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handshake

A quarterly journal on public-private partnerships

In this issue

AMBASSADOR OF THE SEA: Jean-Michel Cousteau's case for sustainable fisheries
A TURNING POINT FOR TREES: Can the Amazon's forests be saved?
RESTORING CARTAGENA'S COAST: A mixed-capital model revitalizes land and sea
IMPACT INVESTING: The Rockefeller Foundation dips its toe into oceans
AGAINST "A VISION OF PERFECTION": John Briscoe argues for incremental solutions

NATURAL RESOURCES + PPPs

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In this issue

Nature doesn't require much from people. But since leaving it untouched to flourish on its own is rarely an option anymore, the next best thing is thoughtful management that preserves natural resources and distributes the bounty fairly. Public-private partnerships (PPPs) can do this.

This issue of *Handshake* focuses on natural resource PPPs that are making a difference. In Cartagena, Colombia, we profile a hybrid public-private agency that has standardized water service to residents while restoring the coast—and in the process, contributed to political stabilization. Around Africa's Lake Victoria, an environmental management initiative with the potential to reduce the pollution and resource footprint of industrial activities demonstrates how to include commercial ventures in conservation. Original articles from the FAO and The Rockefeller Foundation outline how Payments for Ecosystem Services, or PES, brings PPPs' benefits directly to farmers, fishers, and those who maintain forests.

We also draw inspiration from the thoughtfulness of conservationists who know the path forward depends on partnerships. From 2014 Stockholm Water Laureate John Briscoe, who has spent his career making sure taps are turned on, to science correspondent M. Sanjayan, whose call to action came in the rainy forest of Sierra Leone, to Jean-Michel Cousteau, who founded the Ocean Futures Society to carry on his family's stewardship of the sea, the interviews in *Handshake* give voice to the ways people are connected to nature, and how our survival depends on the continuation of this connection.

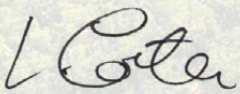

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Photo © Johnny Lye/istock, Amazon River, Brazil

Features

Water

Nature's price tag | 20

The peoples' waterway | 22

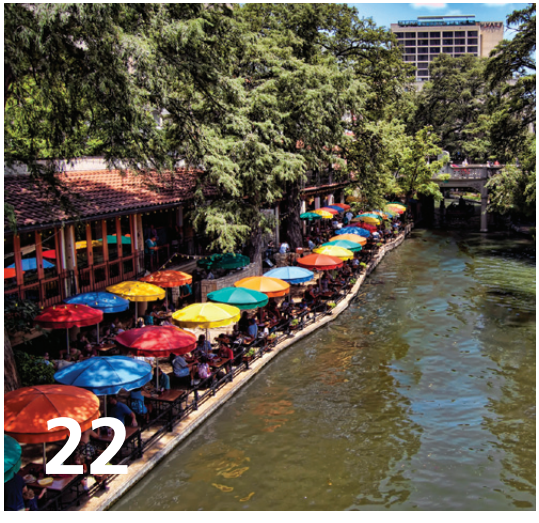
Getting to the source | 26

Restoring Cartagena's coast | 28

Oceans

Taking the bait on impact investing | 34

Our living resource | 42



Forestry

Seeds to trees | 48

Forest fairy tales | 50

From idea to initiative | 56

Offsets

Net positive impact | 58

Conservation trust funds | 64

In this issue

Agriculture

Cultivating channels for investment | 66

Agri-nomics | 70

Interviews

John Briscoe: Water wheel of fortune | 16

Luis Alfonso Pinzón Corcho: Behind the scenes | 32

Jean-Michel Cousteau: Ambassador of the sea | 38

M. Sanjayan: Beyond the "just so" story | 44

Marcus V. Alves: A turning point for trees | 52

Columns

PERSPECTIVE
Insights & opinions
Talking trade-offs | 06

COMPASS
Surveying the PPP landscape
The cost of conservation | 10

INSIDE INFRASTRUCTURE
Commentary on current events
How *not* to spend it | 14

LEGAL*EASE*
Law & legislation, decoded
Leveraging the law | 60

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Illustration © bo68/istock

By Jeff Delmon, World Bank

talking TRADE-OFFS

NATURAL RESOURCES PPPs' PROMISE TO FUTURE GENERATIONS

Public-private partnerships (PPPs) in sustainable natural resources—such as watersheds, oceans, forests, and other natural treasures—need support, management, maintenance, and protection to benefit future generations. Typically, though, talk of PPPs sparks shudders among those who picture greedy corporate robots pillaging the planet's greatest treasures in search of filthy lucre—alongside the private investors wondering where in the world one can make enough profit from sustainable natural resources to merit working through the regulatory and political complexities of such a sensitive sector.

So the terms of the discussion should be set from the start: natural resource PPPs are a trade-off. The private sector needs access to these sustainable natural resources to make money, create jobs, and pay taxes, while the public sector

needs to manage those resources with limited budget and expertise. As compellingly argued by the experts writing in this issue of *Handshake*, sustainability of trees, seas, and everything in between requires recognition that this is an ideal space to leverage the best of public and private.

OF FOXES AND FARMERS

First, let's address the cynics. One might say that creating PPPs in sustainable natural resources is like putting the fox in charge of the hen house. But if done well, this sort of PPP should be like turning the fox into a tenant farmer responsible for managing the hen house sustainably. If he manages it well, he gets his share of eggs and chickens. If he does not, he gets kicked out, loses his investment, and some other fox takes his place. Equally, the government turns from an angry, gun-wielding farmer to a landlord interested in the success of the fox/tenant farmer: in other words, a partner. The head of Brazil's Forest Service makes the case eloquently in these pages, explaining the role of government reforms in laying the foundation for the PPPs that have revitalized that country's forests while continuing to provide livelihoods for its people.

The first step in a PPP for sustainable natural resources requires the government to implement a process for valuing precious resources, putting a monetary and notional value against these resources that are often ignored or taken for granted. This assures government officials appreciate the value for money available from more efficient management and maintenance of the resources (reducing poaching, managing access, and ensuring sustainability). It also underscores the importance of the confluence of interests with the private sector (neighboring commercial activities, property development, and resource access—especially to water).

One might say that creating PPPs in sustainable natural resources is like putting the fox in charge of the hen house. But if done well, this sort of PPP is like turning the fox into a tenant farmer responsible for managing the hen house sustainably.

LIVING DANGEROUSLY?

Although PPPs in natural resources are working, whether or not they're working fast enough, or at a large enough scale, is another question altogether. M. Sanjayan, Executive Vice President at Conservation International and correspondent for Showtime's documentary series on climate change, "The Years of Living Dangerously," believes that the world needs to do better. In a wide-ranging interview, he shares his perspective on how the smallest hiccup in the natural process can have negative health ramifications for humans.

Benefits to government are also important in the natural resource PPP trade-off. By entering into master developer concessions, the government takes on a privately oriented partner that is bound to sustainable management of the natural resources through responsible development plans. In other cases, the sustainable natural resources will be linked to commercial opportunities, as when the private sector exploits a sustainable natural resource for profit but is required (and motivated) to manage that resource sustainably. In agriculture or forestry investments, for example, while they involve exploitation of a sustainable natural resource, the investor must also be careful to manage that resource well to avoid loss of value over time. These are also projects that might normally be managed through leases or licenses with little detail related to investor obligations, but which might be better managed through PPPs setting out exactly what is expected of each of the parties.

The challenge may be bigger, and the structuring more complex, but benefits from a PPP in sustainable natural resource management are significant.

The government therefore gets a clear and detailed partnership with the private investor to deliver the sustainable natural resource management services desired. At the same time, the private investor receives a clear, detailed, and contractual (hence easier to enforce) legal right to exploit the resource, through a socially and politically legitimate process and mechanism. It's a hedge against expropriation, illegal exploitation, land invasion, and local community resistance. Equally as important, establishing the relationship by contract can also reduce the risk of regulatory creep by forcing the government to consider in advance the detailed performance mechanism, and provide a clear mechanism for the parties to work together.

Even where the natural resource itself is not easily translated to a revenue stream, there may be linked activities that create commercial opportunities. Multi-use dams are a good example; in addition to flood mitigation and water resource management, they can provide water for electricity generation and irrigation. Where properly valued, these activities can provide the right mix of incentives for the private investor to manage the sustainable natural resource more effectively than could the public sector.

Payments for Ecosystem Services (PES) is a creative and practical approach. This issue of *Handshake* contributes several important and original threads to the discussion, sharing ideas and showcasing models from the FAO, the Rockefeller Foundation, and the World Bank to demonstrate the variety of ways this works across sectors and around the globe. We also issue a call to action. Although there are now hundreds of PES programs at a variety of scales, an accurate global overview of the total area covered by PES contracts does not exist. Establishing a reliable and up-to-date global database for PES contracts with consistent definitions would be highly

valuable for international policymakers, allowing them to determine the areas with the biggest opportunities for PES projects and to better focus their efforts in stimulating PES contracts.

GETTING PAST PERFECTION

These projects, which determine access to our shared patrimony as world citizens, are not without controversy. John Briscoe, the 2014 Stockholm Water Prize Laureate and director of the Harvard Water Security Initiative, is familiar with the debate over balancing water resources and development agendas. "Development happens in stages," he tells *Handshake* readers, urging government officials, NGOs, and experts who work in the natural resources sector to calibrate their expectations. "A vision of perfection," he says, "means that you can't do anything right." h

"Men have forgotten this truth," said the fox, "But you must not forget it. You become responsible forever for what you have tamed."

—*The Little Prince*, by Antoine de Saint-Exupéry

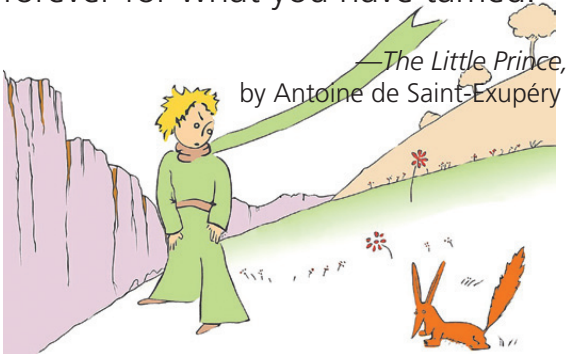


Illustration © Antoine de Saint-Exupéry

RELATED READING

For certain PPPs, sustainable natural resources will be part of a larger value proposition where the value identified for the public is often easily translated into value for the private sector. The most obvious example is the desire to leverage the few opportunities to benefit from sustainable natural resource locations, such as tourism bordering ecological areas and other exclusive positions that the private sector will profit from (though not directly) and will therefore be motivated to protect. Examples of sustainable natural resources as a value proposition include tourism development and national park management, which have been covered in these articles in past issues of *Handshake*:

"The Economics of Uniqueness"

"Whole Park PPPs"

"The Geopolitics of Food Scarcity: An Interview with Earth Institute's Lester Brown"

"Heritage's Helper: An Interview with UNESCO's Francesco Bandarin"

"Fighting Poverty with Passports"

By Robbert van Eerd, World Bank Public-Private Partnerships
& Ruben Brekelmans, PPIAF

THE COST OF CONSERVATION

Trends in Payments for Ecosystem Services

Illustration © plrphoto/istock, Amazon River, Brazil

Payments for Ecosystem Services, or PES, is an innovative approach to public-private partnerships (PPPs) in natural resources whereby managers of natural resources are paid for environmental services. PES has been defined several different ways, but it's known most widely as "a voluntary transaction where a well-defined environmental service (or a land-use likely to secure that service) is being 'bought' by a service buyer from a service provider if and only if the service provider secures service provision (conditionality)." (Wunder, 2005 and Pagiola and Platais, 2007)

The services financed by PES programs have positive externalities, benefiting people other than the direct users, managers, or owners of natural resources. Paying for these externalities through PES schemes can help to strengthen environmental, physical, human, and financial capital.

TRACKING TRANSACTIONS

The use of PES has been growing rapidly since Costa Rica launched the first explicit PES program in 1997. There are now hundreds of PES programs at a variety of scales, ranging from small local to large national programs. However, an accurate global overview of the total area covered by PES contracts does not exist. This is partly due to the lack of a comprehensive listing of PES contracts at the national level, and partly due to differences in reporting standards that impair the reliability of most aggregated numbers.

Establishing a reliable and up-to-date global database for PES contracts with consistent definitions would be highly valuable for international policymakers. It would enable them to determine the areas with the biggest opportunities for PES and to better focus their efforts in cultivating PES contracts.

Despite the lack of aggregated data, there is ample qualitative documentation on PES. Three prominent trends emerge from a review of this documentation.

PES schemes are predominantly used in Latin America, but are spreading to the rest of the world.

In 1997 Costa Rica was the first country to set up an institutionalized PES program. Costa Rica's forests were a major source of income for the tourist industry, which urged the government to pay landholders for preserving forest on their land. In other words, economic and environmental incentives were strongly aligned. The apparent success of Costa Rica's PES program prompted many other Latin American countries to follow its example. In the late 2000s, over 80 PES programs were active in 18 countries in Latin America and the Caribbean.

Today, Latin America is still the center of gravity for PES, but governments elsewhere have started to use PES contracts as well. High opportunity costs remain a major obstacle for PES in Asia, but countries like Vietnam, Indonesia, and China are now using PES contracts on a significant scale for forestry and watershed services.

In many forest areas in Africa, further progress is needed to define land rights and strengthen institutional and government capacity. Nevertheless, some African countries (such as Kenya) have started to initiate PES contracts, and more are considering ways to do the same.

PES initiatives are increasingly user-financed, shifting course from large government financed programs.

In the beginning of PES, government-financed schemes dominated the conversation. For example, Costa Rica's PES program was made possible by a fuel tax. Large scale PES schemes saw multilateral institutions such as the United Nations Development Programme/Global Environment Facility (GEF) or Global Carbon Fund as buyers. The GEF, for example, has been involved in 42 projects since 1991, investing more than $222 million.

In recent years, user-financed PES projects have grown relatively faster than government-financed schemes. User-financed PES doesn't impose a burden on government budgets and better allows for small PES projects in places with weak institutional capacity to monitor services. Hybrid approaches, partly funded by the government and partly by users, also exist.

Multinational corporations are increasingly funding PES projects, albeit often on a more local scale. Examples include Coca-Cola's projects in the Mekong Delta, Vietnam, and United Breweries in Lake Victoria, Uganda. Likewise, smaller companies and individual citizens are also paying for environmental services. Local PES schemes for watershed services in Brazil are a good example.

PES is expanding beyond traditional boundaries into natural resource PPPs that include oceans and coastal areas.

Building on the experience with PES schemes elsewhere, the scope of the concept is being expanded into new areas. Most prominent are new PPP initiatives around ocean conservation. The seafood industry, for example, has teamed up with the World Bank/GEF and Food and Agriculture Organization of the United Nations in the ALLFISH PPP for sustainable fisheries. The recent Global Ocean Action Summit, hosted by the Government of the Netherlands, and the "Our Ocean" conference, hosted by the U.S. Department of State, have stimulated these new types of PPPs, with alliances announced at each.

