

**Levering ecosystems:
A business-focused
perspective on how debt
supports investments in
ecosystem services**

April 2016



Foreword

All companies, including financial institutions, are to some extent reliant on ecosystem services. Methods for valuing these services are evolving, making it easier for substantial investment capital to be deployed into nature conservation, restoration, and rehabilitation. Previous reports that have addressed the investor perspective define conservation finance as “mechanisms where financial investments are made directly or indirectly through an intermediary into an ecosystem that aim to conserve the values of the ecosystem for the long term.”¹

To accelerate the growth of conservation finance as a whole, this report explores how to utilize debt as a tool. This report strives to plot a course for executives in the private sector as well as to inform investors, financial institutions, and conservation-oriented organizations (including NGO's, government and development agencies) that wish to maintain and/or increase the value of ecosystem services.

In September 2015, Mark Tercek, CEO of The Nature Conservancy, made this observation on the evolution of conservation finance deals: “This reminds me of my Wall Street days. I mean, all the new markets—the high yield markets, different convertible markets, this is how they all start. First they start with one-off project financings, you do them one-by-one, you demonstrate how these products work, deals work, and then it grows into a much more liquid market where many people can participate in it at smaller dollar sizes. That’s what I think lies ahead for us.”²

In this paper we outline how debt that compensates investors with market-rate returns can provide companies with the ability to finance activities that conserve, restore, or rehabilitate ecosystem services (as opposed to philanthropic grants or debt with below-market rate returns). We hope that these explanations and case studies impel companies, investors, policy makers, and NGOs to capitalize on the opportunities to scale-up conservation finance.



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Executive Summary

Previous papers published by our organizations have addressed the investor perspective on conservation finance; proposed standards for debt instruments targeting agriculture, forestry, and other land use; and parsed the broad market for green bonds.

In the course of inspecting various ways in which natural ecosystems provide a range of services that benefit human populations, we find that many companies demonstrate it is possible and necessary to both treat the earth well and earn a profit.

“The continuing disappearance of Earth’s last healthy ecosystems is sadly no longer news,” echoes Credit Suisse Chief Executive Officer Tidjane Thiam in a report on conservation finance published by Credit Suisse and McKinsey & Company in January 2016. “What is news,” however, “is that saving these ecosystems is not only affordable, but profitable. Nature must not be turned into a commodity, but rather into an asset treasured by the mainstream investment market.”

Propelling the business world to invest in conservation finance

As part of an effort to accelerate these business strategies, this report explores how businesses can utilize debt as a tool to restore, rehabilitate, and conserve the environment while creating financial value. The report explains how ecosystem services are relevant to companies; briefly examines the state of markets for carbon, water, and biodiversity credits; touches on the suitability of debt financing for companies at various stages and sizes; and highlights tools for measuring and reporting ecological impact.

For businesses and investors who want to take advantage of opportunities to invest in conservation finance, the report recommends the following:

- Develop and prioritize projects that optimize ecosystem services
- Invest in ecosystem services, particularly in resource-intensive industries such as forestry, agriculture, energy, and water
- Implement production processes that restore degraded areas and avoid those that have a detrimental impact on the environment
- Focus on collaborations that produce standardized methods for assigning value and impact to ecosystem services
- Use effective financing mechanisms to support conservation, such as:
 1. Improving agricultural practices using privately-raised debt
 2. Improving resource management with tax credit-enhanced debt
 3. Investing in ecosystem services using funds from a corporate green bond
 4. Investing in conservation by leveraging a development agency loan portfolio
 5. Investing in ecosystem services using a targeted financial institution portfolio
 6. Improving resource management through public-private partnerships
- Employ new planning and measurement tools that estimate the value and impact of strategic investments in ecosystem services
- Convert on increased demand from consumers and investors to further develop environmentally sound practices
- Leverage government incentive programs such as tax credits, guarantees, and market-based trading systems when possible

While the challenges, opportunities, and appropriate methods differ by region, the report encourages further exploration. Innovative thinking can lead to the creation of projects with positive environmental outcomes and enhanced productivity. To the extent that environmental footprints move closer to being recognized as assets and liabilities by companies, debt can be used to fund specific investments in ecosystems that lead to net-positive financial outcomes.

Background

The relevance of ecosystem services to companies

Provisioning, regulating, and cultural services are often interconnected and impact companies across value chains.

Ecosystems provide a range of services that benefit human populations:

- Provisioning services, e.g. food, raw materials, and water;
- Regulating services, e.g. climate, flood, and disease control;
- Cultural services, e.g. tourism, recreational, and cultural benefits.³

Table 1 provides a summary of the main types of ecosystem services and relevant markets that are evolving to exchange the value of these services (which we explore in more detail in the next section). We also highlight services that support the case studies shown later in the report.

Many of the ecosystem services described in Table 1 are related. For example, investments that mitigate global greenhouse gas concentrations also decrease costs by reducing the amount of money that needs to be spent on adapting operations to a warming climate.

Background

The relevance of ecosystem services to companies (continued)

Table 1: Ecosystem Services and Related Markets⁴

Ecosystem Service Category	Sub-category	Example Business and Exposure	Relevant Existing Ecosystem Market(s) ⁱ	Case Studies Involving Service
Provisioning services	Food	Agricultural producer: primary production	Greenhouse Gas (GHG) emissions, hydrological systems, biodiversity	1, 3, 4, 5
	Raw materials	Forestry and agricultural companies: primary production	GHG emissions, hydrological systems, biodiversity	2, 3, 5
	Water	Agricultural producer: water as input	Hydrological systems	1, 3, 4, 6
	Medicinal resources	Pharmaceutical company: product	Biodiversity	N/A
	Genetic resources	Agricultural inputs: source for product	Biodiversity	1
Regulating services	Local climate and air quality	Utilities, miners, and industrial manufacturers: liable under air quality standards	GHG emissions, other air quality parameters such as Sulphur Oxides (SOx) and Nitrogen Oxides (NOx)	3
	Carbon sequestration and storage	Agricultural and forestry companies: license to operate	GHG emissions	2, 5
	Moderation of extreme events	Real estate developer: flood risk Resource producers in prone areas (agriculture, forestry, and fisheries): operational risk Insurance industry: costs	GHG emissions, hydrological systems, biodiversity	6
	Waste-water treatment	Hydro power companies: regulation of flow Producers: water quality and availability for agriculture, forestry, and fisheries	Hydrological systems	N/A
	Erosion prevention and soil fertility	Producers: yield loss due to declining fertility and loss of topsoil	Hydrological systems	1, 3, 5
	Pollination	Producers: yield loss due to loss of pollinators	Biodiversity	1, 3, 5
	Biological control	Producers and intermediaries: yield loss due to new pests and diseases	Biodiversity	1, 3, 5
Cultural services	Tourism	Tourism companies: sea level rise; storm damage to resorts and transport systems; Retailers: loss of tourist-driven store traffic	GHG emissions, hydrological systems, biodiversity, habitats	3
	Recreation	Producers: loss of license to operate due to loss of recreational value	GHG emissions, hydrological systems, biodiversity	2

ⁱ Note that 'hydrological systems' refers to markets that deal both with water quality and flow, and that 'biodiversity' refers to market-based mechanisms that seek to promote habitat and species diversity e.g. species banking and biodiversity offsets.

