to the success of integrated landscape management, it is also a challenging undertaking in countries where rights are often unclear, weakly enforced or in conflict with one another.

CASE STUDY RECOGNISING CUSTOMARY LAND TENURE AS AN INCENTIVE FOR INTEGRATED LANDSCAPE MANAGEMENT IN DOI MAE SALONG FOREST RESERVE, THAILAND

The Doi Mae Salong watershed in North-west Thailand is the headwater of the Mae Chan River, a tributary of the Mekong River. It is extremely important for the regional economy. The landscape has been designated as a Military Reserved Area and comes under the control of the Royal Thai Armed Forces (RTAF). Poor and unsustainable agricultural practices, forest encroachment, and a lack of understanding of the impacts of activities on the watershed further downstream had resulted in the landscape being severely degraded. This was exacerbated by poverty among significant portions of the population and lack of certainty among communities surrounding land-use and access rights.

In 2007, the RTAF started to implement a programme to restore the area and reforest an area of land in the Doi Maw Salong Forest Reserve to prevent erosion and natural disasters. However, the activities of the Thai Army resulted in tensions and conflict with the local people, largely hill tribes, as their livelihoods depended on the use of these areas. Competing and overlapping legislation over use and access rights in the landscape contributed to the confusion. The International Union for Conservation of Nature (IUCN) facilitated a multi-stakeholder dialogue between government officials, local people, and the military to reach agreement on land-use plans for different parts of the reserve. As reforming the legal framework for land tenure was not a feasible short-term option, discussions included how to reach an informal arrangement on land tenure rights. Through this exchange, it was agreed that farmers would support the restoration of erosion-prone sites and priority watershed zones in exchange for access to farming land in valleys (i.e. access and use rights).

This example shows the importance of an agreement on rights as an incentive for sustainable practices in the landscape. This can help avoid conflicts, even if rights are not clarified formally, through legislation.

In this case, the stakeholders came together to view the area not just with their own interests in mind, but as part of an integrated landscape that would benefit from better management and cooperation. As a result of these negotiations, the government of Thailand recognised the value of integrated approaches to find solutions that work for communities and also to conserve biodiversity. The government of Thailand has since experimented with this approach in over thirty landscapes[111].

ENABLING FRAMEWORK FOR PUBLIC PARTICIPATION

'Public participation' describes the interactions between government and non-governmental entities, including civil society, business, indigenous peoples and local communities. These interactions range across a spectrum and include:

- **Information sharing**, as a one-way flow of information from the government;
- **Consultation**, a two-way flow of information and exchange of views;
- **Collaboration**, involving joint activities, where the initiator (usually the government) retains decision-making authority;
- **Joint decision-making**, collaboration with shared control over decisions; and
- **Empowerment**, where control over decision-making, resources and activities is transferred from the initiator to other stakeholders.

In theory, the closer governments can get to fully empowering relevant stakeholders, the more effective the participation of these stakeholders will be, and the more the proposed measures for integrated landscape management will be seen as legitimate and accepted by the population.

Given that so many people depend on landscapes and on their resources for their livelihoods, they stand to be affected by changes in the way landscapes are managed. If multi-sectoral management approaches at the landscape scale are to be legitimate and successfully implemented, they need to include local stakeholders. Ensuring the participation of relevant stakeholders can raise awareness, build capacity, give people the opportunity to voice concerns, and ensure that their priorities are not overlooked.

In most countries, governments have historically claimed - and often still claim - the dominant role in governing natural resources, which may cause resistance to establishing a framework for participation. However, the failure of governments working in isolation to conserve and manage resources for the public good, in the face of a growing global population and intense economic pressures, has pushed more public institutions to tolerate, or even embrace multi-stakeholder landscape management, and establish the frameworks to support such an approach. In countries without a strong civil society, governments may focus on cross-agency landscape coordination, and limit the role of civil society to a consultative one.

The degree to which stakeholders will be able to effectively participate in integrated landscape management will therefore largely depend on the will and capacity of government to ensure the existence and operation of a robust framework for participation. Such a framework should include essential enabling elements such as laws and/or policies to ensure adequate access to information; appropriate conflict resolution mechanisms; and additional provisions to ensure the participation of vulnerable stakeholders (such as indigenous peoples, women, and forest-dependent local communities)[112].

CASE STUDY MULTI-SCALE STAKEHOLDER POLICY DIALOGUES MITIGATE ILLEGAL CHAINSAW MILLING IN GHANA

80% of all timber sold in Ghana is illegal because of a government ban on chainsaw milling established in 1998. This is frustrating Ghana's ambitions to develop a legal and sustainable forestry sector. It is costing the state more than 13 million euros in revenues each year. However, the practice of chainsaw milling is widely accepted in Ghanaian society. Many marginalised communities have little alternative to cooperating with chainsaw millers as a vital source of income. Given this situation, there is a need to reform the ban and adopt policies that regulate logging, but also consider the livelihoods of local communities.

In order to effectively address illegal chainsaw milling, it is important that all stakeholders, from national policymakers to local actors, are involved in the development of solutions. If certain stakeholders sense that new policies benefit only one part of the timber production chain, illegal practices will certainly continue.

Since 2009, Tropenbos International, along with the Forestry Research Institute of Ghana (FORIG) and the Forestry Commission (FC), have facilitated a series of multi-stakeholder dialogues at landscape, district and national levels to identify policy solutions that work for stakeholders across sectors and at different levels of government. These dialogues on chainsaw milling enable all stakeholders to understand each other's viewpoints and have access to relevant information. Over the years, research data and practitioners' knowledge have informed the debate, raising awareness among stakeholders of the scope and complexity of illegal logging, as well as possible solutions.

These multi-level dialogues have proven to be an effective policy development mechanism. They have allowed participants to analyse the context, drivers and impact of chainsaw milling in Ghana, to formulate alternative policies, test new policy instruments, and lay the groundwork for further monitoring and for adapting policy frameworks. The dialogues have been instrumental in developing two new policies: the supply of legal timber to the domestic market and a public procurement policy. In addition, artisanal milling, the legal alternative to the supply of timber to the domestic market, is now being tested in the field.

The effectiveness of these multi-stakeholder dialogues reflects a shift from the conventional command-and-control model to a more collaborative approach to policymaking. This process has transferred power from government and industry to local users, while identifying policy solutions that are acceptable at all levels. Participation in policymaking can establish a sense of ownership and therefore lead to better implementation and respect for policies on the ground.