The idea of "blue carbon" is another a recent development. Blue carbon refers to the process of reducing atmospheric CO_2 and mitigating global climate change by conserving mangroves, sea grasses, and coastal vegetation. Marine Ecosystem Services (MARES) programs aim to expand PES to coastal and marine ecosystems. Projects such as the Abu Dhabi Blue Carbon Demonstration project rode this wave ahead of most others. "Blue Bonds," which are analogous to the existing "Green Bonds" market, may prove critical to this effort.

A CLOSER LOOK

The expansion and proliferation of these trends does not mean that PES is always the best instrument. In some cases, PES has failed to achieve the intended outcomes. In areas where institutional arrangements are weak, the implementation of PES is especially likely to be ineffective.

In addition, inefficiency arises if PES agreements compensate individuals who would have delivered the services otherwise.

However, examination of the trends shows that these examples are exceptions. With a proper enabling environment for PES, it is usually possible to design efficient transactions. Its recent record promises that PES is expected to spread across the world, become increasingly user-financed, and expand to new areas like oceans and coasts. h

FOR FURTHER READING

Global Environment Facility (2010). Payments for Ecosystem Services.

Pagiola, S., and G. Platais. (2007). Payments for Environmental Services: From Theory to Practice. Washington: World Bank.

Wunder, S. (2005). "Payments for environmental services: Some nuts and bolts." CIFOR.

Occasional Paper No.42. Bogor: CIFOR.

See also the PES learning paper series of the World Bank Group.

CAN'T SEE THE FOREST FOR THE TREES? FAO WANTS YOU TO START LOOKING FOR THE PEOPLE INSTEAD.

As countries strive to achieve sustainable forest management, it is important to measure progress in all of the different dimensions of sustainability. Information is routinely collected about environmental and economic aspects of forest management, but measuring the social or socioeconomic benefits from forests is much more challenging, due to a scarcity of data and lack of a clear definition of what exactly should be measured.

> "To measure the socioeconomic benefits from forests, data collection must focus on people, not only trees."

With the exception of formal employment figures, forestry administrations have little information on how many people benefit from forests. Current data collection, which focuses on forests and trees, needs to be complemented by data collection on the benefits that people receive. This is best done by collaborating with public organizations undertaking such surveys.

From "State of the World's Forests: Enhancing the socioeconomic benefits from forests," *Food and Agriculture Organization of the United Nations. Rome, 2014.*

how not to spend it

By John Kjorstad, KPMG

The *Financial Times* newspaper in London has a regular glossy magazine supplement advising its wealthier readers "How To Spend It" (presumably after they've earned it).

Luxury is a personal choice. I wouldn't criticize a private consumer with means for being drawn into the lifestyle, but when it comes to public wealth, the rules are different. I reflect on how Muammar Gaddafi nationalized Libya's oil sector after taking power in 1969 and proceeded to live a life of luxury fueled by natural resource wealth until his downfall and death in 2011. Gaddafi's vanity is the cover story in this parody; for states lucky enough to be blessed with publicly-owned natural resources, here are a few simple rules for avoiding the curse it can bring.

DON'T SPEND IT ON YOURSELF

This goes beyond dictators with a penchant for palaces. Norway is the bellwether for all other oil or resource rich nations to follow. The Norwegians are famously thrifty about how they spend lucrative oil profits. They choose not to increase public spending or subsidize public services (with a few exceptions like social healthcare). The Norwegians opt instead to place state resource revenues in a sovereign wealth fund that largely invests outside of Norway. It's said that a billion dollars per week passes through the fund's office in Oslo, and it will be worth $1 trillion by 2020, according to a BBC report published in 2013.

This strategy helps the Norwegians achieve two things: keep inflation in check by diversifying investment beyond their borders, and preserve wealth for future generations.

DON'T SUBSIDIZE IT

Taking another page out of the Scandinavian playbook, Norway has the most expensive petrol prices in the world despite being Europe's largest oil producer. Instead of subsidizing petrol to make it cheaper for consumers, they tax it to support expensive maintenance of the country's transportation network.

By comparison, Nigeria is Africa's largest oil producer. Its government reluctantly subsidizes petrol because much of the population depends on it (with some even powering homes with personal generators that compensate for frequent blackouts). The removal of subsidies would free up billions of dollars to boost Nigeria's economy

and improve the country's decaying infrastructure. However, once you've started down that slippery slope, it's hard to come back up.

DON'T SPEND IT ON UNAFFORDABLE INFRASTRUCTURE

Using natural resource wealth to fund major infrastructure projects is a great idea in principle, but the underlying business case for building infrastructure needs to stand on its own economic support beams. Infrastructure is an enabler, not a panacea.

The temptation with natural resource wealth is to put the proverbial infrastructure cart before the skills horse and build an Aerotropolis or entire "technology" city with the misplaced hope of attracting global businesses. Abu Dhabi's sovereign wealth fund managers wisely chose a different strategy. Mubadala Healthcare first partnered with the Cleveland Clinic in the United States to bring healthcare expertise to the United Arab Emirates; then they built a clinic together which will open in 2015. Smart.

DON'T FORGET THE LOCALS

There is a wider economy to natural resource wealth, and the local community should benefit as much as possible. China's resource-for-infrastructure deals in Africa ten years ago were great for development (in principle), but left some feeling the model was not sustainable long-term for local populations. Resources are finite—which is what makes them valuable—and sooner or later the local economy will have to thrive without them. Investing in skills and a long-term plan to deliver economic balance and diversity is as important as new roads and railway lines.

DON'T GO IT ALONE

Partnership has many advantages. International expertise is often needed to effectively develop a natural resource. Partnerships can attract foreign investment and allow some of that expertise to transfer into local firms. When ExxonMobil led an unprecedented multi-billion dollar investment into a liquefied natural gas facility in Papua New Guinea in 2010, for example, it knew the socio-economic considerations would be huge as the capital costs of developing the project were greater than the country's gross domestic product.

Following this logic, the company consciously planned around cultural sites and set an agenda to ensure that stakeholders were consulted and compensated in an open and transparent process. The company provided employment, training, and local business development. It also contributed to health, education, and agricultural initiatives. These are essential hallmarks of a competitive, open, and transparent marketplace.

Natural resource opportunities are a stepping stone for further private investment into other infrastructure sectors helping nations tackle the broader transportation, energy, and water challenges they may face. Get them right, and governments won't have to worry about how they spend their wealth. They can invest confidently, knowing that future generations will benefit from their foresight.

Now that's luxury. h

WATER WHEEL OF FORTUNE

John Briscoe's argument for an incremental, not integrated, development agenda

Interview by Jane Jamieson, IFC

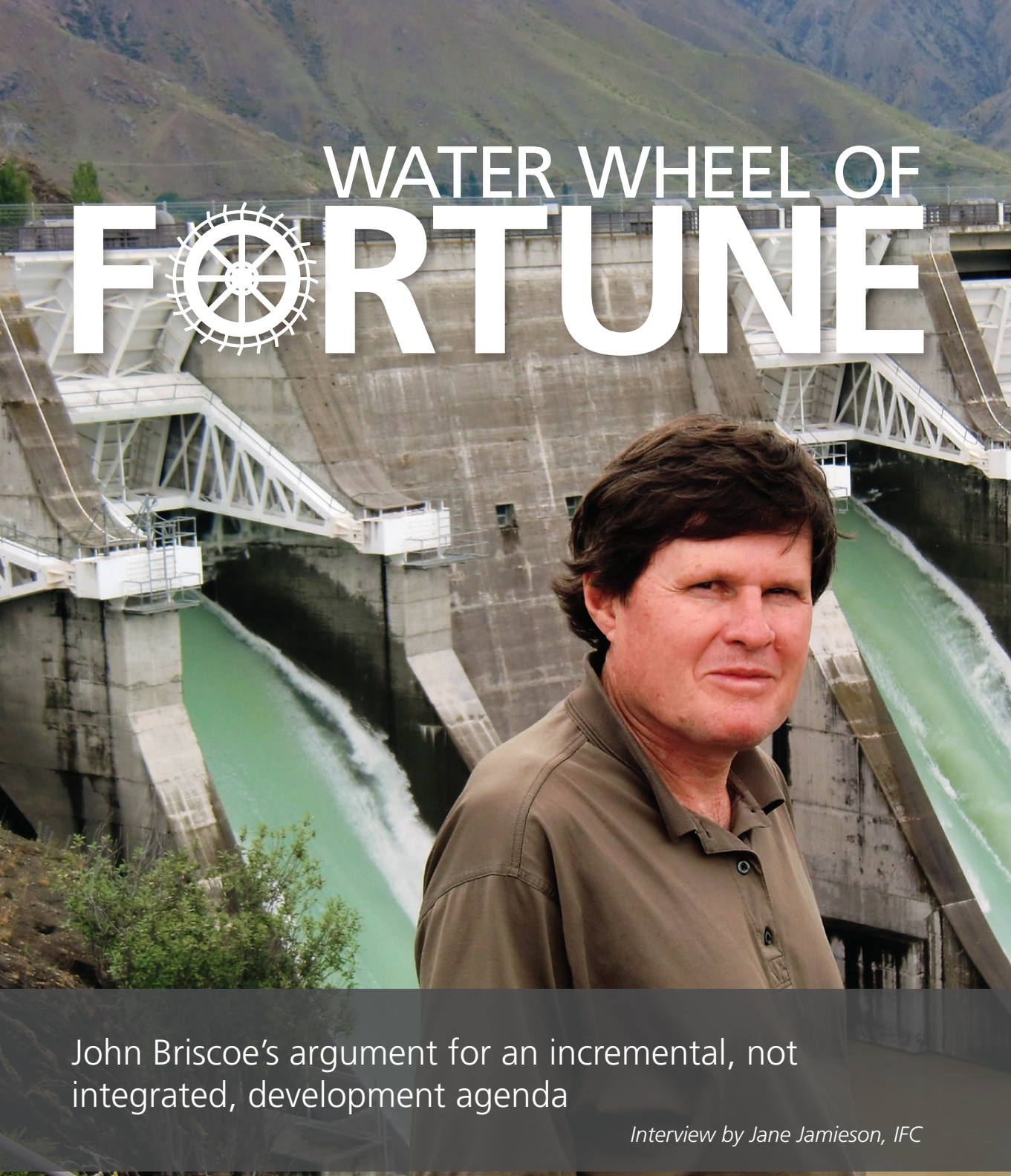


Photo © Alexa Briscoe

John Briscoe's entire career has been devoted to water: how to get it, how to distribute it fairly, how to keep it clean, and how to ensure access for future generations. He was most recently recognized with the 2014 Stockholm Water Prize, known informally as the "Nobel Prize of Water," in honor of his "unparalleled contributions to global and local management of water—contributions covering vast thematic, geographic, and institutional environments—that have improved the lives and livelihoods of millions of people worldwide." He is currently Director of Harvard University's Water Security Initiative, and a professor of environmental engineering and environmental health at Harvard, where he teaches students about water-management issues in international development. Before that, he was senior advisor to the World Bank's $50 billion water program and the World Bank's country director for Brazil. Here, he talks to *Handshake* about ways his even earlier jobs in government were more valuable than what he learned in the classroom, how having a historical perspective on water development can help shape expectations, and why balancing water resources and development agendas isn't really as tricky as it seems.

Early in your career as an engineer in the government water agencies of South Africa and Mozambique, you saw the impact of water scarcity from the inside. How did that perspective eventually translate into your policy work and inform the positions you've taken in global organizations?

Both of those early jobs in government impacted me more profoundly than anything I could have learned in a classroom. In South Africa in the early 1970s, amid the social inequality, as a government worker you felt you were helping develop your country—and in our case, we were in the era of building the water platform for growth. It was obvious that this had to be done, and I was privileged to see what a well-functioning bureaucracy can accomplish. In Mozambique, it was the opposite experience as we worked in a low-capacity government. You have to be incredibly disciplined, set goals, and be clear about what the priorities are. You have to learn to deal with what political leaders perceive as problems, rather than what you think the problems are. Eventually, you establish credibility by solving the perceived problems, and you can then deal with the more complicated problems. This is a fundamental lesson I carry with me.

How is it possible to responsibly develop water resources and balance concerns with a country's development agenda?

It's a tricky question because we make it tricky. Every country in the world has dealt with development in some sort of sequence. No developed country has followed an integrated plan to do it all at once. In every country, there's a need for people to get their water needs met. So water comes first, then that brings sanitation problems, then countries address questions of how to deal with wastewater. So that's handled next. The idea that all of this is done at once is impractical.

But there's no sense of the history—how access to water actually unfolded. For example, look at Great Britain in 1857. The Parliament building in London had to be hung with lime-soaked sheets because of the stink of the Thames. London then had to deal with sewage disposal. Everything happens in stages. But a vision of perfection means that you can't do anything right.

> *A vision of perfection means that you can't do anything right.*

What's the balance between the role of governments in bringing access to water to citizens and the perspective of NGOs?

The government is not just another stakeholder—it is the responsible party, accountable to all of the people. Governments have a legitimacy that's unique. Today, participation of the self-appointed, single-issue NGO is out of kilter. Should you listen to the NGOs? Yes, but you don't necessarily have to accept their views. For me, this is a very important issue.

Do governments see water PPPs as a risk that's different from partnerships in other sectors?

Private investments in water are high-risk, low-return investments in most developing countries. Even in rich countries, PPPs in water are very sensitive. In the Thatcher era in the U.K., water was the government's 17th privatization—close to the last one. That's because it's a highly complex, emotional, and visceral issue, unlike the privatization of telecoms or other sectors. No matter what country you're talking about, Bolivia or Brazil or Argentina, the conditions are quite demanding, and there are no shortcuts. All solutions must be tailored to the country's broader view of how an economy should be organized.

What country is taking an innovative approach to PPPs in water these days?

There has never been a social consensus on PPPs in water in Brazil. But over time a hybrid model developed. For example, in São Paulo, the utility is 51 percent owned by the State, and 49 percent by both local and foreign investors. This has worked very well, with dramatic improvements

in productivity but also with social control. The big-bang approach, as done in Argentina, is often not the right way to go.

Your multiple roles at Harvard highlight the necessity of a multidisciplinary approach to water management. In contrast, many governments take a more fragmented approach, where responsibility lies with just one ministry. What would you say to encourage institutions to involve a broader group in water management?

Water is connected to everything else, just like transport, energy, and other sectors. Thinking that coordination can be solved by an organizational change—creation of a water ministry, for example—is a fallacy. Instead of looking at the organization, you should look at the instruments, like pricing and regulation. That should be the focus. Who that's administered by is unimportant.

The government is not just another stakeholder—it is the responsible party. Governments have a legitimacy that's unique.

FROM "THE GREAT STINK" TO GREAT SEWERS

In 1858, Sir Joseph Bazalgette was commissioned to design and build a system of sewers which would remove the sewage from the Thames.

nature's PRICE TAG

TYPES OF ECOSYSTEM PAYMENTS FOR INTEGRATED WATER RESOURCES MANAGEMENT

PUBLIC SCHEMES

A public entity acts as the primary buyer of an ecosystem service, as well as administering and executing the scheme. Typically, public schemes target water-related services to secure water supply (water-quality and water-quantity services), flood protection, and erosion control through the provision of financial compensation or incentives to induce land users to refrain from changing practices or to change to specific practices.