Background

Status of various ecosystem service markets and investments

Incentives for companies to invest in ecosystem services may come from operational exposure, reputation management, or changing regulation. Governmental commitments are being mirrored by many companies.

Supply Factors

From a supply perspective, there are several types of ecosystem services that have market values in certain jurisdictions. They include GHG emissions (carbon markets), hydrological systems (watershed payments), habitats, and biodiversity (mitigation banking for species and habitats). Other forms of ecosystem services, notably climate adaptation and resilience, are currently priced more indirectly.⁵

Demand Factors

On the demand side, incentives for companies to invest in ecosystem services may rise from operational exposure, reputation management, and evolving regulation and/or compliance issues. According to “Investing in Conservation” — a 2014 report authored by NatureVest⁶ and EKO⁷ — the corporations surveyed deployed USD 458 million into investments that drove a positive impact on natural resources and ecosystems between 2009-2013.⁸ The companies either raised, intend to raise, or reallocate from other capital pools another USD 720 million between 2014-2018. Such investments can generate revenue or cost reductions such as operating, insurance, interest costs, and/or capital expenditures. An example is highlighted in the sidebar on page 7.

Government policies and programs that catalyze business interest are also being developed and implemented. Governments and development agencies have an incentive to promote investment in ecosystem conservation projects as a means to lower remediation costs. In the public sphere, these investments can be funded either directly or through initiatives that leverage private funding. Such investments may be cheaper than future economic damage from inaction.⁹ The climate discussions under the United Nations Framework Convention on Climate Change (UNFCCC) indicate an increasing commitment by governments to curb GHG emissions and mobilize investment in mitigation, adaptation, and resilience within the agriculture, forest, and other land use sectors. For the 2015 UNFCCC meeting (COP 21), over 140 countries submitted Intended Nationally Determined Contributions (INDCs), which described national GHG mitigation strategies. Many of these submissions included targets and adaptation strategies for agriculture, forestry, and other land use.¹⁰

Policy action is being reinforced by many businesses, as evidenced by the 81 companies which signed the American Business Act on Climate Pledge in October 2015 and made specific commitments (including in agriculture).¹¹ Concurrently, many leading global companies are committing to reducing their GHG footprints and developing adaptation strategies. Examples of robust corporate commitments include Marks & Spencer and Unilever, which are reducing deforestation within their supply chains, particularly in palm oil, beef, and paper.¹²

Background

Status of various ecosystem service markets and investments (continued)

US energy company Entergy invested in natural infrastructure in the state of Louisiana to lower the risk of losing significant asset value in the event of a natural disaster.¹³ Entergy collaborated with America's Wetland Foundation and America's Energy Coast to develop a comprehensive, objective, and consistent database to quantify climate risks in the US Gulf.

The US Gulf Coast is expected to be severely impacted by more frequent extreme weather events (e.g. wind and storm surge related damage), sea level rise, and subsidence. This will particularly impact energy infrastructure including offshore oil and gas assets. Beach nourishment and wetland restoration were found to generate significant benefits with relatively low investment requirements.¹⁴

Figure 1: Trends in Payments for Ecosystem Services (PES)ⁱⁱ

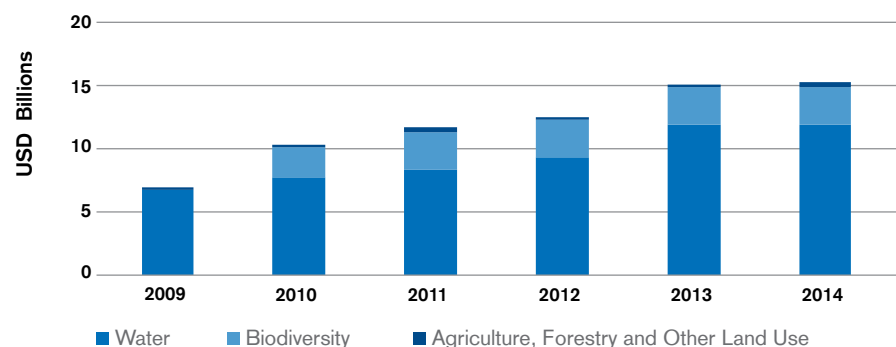


Table 2: Overview of Three Main Ecosystem Services Markets

Ecosystem Markets	State of Market
Greenhouse Gas (GHG) Emissions	<p>Carbon markets, both regulated and voluntary, continue to nurture a diverse set of standards, registries, and projects. The last decade has seen USD 4.5 billion spent by companies, governments, and individuals on one billion carbon offsets generated by conservation and clean energy projects.¹⁸ About 15 percent of transactions were between US-based offset suppliers and buyers, while Europeans have been the major buyers for offsets sold internationally.</p> <p>In 2014 forestry and land use projects represented over half of offset transactions by volume. The annual volume of forest carbon markets has been estimated at USD 200 million.¹⁹</p>
Hydrological Systems	<p>The 'State of Watershed Investment' 2014 report published by Ecosystem Marketplace indicated that the value of investment in global watershed services has been growing at a rate of 12 percent per year. In 2014 companies in the food and beverage sectors contributed nearly one-quarter of all private sector investments in such initiatives (USD 8.8 million), driven primarily by concerns for water quality and future supplies.²⁰</p> <p>In the US water quality trading reached USD 10.7 million in 2014, and new agreements were executed through cost-share agreements to manage wildfire risks on public lands. Businesses are primarily engaged in such activities due to regulations, water availability, and quality risks.</p>
Habitats and Biodiversity	<p>Habitat and species banking is designed to offset the impact of development on biodiversity (i.e., 'no net loss')²¹ by restoring degraded areas or enhancing critical habitats. This activity has primarily occurred in the US. For example, the Endangered Species Act (ESA) in the United States compels mitigation of negative impacts on listed species (e.g. permanent habitat protection).²² Corporate buyers have also transacted for voluntary biodiversity offsets, e.g. under the Business, Biodiversity and Offsets Programme (BBOP).</p>