Tropenbos International

FINANCE CATALYSTS

INTRODUCTION

Raising and allocating finance is a critical part of transitioning to a world with sustainable landscapes. Finance is needed primarily to cover the massive costs of transforming farming and other land and water management practices, setting up and operating multi-stakeholder platforms, and developing shared understanding across landscapes. UNEP's Green Economy Initiative, for example, has estimated that the total cost of transforming agriculture will be USD 198 billion per year until 2050, and that the cost of investing in reduced deforestation and planted forests will be around USD 40 billion per year until 2050[113]. Moreover, landscapes must be able to attract and coordinate investment beyond the scale of individual projects; otherwise finance will fail to be effectively allocated in a way that achieves sustainable landscape outcomes.

Public and private funders can cover these costs, but the funding must be scaled-up. The Green Climate Fund (GCF), which intends to be one of the primary vehicles for channelling climate finance (see page 124), has received financial commitments just over USD 10 billion, at the time of writing. Only around 40% of that total has been converted into actual contributions[114].To date, the GCF has not disbursed any funds. In general, investments by other public sector funding bodies that target integrated landscape management processes are limited by the silos of public sector funding institutions and a lack of understanding of their importance.

Similarly, private finance has been slow to mobilise. Major constraints to mobilising private finance include high investment risk, a mismatch between the time horizons required by investors for a return on their investment and the time horizons of the investment opportunities, and an unwillingness to put capital at risk that is concomitant with the size of the investment opportunities[115].

To help overcome these constraints, this section outlines a suite of initiatives, reforms and policies ('finance catalysts') that can be used to increase the public and private finance flowing towards sustainable landscapes.

MECHANISMS TO COORDINATE LANDSCAPE INVESTMENT

Achieving the multiple goals defined in integrated landscape management requires two types of investments. One is direct investment that generates tangible financial, environmental or social returns (also referred to as 'asset investments'). These can include investments in sustainable practices on-farm, restoration or protection of forests, and large-scale green infrastructure, among other things. The other is investment that supports the process, governance or underlying policies crucial to the development of integrated landscape management (see page 58) (also referred to as 'enabling investments').

Meeting landscape goals will often require some degree of coordination among the different types of investments. For example, recovery of threatened watersheds may require restoration of riparian areas along the entirety of a river that flows through croplands, forests, towns and protected areas, each of which is financed from different sources. A patchwork of uncoordinated investments can increase costs and diminish impacts.

Achieving coordinated investment will usually require one or more entities to be capable of attracting relevant investors and facilitating coordination beyond the scale of individual projects. Entities taking on this responsibility may be government agencies, business associations, farmer groups, community organisations, or coalitions of actors setting up non-profit trusts or investment funds. These coordinators may also serve as aggregators of finance, pooling financing from multiple sources, or may simply advise landscape investors to steer projects in a certain direction. Landscape investment coordinators need a high level of financial literacy, which is uncommon today in most multi-stakeholder landscape partnerships.

Efforts are underway to address this gap. For example, Imarisha Naivasha in Kenya (see pages 64-65) is exploring the establishment of a Sustainable Development Fund to help implement the multi-stakeholder Sustainable Development Action Plan. Through this fund, Imarisha would help implement the financing strategy for the basin and advise investors on how they can best support the landscape vision. They may also fund key activities to draw new investors into the landscape.

REDIRECTING SUBSIDIES

Subsidies are payments or in-kind support offered by governments to companies, farmers or other land managers. Government policy determines which sectors of the economy receive subsidies to support policy objectives, e.g. growth in agricultural output.

Subsidies have been used on a large scale to promote the extraction of natural resources, such as the extraction of fossil fuels, mining, or agricultural expansion into forested areas. However, this has often been unsustainable. For example in Punjab, India, energy subsidies for irrigation pumping initiated in the 1970s to improve food security have contributed to water tables falling over about 90% of the state, causing water shortages for farmers[117].

The scale of the subsidies for activities that promote unsustainable landscape management, such as the expansion of monoculture plantations, far exceeds multilateral funding for sustainable agriculture, ecosystem management and conservation. For example, the total REDD+ investment in Brazil and Indonesia has been, respectively, 70 and 164 times smaller than the subsidies provided to the agricultural sector.

Shifting the balance of public sector subsidies to favour a more holistic approach could be transformational. Subsidies could be used to incentivise activities that balance the multiple priorities of governments pursuing sustainable development, e.g. rural income generation, ecosystem conservation and access to markets, in a way that also meets landscape priorities. Existing subsidies could be reformed to be more holistic, such as linking concessional rural credit to the environmental performance of producers, as has been done with Brazil's somewhat beleaguered Low-Carbon Agriculture programme, or incentivising production using diversified crop systems or intensified pasture management. These reforms would, however, be challenged by the beneficiaries of existing subsidies, who are often politically powerful.

PUBLIC-PRIVATE INVESTMENT MECHANISMS

Investments in landscapes are usually executed by impact or environmental funds, commodity producers, processors or traders (e.g. beef traders financing farm expansion), or public sector institutions (e.g. government agencies providing technical assistance). There is often a mismatch between the volume of capital that any single investor is willing to put at risk and the scale of funding required for a landscape. Investments may not have a risk-return profile that matches the investor, and the project may only generate a return over a long time horizon.

One way to address this problem is to aggregate and list projects so that investors are steered towards suitable opportunities by a centralised entity. Taking it a step further, a portfolio of projects could be aggregated into large-scale investments that are marketed to institutional investors further 'upstream' in the financial system, such as a pension fund that purchases climate bonds. This requires creating public-private investment mechanisms or, more practically, creating public and private sector partnerships, credit lines and funding agreements that share risk and channel investment from, say, bond investors through to development finance institutions, local banks and cooperatives, and to the producers themselves.

An example of this approach in action is GCP's Unlocking Forest Finance project (see page 120), where public finance will be used for a range of activities from producer training to underwriting credit risk, which in turn will support much larger flows of private finance for supply chain transformation. The size of financing available from private capital markets means that this approach could have a transformational impact - investors managing USD 2.62 trillion of assets recently penned their support for green bonds, whilst the bond market at a whole is valued at 50 times this - USD 100 trillion[118].