Public schemes may operate at the local or national level. Local public schemes are PES schemes in which municipalities or local governments fund, administer, and pay for ecosystem services in a specified "local" part of a basin that will yield specific water-related benefits. National public schemes are equivalent to subsidy mechanisms of national governments, under which the financial incentives for the ecosystem service is not tied to a specific locality. As such, national public schemes tend to be river-basin independent.

PRIVATE SCHEMES

Both buyers and sellers are private entities (companies, non-governmental organizations, farmers' associations or cooperatives, private individuals). Private (self-organized) schemes are typically local schemes where the buyers and sellers have been able to identify an agreed ecosystem service and negotiate and settle upon an agreed price. The buyers make payments on a voluntary basis to the stipulations of the agreed contract.

The distinguishing feature of private schemes is the manner in which the PES contract and funds are administered and disbursed. In private schemes, this is typically taken care of by a PES administration (or management) entity (either registered as an NGO or trust fund) that has been established specifically to manage the PES. These PES management units administer the PES contracts with buyers and sellers, collect the funds from buyers, disburse the funds to sellers, and hold them accountable for their service provision.

Payments for Ecosystem Services (PES) are cash transfers to providers of environmental services conditional on continued provisions. PES programs target a variety of ecosystem services, including carbon sequestration, watershed protection, landscape beauty, and protection of biodiversity habitat. They have the potential to be an environmentally effective, economically efficient, and socially equitable tool for implementing integrated water resources management.

This article is adapted from Recommendations on Payments for Ecosystem Services in Integrated Water Resources Management, *adopted by the Parties to the United Nations Economic Commission for Europe (UNECE) Convention on the Protection and Use of Transboundary Watercourses and International Lakes.*

PUBLIC-PRIVATE SCHEMES

Public-private schemes, a specific subset of private schemes, in principle have the same features as a private scheme, except that the buyer (or one of the principal buyers) is a public utility (such as a municipal water-supply company or a public power utility). The feature which distinguishes public-private schemes from local public schemes is the role of the participating public utilities in public-private schemes. This role is limited to that of providing funds to the PES schemes in the role of a service buyer, just as any other private buyer would do. This means that the utility is not involved in the administration and management of the PES contract, as in local public schemes, but participates as a contracting party of service buyers. In public-private schemes, the PES contract is thus administered by a third-party PES management entity in the same manner as in private schemes.

TRADING SCHEMES

Trading schemes refer to the establishment of markets on which established rights (or permits) and/or quotas can be exchanged, sold, or leased. For example, environmental pollution quotas for nitrate, phosphorus, and/or salt discharges may be sold or traded by low-polluters to high-polluters. Also within the realm of water management, trading schemes can be very promising mechanisms for effectively trading, banking, or leasing water quantities among urban/industrial, agriculture, and ecosystem users/uses. A prerequisite for trading schemes is a strong, well-defined and working legal and regulatory framework that (a) clearly defines the pollution quotas or water rights/permits; and (b) allows and enables the (economic) transfer, whether temporarily or permanently, of these among different users and uses, including nature or ecosystems.

Photo © Ajrimes3

SAN ANTONIO RIVER WALK BLAZES A TRAIL IN URBAN ECOSYSTEM RESTORATION

the peoples' WATERWAY

By Steven Schauer, San Antonio River Authority

Texas' San Antonio River Walk is a nationally recognized tourist attraction and one of the U.S.'s most unique urban linear parks. Work began on the River Walk project in 1939, and improvements—the result of a series of successful public-private partnerships (PPPs) and local residents' consistent involvement—continue today.

Archaeological excavations show that the first humans lived along Texas' San Antonio River as long as 10,000 years ago. Today's hunters and gatherers—shoppers and foodies—are also attracted to the waterway. From early in the morning until late at night, residents and visitors stroll along the River Walk, a series of pedestrian-friendly routes made possible by a successful PPP that many other communities around the world are trying to replicate.

SHARED RESPONSIBILITIES

Today, the San Antonio River Improvements Project (SARIP), which includes local residents, is expanding the River Walk—restoring the local ecosystem as it engineers new solutions to the age-old problem of flooding.

SARIP is a $384.1 million ongoing investment in flood control, amenities, ecosystem restoration, and recreational improvements along 13 miles of the river. The City of San Antonio, Bexar County, the San Antonio River Authority (SARA), the U.S. Army Corps of Engineers (USACE), and the San Antonio River Foundation have partnered to deliver the project. SARA provides project coordination among the partners and will conduct ongoing operation and maintenance when the project is completed.

The San Antonio River Foundation has raised money from the private sector to bring artistic, recreational, environmental, and educational enhancements to the San Antonio River.

- Bexar County will contribute approximately $229.4 million from the county's flood tax specifically for flood control and ecosystem restoration elements of the project.
- The City of San Antonio contribution is anticipated to be approximately $76.7 million over the life of the project, from the city's capital improvements fund for amenities and recreation elements.
- USACE will contribute approximately $57.9 million to support the ecosystem restoration and recreation elements in Mission Reach and $2.6 million toward construction in the Eagleland segment on the southern edge of downtown San Antonio.

THE NEWEST MISSION

Mission Reach, the section of the San Antonio River Walk targeted for restoration, is of particular historical significance as it links four 18th century missions—the largest collection of Spanish colonial architecture in North America currently under consideration to become a World Heritage site. But in the years since the

establishment of these missions almost 300 years ago, this stretch of the river's original route, beauty, and life had been lost. In the 1950s, after years of devastating floods, Mission Reach was engineered into a trapezoidal storm water channel by the U.S. Army Corps of Engineers. Though it worked well for flood control, the change left this area devoid of native plant life and with a diminished aquatic habitat.

San Antonio is becoming a world leader in urban ecosystem restoration.

After improvements are made, Mission Reach will once again house the river's natural environments and aquatic habitat. Over 23,000 new trees (over 40 native species) will be added, along with hundreds of acres of native grasses and wildflowers (over 60 species). Features will also include hiking, biking, and paddling opportunities to reconnect people with the river.

By cultivating this drainage channel back into a functioning part of the San Antonio River, San Antonio is becoming a world leader in urban ecosystem restoration. Representatives of cities from countries such as China, India, Japan, South Korea, Israel, Malaysia, Germany, Canada, Mexico, and Taiwan have visited Mission Reach for inspiration, looking for ways to bring these results to their own communities.

CITIZEN CONSENSUS

From the earliest days of the River Walk to its most recent expansion, citizen involvement has been critical to achieving these sought-after results. In 1998, Bexar County, the City of San Antonio, and SARA officially formed the San Antonio River Oversight Committee (SAROC) by enlisting the support of the same citizens who had been vocally promoting the River Walk expansion. SAROC was created as a 22-member stakeholder committee.

The most important lesson learned from the project relates to the formation of SAROC. Rather than selecting specific individuals to sit as representatives on the SAROC, stakeholder organizations were chosen, and each of the 20 stakeholder entities were responsible for choosing their own representative. By selecting organizations to be members of SAROC rather than individuals, SAROC was created to last for the duration of the project—from early conceptual work to completion of construction. Individual turnover on the committee has occurred, but the institutional project knowledge and interest held by each stakeholder organization was kept intact.

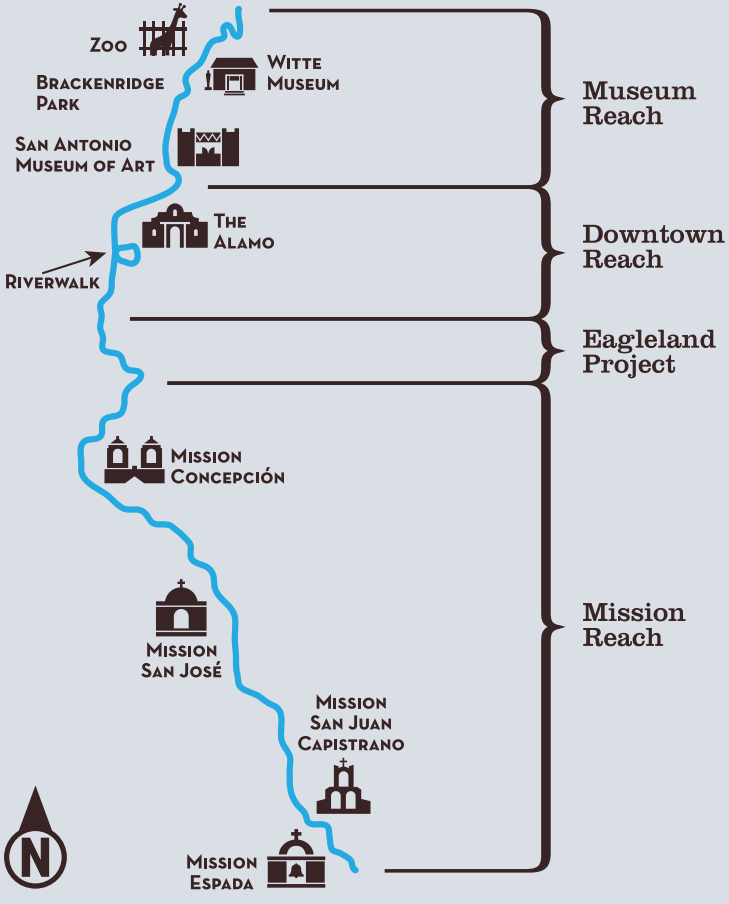
The organizations selected represent a diverse group of stakeholders including neighborhood

associations, chambers of commerce, business interests, nonprofit organizations, and other community associations. Even the Archdiocese of San Antonio was chosen as a stakeholder, because the 1700s-era missions along the river are still active parishes.

Getting a diverse group of stakeholders along with representatives from multiple branches of government to agree on project concepts and final designs was at times a monumental task. Consensus building was of paramount importance; the unity of voice among the committee members helped to provide clear direction for funding, building, and maintaining the project. This open communication and the vitality of the community—both of which contribute to a sustainable ecosystem that will benefit residents and visitors for many years to come—was critical to the success of the project.

SAN ANTONIO RIVER PROJECT

The project is comprised of four distinctive reaches: The Museum Reach, a four-mile segment of the river; the Downtown Reach, a segment of the original River Walk; the Eagleland Project, a one-mile segment; and the Mission Reach, an eight-mile section of the river.



By Nagaraja Rao Harshadeep & Stephen Ling, World Bank

The private sector plays a major role in fueling development around the world, creating millions of jobs, allowing countries to meet basic necessities, and boosting exports. However, private investment is not without its costs—resource use and pollution are high among them. As concern grows, so do innovative approaches to reduce the pollution and resource footprint of industrial activities. The Lake Victoria Environmental Management Program (LVEMP) is an especially promising initiative with potential for replicability.

GETTING TO THE SOURCE

Cleaner production in the Lake Victoria Basin

Lake Victoria has a mythic past. Long known as the source of the Nile River, its waters sustained some of recorded history's earliest communities. In the middle ages, traders explored the rich, fertile area in search of gold, ivory, and other precious commodities. Today, though, the Lake Victoria basin—one of the most densely populated rural areas in the world—is known for its pollution and natural resource challenges. Its shores are speckled with cities and towns, and home to factories that discharge their waste directly into the lake and its rivers.

But an innovative partnership may help turn the tide, restoring to Lake Victoria some of its former glory. Through LVEMP, the governments of Kenya, Tanzania, Uganda, and the newer East African Community members of Burundi and

Photos © Ugurhan Betin/istock

Rwanda are cooperating to undertake cleaner production activities that will help industries improve the efficient use of resources (such as water, electricity, and raw materials), and reduce pollution throughout the production cycle.

COORDINATING CLEANER PRODUCTION

The Kenya Cleaner Production Center serves as a regional coordinator, working with similar centers in Tanzania and Uganda (and helping start such centers in Rwanda and Burundi).

Activities include:

- A survey of industries by key polluting sectors (such as large breweries, sugar, food processing, leather, etc.);
- Awareness workshops and follow-up training;
- Plant-level resource efficiency and cleaner production assessments;
- Identification of measures to improve resource efficiency and reduce pollution; and
- Recognition of good performers though national and regional awards.

LVEMP's work has leveraged significant investments. About $3 million of technical assistance has gone to targeted training and assessments for 186 industries in Kenya, Tanzania, and Uganda. Of these, 88 adopted cleaner production techniques. In just 30 of these industries, this has leveraged about $82 million in investments and cost savings of $14.5 million annually. Results reward participants with very short pay-back periods, generally ranging from a few months to a couple of years.

COMMON INTERVENTIONS

Energy: Simple activities, such as placing translucent roofing tiles in factories that let in natural light, have saved hundreds of thousands of dollars annually in electricity bills for large factories. Other investments have included metering, improved electrical control systems and variable speed drives, higher efficiency bulb replacement, wind-driven cyclones, lights on timers, power co-generation, and improved insulation.

Water: Activities include rainwater harvesting, "dry" cleaning or use of pressurized hoses, metering, fixing leaks, condensate recovery, and water recycling.

Wastewater: Activities include improved metering, wastewater treatment, and recycling. Some of these, like chrome recovery, have very short payback periods and significant environmental and public health benefits.

Process Improvements: Other activities include the overall modernization of the production process, resulting in savings of water, wastewater, and energy, and a reduction in materials wastage.

Over time, these activities have demonstrated that the best way to get local, regional, and global environmental benefits from industries is to incentivize and emphasize the financial benefits of such activities.

In the arena of cleaner production, small technical assistance inputs can leverage significant private sector investments. Work like this can be scaled up in the region, but also be replicated far beyond Lake Victoria—which has the potential to once again be recognized as the source of great natural wealth.

Photo © piccaya/istock, Cartagena

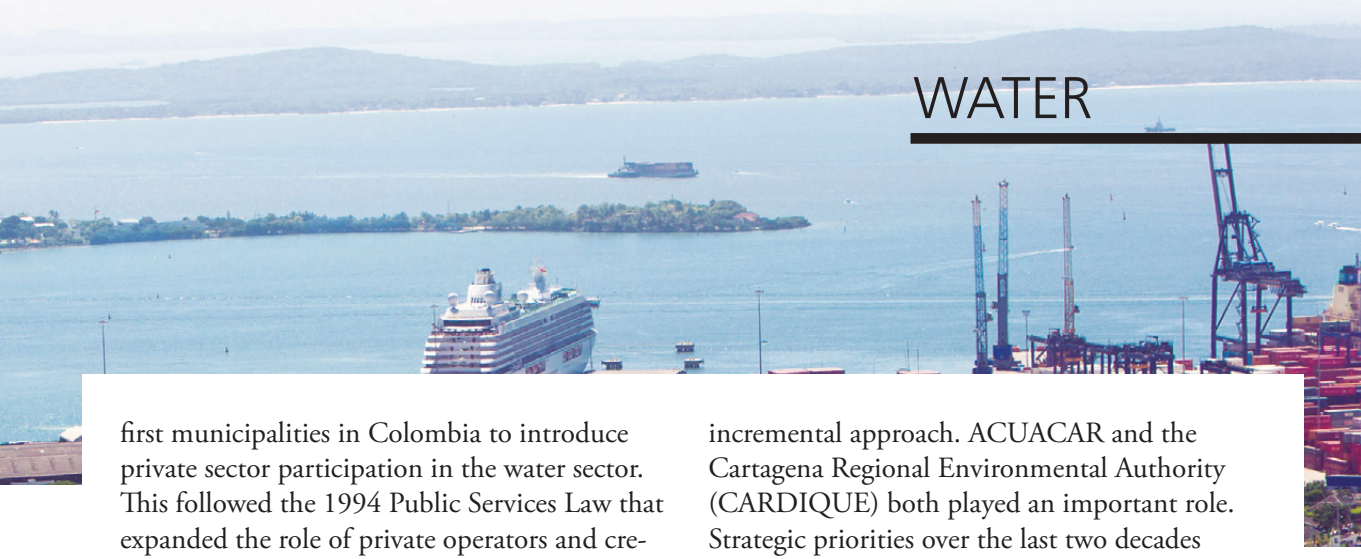
restoring CARTAGENA's COAST

By Elvira Broeks, World Bank

A mixed-capital model for water and sanitation in Cartagena—one of the first instances of private sector participation in Latin America—raised public health standards and restored the coast, revitalizing this historic city.