ⁱⁱ Note that this chart includes carbon finance flows to companies operating in the agriculture, forestry, and other land use sectors. It does not include funds from development agencies and government incentives (taxes, subsidies, and spending). Data compiled from various Ecosystem Marketplace reports and from previously cited reports.²³

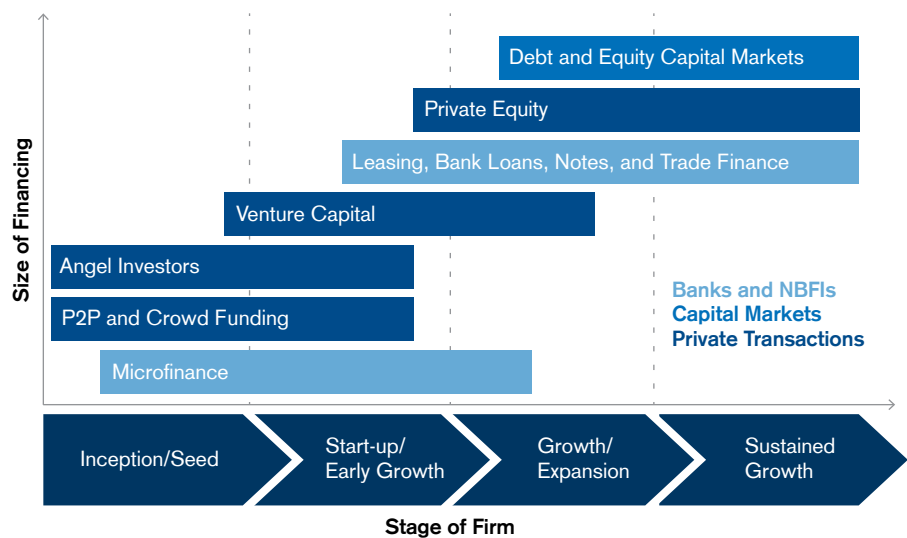
Background

When and why companies choose debt financing

The most suitable financing mechanism will be determined by the maturity of the business and the size of the investment being made.

The appropriate financing mechanism is dependent upon the maturity and size of the investment opportunity, which can range from early-stage and micro-scale to mature-stage and very large-scale. Figure 2 illustrates the suitability of different types of financing based on the stage of the firm and amounts needed.

Figure 2: Suitability of various financing products. ("P2P" refers to "Peer-to-Peer" lending, and "NBFIs" refers to "Non-Bank Financial Institutions"). Exhibit is authors' own.



Compared with equity, debt can be attractive because:

- Liabilities are relatively clear
- Interest on loans is usually tax-deductible
- There is no dilution of ownership

Companies access debt from financial institutions through instruments such as:

- Credit lines and working capital facilities
- Debt securities such as bonds, which are purchased by different types of investors and may be traded
- Debt instruments to fund a portfolio of loans

Case studies

In the following case studies, companies have financed investments into ecosystem services with the support of debt. While by no means exhaustive, these structures can realistically be utilized to generate market rate returns for investors while creating value for businesses and the environment.

The case studies cover the following six types of situations:

1

Improving Agricultural Practices using **Privately-Raised Debt**

2

Improving Resource Management using **Tax Credit-Enhanced Debt**

3

Investing in Ecosystem Services using funds from a **Corporate Green Bond**

4

Investing in Conservation by leveraging a **Development Agency Loan Portfolio**

5

Investing in Ecosystem Services using a **Targeted Financial Institution Portfolio**

6

Improving Resource Management Through **Public-Private Partnerships**

Case studies

Choosing an appropriate debt financing instrument depends upon a number of factors.

Table 3: Debt Financing Considerations

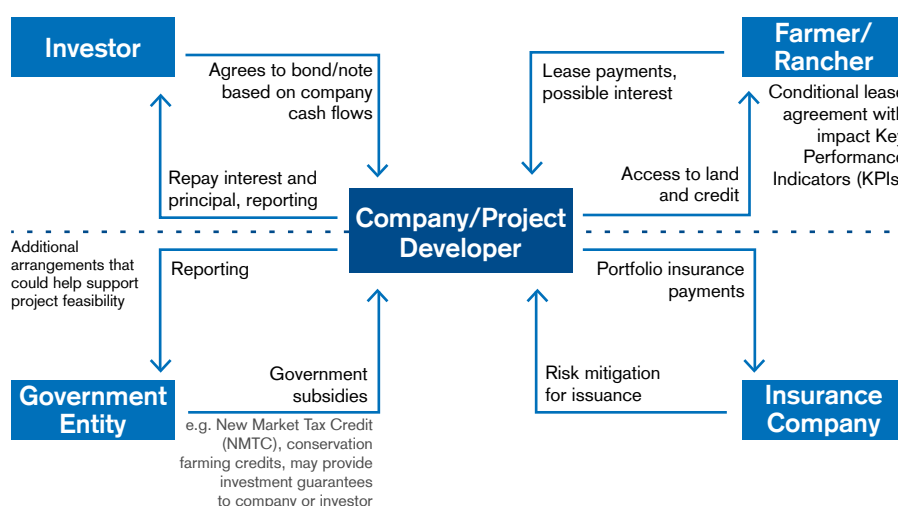
Issue	Impact on financing decision
How much money is required and for what?	The volume of financing required influences the suitability of different debt products. It may be more cost effective for a company to borrow smaller amounts from a bank than to issue a single, sizeable bond.
Will the returns be adequate? Are the cash flows stable?	Ability to repay the loan amount plus interest is a key factor. For a company this means identifying a relevant, material, tangible revenue increase, or cost reduction.
Who is the borrower?	This may be a company, a Special Purpose Vehicle (SPV) with a pool of assets, or some other organization such as a financial institution, government or development agency. The credit-worthiness of the borrower will be considered in pricing the debt.
Is the loan secured? If so, by what assets?	Debt instruments can be unsecured or secured and backed by assets, e.g. collateral and bank guarantees.
What is the time horizon of the initiative(s) and respective financing?	Initiatives with varying cash flow time horizons will be suitable for different repayment time frames. Repayment of the initial amount (principal) and interest impact the pricing of the debt. Loans that require longer duration to be repaid carry an additional risk for which investors must be compensated. The time horizon impacts coupon and yield calculations and thus the cost to the borrower and perceived value.
What is the liquidity of the debt?	Generally the more difficult it is for an investor to eventually transfer the ownership of a product, the more compensation an investor will require.
What are the risks and can they be mitigated?	If debt is raised for a specific project, it is important to consider what risks may impact payment and whether it is possible to mitigate or transfer these risks. For example, if a company issues a bond to finance a large water project, the relevant risks may include Engineering, Procurement and Construction (EPC), currency risks, natural resource risks, as well as political and legal risks. EPC risks can be mitigated by performance guarantees; hedging facilities, or denominating loans in hard currencies may mitigate currency risks; natural resource and political risks may be mitigated by insurance.