This approach faces challenges. It requires the public sector to commit funding; monitoring and evaluation across multiple investment flows is more complex; and there is a risk of unbalanced investments in a small number of large projects where the additionality of financing is marginal.

CASE STUDY LANDSCAPE BONDS

Bonds are a type of financial product in which an 'issuer' receives a lump-sum investment, called the 'principal', in exchange for a promise to repay the principal, with interest to the investor at a later date. Landscape bonds are a new, innovative approach to drive large-scale private investment from the capital markets into sustainable landscapes. They can help bridge the gap between the financing available for single projects and the finance needed for coordinated investments across the landscape.

Investors in international capital markets (e.g. sovereign wealth funds or insurance companies) are already beginning to shift some of their assets into green bonds. Green bond issuance tripled in 2014 to USD 37 billion, relative to 2013, and is expected to grow to USD 70-80 billion in new issuances in 2015. Over 85% of the proceeds from these bonds, however, are used to invest in energy, buildings, industry, water and transport. Only 3.9% and 4.3% of proceeds are invested in agriculture and forestry, and climate adaptation, respectively - areas that could potentially be considered as overlapping with sustainable landscapes[119]. There is an opportunity for sustainable landscapes to capture a much larger share of this growing bond market. The first step in doing so is by piloting sustainable landscape bonds.

The Unlocking Forest Finance (UFF) project, led by GCP, is doing just this. Operating at the scale of subnational regions (Acre, Brazil; Mato Grasso, Brazil; and San Martín, Peru), the project is helping these regions to identify a portfolio of activities that stop the conversion of tropical forest and transition towards sustainable modes of development, whilst also generating a financial, environmental and social return on investment. The portfolio of activities spans supply chains (e.g. intensification of cattle farms), conservation (e.g. enforcement of the Forest Code) and livelihoods (e.g. market access for rural smallholders) in an integrated way. The total investment cost is hundreds of millions of dollars. The project is then aggregating these projects into a coordinated investment mechanism that will issue bonds in combination with public investment and tools for risk mitigation.

For example, bonds could be issued by a development finance institution (DFI), which then lends directly to intermediaries investing in agroforestry projects, in combination with climate/donor finance targeted at technical assistance and training. The returns on investment in the aggregated portfolio of projects can repay the bond. Critical to success is building a consortium of potential implementing partners, such as DFIs, local banks, regional governments, producer associations and community associations. The ultimate goal is that the consortium of partners, led by regional governments, can access much larger volumes of capital for sustainable development.

CASE STUDY LANDSCAPE INVESTMENT PLATFORMS

Several private investment platforms seek to fund the transition to sustainable landscapes, by packaging investment opportunities. In this section we investigate a few of these platforms, comparing and contrasting their respective business models.

The Landscape Fund (TLF), a joint initiative of the Munden Project and the Centre for International Forestry Research, aims to transform landscapes by providing a diversified portfolio of long maturity, low interest loans to small-scale borrowers for sustainable agriculture and forestry[120]. These loans will be aggregated using a software platform, and offered to the international investment community. TLF uses a statistical model to identify geographical areas with low transaction costs and high opportunity for transformative impact, and works with existing local financial intermediaries to enhance existing loans or create new ones.

In contrast to TLF, **the Althelia Climate Fund** targets change at the project-level, providing debt to carefully selected agricultural projects that have the potential to generate multiple income streams, such as certified commodities and carbon credits[121]. It utilises public-private partnerships to leverage co-investment from public institutions, and has a unique credit guarantee from the USAID Development Credit Authority to lower the risk profile for private investors.

Althelia and TLF share various characteristics and ways of addressing common problems, which may be transferable to other investment platforms hoping to fund sustainable landscapes. For example, both Althelia and TLF would aggregate multiple project-level investments for the international investment community, up-scaling transformative change. They also leverage public finance to reduce risks and thus increase the appeal for private investors, and use debt, rather than equity, to access a broader universe of landscape investment opportunities.

There are several public funds that invest in sustainable landscapes. For example, **the BioCarbon Fund Initiative for Sustainable Forest Landscapes** (ISFL) is a USD 380 million project, managed by the World Bank and financed by Germany, Norway, the UK and the USA[122]. ISFL funds the jurisdictional-level design and implementation of climate-friendly land use policies in regions with a high risk of agricultural expansion into forests, working closely alongside REDD+ programmes to balance improved livelihoods, protected forests, and higher agricultural productivity. The ISFL also incentivises positive performance by disbursing payments according to emission reductions.

LENDING AND INVESTMENT SCREENING

Financial institutions direct the vast majority of investment into unsustainable activities. This is because, at the 'upstream' end of the financial system (e.g. pension funds), investment managers have a duty to maximise returns for their clients irrespective of environmental considerations (unless clients specify otherwise), and commercial banks invest in projects with the best risk-adjusted returns, which have historically been sectors such as fossil fuel extraction, mining, etc. Further 'downstream' in the financial system, companies and local financial institutions have historically financed projects that, respectively, increased their earnings or promoted economic growth, typically at the expense of environmental considerations. Credit lines - particularly those offered by development finance institutions or governments - often compete with each other and have different priorities (e.g. income growth versus climate adaptation), are offered on terms that are difficult for smallholders to comply with, and may not be known or understood by farmers.

Sustainability screening criteria for loans and investments can be used to redirect capital flows away from unsustainable investments and towards those that promote healthy landscapes. The screening criteria would need to align the competing priorities of credit and investment already on offer, e.g. for rural income growth versus agricultural expansion. Similar screening procedures are already established in due diligence, e.g. a commercial bank establishing whether the fundee is complying with relevant environmental laws. This exact restriction (compliance with environmental law) has been applied to rural credit in Brazil, successfully contributing to an estimated 15% reduction in deforestation in the Amazon between 2008 and 2011[123].

Increasingly, international financial institutions are incorporating screening criteria into their lending. This means that projects seeking financing are more likely to obtain it—or to receive better financing terms — if they fulfil criteria related to social and environmental performance. One example is the Equator Principles, which international banks voluntarily adopt as a stated commitment to avoid investing in enterprises involved in tropical deforestation. Since 2012, 77 financial institutions in 32 countries have adopted the Equator Principles, collectively representing more than 70% of international debt finance in emerging markets.