Cartagena, Colombia has a population of around one million, and it has experienced rapid growth as the population doubled over the last two decades. Because of its history and spectacular natural attractions, Cartagena is also Colombia's largest tourist area, welcoming around one million visitors annually. But just a few decades ago, Cartagena faced an uncertain future. By the mid-1990s, rapid population growth, unplanned urban development, and poor wastewater management had severely deteriorated Cartagena's rich coastal resources, generating a public health and environmental crisis. At this time, less than half of the households had connections to a wastewater disposal system and none of the wastewater was treated.

Desperately in need of solutions to save the city, the District of Cartagena became one of the



first municipalities in Colombia to introduce private sector participation in the water sector. This followed the 1994 Public Services Law that expanded the role of private operators and created a national tariff regulator alongside a service quality regulator. After many years of chronic inefficiencies in the provision of water supply and sanitation services (WSS), the District decided to liquidate the municipal utility and create a new public-private mixed capital enterprise with the World Bank's support. In December 1994, Aguas de Barcelona (AGBAR, the privately owned Water Company of Barcelona), was selected as the partner of the municipality, and the mixed enterprise Aguas de Cartagena (ACUACAR) was created.

ACUACAR took over responsibility for the provision of WSS services in June 1995. The District was responsible for capital investments to expand the existing WSS system, while ACUACAR was responsible for capital expenditures to improve the existing system. Although this model is commonly used in Spain, this was the first time such an arrangement had been tried in Latin America.

DUAL PRIORITIES

Tackling Cartagena's public health risks and severe coastal environmental degradation in the mid-1990s required a long-term incremental approach. ACUACAR and the Cartagena Regional Environmental Authority (CARDIQUE) both played an important role. Strategic priorities over the last two decades included:

- Improving water supply service in order to enhance ACUACAR's financial stability and cost recovery;
- Improving drainage in high-value economic areas that were subject to frequent flooding and sewer overflows into the streets and surrounding beaches;
- Improving water circulation in the Ciénaga de la Virgen (an estuary that at the time received 60 percent of Cartagena's untreated wastewater) with the construction of self-actuating tidal gates to increase flow into the Lagoon, and a long seawall within the estuary to route the tidal flows through the Lagoon and flush out the pollution; and
- Collecting, treating, and disposing of Cartagena's wastewater through the construction of a submarine outfall coupled with a preliminary wastewater treatment plant.

RESULTS

Improvements have been dramatic. Coastal beaches are virtually pollution-free, and there have been significant improvements in the

Photo © piccaya/istock, Cartagena

Cartagena Bay water quality and the ecological restoration of the Ciénaga de la Virgen. Moreover, through improvements in utility management, moderate increases in tariffs, and infrastructure investments, ACUACAR has been able to significantly improve the quality and efficiency of water and sanitation services and achieve sustainability. Potable water, which meets the national quality standards, is provided on a continuous basis to all households—even to the poorest neighborhoods.

Based on its tariff revenues, ACUACAR is able to cover all operating and maintenance costs, and help contribute to infrastructure investments. ACUACAR's mixed capital model has become institutionalized in Cartagena, and the combination of local political control of the company combined with professional private sector management has performed remarkably well.

KEY LESSONS

As with every significant public-private partnership, the officials behind the project faced many challenges along the way. Some of the lessons learned from Cartagena's rich experience include:

An efficient and sustainable water utility is crucial for effective wastewater management—which is fundamental for coastal cities. The creation of ACUACAR in 1995 was a key component of Cartagena's success.

Partnerships at the local, national, and international levels can facilitate and expedite environmental improvements. The Colombian national government formulated the policy framework for private participation in the water sector and enhanced environmental management, as well as providing significant financial support for Cartagena's infrastructure. Strong partnerships at the local level between CARDIQUE, the District of Cartagena, and ACUACAR were indispensable to program con-

tinuity and coherence. International institutions, such as the World Bank, provided financial support and technical assistance.

Public relations, community outreach, and building consensus among local stakeholders is critical to planning and implementing wastewater programs. There is usually no obvious "best technical solution," but in consultation with all stakeholders, a "preferred alternative" often emerges. The challenge is then to implement this approach in an expeditious manner to avoid further environmental degradation.

Comprehensive wastewater management is a long-term process and can take a decade or longer. In Cartagena, it took around five years (1995-2000) to ensure the proper policy, institutional planning, and financial arrangements were in place before the construction could commence, and then over ten years (2000-2013) before the wastewater treatment system could be fully constructed and commissioned.

Long-term, incrementally phased, and prioritized programs are necessary for water pollution control and environmental restoration. With the commissioning of the wastewater management system, Cartagena has completed the first phase of its long-term program to restore the coastal environment.

Submarine outfalls, combined with preliminary treatment, can be an appropriate solution for protecting coastal areas such as beaches, bays, and estuaries, while providing flexibility for future upgrades as necessary and when affordable. The feasibility of an outfall approach depends, of course, on the capacity of the receiving water body to assimilate the discharges and must be accompanied by extensive environmental, engineering, and social studies.

This article is adapted from and updates "Restoring the Coastal Environment in Cartagena, Colombia," published in the World Bank's Environment & Water Resources Occasional Papers.

Source: Aguas de Cartagena

SEWAGE SYSTEM COVERAGE

WASTEWATER TREATED

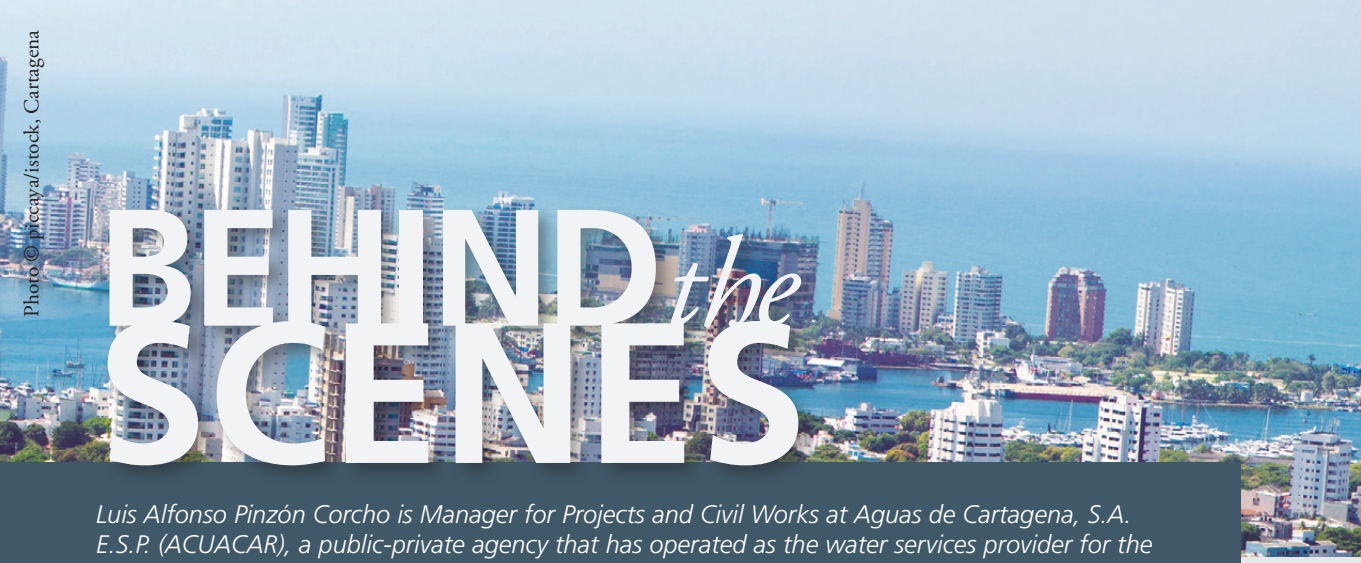


Photo © pjccaya/istock, Cartagena

BEHIND *the* SCENES

Luis Alfonso Pinzón Corcho is Manager for Projects and Civil Works at Aguas de Cartagena, S.A. E.S.P. (ACUACAR), a public-private agency that has operated as the water services provider for the city of Cartagena since 1995. With financing support from the World Bank and the Inter-American Development Bank that required the backing of the Colombian government, ACUACAR and the City of Cartagena have jointly invested more than $300 million in the design and implementation of the Master Plan for Water and Sewerage for Cartagena. In this interview, Pinzón outlines what reforms were necessary to create this unique hybrid agency, how dependable water and sanitation services have helped stabilize the country, and what's next for ACUACAR.

Interview by Alison Buckholtz

WHAT ARE THE MOST SIGNIFICANT REFORMS THAT WERE REQUIRED BEFORE ACUACAR WAS EVEN CREATED?

Decentralization was a major force in shaping the structure of the water and sanitation sector, since through the Decentralization Law it transferred the responsibility for operating and managing the systems to the local level. Secondly, with Law 142, enacted in 1994, more aggressive reforms were introduced that allowed private sector participation (PSP) in the infrastructure sector. This clearly separated service provision and policymaking, and created the Water Regulatory Commission alongside the Superintendency of Public Services, which is responsible for monitoring and supervising the adequacy and efficiency of operating companies.

WHAT SORT OF ROLE HAS IMPROVED WATER SERVICES AND WATER QUALITY—A RESULT OF THIS PARTNERSHIP—PLAYED IN STABILIZING COLOMBIA?

The lack of adequate water and sanitation services strengthened the circle of unhealthy conditions, poverty, and lack of opportunity. With improved water and sanitation services, and better water quality, there is a good chance that the circle can be broken. These are key factors for putting urban and rural development back on a feasible and sustainable growth path that can improve the economy and the quality of life for millions of Colombians. With this kind of partnership and planned investments, a rapid improvement of water services is possible. This is the basis for a sustainable growth plateau and a path to a more sustainable country.

CARTAGENA'S EXPERIENCE CAN SERVE AS AN INSPIRATION TO THE WIDER CARIBBEAN REGION AND PROVIDE A MODEL FOR OTHER DEVELOPING COASTAL CITIES. HOW WOULD YOU ADVISE GOVERNMENT OFFICIALS WHO ARE INTERESTED IN CREATING AN AGENCY SIMILAR TO ACUACAR?

It is important to support water sector reforms for large- and medium-sized cities by facilitating the incorporation of the private sector in the management and operation of water and sanitation services in the utilities, and by providing financial support of these utilities to ensure services to the poor. Once the private sector gets involved in the management of utilities, the water and sanitation service quality will improve, become more efficient and reliable, and cover access to poor consumers. There are different mechanisms to facilitate the incorporation of PSP, and a mechanism should be tailored to respond to the needs of each municipality.

THE ACUACAR CONTRACT INCLUDED VARIOUS PERFORMANCE TARGETS TO IMPROVE SERVICE QUALITY, REDUCE LEAKAGES, AND IMPROVE COLLECTIONS. WHAT OTHER TARGETS OR MILESTONES HAVE BEEN SIGNIFICANT?

The level of customer satisfaction is a key factor in making water and sanitation services sustainable, so providing excellent water quality is very important, as well as responding quickly to customer needs and requests. It's equally important to develop, provide, and maintain an efficient and economical system of water supply and sewerage. Assuring service reliability and availability requires a complete risk analysis and contingency plan, enabling a quick response to an unexpected event.

IN ADDITION TO IMPROVED WATER SERVICES, THE COMPLETION OF THE WASTEWATER SYSTEM HAS GENERATED SPECTACULAR ENVIRONMENTAL IMPROVEMENTS, LIKE POLLUTION-FREE COASTAL BEACHES WHERE IT IS NOW SAFE FOR PEOPLE TO SWIM. WHAT IMPROVEMENTS TO THE ENVIRONMENT WOULD ACUACAR LIKE TO SEE?

Cartagena has a rich endowment of natural resources that need to be restored and maintained to guarantee the conservation of these water bodies. With the support of CARDIQUE, the City of Cartagena and the Ministry of Environment, the improvement and conservation of the Ciénaga de la Virgen is a key issue to continue to address. This requires the formulation and implementation of a strategy and action plan to accelerate the lagoon's recovery.