Case study 1

Improving agricultural practices using privately-raised debt

A company that manages a portfolio of agricultural assets can raise debt from investors to fund improvements to agricultural practices or equipment. These improvements may mitigate the environmental impact of farming activities and can also be linked to crop price premiums driven by downstream demand for certified produce. Further, these types of arrangements may be used for other stakeholders in a community to access land and farming techniques that they may not otherwise be able to attain using their own capital.

Figure 3: Example of a note to fund sustainable land management



Iroquois Valley Farms (IVF) provides an example of a company that is deploying a strategy using privately-raised debt

Iroquois Valley Farms (IVF), based in the state of Illinois, is a company that purchases and leases land to farming families. All farmland is transitioned to and maintained as USDA certified organic (if not already so), which can lead to a premium crop price. IVF is currently raising funds through a USD 20 million capital raise of which USD 15 million is equity and USD 5 million is a series of notes. The company recognizes the dangers of over-leveraging, especially for a business focused on primary agriculture where returns are relatively modest; it also faces the challenge that investors tend to seek larger-sized investments.

Privately-raised debt key points

- Can be used for larger issuances (through bonds) or smaller issuances (through notes)
- The structure is primarily used to fund existing business capital expenditures (CAPEX) or operating expenditures (OPEX)
- The borrower can be a new or existing company with a track record and a portfolio of assets
- The security is based on the issuer's asset base, for example land (title deeds) or an existing loan portfolio
- Investment duration may be relatively short or long
- The risks are primarily linked to the company (issuer)

Case study 2

Improving resource management using tax credit-enhanced debt

It is feasible to use debt to finance improvements in land management that will eventually become a public good. For example, The Lyme Timber Company has successfully used tax-efficient debt to help fund the purchase of land that eventually is transitioned into easements.

The Lyme Timber Company (Lyme Timber), based in the state of New Hampshire, is a private Timberland Investment Management Organization (TIMO) focusing on the purchase and management of North American land with unique conservation values. The company currently holds over 550,000 acres. Lyme Timber has a particular emphasis on investing to maintain and increase conservation value. The company employs a variety of mechanisms to generate revenues from sustainable forest management: recreational leasing, sale of environmental offsets (including carbon credits), and alternative energy supply agreements.

Lyme Timber has also supported the conservation of 750,000 acres of land under conservation easements. The company has been particularly innovative in how it structures deals. For example, it has worked with conservation organizations to purchase important habitat areas and transition these into land banks (easements) over time; e.g. a TIMO buys the land and the NGO has an option to purchase all or part of the asset at a later date once funds have been assembled. This type of structure supports Lyme Timber's purchase and ensures that the lands are quickly transitioned to good management practices.

In the state of Maine, Lyme Timber purchased 22,000 acres of high priority land in 2008 for USD 19.3 million with USD 4.8 million in equity, USD 12.5 million bridge financing through the federal New Markets Tax Credit (NMTC) Program, and a USD 2.0 million option payment from Downeast Lakes Land Trust (DLLT) to purchase conservation interests over time. Such structures illustrate how forest management companies can utilize different public financing programs, options, and prepayments to promote sustainable land management.

Tax credit-enhanced debt key points

- May be used for larger issuances (through bonds) or smaller issuances (through notes)
- The structure is primarily used to fund CAPEX or OPEX of an existing business
- The borrower can be a new or an existing company with a clear portfolio of assets
- The security is based on the issuer's asset base, for example land (title deeds) or an existing loan portfolio
- Investment duration may be relatively short or long
- The risks are primarily linked to the company (issuer)

Case study 3

Investing in ecosystem services using funds from a corporate green bond

Corporate portfolios of ecosystem conservation projects may not be large and stable enough to warrant a bond issue. Some form of aggregation is likely to be necessary, such as a corporate-level issuance with a range of different investment themes, including ecosystem conservation but also other issues such as energy and waste.

Some companies operating at a larger scale have shown that bonds with multiple green uses of proceeds can include land-use enhancement or conservation. SCA Group, a listed Swedish forestry company, issued a SEK 1.5 billion, 5-year green bond in 2014. The bond is linked to green projects including sustainable (certified) forestry and also comprises renewable energy, fuel switching, and waste and water management. Other companies that have issued such bonds include Unilever²⁴ and BRF Brasil Foods SA (BRF).²⁵

This structure is relevant when there is a clear strategy of what needs to be funded and the resultant revenues. In the context of conservation finance, it translates to a clear ability to monetize these benefits through additional revenue generation or cost reduction — e.g. premiums on organic produce or tax credits. Most, if not all, of the large companies active in the forestry and agriculture sectors have debt outstanding. While most corporate issuers have some form of sustainability or corporate governance programs, these currently tend not to be tied to financial planning and performance or specific debt programs.

Aggregated issuance key points

- Suitable for larger issuances (through bonds) or smaller issuances (through notes)
- The structure is primarily used to fund CAPEX or OPEX of an existing business
- The borrower is likely to be an existing company with a track record and a clear portfolio of assets
- The security is based on the general creditworthiness of the issuer
- Investment duration may be relatively short or long
- The risks are primarily linked to the company (issuer)

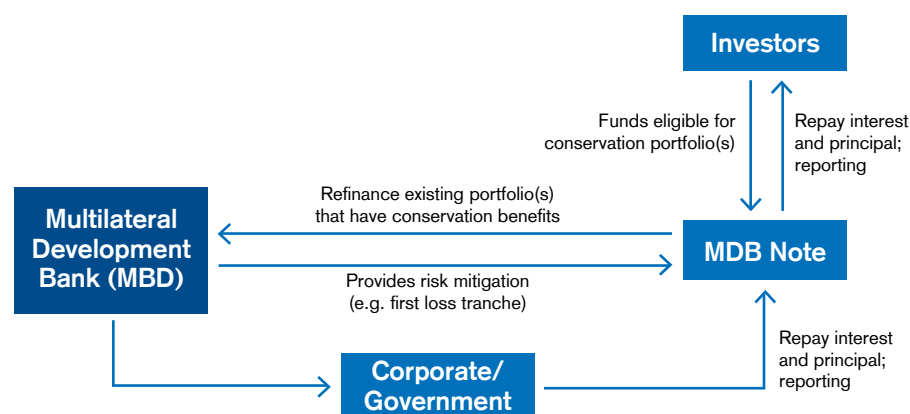
Case study 4

Investing in conservation by leveraging a development agency loan portfolio

Multilateral Development Banks (MDBs) are natural partners in conservation projects in light of many MDBs' mandates to support projects that promote sustainable development in target countries. This is relevant to businesses because development bank loan portfolios enable companies to implement development activities while benefiting from the high credit ratings of the lending institutions.