REFOCUSING CLIMATE FINANCE AND OFFICIAL DEVELOPMENT ASSISTANCE

Most climate finance is aimed at renewable energy, energy efficiency and transportation, rather than sustainable land-use, and the money allocated to sustainable land-use is mainly distributed via the REDD+ framework. However, being primarily aimed at avoided deforestation, the REDD+ framework is not always relevant for supporting low-emission development at the landscape scale.

Climate finance, particularly REDD+, could be spent in a more holistic way that recognises the multiple functions of landscapes, or directed to local landscape scale programmes rather than national authorities. This would maximise its impact in tackling the varied drivers of deforestation and ecosystem destruction within a landscape. The Green Climate Fund, for example, (see page 124) could disburse climate finance to local landscape initiatives, such as GIZ's Regional Economic Development Programme in Siem Reap Province in Cambodia, focusing investments on sustainable landscape management and multi-stakeholder platforms.

Similarly, international public finance for agricultural development could be mobilised to fund activities that explicitly balance trade-offs and encourage synergies between agricultural development, income generation and ecosystem conservation. For example, the Global Environment Facility's programme for Fostering Sustainability and Resilience for Food Security in Sub-Saharan Africa, funds programmes that improve food security, reduce biodiversity impacts, and reduce greenhouse gas emissions.

Where official development assistance (ODA) is joined up with climate finance (e.g. with co-investment from international private investors via landscape funds (see page 121) or landscape bonds (see page 120)) it could have a larger impact on landscapes. This integrated approach to donor spending will be critical in meeting the SDGs. The New Climate Economy 2015 report highlights the importance of a holistic approach that can meet growing demand for food and wood products, whilst also increasing resiliency to climate change, improving governance of natural resources, preventing deforestation and restoring ecosystems[124].

That said, there are numerous obstacles to such changes. For instance, international decision-making over climate finance is highly politicised. It may be difficult to prioritise sustainable landscapes over other causes clamouring for attention, or to integrate it into REDD+ for example.

CASE STUDY THE GREEN CLIMATE FUND

The Green Climate Fund (GCF) was established under the United Nations Framework Convention on Climate Change in 2010 to streamline the delivery of climate finance to developing countries. It will deliver part of the USD 100 billion per year of climate finance that has been promised by developed countries by 2020[125]. As of August 2015, developed countries have contributed almost USD 6 billion to the GCF and have pledged a further USD 4 billion[126]. The GCF may start disbursing funds by the end of 2015.

The GCF will allocate funds via two 'windows': a mitigation window and an adaptation window. It also hopes to attract private finance through a Private Sector Facility. This will allow the GCF to scale up climate finance by several orders of magnitude, leveraging finance from the estimated USD 225 trillion of capital available in international financial markets[127].

In order to speed up the disbursement of funds, the GCF has delegated its power to approve certain projects to 'accredited entities'. A wide variety of organisations can become accredited entities, as long as they meet specific fiduciary, environmental, social, and gender requirements.

As of July 2015, the GCF Board had approved 20 organisations. These include multilateral development banks and regional organisations, as well as national organisations such as the Centre de Suivi Ecologique in Senegal and the Peruvian Trust Fund for National Parks and Protected Areas[128].

The GCF could have a major impact on how climate finance is spent over the coming years. In November 2015, the Board of the GCF is due to approve its first portfolio of projects. Given that sustainable, multi-functional landscapes are important for both mitigation and adaptation, it is hoped that these and future projects will target sustainable landscapes.

In addition, the GCF should continue to encourage accreditation applications from organisations with the capacity to operate at the landscape level (e.g. national bodies). The Private Sector Facility should be flexible enough to allow private investors to co-invest with the GCF, using innovative financial structures such as landscape bonds (see page 120), and to direct investments to small to medium sized enterprises (SMEs).

REFORMING FISCAL POLICY TO SUPPORT LANDSCAPE STRATEGIES

Tax revenues are collected by treasury departments and spent on the government's priorities, such as infrastructure, defence or education. The particular priorities and spending decisions of the government may or may not align with landscape management objectives (e.g. conservation versus mining).

Taxation and public spending can be used together to achieve landscape outcomes. Finance can be directed into particular activities, such as the local stakeholder platforms discussed in the previous chapter. For example, national authorities could devolve to local authorities the powers needed to change fiscal policies, or at the very least facilitate fiscal transfers so that local authorities can invest in healthy, multi-use landscapes. Of particular importance is the power to ring-fence tax revenues raised from natural resource extraction and to spend them on specific activities within particular landscapes. For example, in Colombia, royalties from resource extraction (e.g. mining) are allocated to regional and local authorities to invest in sustainable development projects at the landscape level[129]. Or in Paraná, Brazil the state government allocates federal tax transfers to local authorities if they comply with environmental criteria[130].

Fiscal reform can also be achieved on a much more local scale. For example, proceeds from corporation taxes levied on companies that benefit from clean water could be ring-fenced to fund environmentally friendly agricultural practices in the watershed, or sponsor stakeholder workshops on local land use decisions and conflicts. This type of mechanism is used in Costa Rica, where the environmental agency (FONAFIFO) acts as an intermediary between large water users, such as utilities, and upstream providers of watershed protection, such as hillside coffee farmers[131].

It may be politically challenging to devolve fiscal policymaking to local authorities, since greater fiscal autonomy reduces governmental economies of scale. Unless finance flows are managed carefully, localised redistribution of tax revenues may lead to corruption. There is often resistance to ring-fencing tax revenues for specific programmes, since it reduces the governmental flexibility to spend according to changing needs and priorities.

SHAREHOLDER ACTIVISM

Shareholder activism can effect change with agricultural producers, processors, traders or natural resource companies by pressuring them to change their policies. For example, shareholders can insist that commodity buyers preferentially source commodities from producers who comply with certification standards/roundtables, or that natural resource companies assess new projects in the context of their exposure to carbon, water or other risks.

To pressure a company to change its policies, shareholders can raise questions at general meetings, propose resolutions, and publicise the company's behaviour in the media. For example, in 2015, shareholders in Bunge, a major global agribusiness, filed a resolution asking for an assessment of its exposure to deforestation and a commitment to full compliance with deforestation standards[132]. Although the resolution failed, it prompted Bunge to start mapping deforestation within its supply chain[133]. Similarly, a shareholder resolution was issued to Shell, asking the company to assess its exposure to carbon risk and to put in place risk-management processes[134], to which it responded and supported.