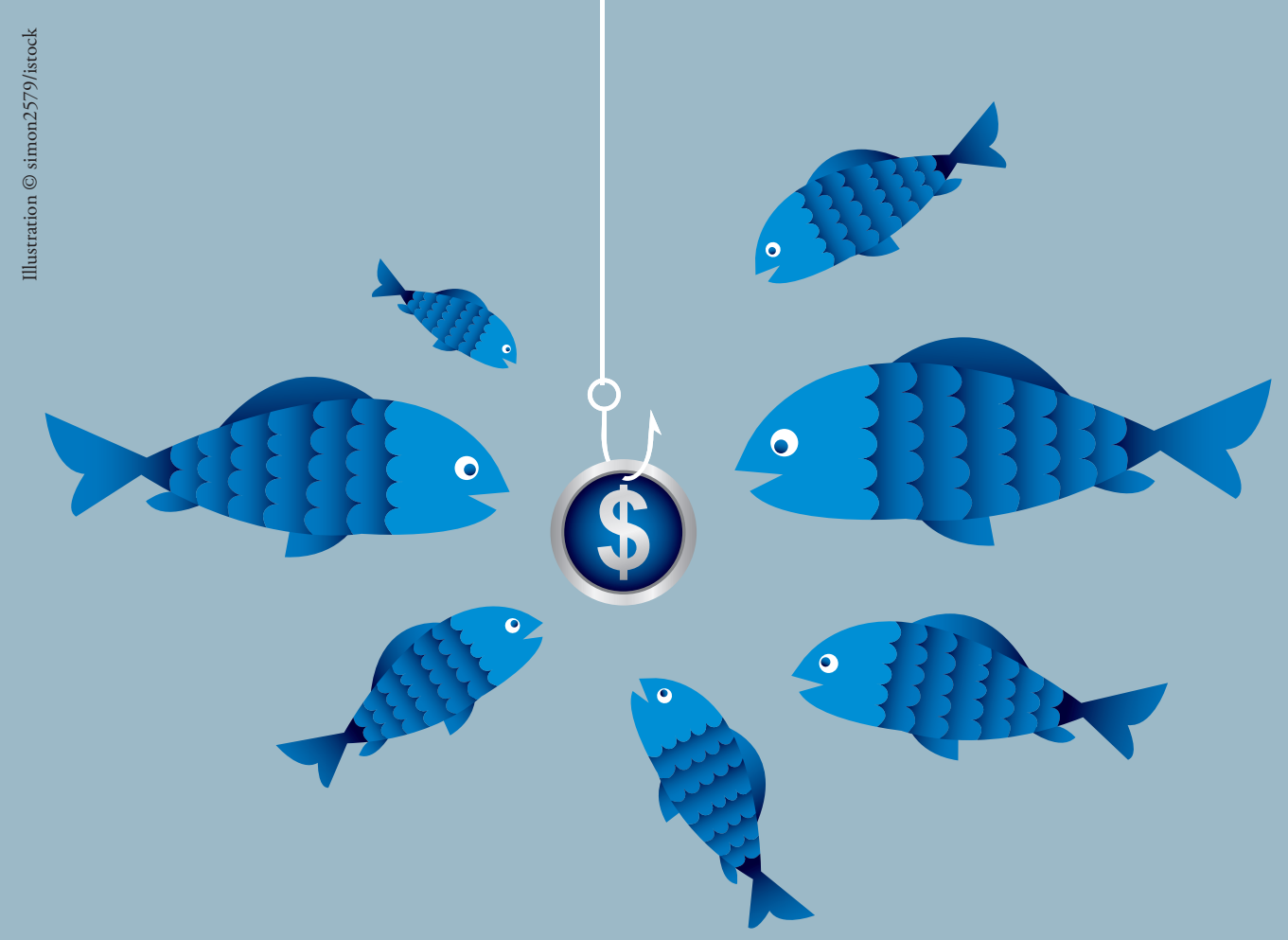


Illustration © simon2579/istock

TAKING THE BAIT ON IMPACT INVESTING

New models to finance sustainable fisheries

New forms of investments are emerging, including public-private partnerships, that will unlock opportunities for better fisheries management and shared value creation.

By Cristina Rumbaitis del Rio, The Rockefeller Foundation

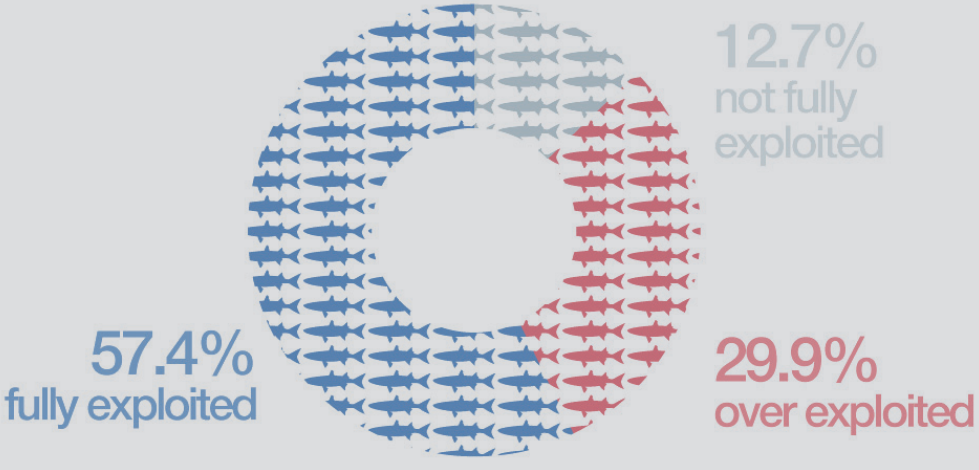
In early 2014, The Rockefeller Foundation President Judith Rodin and my former colleague Margot Brandenburg released a new book on the power of impact investing. Impact investing—investment dollars designed to deliver both financial and social or environmental returns—provides investors with a compass for shared prosperity. It shows the power of double bottom line investments, where a social gain is delivered and the investor earns a worthwhile return.

A similar approach to investing can be applied with potentially transformative results to oceans and fisheries management. With better investment strategies and simple changes in fishing practices and management, we could provide immense opportunities for returns on investment while improving the livelihoods of small-scale fishers and delivering a more reliable product for consumers.

MANAGING FISHERIES BETTER

The core idea here is simple—better managed fisheries are more profitable than poorly managed ones—and so there is potential to make money by putting in place the management measures that allow fish stocks to rebound. To unlock this potential, we need to learn from what has been done in other sectors, innovate

SWIMMING AGAINST THE CURRENT



Source: FAO (2012). The State of World Fisheries and Aquaculture, 2012. FAO, Rome.

and test ideas with some risk capital, and mobilize a good dose of a global ambition.

With good reason, there is a tendency to be pessimistic about the challenges and opportunities ahead for the fisheries sector. Too many people are chasing too few fish, and globally more than 80 percent of fisheries are over-fished or on the verge of collapse. The pressure on wild fish stocks is mounting as demand for fish continues to rise. Climate change adds a layer of uncertainty to the future of our oceans and their related resources.

Saving our oceans has gone from being mostly a public policy-focused endeavor to a collaboration between private and public actors who derive shared value from improved fisheries management.

Despite these daunting challenges, we are already seeing positive changes, including the increasing involvement of the private sector in advancing models for sustainable seafood production. We're seeing seafood buyers and retailers get involved with fisher groups to make sure that the fisheries where they source their product are well managed. We're seeing them invest time and resources in improving conditions in poorly managed fisheries through Fishery Improvement Partnerships, which are growing in number and coverage across the globe.

NON-TRADITIONAL ALLIANCES

Saving our oceans has gone from being mostly a public policy-focused endeavor to a collaboration between private and public actors who derive shared value from improved fisheries management. Indeed, this new wave of interest and non-traditional alliances is part of what has piqued The Rockefeller Foundation's interest in this area, leading to an exploration of new approaches to unite the actors who will benefit from improved fisheries—impact investors, seafood retailers, seafood processors, government regulators, and fishers—to make the urgent changes needed to revitalize small scale fisheries.

Already, new forms of investments are emerging that will help unlock opportunities for better fisheries management and shared value creation. EKO Asset Management Partners, with support from The Rockefeller Foundation, Bloomberg Philanthropies, and in cooperation with Oceana and Rare, has proposed three mechanisms that could help change the future of fisheries. These include:

1. A microfinance/small and medium-enterprise route-to-market vehicle, which targets improved processing and distribution logistics to increase the sourcing of sustainable seafood in developing countries. This mechanism gives local fishers the opportunity to benefit from the success of this model.
2. A public-private partnership vehicle whereby investors fund private partners to deliver a number of data, enforcement, management, and assessment services that

support sustainable fishing practices and increased employment in the fisheries sector.

3 A pay-for-performance impact vehicle. This would fund interventions targeted at specific seafood production systems, providing long-term supply contracts that alleviate the burden of risk borne by fishers in exchange for measures that improve the management of the fishery.

The unique added value of these strategies is that everyone involved in the partnership is a winner: the marine ecosystems, fisheries communities, investors, and consumers. All will benefit from the improvements made to fisheries, and the subsequent increased fishing efficiency and resilience of the resource. These mechanisms will be further developed in the Philippines, Chile, and Brazil, and, if promising, will be tested further by market actors.

The growth of the impact investing field has proven that there is an appetite among investors for these kinds of social and environmental investments. These financing tools might satiate this hunger while propelling fisheries toward a sustainable future.

THE CHANGING CULTURE OF FISHERIES IN CHILE

A personal reflection on the hake fishery in Chile, the changes and challenges, and why sustainable fisheries are important.

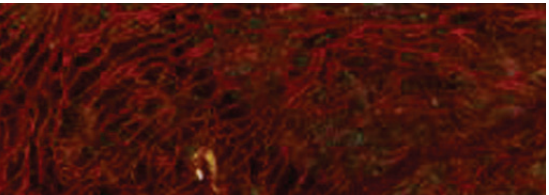
AMBASSADOR *of the* SEA

Jean-Michel Cousteau's case for sustainable fisheries

Since first being "thrown overboard" by his father at the age of seven with newly invented SCUBA gear on his back, Jean-Michel Cousteau has been exploring the ocean. The son of ocean explorer Jacques Cousteau, Jean-Michel has investigated the world's oceans aboard Calypso and Alcyone for much of his life. Jean-Michel founded Ocean Futures Society in 1999 to carry on this pioneering work. Here, he speaks to Handshake *about how a life on the sea convinced him of the urgent need for more sustainable fisheries.*

Photo © Carrie Vonderhaar/Ocean Futures Society

Interview by Alison Buckholtz



INTERVIEW

Your family has played a legendary role educating people about nature, transforming familiar surroundings into something magical, and encouraging responsibility toward the Earth. What are the best ways to transmit deep respect for the environment—and environmental stewardship—from generation to generation?

Children around the world have a hard time listening to their parents. But if you make them part of the adventure, if you take them into nature, to the ocean, to the mountains, together, as a team—then, kids absorb everything. Kids have to feel, touch, smell—that's the best investment you can make as a parent. I know that from raising my own children—my son started buddy breathing in a swimming pool on his fourth birthday, and my daughter was taken SCUBA diving with my father in the Mediterranean when she was nine years old. As adults, my children are now dedicating themselves to better understanding how we depend on nature for the quality of our lives.

In the last several years you have become a vocal proponent of sustainable fish farming. How did your ideas on this evolve?

I grew up in the South of France with my friends, the fishers. The fishers make a living by catching and selling fish. That's how they pay for their boat, feed their family,

and survive. Well, it's no fault of theirs but we're taking more from the ocean than the ocean can produce. Every year we are adding another 100 million people to the planet. We're starting to eat up our own natural capital. That's why we need to do exactly what we did when the early hunters and gatherers on the planet ran out of things to catch and gather on land. We need to farm. There are many different species of freshwater and ocean species we can farm in a sustainable way—by putting it where the demand is.

> *"Let's not forget that when you buy a fish from the ocean, you're not just buying the fish. You're buying the service to catch, transport, and freeze it."*

Do farmed fish taste different?

Because these fish farms will be completely self-contained, it ultimately improves the quality of our food. This is because we now use the ocean as a garbage can and a universal sewer where thousands of chemicals wash down the land and end up in the ocean. Many species of heavy metals have been washed into the ocean. All of that accumulates in the food chain, including the creatures we catch and put on our plates. The fish from fish farms will not have this problem.

I have had some of the fish from the lab of Dr. Yonathan Zohar at the University of Maryland Biotechnology Institute's Center for Marine Biotechnology, who supplies them to local restaurants. It tastes exactly like fish just caught in the Mediterranean. I would never have known the difference.

What impact can these sustainable fisheries make on the environment?

Let's not forget that when you buy a fish from the ocean, you're not just buying the fish. You're buying the service to catch, transport, and freeze it. With the ability to put a fish farm wherever the demand is, completely self-contained, those fish will cost much less. And because it's self-contained, it means their waste becomes resources that will help plants grow—and the plants that are growing will feed these fish. It is a completely closed system. Putting the fish farm at or near the source of the demand will drastically reduce transportation, in turn reducing CO_2 emissions.

There's even a sustainable energy solution here. The energy that you need is generated by the fish, which produce methane. This methane can be converted to energy to drive the pumps that circulate the water.

How would you advise citizens who want to work with government officials to create policies for sustainable fisheries?

People in government are there for a very short period of time. Their obsession is to do something while they are in power. Our job, looking at the long term, is to sit down with them, never point a finger, and reach their heart. Those people have families, they have children, they want to make a difference. We can help them use their experience in government to continue doing what they should be doing, much better than they have, and make sure the next generation will benefit from that. You have to reach their heart.

You are very optimistic about the future of sustainable fisheries. What would you tell a young person who chooses to fish for a living?

I tell young people, if you want to stay in the business of fish, become fish farmers and you'll have a wonderful life. As people, we have options. We can disappear like another species, or because we have the privilege of these immense and incredible tools—our hands and our brain—we can be the one species that will not disappear. We can adapt. We can look at our children and grandchildren and tell them they will have the same advantages we had. I am a firm believer that this is what we are heading toward.

TED
IDEASWORTHSPREADING

SYLVIA EARLE: MY WISH—PROTECT OUR OCEANS

Legendary ocean researcher Sylvia Earle shares astonishing images of the ocean—and shocking statistics about its rapid decline—as she makes her TED Prize wish: that we will join her in protecting the vital blue heart of the planet.

In 50 years we've...

- eaten over 90% of big fish in the sea.
- seen nearly half of the coral reefs disappear.
- protected less than 1% of the world's oceans.

OUR LIVING RESOURCE

85 nations + $102 billion
per year are involved in international trade in fish and fish products.

350 million
estimated jobs are linked to the oceans globally.

1 billion
people in developing countries depend on fish for their primary source of protein.

5x more
carbon is stored by coastal habitats than by tropical forests.

5x more
nitrogen fertilizer application—a huge source of ocean pollution—exists than in 1960.

405 dead zones
where most marine life cannot survive, spot our oceans.

Source: "Oceans: Our Living Resource," *Global Partnerships for Oceans*

Photo © Jim Maragos/USFWS

OCEANS

Oceans cover 71 percent of the planet. Our oceans feed us, provide a source of livelihood and economic stability, regulate our climate, and so much more. But the shared resource of the world's oceans is under stress and it's time to work together to restore the health and productivity of oceans.

THE GLOBAL PARTNERSHIP FOR OCEANS AND PPPs: WHAT'S NEXT?

The Global Partnership for Oceans (GPO) is a growing alliance of over 140 governments, international organizations, civil society groups, and private sector interests committed to addressing the threats to the health, productivity, and resilience of the ocean. It aims to tackle widely documented problems of overfishing, pollution, and habitat loss.

The GPO's Blue Ribbon Panel—convened by the World Bank to advise the GPO—comprises leaders from 16 countries, representing government, the private sector, civil society organizations, academia, and multi-lateral institutions. The Panel was tasked with providing recommendations to the GPO on the principles and practices for prioritizing and implementing sustainable ocean investment.

Nelson Del Rio, in his role as a member of the World Bank GPO Blue Ribbon Panel, is focused on the development of goal-based PPPs and related financing as tools to generate socio-ecological sustainability of the oceans and related communities. These PPP-specific efforts will be highlighted in a future issue of *Handshake* following the launch of his new effort, Prosperity of the Commons International, with co-founders Robin Davies and Jack Sterne.

TWO MINUTES ON OCEANS: BLUE CARBON

A two-minute look at the importance of marine coastal habitats in mitigating climate change, ocean acidification, and other issues related to the increase in atmospheric CO_2.

M. Sanjayan, Executive Vice President of Conservation International, is also the science correspondent for the Showtime climate change documentary series "Years of Living Dangerously," and contributes science and environment reporting to a number of international media outlets. In his role at Conservation International, he focuses on how conservation can improve human well-being, wildlife, and the environment. Here, he shares with Handshake *his ideas for sustainable conservation after the donor dollars stop coming, how government officials can create public-private partnerships (PPPs) for protected areas without ceding control, and the "aha" moment in the forest of Sierra Leone that powers his efforts to save the world.*

BEYOND THE "JUST SO" STORY

Quantifying the benefits of conservation

Interview by Alison Buckholtz

Photo © Ami Vitale

How have PPPs changed ideas about conservation?