MDBs such as the World Bank and development banks in the Americas, Europe, Asia, and Africaⁱⁱⁱ have significant loan portfolios supporting an array of socially and environmentally beneficial initiatives, some of which fall within our definition of conservation finance. Many of these initiatives target conservation activities.^{iv} While there are few loan portfolios that specifically support conservation activities, there are opportunities for collaborating with these institutions to gain access to additional cost-effective funding for conservation.

Figure 4: Multilateral Development Bank (MDB) can effectively refinance a suitable portfolio. For example, an existing loan that was originated to improve ecological resilience by investing in sustainable coffee production methods could be part of a development bank loan portfolio and be refinanced in a more targeted manner.



Multilateral Development Banks (MDBs) loan portfolio key points

- There is opportunity for a sizeable issuance, which can reduce borrowing costs and gain significant institutional investor interest
- The structure is a new entity but backed by an existing portfolio of loans and potentially with a guarantee for a highly rated institution
- Duration may be relatively long but the quality of partners may increase opportunities for issuing a note with a longer term
- The risks are primarily linked to the underlying loan portfolio (i.e. the selection of loans that are included) and the guarantor

ⁱⁱⁱ Examples include The World Bank, Inter-American Development Bank (IDB), European Investment Bank, Asian Development Bank (ADB), and African Development Bank (AfDB).

^{iv} Examples include the European Investment Bank (EIB)'s Climate Awareness Bonds, the AfDB Food Security Bond, and The World Bank equity index-linked note.

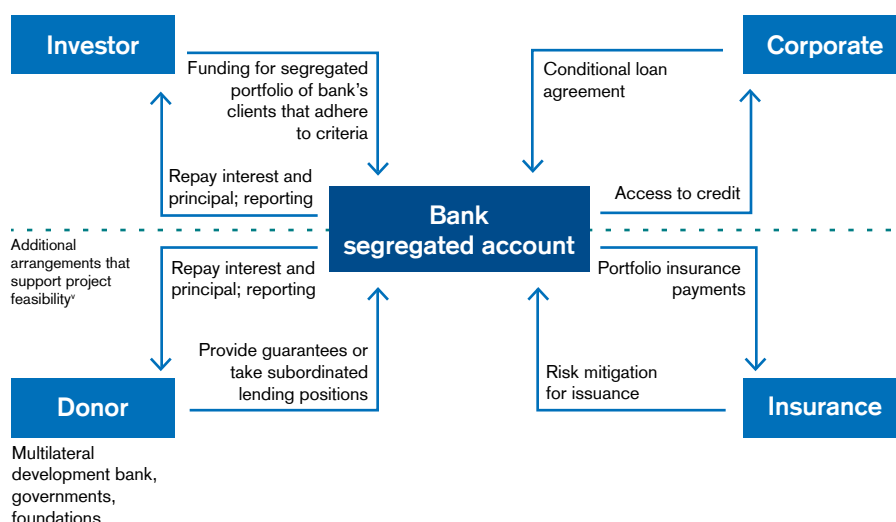
Case study 5

Investing in ecosystem services using a targeted financial institution portfolio

A financial institution can create a targeted green debt portfolio by screening for loans that meet certain criteria. Interest from a bank to pursue a segregated portfolio is likely to depend on its cost of capital and alternative fundraising routes. This is also a means to attract attention from new investors and may be used to both refinance existing loans as well as fund new projects.

An example of a targeted financial institution portfolio is a 2014 issuance by Canadian Toronto Dominion Bank (TD), which issued a CAD 500 million, 3-year bond for green initiatives in Canada. Proceeds are used exclusively for renewable and low carbon energy and related infrastructure; energy efficiency and management (particularly in buildings); green infrastructure; and sustainable land use management, including certified sustainable agricultural and forestry practices^{vi, 26}

Figure 5: Bank or Non-bank financial institution (NBFI) debt financing for specific programs (e.g. renewable energy or energy efficiency).



Targeted Financial Institution Portfolio key points

- Likely to be for larger issuances where relatively high transaction costs can be offset by amounts raised
- The borrower is regulated and has a track record
- The borrower has clear criteria for use of proceeds to differentiate the issuance from a normal bank debt program
- The security is based on the strength of the dedicated bank / non-bank financial institution (NBFI)
- Investment duration may be relatively short or long
- The risks are primarily linked to the creditworthiness of the financial institution (rating) and the currency

^v Depending on the perceived risk of the debt (e.g. currency or political risk), it may be complemented by development agency support and risk mitigation add-ons.

^{vi} In 2014 the allocation was primarily to green buildings, solar power, hydroelectric, biomass, and wind energy.

Case study 6

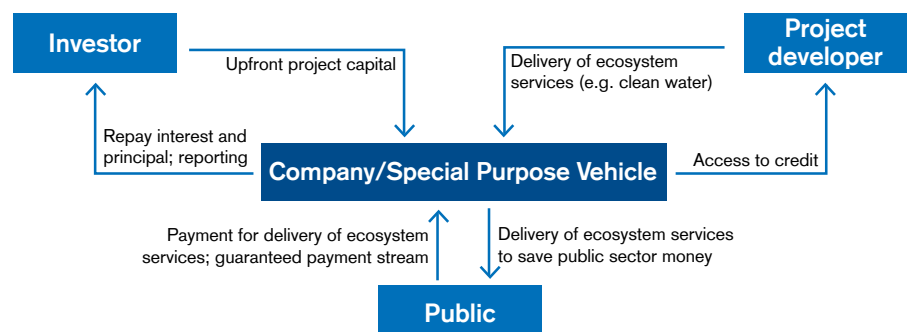
Improving resource management through public-private partnerships

Through its impact investing unit NatureVest, The Nature Conservancy is exploring innovative financial structures to support conservation. One recent example is the Murray-Darling Basin Balanced Water Fund. This AUD 27 million fund includes an AUD 5 million loan from National Australia Bank (NAB) and will be invested in buying and trading water rights as well as re-watering wetlands in the basin. The Fund aims to generate a financial return while also enabling habitat protection and restoration, community resiliency, and sustainable job creation.