There is a growing movement by institutional investors towards active shareholdership and good governance, especially in light of new research showing a correlation between corporate action on climate change and improved earnings[135]. For example, up to and including 2014, the Norwegian government pension fund, the world's largest sovereign wealth fund, divested its shareholdings in 114 companies due to environmental concerns[136], many in the palm oil and paper producing sectors[137], and it has continued to identify and divest from major deforesters throughout 2015[138].

However, if there are additional costs to companies that cannot be passed down the supply chain, there may be a negative impact on profitability and therefore equity values. Although there are some metrics for exposure to deforestation risk[139], there are no metrics for landscape risk. Finally, pressure applied to producers is likely to have a bigger impact if they see greater demand for greener commodities from their buyers, but whether this demand will expand is unclear.

MARKET CATALYSTS

INTRODUCTION

Sustainable landscapes can produce a wide range of products and services with economic value. However, these are often not properly valued in markets, increasing the likelihood of land-use decisions that lead to negative outcomes. This section will highlight opportunities to help to transform relevant markets and ultimately improve the business case for a move towards sustainable landscapes.

To achieve this, better information on the value and origin of products and services from sustainable landscapes must be available to relevant market actors. This can be achieved through voluntary or statutory means, and relevant tools include some very mature single-product certification schemes (e.g. Forest Stewardship Council) as well as new and emerging certification systems (see page 134).

Secondly, there needs to be an increase in demand for products and services from sustainable landscapes. This can be achieved by leveraging increasingly prevalent company commitments on sustainability (see page 131), and by supporting the development of markets for a more diverse range of products within a landscape (see page 138).

Some catalysts can deliver broad potential impact by creating or strengthening markets for products and services that can only truly be delivered at landscape scale – examples include REDD+ at national or sub-national jurisdictional levels (see page 136), and economic incentives for watershed protection services for large watersheds. Other catalysts, such as ecotourism (see page 139), do not solely operate at the landscape scale, but with the right approaches can deliver strong outcomes towards sustainable landscapes. Ultimately, integrated landscape management is likely to be a necessary approach for delivering all of these opportunities into the future.

The catalysts included here are not comprehensive, but indicate some of the key opportunities for leveraging the power of markets to support sustainable landscapes.

CORPORATE COMMITMENTS

There is an increasing imperative among businesses worldwide to understand and manage the environmental and social impacts embedded in their operations, supply chains and investments. This is driven by an appreciation of the growing reputational, legislative and operational risks associated with these impacts[140] and the benefits of being an early-mover in a changing marketplace.

Accordingly, more and more major companies are taking on ambitious commitments and corresponding policies on sustainability. For example, Unilever has committed to halve its environmental footprint (e.g. water usage, GHGs, solid waste) by 2020. It has also been a leader in its early commitment to deforestation-free supply chains[141]. Commitments can also be made by groups of companies. For example, the Consumer Goods Forum (CGF) is a growing coalition of retailers, manufacturers, processors and traders in the food, fuel and fibre sectors with joint sales of over USD 3 trillion[142] that are working to phase deforestation out of their supply chains to achieve zero net deforestation by 2020[143].

These commitments can be an important catalyst in the transition to sustainable landscapes. Firstly, by sending a powerful signal to the global market that the days of unsustainable production and procurement are numbered, incentivising actors up the supply chain to improve practices, including through integrated landscape management. Secondly, via commitments by major producers themselves, who will then need to take a lead in implementing more sustainable production practices. It remains to be seen how such commitments can lead to better incentives for smallholder producers, who currently account for a significant percentage of production in key landscapes, but who remain unengaged with the zero deforestation agenda.

Despite the recent progress behind zero deforestation pledges, e.g. in the New York Declaration on Forests (see page 41), few cut across all of the forest-risk commodity supply chains that companies are involved with, such as beef, pulp and paper, soy, and palm oil. Out of the 250 corporates recently assessed by the Forest 500 ranking initiative[144], only 8% had a zero or zero net commitments across all forest-risk commodities.

Furthermore, there are many barriers to the implementation of these commitments on the ground, not least because of the complexity of supply chains, which may obscure links between potential buyers that may have a zero deforestation policy and the production landscapes to which they are linked.

CASE STUDY SABMILLER AND THE WATER FUTURES PARTNERSHIP

SABMiller, one of the world's largest brewers, is shifting towards a production approach that is more collaborative with other stakeholders in a landscape. This is because its future growth largely depends on expanding its production in emerging markets where resources are limited and must support numerous competing demands. In particular, SABMiller is dependent on a supply of clean water for both drink production and cultivating crops. However, water is a local resource and, if SABMiller's water use is uncontrolled, it could exacerbate water scarcity in many landscapes. This may cause both operational risks (e.g. such as higher operating costs due to shrinking water supply and lower crop yields), and reputational risks due to tensions with local communities over water security.

In addressing these risks, SABMiller has made a number of high-level corporate commitments, including to reduce water use per hectolitre of beer by 25% from 2008 levels by 2015 as part of its global programme "Ten Priorities: One Future".

As part of achieving these commitments SABMiller, in cooperation with WWF and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, has created the Water Futures Partnership, which supports companies to engage in collaborative action with local civil society, government representatives, local businesses, and other stakeholders to address shared water risks.

In South Africa, the Water Futures Partnership focused its activities on hops farms in the Southwestern Cape, which was considered the most at-risk landscape for South Africa Breweries' production. By constructing water footprints[xv] the partnership was able to identify shared water risks for different stakeholders including the businesses, communities and governments in the landscape, and develop collaborative action plans to mitigate those risks, e.g. removing invasive, water-consuming trees from the watershed[145].

xv A water footprint refers to the amount of fresh water used in the production or supply of the goods and services used by a particular person or group

SUSTAINABLE LANDSCAPE CERTIFICATION AND LABELLING

Eco-certification and eco-labelling schemes enable producers to demonstrate and promote the sustainability of their production systems. Certification systems verify that production standards (e.g. voluntary sustainability standards) are being followed, and labels communicate environmental or social attributes of a given product to end-consumers. They are driven largely by non-governmental organisations who wish to encourage consumers to use their purchasing power to buy products that are produced in a sustainable and socially equitable way.