It's almost impossible to do conservation the old way, like what Roosevelt pulled off, which is essentially declaring a place off limits. You just can't do that anymore. Virtually everything I've ever been able to do in the field of conservation over the last decade has had a very big element of public-private partnerships, and all the big nonprofits understand this right now. I worked on one of these partnerships several years ago to protect a very large area, 21 million acres of temperate rainforest. It happened by bringing together 30 First Nation communities, the timber industry, and the government. The basis of the partnership was all of us recognizing a common future where First Nation communities transition into a more green, sustainable economy.

Do governments still need to be convinced that these partnerships will benefit them?

Here's the thing with governments: many officials recognize the incredible power of these partnerships to bring untapped sources of revenue, often going directly to the people of the area. But it's always the lack of control that government officials worry about. It's not that they don't get it—they do—they just don't want to lose their jobs. So when talking to government officials, we start with what their challenges are. Once you understand their challenges, starting to talk about solutions will eventually lead you to talking about how to diversify sources of funding, how to increase technical capacity, or materials, or resources.

What makes protected areas work over time, withstanding changing governments and fluctuating economies?

If you want sustainable conservation—that is, conservation that lasts beyond the donor dollar—it has to be inclusive. It has to self-generate need and value, locally. As long as conservation relies exclusively on U.S. and European philanthropy and World Bank and NGO funding, that's easy. Everything will be safe. But the minute that tap turns off, the whole thing will fall apart, unless you create that self-generating value. It doesn't have to be equal or complete, but it has to be there. That's why when you look at these parks in protected areas that have managed to hang on, even in very difficult places, it's often because they have that local constituency that understands the value that nature or the park provides.

Protected areas work when you have local voices raised to protect that place. When there is a local constituency built in, there's a chance that protected areas will weather the storms of change, whether government change or policy change. In order to get that local participation, you have to be able to demonstrate your value to the people.

Where have you seen local voices make a big difference in a conservation project?

At Conservation International we've worked closely with President Tong of the Republic of Kiribati to help create the Phoenix Island Protected Area. The Republic of Kiribati is 2,000 miles from end to end, a gigantic seascape, and its waters are home to enormous schools of migratory tuna. If you want to protect tuna at scale, you have to identify the places that are important to them, and Phoenix Islands are incredibly important to them because that's where they spawn and aggregate. President Tong has completely closed it to commercial fisheries starting at the end of 2014. Of course, in the Republic of Kiribati, people make their income from fisheries, so it's a big deal for them to sacrifice short term gains from commercial fleets from the U.S. and Asia. But they're doing it, and during the transition we're helping government enforce the closure, and helping local people gain some benefits until stocks recover.

What's the role of communication in developing the support of local constituencies?

How you communicate is key. People need nature. If you start from that premise, then how we communicate and empathize with people on issues related to conservation becomes an incredibly useful tool and a skill—maybe even more important than how we understand when animals migrate, or where birds nest. This work is about the human condition, and by listening—empathetically listening—you feel what people are dealing with, and their pain. If you go with your assumptions, you can be totally wrong. You have to back your way into a solution.

How has the idea of "natural capital" changed conservation PPPs?

One of the most important things you need for a PPP to work is a true accounting of natural capital. This has started, and the Gabarone Declaration is a good example. Ten African heads of state agreed to account for their natural capital in their planning. You need that as a first step—but it has to go beyond the simple, obvious stuff and delve into the interdependencies between people and nature. Right now, I can only tell you a "just so" story or an anecdote about what a forest is worth or what will happen if a breeding ground for fish is restored. I can't quantify what the beneficial effects on people will be if we fix the fisheries in Lake Malawi, for example, but I can tell you that if we save the lake, we save

> *If you want sustainable conservation—that is, conservation that lasts beyond the donor dollar—it has to be inclusive. It has to self-generate need, locally.*

the people. But we can't get funding with just the story. We need to go a step beyond that and make sure our work is data driven.

What's happening in Lake Malawi?

Fisheries along the shoreline have collapsed in many Rift Valley lakes, and this has led to an increase in the snail population. Snails bring bilharzia, a little fluke that swims into your legs, works its way to the veins between your liver and small intestines, produces millions of eggs, and clogs your veins. Now, in some villages around Lake Malawi, 85 percent or more people have bilharzia. Among all the other problems, an infected person urinates blood. Then we see HIV infection rates skyrocket. So here you have the collapse of the fisheries, and it results in the increase in bilharzia and HIV. We put the pieces together in order to see the big picture. Everywhere, we find very surprising links to nature that we ignore at our peril. We evolved alongside nature, so it makes sense. But these deeper connections are underappreciated and difficult to monetize.

Everywhere, we find very surprising links to nature that we ignore at our peril.

Your family wanted you to become a medical doctor and you studied genetics in grad school. Why did you decide conservation was your calling?

I trained myself to save the world. My "aha" moment came on a rainy day in the forest of Sierra Leone, a few years after the civil war there ended. I came into a tiny little village to take shelter from the rain, and I saw a group of children huddled around a little smoky fire. I went up to them and looked over their shoulder and saw they were burning the fur off a dead monkey. They were going to cook and eat the monkey. As I watched the scene, slightly fascinated and slightly grossed out, I saw they had this little piece of tin, about as big as a card, that they were using to fan the flames of the fire. I looked at this little piece of metal once they set it down, and it said World Food Program (WFP), alongside the WFP logo—it had been cut from a metal sign. I thought, "The irony!" They're using a sign from the WFP to fan the flames of the fire to cook the monkey they got out of the forest when they had nothing else to eat. So at the end of the day, when the government abandons the people, when institutions crumble, when people just don't have any other means, guess what? Nature still provides the ultimate safety net.

Here's what I realized coming out of that jungle: that the poor can be the greatest allies we have in the fight to save nature. They are our best allies because they need their natural resources far more than we do.

Photo © andreusk/istock

SEEDS *to* TREES

By Tuukka Castrén, World Bank

Encouraging more balanced private investment in forests

Sustainable forest management needs between $70 billion and $160 billion each year to be implemented properly, but official development assistance to forestry only covers about 1 percent of the estimated total financing need. Those numbers don't bode well for the future of forests.

The private sector has a role to play in filling the financing gap. And it is stepping in to fill that need—especially in countries where there is considerable private forest investment. But available data points to an uneven distribution of private forest investment across regions and countries.

A CLEAR IMBALANCE

Total private sector plantation investments in developing countries are estimated at $1.8 billion in 2011 (excluding "Reducing Emissions from Deforestation and Forest Degradation," or REDD). Latin America accounts for a vast majority of annual investments, with $1.5 billion (83 percent) of the global total amount. Investments in Asia and Oceania are estimated at $279 million (16 percent of the global total), while private investments in plantation forests in Africa are estimated at $20 million (just 1 percent of total value). Although Latin America draws the most private forest investment, it is unevenly allocated: Brazil accounts for more than 80 percent of the regional total.

There is a similar trend of regional imbalance in the estimated 66 million hectares of commercial, production-oriented forest plantations in developing countries, about one-third of which

are privately owned. Privately owned plantations are spread over 18.7 million hectares in Latin America and comprise 78 percent of total commercial-production plantations. In contrast, there are only 5.1 million hectares of commercial plantations in Asia and Oceania and 0.3 million hectares in Africa.

RISKS AND RETURNS

It is clear that while some countries are struggling to gain access to private forest financing, others are drawing the lion's share. Correcting this imbalance requires that we understand its root cause. So in a study recently published by the World Bank's Program on Forests, we begin with the following question: What factors cause private forest investment to flow to certain countries, and not others?

We found that, when assessing potential investments, forest investors acted like any other investor and compared expected returns and risks. Tree-growing conditions, access to markets, growth potential, physical and institutional infrastructure, and the business environment—including political and economic stability and security of land tenure—are some of the major determinants of investment flows.

We also discovered that the main barriers to financing private investments in Sustainable Forest Management (SFM) in developing countries include high real and perceived risks, such as those related to land tenure; the weak availability of both domestic and foreign equity and loan financing; and unfavorable terms for financing. Finally, high upfront costs of preparing investment projects in the forestry sector also discourage private forest investors.

PLANTING PRIVATE FOREST INVESTMENT

To attract more forest investment, the government needs to take steps to make the business environment better—by improving policy and legislation, governance, transparency, and infrastructure. The public sector can also strengthen land tenure systems, reduce investment risks through guarantees and public-private partnerships, and improve access to finance. Access to information—especially around the availability of suitable land for investments—is also important for potential investors.

To attract more forest investment, the government needs to take steps to make the business environment better.

There are many ways for the public sector to facilitate long-term investments in sustainable wood production. These include strengthening the information base on forest resources and finance and recording and publishing information on domestic investments.

Private forest investment may be unbalanced, but this trend shouldn't be accepted as irreversible—especially considering the urgent need for SFM. The private sector has a role to play in SFM and, by taking action, the public sector can make it easier for private forest investment to grow where it's needed most.

By Steve Gretzinger, World Bank

Forest fairy tales

You might have heard investing in timberlands is risky.

But did you know: Investment in private timberland in the U.S. and Europe has been quite profitable over the last 20 years. There's been a very good, inflation-adjusted return, relatively low risk, and little correlation with other financial sectors. As part of this trend, pension funds have put substantial funds into Timber Investment Management Organizations (TIMOs). For example, Harvard University's pension fund was a pioneer in timberland investment, alongside others such as Hancock and TIAA-CREF. At one point, Harvard was one of the largest non- industrial private timberland owners in the U.S.

Although these results from the north aren't immediately and easily transferable to the Amazon, the Congo, or Indonesia, it does show that timberland investments can be a surprisingly good and even conservative investment with decent returns. In other words, trees always grow despite market fluctuations, and multiple products equal multiple revenue streams. This premise is a surprise to many government officials in tropical countries faced with deforestation, who are grappling with approaches to stopping illegal logging.

You might have heard Protecting the rainforest requires a "hands-off" approach based on protected areas.

But did you know: There is very little economic incentive for landowners to sustainably manage forests since it is cheaper, easier, and quicker to cut trees, and convert forests to agriculture. Likewise, simply classifying an area

Debunking the 4 biggest myths

as a national park—where no resource use is allowed—often does not work well, since hungry people are seldom kept out by under-funded governmental agencies.

A more pragmatic and functionally successful approach is to place forests under management where landowners obtain tangible benefits from following government rules. Here's one example: in the Peruvian Amazon, recent studies showed that some of the lowest deforestation rates occur in forest concessions where you have active road-building, tree-cutting, and transportation. Under such models, forest is not converted to agriculture but remains as managed forest under regulation. People are making money, and following procedures. If companies stick to the law, they can manage a concession for 40 years, investing in infrastructure, deriving incomes, and having a steady supply of raw materials. The opposite approach—declaring an area off-limits—invites illegal activity, since it is often not protected effectively.

You might have heard Carbon credits, natural capital, and non-timber forest products will save the rainforest.

But did you know: Natural capital accounting makes sense intellectually, but the market seldom recognizes it at present, and it is not a reality for most owners or managers of forest areas. It is difficult to put a value on natural capital in a way that will translate into peoples' everyday lives. Policies that promote this concept still have little relevance with most actors in a practical sense, because economic concerns are so pressing. If a farmer can't feed his kids and can't get a loan, he has to cut down trees and plant yucca regardless of natural capital accounting, Kyoto protocols, or the academic value of all components of the native plants found in a forest.

You might have heard More stringent government regulations lead to better forest management.

But did you know: For government officials it's natural to think that more rules provide a framework for control, but what happens is that the "good guys," who follow these rules to the letter, are penalized. Although these regulations are well intentioned, they often put a burden on people who ultimately do what they have to do and apologize afterwards. Often, the most practical business plan—if you are earning money to feed your family—is to not abide by the rules. Following stringent rules results in additional costs that illegal or informal operators evade, thus making the products made by the "good guys" more expensive and less attractive to buyers.

Letter illustration © Mary Ann Shmweli/istock

Border illustration © Dzhamiliya Ermakova/istock

A TURNING POINT FOR TREES

Brazil's Public Forest Management Law ushers in a new era of PPPs

Interview by Mahomed Bashir, IFC

Photo © Serviço Florestal Brasileiro

The Brazilian Amazon forest is the largest tropical forest area in the world, and the country is both the largest consumer and producer of tropical timber. But forest conversion to agriculture—driven primarily by the demand for land for livestock and agricultural production—is damaging and inefficient. First, there is no investment in new technologies to explore the full economic potential of a species-diverse forest. Further, there is no way to sustainably explore the forest to guarantee a continual flow of wood products—which assures a robust local economy alongside the forest's public benefits. As a result, the economic activities undertaken in the Amazon forest represent only four percent of the region's GDP, and deforestation has increased exponentially to make room for cattle raising and soybean fields.

Marcus V. Alves, Managing Director of the Brazilian Forest Service (Serviço Florestal Brasileiro, or SFB), is charged with implementing decade-old government legislation and reforms to curb these trends. Here, he talks to Handshake *about the turnaround in forest management since the new law, the growing role of public-private partnerships (PPPs), and what he's learned about including the private sector in these efforts.*

Why was it necessary for the Brazilian government to implement reforms to curb the rate of deforestation in the Amazon region? How have these reforms affected deforestation rates?

Expansion of the agricultural frontier is the major driver of deforestation in the Amazon region, along with land grab attempts. In the early 1990s, timber production in Brazilian Amazonia reached more than 50 million cubic meters of logs. Since then, it has been falling until reaching its lowest level ever recorded in history, around 12 million cubic meters per year.

Overall, it is clear that there is a close relationship between the deforestation rate and consumption of Amazon roundwood. Even considering the significant reduction in the consumption of tropical Amazon logs, the supply of wood from sustainable sources is still incompatible with domestic demand. And this is due to the lack of forest tenure rights by most of the companies that operate in the Amazon, which cannot secure long-term stable and sustainable forestry-related activities by private companies.

But there has been great progress during the last decade, with government dedicating significant efforts to better manage the Brazilian forests. As a result, from 2004 to 2013, the deforestation rate dropped more than 80 percent.

The Public Forest Management Law of 2006 was a turning point in management of the forest sector. What parts of this law could be adapted by other governments facing similar threats due to deforestation?

In 2006, the Brazilian Congress passed a law addressing forest tenure and management. The Public Forest Management Law of 2006 decentralized the regulatory role for sustainable forest management in private lands, giving state governments a stronger role. The law also created the conditions for adding value to forests through sustainable forest management, and established a legal framework to implement sustainable public forest management through concessions.

> *"The development of the Amazon region requires the establishment of a new forest-based economy."*

However, the main achievement of that law is related to the establishment of solid mechanisms of transparency and social control, which makes it possible to create a sound environment for strong forest governance. This aspect of the law should be considered for adoption by any government that really expects to reduce deforestation and forest degradation.