The Murray-Darling Basin is Australia's most important agricultural area—generating over 40 percent of the nation's agriculture—and is one of the most engineered water basins in the world. Over the past century, the Murray-Darling Basin's natural systems have become highly degraded as the infrastructure required to support growing agricultural production has severely disrupted natural hydrologic cycles and processes.

The Australian Commonwealth and state governments have been carrying out their own environmental watering efforts focusing on the largest, publicly-owned wetland areas. The Fund will complement governmental watering by focusing on the wetland systems located on private lands that are essential in providing connectivity for species that move through the landscape or as a refuge in times of drought. Importantly, the environmental strategy is focused primarily on years when water is in abundance, and the Basin would have experienced natural flooding. In years of drought or water scarcity, the majority of the water is leased back into the agricultural community, ensuring returns to both the environment and agriculture are kept in balance. NatureVest believes the Fund will act as a demonstration project that can be replicated around the world and will show that agricultural, environmental, social, and financial outcomes can be achieved.

Figure 6: Public Private Partnership (PPP) debt instruments.



*Note that this diagram is a general illustration of a PPP structure and is not representative of the NatureVest case.

Public Private Partnership (PPP) key points

- Clear long-term public sector strategy where there is a cost saving or revenue increase that justifies spending public budget
- Requires sufficient portfolio of potential and sizeable projects to justify bond issuance
- Company or special purpose vehicle (SPV) has a strong independent track record of service delivery and arrangements in place for public sector and investors in case of non-delivery
- Agreed upon reporting criteria that have links to cost savings or revenue increases for the public sector

The road forward

Conservation finance is moving along a promising trajectory. Growth has been reported at 26 percent per year and is expected to triple over the next five years.³⁰ The January 2016 report “Conservation Finance—From Niche to Mainstream: The Building of an Institutional Asset Class” authored by Credit Suisse and the McKinsey Center for Business and Environment estimates the investment potential for conservation finance at roughly USD 200-400 billion by 2020.

The road forward (continued)

There are still fundamental hurdles to overcome for businesses looking to drive the field forward. Predicting the impact of environmental initiatives can be challenging, and while advances have been made in data gathering and analysis, there is room for improvement. We need to concentrate on collaborations that will produce standardized methods for assigning values to ecosystem services. A consistent focus on metrics and tools that measure impact becomes crucial in companies' balance sheets. The road forward for companies that finance ecosystem services will be stimulated by combinations of key performance indicators and business-related outcomes (explained in Appendix 1) that lead to enhanced productivity and resilience.

There is visible momentum coming from several directions.

- Many sources of funding are potentially available to businesses to fund investments in ecosystem services
- Asset owners are increasingly demanding that environmental metrics be disclosed and integrated into financial statements, driving more investment into nature conservation, restoration, and rehabilitation activities
- Governments are advancing policies that incentivize assessment of environmental risks and investments into ecosystem services
- NGOs and foundations are working with businesses to catalyze further investments

Now that some of the early-stage groundwork has been laid by deals such as those highlighted in this report, businesses have a compelling opportunity to pursue strategies to invest in ecosystem services.

Glossary

ABS	Asset Backed Security	MDB	Multilateral Development Bank
ADB	Asian Development Bank	MFI	Microfinance Institution
AfDB	African Development Bank	NBFI	Non-Bank Financial Institution
AFOLU	Agriculture, Forestry and Other Land Uses	NGO	Non-Governmental Organization
AUD	Australian Dollar	NMTC	New Market Tax Credit
BBOP	Business, Biodiversity and Offsets Programme	NOx	Nitrogen Oxides
CAD	Canadian Dollar	NRCS	Natural Resource Conservation Service
CAPEX	Capital Expenditure	OPEX	Operational Expenditure
CBI	Climate Bonds Initiative	PES	Payments for Ecosystem Services
CBO	Collateralized Bond Obligation	P&L	Profit and Loss Statement
CDO	Collateralized Debt Obligation	PPP	Public Private Partnership
CDP	Carbon Disclosure Project	P2P	Peer-to-Peer
CHF	Swiss Franc	ROI	Return on Investment
CSR	Corporate Social Responsibility	REDD+	Reducing Emissions from Deforestation and Forest Degradation (conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon stocks)
CSV	Corporate Shared Value		
DLT	Downeast Lakes Land Trust	SASB	Sustainable Accounting Standards Board
EIB	European Investment Bank	SEK	Swedish Krona
EMTN	Euro Medium Term Note	SOx	Sulphur Oxides
EPC	Engineering, Procurement and Construction	SPV	Special Purpose Vehicle
ERISA	Employee Retirement Income Security Act of 1974	tCO₂e	Tons of Carbon Dioxide equivalent
ESA	Endangered Species Act	TD	Toronto Dominion Bank
ESG	Environmental, Social and Governance	TIMO	Timberland Investment Management Organization
FSB	Financial Stability Board	TNC	The Nature Conservancy
GEF	Global Environment Facility	UN	United Nations
GHG	Greenhouse Gas	UNEP	United Nations Environment Programme
HNWI	High Net Worth Individual	UNFCCC	United Nations Framework Convention on Climate Change
IDB	Inter-American Development Bank		
IDH	Dutch Sustainable Trade Initiative	USAID	United States Agency for International Development
INDC	Intended Nationally Determined Contributions	USD	United States Dollars
IFC	International Finance Corporation	USDA	United States Department of Agriculture
IIASA	International Institute for Applied Systems Analysis	USFWS	United States Fish and Wildlife Service
IUCN	International Union for the Conservation of Nature	WWF	World Wildlife Fund
IVF	Iroquois Valley Farms		
JV	Joint Venture		
LLC	Limited Liability Company		