No standards or certification schemes are currently assessing sustainability outcomes at the landscape scale, although some organisations are developing new frameworks to move in that direction (see below). In most certification schemes, independent agencies verify the compliance of individual producers with a standard, and the certification is specific to a particular individual landholding. Although many thousands of landholdings are certified, they are typically spread across a landscape or a country that is mixed with non-certified land-holdings. Some schemes do however include criteria that can indirectly support sustainable landscapes (e.g. community engagement or education on biodiversity conservation within certification schemes).

In order to encourage sustainability on a landscape scale, new landscape approaches to certification and labelling are emerging. In the Luangwa Valley, Zambia, the Community Markets for Conservation (COMACO) Company provides extension support and access to high-value markets for vulnerable communities surrounding natural parks, in exchange for commitments to use sustainable agricultural practices and agreements to stop poaching[146]. The recipients are selected based on the design of a collaborative landscape management plan. Several of the products including honey, rice, peanut butter, soy, and groundnuts, are branded and sold using the "It's Wild!" label. This signals that the products originate from small-scale farmers in Zambia that have adopted sustainable agricultural practices while conserving and restoring ecosystems and wildlife[147].

A central challenge with bringing standards, certification and labels to a landscape-scale is the complexity of monitoring. This is an area in which a variety of certification organisations are now making progress. For example, the Verified Carbon Standard is working with producer countries and partners to develop a new framework, the Landscape Sustainable Production Standard (LSPS), which measures social, environmental, and economic improvements within the landscape (see page 134). It recognises that not all activities can be certified sustainable within a landscape, and focuses instead on outcome-based certification. On the other hand, the Rainforest Alliance's Natural Ecosystem Assessment tool conducts combined monitoring at the landscape, farm and plot levels (see page 135).

CASE STUDY THE VERIFIED CARBON STANDARD'S LANDSCAPE SUSTAINABLE PRODUCTION STANDARD

The Verified Carbon Standard (VCS) is developing a new framework – the Landscape Sustainable Production Standard (LSPS) – to facilitate assessment of key landscape-scale social, environmental and economic outcomes of sustainable production efforts around the world.

Based on its experience developing and piloting the Jurisdictional and Nested REDD+ standard, VCS has seen how such frameworks can serve as useful tools for scaling up project- or farm-level efforts, whilst encouraging the deployment of complementary policies and measures that drive large-scale sustainable land management. Such standards have also created opportunities to link verified performance with diverse sources of finance. Similarly, LSPS is intended to support the effective design and implementation of sustainable production initiatives operating at different scales, whilst also driving public and private finance and other incentives to performing regions.

LSPS will enable the streamlined measurement, monitoring and reporting of key landscape-scale metrics, such as those related to deforestation, GHG emissions, water, livelihoods, and productivity, whilst helping to define how these dimensions of sustainability interact, including potential synergies and trade-offs worth considering. Rather than using a traditional certification model focused on end consumers, LSPS will provide the platform to monitor and report incremental progress over time, to identify sustainability risks and opportunities, and provide valuable information to decision makers and supply chain actors, including investors and commodity buyers.

LSPS will also enable actors across the landscape including governments, producers and civil society, to align on common big-picture objectives, and work together to achieve and demonstrate landscape-wide performance. For example, consumer goods companies and other commodity buyers could use LSPS to identify green supply regions that will help them meet zero-deforestation commitments, minimize reputational risks, and meet/communicate internal sustainability goals. Green bond issuers and impact investors could similarly use LSPS to identify attractive investment regions and opportunities, to screen for macro (landscape) risks, and to credibly demonstrate "green" investment performance. LSPS could also be used by donors and development banks to identify regions and initiatives that could benefit from funding based on progress and the potential to drive large-scale benefits.

VCS is working with partners, including Rainforest Alliance and Solidaridad, to develop and pilot LSPS in key landscapes in Latin America, Africa and Asia.

CASE STUDY LINKING SUSTAINABLE AGRICULTURE CERTIFICATION TO LANDSCAPE-SCALE OUTCOMES THROUGH THE NATURAL ECOSYSTEM ASSESSMENT TOOL

In an attempt to make agriculture more efficient, less polluting and less damaging to wildlife and ecosystems, Rainforest Alliance has been providing training to farmers on best practices based on the Sustainability Agriculture Network (SAN) standard, and subsequently certifying farms that have adopted these practices. Whilst much of the focus of these activities is at the farm-scale, many farmers and buyers of certified crops also want to understand and document how these changes in practices are impacting broader goals at a landscape scale, such as protecting watersheds and conserving wildlife.

To help achieve this, the Rainforest Alliance has developed the Natural Ecosystem Assessment (NEA), which is a set of tools used to assess the condition of natural and semi-natural ecosystems on and near farms working with Rainforest Alliance.

The NEA works by tracking changes in on-farm vegetation, including tree diversity and structure; land use on and adjacent to certified farms; and, broader effects on forest encroachment, conservation and connectivity. Monitoring is conducted at the landscape, farm and plot scales, and usually occurs before and after training and certification. The results of the NEA can help to answer questions about land cover changes, the degree to which certain practices provide habitat for wildlife, and evaluate the differences between certified and non-certified farms (e.g. encroachment on protected areas). The assessment can also be easily tailored to the specific goals of a particular initiative[148].

In South Sulawesi, Indonesia, Rainforest Alliance is promoting biodiversity-friendly cocoa agroforestry on farms that border highly endangered bird species habitat. The landscape's ecosystems were first mapped out using the NEA. This helped understand the landscape's biophysical context and identified priority investments. Local training materials on the Sustainable Agriculture Network standards were developed, as well as specific tools for community-led biodiversity assessments. Rainforest Alliance then conducted meetings with key buyers of cocoa to encourage the purchase from certified farms, catalysing greater adoption of SAN standards within the landscape. The application of the NEA, coupled with the incentive for farmers to adopt SAN standards helped to catalyse the development of integrated landscape management in the area[149].