In the last few years, the Brazilian Forest Service has been trying to involve the private sector in sustainable forest management. What are some of the lessons Brazil's forestry sector has learned about including the private sector in plans to stabilize forests?

There is no doubt that the development of the Amazon region requires the establishment of a new forest-based economy—the opposite of what has been in place for the last decades. The federal government employs a model that focuses on forest management for multiple uses, where actors act in synergy to ensure the maintenance of the forest as a permanent economic and environmental asset, able to generate employment and income for the people who live in and near the forests.

Since more than 55 percent of Brazilian territory is covered with forests—and of those, more than 60 percent are public and administered by the governments at federal, state, and municipal levels—federal and state governments have a huge responsibility in managing these lands. That responsibility must be shared with the private sector. Our experience with the private sector has demonstrated the importance of working with companies that have not only extensive experience in forest management, but more importantly, solid business management capacities.

Some investors believe that investing in tropical forest concessions may raise reputational risks. How would you convince an international investor to bid for a tropical forest concession?

There is still mistrust (based on misunderstanding) within a few segments of the Brazilian society and also among a group of potential investors in relation to forest concessions. However, this suspicion has diminished as the model adopted by the federal government has consolidated its administrative procedures, demonstrated technical and economic feasibility, and has been implemented with an awareness of indigenous rights.

Reliable institutional capability for contract monitoring by the federal government and, more importantly, legal and land tenure security for the entire duration of the contract, should offset any reputational risk incorrectly associated with forest concessions in Brazil. Finally, transparency, social control, and strong governance are our best sales pitch for Brazilian forest concessions.

Where is the Brazilian forest policy heading? What are the main challenges and trends we should expect in the next five years?

Considering the need for conserving Brazilian forests, the actual and the future demand for timber products, the need to comply with forestry legislation (reducing illegal forestry practices and activities), and the need to establish and strengthen local and regional forest-based economies in the Amazon region, PPPs are key elements necessary to the success of this fairly recent forest policy. These PPPs for sustainable management of Brazilian tropical forests will play an increasingly large role managing Amazon forests.

> *"PPPs for sustainable management of Brazilian tropical forests will play an increasingly large role in managing Amazon forests."*

There still are some key issues that we need to face in order to scale up investments in sustainable forest management through PPPs. These include speeding up land/forest tenure reforms; enhancing law enforcement; improving logistics and infrastructure; financing forestry and industrial operations; and reducing costs of transactions and compliance.

Marcus V. Alves, Managing Director of the Brazilian Forest Service (Serviço Florestal Brasileiro, or SFB)

FROM IDEA TO INITIATIVE

"Trees for Life" takes root in South Africa

By Andrew Venter, Wildlands

Wildlands Conservation Trust, one of South Africa's leading environmental organizations, facilitates connections between local communities and their supporting ecosystems. Its "Trees for Life" initiative trains citizens to become "Tree-preneurs" who harness the opportunities to become viable small businesses in their own right. Here, Andrew Venter, CEO of Wildlands, gives Handshake *readers a tour of the successful program.*

The Green-preneur concept was born in the rural village of KwaJobe in northern KwaZulu-Natal, South Africa, in 2004, as our Wildlands Conservation team was running environmental workshops with local schools. The team had gathered around 200 local scholars and was showing them the basics of tree propagation, using seeds indigenous to the area. The participants had a thirst for knowledge.

A few weeks later, when we returned to the site to see if any of the seeds had grown, we were surprised to see that the majority were flourishing despite any obvious care. That's when the idea behind our "Trees for Life" program started to take root, and today it's making it possible for the poor to feed, house, and educate themselves by growing indigenous trees.

FORESTRY

In Wildlands' "Trees for Life" Program, Tree-preneurs grow trees and then barter indigenous trees they plant for food, building material, educational support, water tanks, bicycles, and solar panels. This program has spread to over 100 communities, involved over 8,000 individuals, and enabled the propagation of millions of trees.

Based on the success of the "Trees for Life" initiative, our team developed the program "Greening Your Future," which enables tree planting across 24 community-based ecosystem restoration sites.

GREENING YOUR FUTURE

"Greening your Future" faced the challenge of reintroducing trees into the flood plain used by the community for farming, while helping the community improve farming activities to make the most of what the local environment offers.

Photoa © Wildlands Conservation Trust

Photoa © Fotosmurf03/istock

NET POSITIVE IMPACT

Biodiversity offsets offer solutions

By Valerie Hickey, World Bank

Madagascar is recognized as a global biodiversity "hotspot"—rich in plant and animal species not found anywhere else in the world. In the country's southeastern corner, where the Vohimena Mountains unfold into coastal plains extending to the Indian Ocean, remaining pockets of coastal forest provide a home to around 13 percent of Madagascar's native flora species.

While rich in ecology, this is one of the poorest and most isolated parts of the country: 82 percent of people here live on less than $1 per day. In 2004, the mining group Rio Tinto—which is mining for ilmanite in these coastal plains—committed to a policy of "net positive impact" (NPI) on the area's biodiversity. In other words, the company promised that by 2065, a combination of minimizing damage, rehabilitation, community-based actions, and conservation elsewhere will result in biodiversity being better off in terms of forest coverage and quality than before the mining operation took place. Part of these efforts include minimizing impact at its mine sites, rehabilitating forested areas once mining is completed, and working with communities on alternative livelihood programs.

Another tool has the potential to advance conservation goals after all other appropriate mitigation measures have been considered: biodiversity offsets. This approach to mitigation means the company will protect equivalent coastal forest areas outside its mine sites to help reduce the overall loss of this type of ecosystem. It's expected that these offset sites—which are either fully funded by the company or co-funded with government and conservation organizations—will eventually cover some 6,000 hectares of Madagascar's coastal forest.

BIODIVERSITY IS GOOD BUSINESS

Rio Tinto is clear that this NPI policy is good for its business. In a 2008 position statement, the company declared: "We want to be biodiversity leaders within the mining industry, for the competitive advantage and reputational benefit this provides. Our performance on biodiversity

conservation and management issues will create benefits for our business."

All eyes are now on the company as it works to fulfill its NPI commitment at this and a number of other pilot sites in Africa and Mongolia. Specialists, including people from the International Union for the Conservation of Nature, are working with Rio Tinto to oversee progress, strengthen methodologies, and identify limitations.

Many other companies are realizing the benefits of mitigating their impacts onsite and offsite, including using biodiversity offsets. Two of the largest oil, gas, and mining industry associations (IPIECA and the International Council on Mining and Metals) have developed the "Cross-Sector Biodiversity Initiative" in partnership with the Equator Principles Finance Institutions. Their motivation is to find ways to conduct biodiversity management in a more coordinated manner.

COMBINING FORCES

This important work could be a taste of things to come: public-private biodiversity conservation deals that benefit countries, companies, and local communities who depend most on natural resources. (By some estimates, ecosystem goods and services account for more than half the household income of the poor.)

Offsetting is an approach with real benefits for developing countries and local communities. Many governments are looking to reconcile the need to expand their extractive industries and commercial agriculture for jobs and food security, with their desire for well-managed protected areas, and sustainable forest management. Biodiversity offsets offer a way to address these distinct objectives in a spatially organized manner.

Early evidence suggests that well-designed biodiversity offset efforts could ensure that large-scale infrastructure, extractive industries, and commercial agriculture proceed in ways that maintain forests and other natural ecosystems, their environmental services, and many rural livelihoods. However, since conservation and biodiversity protection are not the core business of investors, the World Bank Group is engaged in early-stage work with the governments of Liberia and Mozambique to assess the feasibility of nationally aggregated biodiversity offset schemes. These initiatives could establish a state-endorsed specialized agency (such as a conservation trust fund) that could deliver conservation outcomes at offset sites where it makes the most sense to secure ecosystems that are equivalent or greater than those that are lost. The investor would transfer liability and funding for managing the offset, in the form of an endowment, to the specialized agency.

Aggregated offset schemes could help reduce transaction costs by achieving economies of scale rather than each separate investor shouldering the burden alone. They could also overcome the limitations of individual project offsets by coordinating larger, collective offsets that could support national conservation priorities. And importantly for governments and companies, aggregated offsets could improve delivery of conservation impacts and provide for long-term sustainability through institutions that maintain and monitor conservation impacts when the investment project closes down.

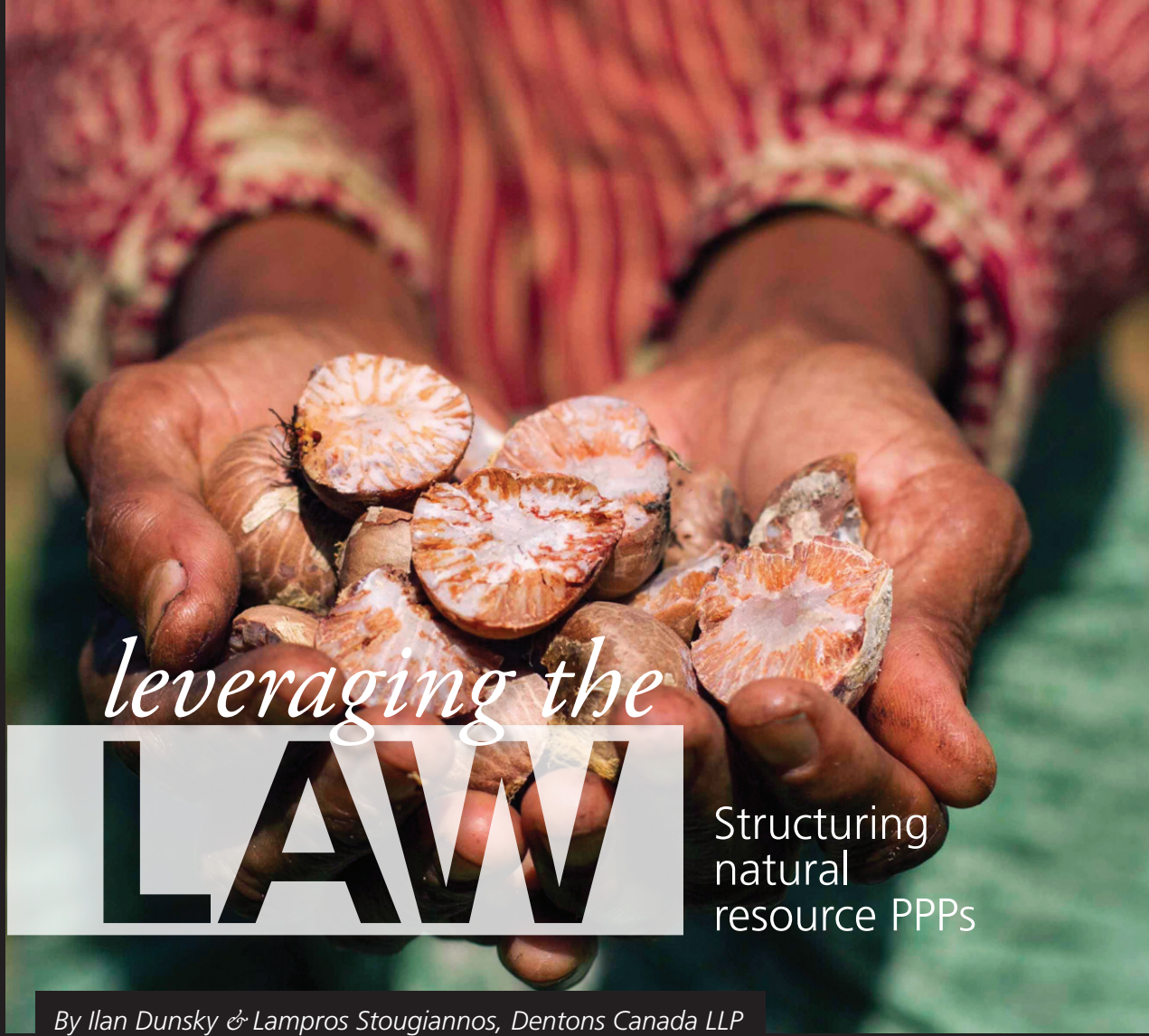


Photo © Center for International Forestry Research

leveraging the LAW

Structuring natural resource PPPs

By Ilan Dunsky & Lampros Stougiannos, Dentons Canada LLP

"A nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased, and not impaired, in value," Theodore Roosevelt, America's 26th president, remarked in 1910. Coming from America's "Conservation President"—who signed legislation establishing the first five U.S. national parks, as well as the Antiquities Act—this is often cited as an example of a forward-looking leader institutionalizing sustainability and stewardship of the environment.

Though no one can lay claim to the ideas behind conservation, the impulse to institutionalize it has taken hold in the last century. In the past few

decades, legislation and other legal tools have boosted options for conserving and developing natural resources, and public-private partnerships (PPPs) may prove to be a particularly effective solution.

LEVERAGING THE MODEL

Traditionally, the PPP model has been applied to the delivery of public infrastructure or public services—including highways and bridges, hospitals, schools, and even correctional facilities—on behalf of a public authority. The model has demonstrated time and again that it is adaptable and sufficiently flexible to accommodate varying structures, depending on the specifics of any given project. For natural resources, similar models have been successfully applied to the development of renewable energy facilities (particularly hydro, solar, or wind energy production). This works by adapting principles similar to traditional PPP projects and combining these with various existing legal and contractual structures such as concessions, offtake agreements, and development or project agreements.

The issue becomes more complex when considering non-renewable natural resources, such as minerals and petroleum, which are by their very nature finite. These natural resources have traditionally been exploited as concessions; the government will grant a developer the right (generally on an exclusive basis) to exploit a specific resource in a given area. The developer will finance the project and develop, extract, and sell the resource, paying back to the government concession fees often based on the amount and/or value of the resources extracted.

CONCESSION VS. PPP

But the differences between a natural resource concession and a PPP can be significant. First, in the case of a natural resource concession, government typically operates at arm's length from the concessionaire, as government's role is typically limited to that of regulator. Second, the concessionaire recovers its investment only from the sale in its own name of the resource extracted, with little or no contribution from government. In addition, depending on the legislative environment in place, concessions may not offer a sufficient framework within which to effectively address broader issues such as sustainable development and environmental protection. Finally, the main public benefit associated with concession projects is the royalty fees and taxes returned to government in exchange for exploiting the resource, together with local employment opportunities.

However, it is possible to structure such projects in a manner more similar to a PPP to permit government a more active role by imposing additional obligations on the concessionaire. Examples include the carrying out of functions

on behalf of governmental authorities, including responsibility for primary education and healthcare, the supply of clean water, training opportunities for the local population, or the construction of infrastructure not directly related to the natural resource being exploited, such as schools, hospitals, roads, and electricity distribution networks. These elements would add to the public benefit obtained through the natural resource concession.

When combined with a conducive payment mechanism and effective monitoring, PPPs can maximize the sustainable local economic development potential of a project and otherwise encourage desired results in a flexible manner.