Appendix 1

Tools for measuring impact

Table 4: Selected Tools for Measuring and Reporting Ecological Impacts

Issue	Tool	Motivation for use
Natural capital and general	Integrated Evaluation of Environmental Services and Tradeoffs (InVEST) ³¹	Quantify benefits of ecosystem services for risk screening, scenario planning, and sensitivity analysis
	Wealth Accounting and Ecosystem Partnership Services (WAVES) ³²	Include natural capital measurements in national accounts of developing countries
	Corporate Ecosystem Valuation (CEV) ³³	Incorporate ecosystem values into business
	Corporate Ecosystem Services Review (ESR) ³⁴	Address risks and opportunities of corporate impact and dependence on ecosystem services
	Vital Signs ³⁵	Integrated, near real-time measurements of agriculture, ecosystem services, and human wellbeing
	Artificial Intelligence for Ecosystem Services (ARIES) ³⁶	Model, map, and quantify ecosystem service delivery between source and use locations
Greenhouse Gases and Carbon	CDP	Voluntary corporate disclosure: potential acceptance into sustainability ratings e.g. sustainability indexes
	Climate Action Reserve (CAR)	Legislation implemented by the state of California
	Verified Carbon Standard (VCS) ³⁷	Voluntary carbon market
	American Carbon Registry (ACR) ³⁸	Voluntary carbon market
	Gold Standard ³⁹	Voluntary carbon market
	Clean Development Mechanism (CDM) ⁴⁰	UN-mandated compliance (in particular EU)
	USDA COMET-Planner ⁴¹	Evaluate potential carbon sequestration and GHG reductions using USDA-NRCS conservation practices
Biodiversity	Business and Biodiversity Offset Program (BBOP)	Voluntary offsets
	Species habitat banking	Biodiversity impact of US companies — legislation
	Biodiversity Risk and Opportunity Assessment (BROA) ⁴²	Biodiversity impacts and dependencies of companies with agricultural supply chains
	Integrated Biodiversity Assessment Tool (IBAT) for Business ⁴³	Risk-screening (potential investments, facility siting)
Watersheds	Simple Effective Resource for Valuing Ecosystem Services (SERVES) ⁴⁴	Develop natural capital financing, inform policy at the basin/watershed/project scales
Watersheds Water quality and flow	Spatial Rainfall (SpatRain) ⁴⁵	Event-level rainfall mapping
	Global Water Tool ⁴⁶	Map corporate water use and assess operational risks
Water quality and flow Forests & land use	Storm water	Storm water trading programs in Ohio, DC, and Philadelphia
	Aqueduct ⁴⁷	Water risk screening
	Simgro ⁴⁸	Model regional systems (plant-atmosphere interactions, surface, and ground water)
	Global Forest Watch 2.0 ⁴⁹	Track deforestation, identify hotspots, or detect logging in protected areas using multi-scale remote sensing
Sulphur Oxides (SOx)	National Atmospheric Deposition Program ⁵⁰	Map distribution of air pollutant deposition
SOx & Nitrogen Oxides (NOx) in Soils	Clean Air Status and Trends Network (CASTNET)	Assess trends in air pollutant concentrations, deposition, and ecological effects
	Web Soil Survey (WSS) ⁵¹	Access soil maps and data for general farm, local, and wider area planning

Appendix 1 (continued)

Tools for measuring impact

Adding non-financial metrics

One specific set of challenges is establishing metrics and bringing these metrics onto the balance sheet of companies. In the context of conservation finance, these are typically one or a combination of the following depending on the specific context:

- Greenhouse Gas (GHG) mitigation in tons of CO₂-equivalent (tCO₂e)
- Water quality (sediment, nutrient, and agrichemical loads)
- Water flow, e.g. adequate water supply during low precipitation periods, sub-surface recharge capacity during high precipitation periods
- Air quality, e.g. reduction or elimination of haze, ozone (damaging to plant growth), particulate matter
- Area, e.g. of species habitat or designated wetlands
- Biodiversity, e.g. existence and density of keystone species; mitigation of pest or disease pressure
- Resilience to extreme weather, e.g. reduced storm surge damage from coastal wetlands

In addition, there are business-related outcomes, including:

- Productivity, e.g. tons produced per hectare or acre
- Soil fertility measures — range of chemical and physical metrics
- Local climatic factors including temperature, radiation, and air moisture

Quantification of these metrics can include a mix of remote sensing (e.g., change in land use areas), direct measurements (e.g., improved water quality), modeling (e.g., habitat suitability), data mining (e.g., public datasets), and surveys (e.g., conservation adoption by land managers). Common challenges for measurement of ecological impact include:

- Detecting the ‘signal’ (i.e. effects) of conservation initiatives from the ‘noise’ in complex, dynamic landscape mosaics, which are influenced by numerous internal and external drivers
- Quantifying the importance for conservation objectives of spatial configuration of different land covers and land uses relative to the condition of specific land areas
- Absence of baseline measurements prior to conservation interventions
- Quantifying effects based on measurements, proxy variables, or estimation factors associated with specific activities, depending on available measurement techniques and cost

Appendix 2

Debt in the context of other funding mechanisms

Companies finance investments in ecosystem services in various ways, and initiatives can be financed through external or internal means.

Table 5: Overview of financing methods for ecosystem investments by companies

Source	Method	Comments
External	Grants	<ul style="list-style-type: none"> – No scale – No sustainability + Limited to company
	Government incentives e.g. tax credits and reverse auctions for ecosystem services	<ul style="list-style-type: none"> – Requires regulation + Level playing field for companies
	Payments for Ecosystem Services (PES) and specialized funds e.g. for carbon / biodiversity offsets	<ul style="list-style-type: none"> – Company gives up control of potential asset – Requires market (willing buyers) to create value + Company may not need to invest resources to monetize
	Capital raising (new debt or equity)	<ul style="list-style-type: none"> – Usually blended with wider strategy e.g. refinancing – May be difficult to ring-fence conservation investments + May attract new investors, support differentiation + Company has most control over budget allocation + Alignment with overall corporate strategy
Internal	Corporate Social Responsibility budget (from existing balance sheet and reinvested cash flows)	<ul style="list-style-type: none"> – Typically relatively small amounts, may be related to minimizing taxes +/- Must compete on ROI basis compared to internal cost of capital and capital allocation strategy + May be tax efficient, low cost to company
	Existing capital expenditure or operational budget (from existing balance sheet and reinvested cash flows)	<ul style="list-style-type: none"> – Not always applicable to ecosystem investments + When applicable, can be justified on the same basis as other business opportunities + Lowest cost of capital since drawn from internal funding markets.

Supply Factors

Company borrowing, both in terms of amounts and form, is dependent on business conditions and macroeconomic factors. For example, low interest rates may encourage some companies to refinance their loan portfolios, thus prompting corporate bond issuance.

Regulations may also directly encourage companies to invest in ecosystems by bringing to light non-financial expenses and creating liabilities for the destruction of natural capital (e.g. disclosure on GHG emissions, cap and trade for pollution reduction), or by introducing fiscal incentives.

Demand Factors

As it pertains to this report, demand for labeled green debt products continued to rise at a fast pace through 2015.⁵² Generally, investor appetite for debt instruments can be driven by several factors, including government economic policy. In recent years expansionary monetary policies that reduce interest rates and encourage borrowing have led some investors to seek out riskier investments in search of higher-yielding debt instruments.