PAYMENTS FOR ECOSYSTEM SERVICES

Payments for ecosystem services (also referred to as payments for environmental services or PES) is a tool for ensuring that those who maintain an ecosystem's ability to provide services, such as watershed protection, are compensated for doing so. Payees may be beneficiaries, such as users of these services, or polluters offsetting their negative environmental impacts elsewhere, as in the Clean Development Mechanism. In the current economic system, the stewardship of ecosystems is not rewarded, often resulting in their over-use or conversion to more profitable land-uses. This is despite the evidence that the resulting loss of these ecosystem services can have a significant economic cost. For example, in East and Southeast Asia, the cost of natural resource depletion is estimated between 2% of Gross National Income (GNI) in the Philippines and 12% of GNI in Laos[150]. PES aims to address this market failure through the provision of economic incentives for the conservation of these ecosystems.

PES schemes have proliferated over the last few decades, mainly focused on carbon, biodiversity and hydrological services. These schemes vary widely in their character, ranging from project to national scale; from direct public payments for ecosystem conservation such as Mexico's national programme of payments for hydrological environmental services (PSAH) to formal ecosystem service markets including the voluntary carbon market; and in focus, with some including social objectives.

For PES schemes to contribute to outcomes at the landscape-scale, it is critically important that incentives are designed not only to shift practices by individual natural resource owners such as farmers, but to stimulate coordinated action across a landscape. This requires that PES schemes engage targeted groups of resource owners within critical areas of the landscape, for example areas of high carbon stock or critical watersheds. This is reflected in the shifting focus of REDD+ schemes (payments for carbon from avoided deforestation and degradation) from the project to the jurisdictional scale. Leakage, where deforestation is displaced beyond the project site, can be better addressed by working at the jurisdictional scale.

Key challenges for PES schemes at the landscape scale include high transaction costs for local actors and insecure tenure rights, which can exclude these stakeholders from receiving benefits.

CASE STUDY PAYMENTS FOR ECOSYSTEM SERVICES SCHEMES SUPPORTIVE OF LANDSCAPE-SCALE OBJECTIVES

Carbon: REDD+ project in the Alto Mayo Protected Forest in Peru

An example of a payments for ecosystem services scheme is the Alto Mayo Conservation Initiative REDD+ project in San Martin, Peru which has received validation and verification from the Verified Carbon Standard and issued its first verified carbon units on the voluntary carbon market in December 2012. The project also received Biodiversity Gold Level validation and verification from the Climate, Community, and Biodiversity (CCB) standard, meaning that it delivers additional exceptional biodiversity benefits. In this case, the buyers of these carbon credits are not only rewarding carbon sequestration but also biodiversity conservation.

Revenues from the sale of carbon credits are invested in the development of economic opportunities, such as sustainable coffee production, compatible with forest conservation. This is informed by a collaborative management plan that balances the needs of forest conservation with those of the people who rely on the landscape for their livelihoods[151].

Biodiversity: biodiversity offsetting in Malaysia

Voluntary biodiversity offsetting schemes have been developed where an organisation manages areas of protected land for conservation purposes on behalf of another organisation paying to offset ecosystem damage being incurred elsewhere. For example, the Malua BioBank in Sabah state in Malaysia generates biodiversity conservation certificates that are purchased by companies. The revenue is invested into forest restoration projects, which are guided by a Conservation Management Plan developed in cooperation with the Sabah Forestry Department and local communities[152].

MARKET CATALYSTS TO DIVERSIFY PRODUCTION IN LANDSCAPES

Incentivising producers to use land management practices that do not place undue pressure on any single resource within the landscape and help maintain agroecological diversity is important for achieving sustainable landscapes. Diversifying the products grown can support both the ecological resilience of the landscape and the economic resilience of its stakeholders. However, clear demand and accessible markets for such products are essential in incentivising producers to diversify production in a landscape.

One way of diversifying the products grown within a landscape is to develop strong markets for secondary products[xvi] such as traditional indigenous foods, heirloom varieties, sustainably gathered wild products, and non-timber forest products. Buyers of these types of products can range from local and regional consumers of raw goods, to processors and international consumers. For example, in tropical Africa, intercropping cacao with the Allanblackia tree provides shade for the cacao crops, helps retain soil moisture, and also attracts wildlife. To help support this land management practice Unilever, in partnership with the International Union for Conservation of Nature (IUCN), the Netherlands Development Organization (SNV), and the World Agroforestry Centre (ICRAF), is developing the market for the edible oil from the seeds of the Allanblackia tree, by using it in products such as margarine, soap and cosmetics[153].

The adoption of standards which reward multiple outcomes (e.g. biodiversity-friendly agricultural practices) may also stimulate the diversification of production in a landscape, through opening up new markets provided there is adequate demand (see page 133).

Local forums including farmers markets, Community Supported Agriculture (CSA) systems and consumer cooperatives can also improve access to markets through creating direct relationships between buyers and sellers and providing opportunities for buyers to choose from a wider range of products than they may be able to access through conventional supply chains.

Farmers' cooperatives can also help diversify the supply of products available in a particular landscape by varying what is grown, or the types of processing that takes place, whilst encouraging their members to improve the sustainability of their production techniques. For example, the Oro Verde Cooperative in San Martin, Peru includes 1,080 member families who produce certified organic and fair trade cocoa and coffee, as well as other value-added products, for domestic and international markets[154].

xvi Secondary products are those made from raw materials that are not the primary product of a company or industry.

ECOTOURISM

Ecotourism is a subset of the tourism industry, a market in which the "buyers" are tourists who seek to pay for the experience of recreation and enjoyment of landscape beauty, with the intention of supporting conservation efforts and of minimising their ecological impact. The "sellers" in this market are usually private businesses, government agencies or community-based organisations that manage the tourist destination. The use of sustainably produced products in tourist facilities or local foods can also be part of a strategy for ecotourism to support sustainable landscapes. Types of ecotourism relevant to landscape management include:

Nature- or wildlife-based tourism makes use of either public or private parks and provides incentives for land owners and/or managers, to maintain habitat connectivity and natural areas for tourists who seek out wildlife or natural areas;

Agro-ecotourism combines nature/wildlife based tourism with sustainable agriculture and exposes tourists to rural landscapes that are a combination of wild and agro-ecosystems. Agro-tourism can involve visits to biodiversity-rich farms, accessing land to observe the local flora and fauna or learning about sustainable agriculture. This can provide incentives for farmers to maintain natural areas while managing agricultural lands sustainably;

Community-based tourism is a form of ecotourism that emphasises local development for communities and local residents for them to have substantial control over, and involvement in, its development and management. In this form of ecotourism, local residents share their environment and way of life with visitors, including activities such as festivals, homestays, and the production of artisan goods. As a major proportion of the benefits remain within the community, this provides incentives for entire communities to maintain natural areas while managing agricultural lands sustainably.