There is nothing in the PPP model to prevent a government from establishing a payment structure that would seek to encourage or discourage certain operator activities or behaviors. For example, where traditional forestry concessions typically grant forestry companies cutting rights over a defined territory, in developed countries the concessionaire may be required by law to replant harvested areas. One can imagine structuring a PPP in a developing country which combines the granting of long-term cutting rights to a private operator with stewardship responsibilities, including reforestation but also (why not?) ecotourism and fauna preservation. In a mining operation, governments could consider increases or decreases in royalties payable to it upon the achievement or not of certain predetermined benchmarks by the operator, similar to the deduction regimes contemplated in traditional PPP projects. As always, the structuring of any such mechanisms would likely require great care, given the number of variables involved and the need to properly balance any additional obligations imposed on the operator with the need to ensure the project remains commercially viable and financeable.

Among PPPs' key innovations are monitoring mechanisms developed to ensure that project budgets and timelines are respected and that the operator complies with its obligations pursuant to the applicable contractual framework during the lifetime of the project. Many developing countries lack the capacity or the resources to follow up on the monitoring of a project, and this can lead to the government failing to recover obligations owed to it or becoming liable for additional payments. In the context of a natural resource project, a PPP-styled monitoring mechanism could be incorporated to address these concerns. To address the issue of capacity within government to effectively monitor, the

operator could be required to support government in the establishment and operation of monitoring agencies through capacity building.

PPP FLEXES ITS MUSCLE

One of the key advantages of a PPP is the flexibility provided to government to develop and impose operator obligations applicable to any given project. When combined with a conducive payment mechanism and effective monitoring, PPPs can maximize the sustainable local economic development potential of the project and otherwise encourage desired results in a flexible manner. A PPP may also enable governments to achieve social benefits while reducing financial losses (legal or otherwise) associated with operating a civil service by enabling money generated by a project to be spent directly by the operator on the desired public infrastructure and services, rather than being routed through government ministries.

Given the mixed history of the use of natural resource royalties by some countries, PPPs may provide a method for achieving social, economic, and other development aims in a more direct and efficient manner, enabling countries to heed Roosevelt's call to behave well. h

Photo © Center for International Forestry Research

Photo © Neil Palmer/CIAT, Amazon, Brazil

By Valerie Hickey, World Bank

CONSERVATION TRUST FUNDS

Partnerships that protect

The good news is that the area of Earth covered by protected areas is increasing. Over 14 percent of land, and a growing percentage of territorial oceans, are under some form of protection. The not-so-good news is that protected areas cost a lot to maintain and sustain, often suffering from the boom and bust of project financing that erodes their natural, financial, human, and institutional capital over time.

So what do fiscally-stretched governments wishing to meet their commitments to biodiversity protection and poverty eradication do? The answer is partnership and financing innovation. Such a solution is clear when we examine the Latin America and Caribbean region's experience with conservation trust funds (CTF).

FINDING FUNDING

In 2010, parties to the Convention on Biological Diversity (CBD) committed to conserving 17 percent of terrestrial and inland water, and 10 percent of coastal and marine areas, by 2020. The CBD focused especially on areas of particular importance for biodiversity and ecosystem services.

According to the 2014 World Development Indicators, countries have been making good progress toward this target for many years, with low and middle income countries reporting 14.6

percent of their total land under protection—up from 8.6 percent in 1990. In the Latin America and Caribbean region, the CBD target has already been exceeded with a massive 21.4 percent of total land in protected area management.

Key to the region's progress has been solid regulation and institutional frameworks, as well as the development of sustainable financing mechanisms. CTFs—public-private institutions entrusted with long-term endowments for conservation—have played a pivotal role.

INCUBATORS OF CONSERVATION

A 2010 study found 22 CTFs functioning in 15 countries across Latin America and the Caribbean, with revenues flowing from them supporting 660 protected areas. These CTFs are generally set up as private legal entities independent from government, often including private sector representatives on their governing boards to help shape investment policies. Many of these CTFs have grown to become incubators of conservation that reach beyond the boundaries of protected areas. The Mexican Fund for Conservation of Nature, for example, applied 75 percent of the interest obtained from the protected areas fund it managed to new staff salaries for the federal protected area system.

Other innovative examples are also boundary-busters. In Brazil, for example, the World Bank supported the State of Rio de Janeiro to meet 43 percent of its financing needs by setting up the Atlantic Forest Fund. This is a financial and operational mechanism developed by the Brazilian Biodiversity Fund (Funbio) to provide greater agility, efficiency, and transparency for the State's protected areas.

In this case, the Fund helps the State capture support from different sources, including environmental compensation from industry, domestic and international grants, and carbon credits. Environmental compensation from investment projects, which is mandated by Federal law, is by far the greatest contributor to the Fund. The State is now on track to further strengthen the financial sustainability of its protected area system—so much so that financing may no longer be a constraint to meeting ambitious goals of doubling the area of Atlantic forest under protection across five neighboring states.

GLOBAL GOALS

All over the world, there is a dawning awareness within the private sector of the need to secure ecosystem services to ensure sustainable supply chains and manage risk. Each year, the merit of investment in natural infrastructure like forests and reefs becomes more obvious. Protected areas can conserve watersheds and regulate water flow, prevent soil erosion, influence rainfall regimes and local climate, conserve renewable resources, and protect breeding stocks, natural pollinators and seed dispersers. All of these actions boost industry and agriculture across the entire spectrum of the economy. CTFs, which support countries trying to meet their protected area commitments, are busting economic as well as geographic boundaries, bringing benefits beyond sectors or regions. h

CULTIVATING CHANNELS *for* INVESTMENT

By Bernardete Neves, FAO

Illustration © FAO, 2012

Public-private partnerships invest in ecosystem services in agriculture

In densely populated rural areas where family farming is the main livelihood, pressure on soils and water increases every season. Without conservation measures, soil fertility is washed away into rivers, and with it, the family's food security for the following seasons. But this is a problem not only for the farmer. Land degradation also affects other water users further downstream, increasing water treatment costs and reducing water flow during the dry season. As fields lose productivity, pressure on remaining forests increases and their conversion to new cropland is more tempting, despite forest protection laws. With forest loss, global biodiversity and carbon storage further deteriorates, and we all pay the price. Ultimately, sustained pressure on the natural system may lead to environmental migration and add pressure on teeming urban areas.

Thinking globally and acting locally takes on a whole new meaning when we see farmers as managers of our ecosystem services. Voluntary mechanisms offering long-term incentives to these men and women who are responsible for our ecosystems are becoming more and more common around the world, and are generally referred to as Payments for Ecosystem Services (PES).

Agriculture provides more than food and fiber. The farmers, herders, and forest managers who manage the world's land-based ecosystem services make decisions that reverberate throughout society at the local, national, and international level. To adopt more sustainable practices, these caretakers of the land need an integrated incentive package that combines capacity building with access to rural finance and higher value markets. They also require a path to participation in the design of these policies and programs. But financing such an integrated approach is costly and requires investment from a wider range of stakeholders.

AGREEING ON SUSTAINABILITY

A PES contract is an agreement between agriculture practitioners (such as farmers, herders, forest users) and other sectors of society that have vested interests linked to their activities to assure the continued provision of ecosystem services. These agreements can be local affairs—for example, between a water bottling company and the farmers around its spring, agreeing to reduce pollution beyond the levels mandated by law. Another model includes national programs where forest owners receive incentives to map and conserve remnant forest patches in their farms; in exchange, farmers receive technical assistance to improve productivity in their current farmland, to reduce the risk of expansion through deforestation. In these national programs, hydropower companies or tour operators contribute funds to invest specifically in their region of interest.

These and other initiatives are experimenting with a variety of governance systems at different scales worldwide. While their respective goals differ, they all aim at partnering with the private sector for long enough to allow the ecosystem to reveal improvements in its services. In some countries where agriculture is highly productive, national PES programs act as incentives to bring farmers closer to complying with existing pollution control, biodiversity, and water protection laws, eventually expanding beyond that. In developing countries, these projects often pilot new legislation, demonstrating the need for locally earmarked water-fee investment in watershed management or tourism benefit-sharing to compensate for the costs of wildlife conservation.

Pooling funds from public and private sources is key for catchment-wide, long-term land and water management strategies.

A PLACE AT THE TABLE

PES teams' jobs are hardest at the start, from the moment it's time to set the negotiating table for the various actors in the lansdscape. At this stage, getting the ministry of agriculture to understand the concerns of the ministry of environment, or water supply companies to explain their concerns to the mining industry, is arduous. In developing countries, simply bringing these actors together has been an achievement in itself. Once this happens, PES also requires cross-sectoral dialogue. This allows public authorities to work more closely with the private sector, exploring

legal options to allow for private co-financing of their development programs, and benefiting from their less risk-averse attitude to testing new approaches and technologies.

Within the private sector, Nespresso, Coca Cola, and Danone are examples of companies that have added PES to their portfolio of socially and environmentally responsible investments. Nespresso, together with NGOs and government partners, assists the coffee producers taking part in its AAA Sustainable Quality Program in improving quality and productivity. Farmers who join the AAA program agree to adopt good agricultural practices, such as preservation of biodiversity, water management, or prevention of soil erosion, so they can sustain long-term production in a preserved environment.

National PES programs act as incentives to bring farmers closer to complying with existing pollution control, biodiversity, and water protection laws.

Similarly, Coca Cola and its water bottling businesses around the world have engaged with conservation NGOs, universities, and national programs to increase water infiltration and offset their water footprint. The soy and corn farmers who participate in this initiative benefit from a cash incentive to adopt conservation agriculture and the consequent improvements in soil water retention and productivity increase. Danone invests in forest rehabilitation and renewable energy as a contribution to its carbon neutrality goals. The communities in the Sundarbans that have joined the program benefit from new mangrove nursery business and from the restored ecosystem function of the mangrove, which is acting as a nursery and feeding ground for fish.

Many of these private initiatives are heavily funded and highly technological—but they remain extremely local, covering only a few dozen households. The challenge lies in upscaling these solid initiatives to cover larger areas at lower cost. FAO's contributions at this stage include sharing lessons from field experience in its member countries, facilitating cross-pollination of ideas, and distilling key PES governance models to facilitate wider replication of good practice.

PES AROUND THE WORLD

Water trust funds are one of the most successful instruments to facilitate public-private investments in PES. In Latin America alone, there are 44 funds at different stages of development, and The Nature Conservancy (TNC) is now expanding its experience with these into Africa and Asia. While current funding is still mostly public—from legally required contributions like water fees or compensatory environmental investments—this type of instrument can also accommodate voluntary investment from the private sector. Finding a channel to pool public and private funds is one of the key obstacles in the first phases of most PES agreements, and this

is key for catchment-wide, long-term land and water management strategies.

In Italy, the province of Perugia is partnering with Syngenta to ensure that the farmers receiving agri-environment payments from the European Commission to further protect and enhance the environment on their farmland actually create quality habitats for pollinators. By using the advised seed mix proportion, purchased from any seed dealer, and following the management protocol advised by Syngenta, the farmers can actually deliver the environmental service they are receiving subsidies for: pollination, a crucial service of the agriculture ecosystem to farm productivity. Subsequent landscape beautification is another valuable asset that agro-ecosystems contribute to regional tourism.

But some of the most promising PES stories remain unwritten. For example, in Kenya, even after several years of negotiation, and despite the willingness of Kenya Electricity Generating Company Limited, targeting a share of the water fees being collected in the upper part of the Tana River to reduce sedimentation in the river has not yet been possible. Culprits include overlapping and outdated water fee regulations that have discouraged additional investment from the hydropower company.

To assure that PES achieves its potential, governments must open channels for the private sector to invest. On the other side, the private sector needs to be willing to partner with institutions whose business practices might be unlike theirs. Cultivating a common strategy will pay off in the long run. After all, we are all part of the same ecosystem.

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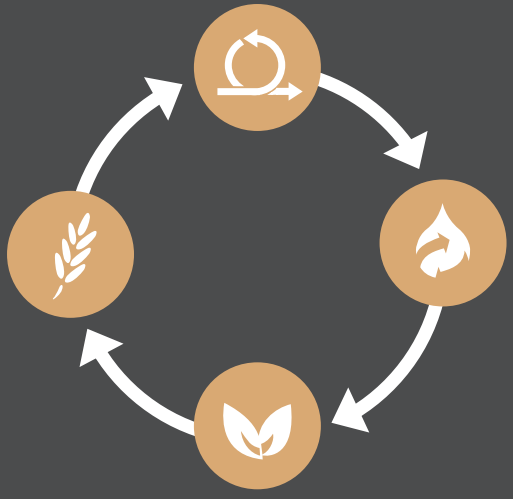
AGRI-NOMICS

FAO**LAND**&**WATER** EXPLAINS ECOSYSTEM SERVICES

WHAT ARE ECOSYSTEM SERVICES?

Ecosystem services in agriculture include the benefits society gets from the environment, thanks to farmers' interventions. Nutritious food, clean water, healthy soils, pest and disease control, and biodiversity are just a few examples of those benefits.

EXAMPLE OF THE ECOSYSTEM SERVICES SCENARIO



Sustainable agricultural practices such as conservation tilage, bench protection, or soil organic matter management...

induced by training, payment, or impoved access to knowledge, information, and markets...

leads to better erosion control, reduced water runoff, and improved soil formation...

and finally provides healthy food while ensuring long-term production potential and integrity of the natural resource base.

Source: "Incentives for Ecosystem Services in Agriculture (IES)," *FAO*

AGRICULTURE

ACTIVITIES THAT PROVIDE ECOSYSTEM SERVICES

- Terracing or agroforestry practices
- Increase irrigation use efficiency, protection of wetlands, farm-level water harvesting
- Establishing contour grass, flower strips, and hedgerows

INCENTIVES—SERVICE BUYER

- Offsetting to compensate for emissions
- Intact natural resource base used for products and services
- Fulfillment of sustainability and environmental responsibility commitments

INCENTIVES—SERVICE PROVIDER

- Training
- Improved access to markets and credits
- Payments

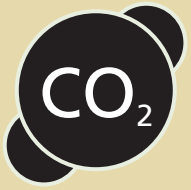
ECOSYSTEM SERVICES

- Erosion control and carbon sequestration
- Stable water supply for farming activities and business downstream
- Biodiversity and pollination

BENEFICIARIES—SOCIETY AND PRIVATE BUSINESSES

- Water users: clean water, stable supply
- Sustainable supply of healthy food
- Business interested (agriculture, green economy, eco-tourism, etc.)

FROM TREES TO SEAS



Source: NOAA

The upper safety limit for atmospheric CO_2 is 350 parts per million (ppm).

401 ppm

as of June 2014

By 2050

experts estimate there will be no fish or coral reefs left due to overfishing and ocean acidification.

Source: Science, World Resources Institute

In 60 years

there will be no topsoil left.

Source: Time/World Economic Forum

1/4 of land animals

will be extinct by 2050 due to global warming.

Source: Nature /Leeds University

1 out of 3 bites of food

depend on pollination by insects but over **30%** of bee colonies have collapsed.

Source: Yale University

What I$ nature WORTH?

DO OUR MOST PRECIOUS RESOURCES HAVE A FUTURE?

Photo © Victoria Adams-Kotsch, Granite Lakes, Colorado, U.S.A.

"Nature is the ultimate source of all economic value... No commerce or culture is possible without clean air and water, fertile topsoil, a chemically stable atmosphere, and raw materials for food, energy, and medicine."

—Allen Hershkowitz,
Natural Resources Defense Council

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