Appendix 3

Hurdles and opportunities

Hurdles to the acceleration of debt-driven ecosystem investment

Incomplete risk identification and assignment

There are fundamental challenges around materiality and assignment of risk. Predicting the impact on environmental degradation can be challenging and most commercial organizations including companies and financial institutions neither have the ability to assess these risks nor have a legal responsibility to do so. Compounding this challenge is the fact that a good information base for understanding and evaluating relevant conservation interventions is often missing. This is particularly frequent in less developed countries and regions.

Underappreciated value in the internal competition for capital

Investments into ecosystems are often seen purely as corporate social responsibility (CSR) initiatives and not as explicit value generators. This phenomenon can disadvantage such projects when benchmarked against an internal 'hurdle rate,' which is often used as a determinant for budget allocation within companies. Even when such initiatives are viewed as investments or sources of value generation, the return on investment (ROI) may not compete with 'normal' business activities and are hence postponed. This phenomenon is tied to incomplete risk assessment since such investments often serve to reduce risk associated with external shocks.

Lack of enabling policies and enforcement

Enabling regulation may not exist or may not be properly implemented and enforced. This includes regulation that allows the creation and sale of environmental goods, regulation on pollution, land use zoning, financial accounting methods, taxation and subsidies for agricultural production, and asset investments.

Aversion to extra costs associated with environmental diligence

Who should pay for the additional due diligence and auditing requirements associated with evaluating ecosystem footprints? Many investors are now demanding a market rate return from companies while also asking for impact metrics to be identified and published.

Opportunities serving as tailwinds for further development

Impetus to deploy capital towards green activity grows among asset owners

There are several market developments that signal opportunity. Institutional investors are becoming increasingly aware of the risks climate change poses on portfolios in the long term, as reflected by public investor statements and portfolio allocation pledges^{vii}. This is leading to increased demand for green products that institutional investors can deploy capital into, such as green bonds. Investor demand for labeled green bonds is high, and supply has generally been unable to keep up with demand. There is early evidence suggesting that green bonds may trade at a premium in the secondary markets.⁵³

Regulatory reform: unlocking pension capital

Deregulation is also adding to the amount of capital available to investments with a predefined social or environmental use of proceeds. For example, in October 2015 the US Department of Labor Secretary removed a 2008 restriction on the Employee Retirement Income Security Act of 1974 (ERISA) that had limited impact investing by pension funds.⁵⁴

Foundation capital: complementing institutional capital

In recognition of the relatively early stage of internalization of many of these environmental issues and the need to test new investment structures, several major foundations are promoting 'layering' or 'blending' arrangements with investment products. This effectively means that funding with a below market rate return to subsidize a standard market rate of return for commercial investors.

Increasing disclosure requirements move footprint closer to the Profit and Loss Statement (P&L)

Increasing disclosure requirements can be expected to spur corporate activity to invest in conservation, including for GHG mitigation, by making the environmental costs and benefits of specific business practices more transparent. Several countries now require companies to disclose their GHG emissions if they are to list on main stock exchanges. Voluntary reporting on some of these issues is becoming mainstream, e.g. through CDP.⁵⁵

^{vii} Examples of investor commitments are exemplified by the growing number of green bond funds, e.g. from SPP, SEB Asset Management, Nikko Asset Management, BlackRock, Calvert Investments, Shelton Capital Management, and State Street.

Appendix 3 (continued)

Hurdles and opportunities

Looking forward, international bodies such as the Financial Stability Board (FSB) are considering a special task force to develop voluntary, consistent climate-related disclosures to inform lenders, insurers, investors, and other stakeholders in understanding material risks⁵⁶. Other important industry bodies are also developing approaches to internalize social and environmental externalities, such as the Sustainability Accounting Standards Board (SASB).⁵⁷ To the extent that environmental footprints move closer to being recognized as assets and liabilities by companies, debt can be used to fund specific investments in ecosystems that lead net-positive financial outcomes.

Corporations: pursuing sustainable development funding

In terms of opportunistic corporate strategy, several larger scale direct corporate initiatives are underway, including by Nestlé Nespresso, which is planning to invest around CHF 500 million over the next six years under 'The Positive Cup' program, based on its Corporate Shared Value (CSV) approach. Part of the funds will be used to create a new Sustainable Development Fund.⁵⁸ The Danone food company and Mars, Inc. have also announced their support for the Livelihoods Fund for Family Farming.⁵⁹

Both of these initiatives, and others, including those led by various NGOs such as The Nature Conservancy (TNC), World Wildlife Fund (WWF), the Dutch Sustainable Trade Initiative (IDH), and the International Union for the Conservation of Nature (IUCN) could become the basis for issuance – though this would likely be in the form of a SPV rather than on a specific company balance sheet.

Evolving policies: opportunities to leverage government funds

Opportunities exist to leverage government incentive programs within financial structures. For example, tax exemptions, reductions, credits, and rebates have been used effectively to promote investment in renewable energy and energy efficiency and could be more widely applied to encourage investment in conservation finance. There are other examples of PPPs, including in the tourism industry, that fit the conservation finance mission utilizing other types of financing.

Furthermore there are opportunities linked to existing and new regulations. In the US, opportunities may lie with the 2014 USDA Farm Bill, where voluntary conservation finance programs are offered to agricultural producers and other landowners by the USDA Natural Resource Conservation Service (NRCS).⁶⁰ In several regions, NRCS operates specialized landscape conservation programs focused on water, wildlife, and ecosystems.⁶¹ The US Fish and Wildlife Service (USFWS) runs a partner program that can provide financial support up to 100 percent to implement restoration activities to improve habitat for fish and wildlife on private lands.⁶² Additionally, Section 319(h) of the Clean Water Act establishes a federally funded grant for water quality improvements (i.e. agricultural nonpoint source pollution).⁶³ Such programs could become the basis for encouraging development of new financing structures that use public funds to leverage private investment.

Insurance companies: opportunities to mitigate risk

There may also be opportunities to leverage increasing climate risk exposure mitigation instruments within the insurance industry (e.g. Catastrophe (Cat) Bonds and Cat Bond Swaps) to facilitate investments in 'natural capital' risk mitigation programs. Such models are, however, in their infancy. Rockefeller Foundation, together with Swiss Re, Goldman Sachs, and Risk Management Solutions (RMS), recently launched a new program called RE.bound, a 'catastrophe bond-like product that can promote project-based risk reduction solutions'.⁶⁴ Similarly, others have explored ideas around Flood Mitigation Bonds in the US.⁶⁵

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