Community-based tourism is taking place in the Maasai Steppe Landscape in northern Tanzania, where the African Wildlife Foundation, Tanzania Land Conservation Trust, and private-sector partners have helped to protect a critical wildlife corridor between the Tarangirie and Lake Manyara National Parks by transforming a poorly managed cattle ranch into the Manyara Ranch Conservancy. The Conservancy, which spans 45,000 acres, is now home to a semi-permanent tented camp and offers various wildlife-viewing activities that help to generate income for local communities. This also helps to ensure that the critical migratory corridor is not sold and divided into small, unsustainable agricultural plots[155].

To have a landscape impact, ecotourism programmes must have a landscape management plan that considers important ecosystem services such as habitat connectivity for wildlife, and includes a mechanism to distribute benefits across landscape actors. The landscape dimension of ecotourism can also serve as a powerful extra motivating factor for tourists who are seeking to use their purchasing power to improve the conditions of the places they visit.

CONCLUSIONS

RECOMMENDATIONS

The nations of the world are now committed to achieving the Sustainable Development Goals: a commonly agreed and ambitious set of 17 goals and 169 individual targets for positive economic, social and environmental outcomes. But these cannot effectively be pursued one by one, or in isolation from each other. Rather we need strategies that will simultaneously achieve progress towards many of these goals and targets, at a scale and speed commensurate with the size and urgency of the challenge we face. The authors are confident that integrated landscape management is an essential tool in achieving outcomes at a scale that can meaningfully contribute to national goals.

Though there are thousands of integrated landscape initiatives underway, to date there have been few well-documented cases of landscapes that can truly be called sustainable. We lack methods and metrics to fully assess the contribution of these landscapes towards sustainable development at multiple scales. However, many encouraging case studies can be found in this book that demonstrate how integrated landscape management can be instrumental in achieving sustainable development outcomes. In Sao Felix do Xingu municipality, Brazil, carbon emissions have dropped 85% (from a 1999-2008 average to 2014) due, in part, to multi-stakeholder action to reduce illegal deforestation within its 'Green Municipalities' programme. In Central Europe, the Danube River now flows more cleanly through 19 countries. In the Ethiopian highlands, productivity and food security have increased due to integrated watershed management programmes. Importantly, when taken together, these case studies show that integrated landscape management is flexible enough as an approach to have impact across an enormous range of geographies, cultures, types of actors, institutions and needs.

Let us imagine what might be possible if these examples of best practice were to become the norm across the world's catchments, forests, farms, urban peripheries and indigenous territories. In the not too distant future, we could envisage a world where integrated landscape management has helped to:

- Build the foundations for green economies;
- Reverse the degradation of croplands, rangelands, forests and watersheds;
- Increase agricultural production and food security;
- Strengthen the rights and livelihoods of local people.

So what is required to more systematically scale up effective integrated landscape management?

The authors offer five broad recommendations:

1. Adopt integrated landscape management as a key means to make progress towards the Sustainable Development Goals at national and sub-national scales

- Governments, investors, businesses, and communities adopt integrated landscape management approaches within their policies and plans, implementation strategies and reporting processes.
- Key stakeholders come together to develop a shared vision and clear landscape-level goals, actions and indicators.
- Use integrated landscape management to align local development with relevant national and sub-national policies (e.g. climate, energy).
- Maximise synergies and minimise trade-offs in the work of public agencies across sectors and levels.
- Focus and prioritise actions to assist the most at-risk areas and vulnerable people, facing threats like food insecurity, water shortages and desertification.

2. Empower local stakeholders to design sustainable landscape solutions that meet their unique priorities and contexts

- Recognise and strengthen local organisations and institutional platforms for meeting, sharing, consulting, acting and monitoring in landscapes.
- Recognise and respect the human, statutory and customary rights of all actors in the development of landscape management initiatives.
- Recognise local stakeholders' goals and indicators in the design of national and global systems for implementing and monitoring SDGs.
- Clarify roles and responsibilities within collaborative landscape plans.
- Pursue further decentralisation of policy decision-making around natural resource management.

3. Develop landscape strategies that contribute to inclusive green economies

- Connect producers with buyers to support and strengthen commitments to source products from sustainable landscapes.
- Invest in market innovations that provide financial benefits to farmers and other land managers who contribute to agreed landscape goals
- Develop verification and assurance mechanisms for landscapes as sustainable sourcing areas - for example, landscape-scale certification that trade is 'deforestation free' - to reduce risk for buyers, investors and producers.
- Secure 'High Conservation Value' areas within production landscapes and ensure production systems are compatible with conservation goals.
- Support companies to include criteria for good governance of natural resources in their sourcing guidelines.

4. Leverage multiple sources of finance to achieve landscape goals

- Establish mechanisms to integrate and coordinate financing from public, private and civil society sources to build landscape solutions at scale.
- Strengthen business incubators to build capacity of green enterprises and entrepreneurs to contribute to landscape level goals and link them to investors.
- Build investment pipelines and portfolios that can aggregate individual investments across sectors and landscapes.
- Apply environmental and social standards to landscape investment design and screening.

5. Build capacity and facilitate learning among key stakeholders for better outcomes in integrated landscape management

- Invest in knowledge synthesis and guidance for effective implementation of integrated landscape management.
- Develop learning systems for emerging leaders in integrated landscape management to actively share and discuss lessons from successes and failures.
- Establish multi-objective landscape monitoring and data systems for adaptive management.
- Convene multi-stakeholder dialogues to deepen understanding of landscape management and encourage cross-stakeholder communication.
- Build long-term interdisciplinary research partnerships between universities and landscape initiatives.

Integrated landscape management is vital for dealing with the pressing and growing challenges of this century. This book represents a collaborative step by partner organisations working in this space to systematise and refine landscape approaches and tools. We encourage you to continue this journey with us.

In the context of ever-changing landscape conditions, we must do more than just advocate for the landscape approach: we must learn to do it well, together.

ANNEXES

ENDNOTES

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