

# 1. Markets meet the environment in unexpected places

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Thinking about the environment in the developing world conjures up images of deforestation and flooding, poaching and poverty, or polluted water and air. Much has been written about these difficult problems. This book takes a different approach by looking through the haze to spot places where local environmental entrepreneurs are finding innovative solutions. The answers involve establishing property rights and encouraging market exchange.

The following chapters include real world case studies of entrepreneurs working to trade beehives for water, contract with communities to conserve wildlife, entice ranchers to graze less sheep, encourage villagers to use terraced farming, virtually fence a marine fishery, and to empower indigenous groups to manage their forests more efficiently. As you will see throughout this book, with the drive to create wealth, entrepreneurs are capable of both improving environmental quality and local economies in some of the least expected places.

The connection between wealth and health has long been understood in academic circles (Wildavsky 1980, Pritchett and Summers 1996). Evidence of this relationship can now be seen in mainstream outlets such as the *Wall Street Journal's* annual "Index of Economic Freedom" and the World Bank's "Doing Business Project." In Switzerland, for example, incomes are very high and so is average life expectancy at 82 years. But in countries such as Somalia incomes are low, with life expectancy at only 51 years.

More recently, the link between wealth and environmental quality has materialized. Despite the popular belief that market economies only generate consumerism and waste, in reality markets help create the capital that gives individuals the motivation and wherewithal to solve environmental problems. Economist Bruce Yandle and colleagues demonstrate this connection via the Environmental Kuznets Curve (EKC; Yandle et al. 2002). Although there is no single relationship that fits all pollutants for all places and times, there are families of relationships where the inverted-U EKC is the best way to approximate the link between environmental change and income growth. This connection can be seen in the levels of many environmental pollutants, such as sulfur dioxide, nitrogen oxide, lead, chlorofluorocarbons, and other chemicals previously released directly into the air or water.

The acceptance of the EKC hypothesis for select pollutants has important policy implications. It implies that some environmental degradation along a country's development path is inevitable during the "take-off process" of industrialization. It also suggests that when a certain level of per capita income is reached, economic growth helps to undo the damage done in earlier years and create the affluence needed for individuals to put more resources toward improving environmental quality. As Yandle et al. (2002, 17) suggest, "If economic growth is good for the environment, policies that stimulate growth [trade liberalization, economic restructuring, and secure property rights] should be good for the environment."

Despite "wealthier is healthier" and EKC models, the presumption that market economies pollute and destroy the environment remains. A big glitch with this impression is that most areas where environmental destruction is rampant are those where markets are absent, where laws change overnight, and where bombastic leaders have made their mark with property expropriations. The root of the problem then is not capitalism, but its absence. As we will see in this book, a healthy environment is itself a form of wealth, which individuals via free enterprise are able to make the most of.

## **The role of institutions**

Despite pouring more than 4.6 trillion (in constant 2007 dollars) in aid from the Western industrialized world into the developing world over the past 50 years, many nations remain trapped in a desperately poor economic and environmental state (Harvey 2012). Regardless of this outcome, Western governments continue to make larger aid payments. As a result, many governing elites are propped up by external support, which feeds a growing global welfare state.

If you can tune out the loud calls for more aid to less-developed countries, you can quietly hear economists and political scientists making reasoned requests to dig deeper for solutions, to look at each country's unique institutional environment rather than relying on the same faltering solutions (Arrow et al. 1995, Boudreaux and Aligica 2007). In his 1993 Nobel Prize speech, Douglass North said: "Institutions form the incentive structure of a society and the political and economic institutions, in consequence, are the underlying determinant of economic performance." Another Nobel Laureate, Elinor Ostrom (Ostrom 1990, Ostrom et al. 1993), demonstrated this idea by looking at real-world cases, showing that the economic and political performance of a society is not determined by the availability of resources but rather by institutional successes and failures (see Chapter 2 for a more in-depth discussion on institutional design).

In general, institutions can be thought of as the rules to a game – who has the rights to do what, how will a soccer player know when he is offside or who will call a foul in a basketball game (Anderson and Huggins 2003)? Unlike the rules in team sports, however, these guidelines often arise “spontaneously,” as by-products of individual choices, rather than deliberately through collective action (Hayek 1973).

Of these sets of rules, the legal environment has received the most attention. Faced with conflicts of resource use and confusion over resource ownership, parties can seek rights resolution through the courts as Nobel Laureate Ronald Coase repeatedly points out. If adjudication cannot fix the problem then perhaps the legislature can. But as Ostrom (2010) and Aligica and Boettke (2009) discuss, the Coasean formula for resolving disputes – negotiate, adjudicate, legislate – has its limitations. Only when the informal rules of a culture, such as customs and beliefs, support the emerging formal rules, will the positive effects of secure property rights, contract, and trade gain traction.

We have learned from the industrialized Western world that once property rights are embedded in an environment, the path to prosperity is paved. But why has this path been difficult to replicate in the developing world? We have a few hints, as Peruvian economist Hernando de Soto (2000) points out, the path to property rights reform is an indigenous route that evolves

organically and cannot be designed from afar. But what is the incentive to begin down the property rights path or to even think about improving the environment for individuals living near subsistence? The poor cannot afford to ignore tradeoffs associated with preserving land for environmental amenities or cleaning up air and water at the expense of economic development. Consequently, markets are being applied in many developing areas out of necessity – people simply do not have the time or resources to be environmentalists unless it pays. In other words, making the environment an asset is essential in the developing world where people have not yet reached a level of wealth necessary to afford them the time to think about being green.

This monograph aims to raise awareness of market solutions to environmental challenges in some of the poorest parts of the world. To accomplish this goal, alternative approaches based on trade and entrepreneurship – rather than the typical command and control path – are explored. To further strengthen the argument, specific case studies are highlighted. In most of these cases, the author has explored the situation first hand and in all cases the chapters were reviewed by experts in the field. These illustrations come from some of the least expected places. Why? Because if free market environmentalism can work in locations where the word “market” may not even exist or is shunned in the

local vocabulary, then this approach has the potential to work in every corner of the globe.

### **It begins with entrepreneurs**

Entrepreneurs exist in all cultures and countries. They thrive off of finding solutions where others see only failures. In the environmental arena, they are individuals or groups of people who think of innovative green business opportunities and who take on the risks required to convert ideas into reality. As resource economist Terry Anderson (2012, 4) writes, “Environmental entrepreneurs are my heroes, they give us cause to celebrate the future of our planet by finding ways to ameliorate or solve environmental problems.”

Entrepreneurs are tackling environmental challenges by learning how to collect benefits from what would otherwise have been a “tragedy of the commons,” a term coined by Garrett Hardin (1968) in *Science* to describe a common cow pasture that is ruined by too many people overgrazing their cattle. His fable is a useful illustration of a genuine public policy problem – how do you manage a resource that does not belong to anyone? A few solutions: one, close the commons and convert the environment into a private asset. This requires the entrepreneur to create or define property rights, which he or she will do when the benefits of having a well-defined system outweigh the costs of creating the system

(Boettke and Coyne 2003). Two, given the right institutional arrangement, the commons can remain open but be communally managed (Ostrom 1990).

To better understand this process, consider the creation of the western frontier of the United States during the nineteenth century. It was not always clear who owned the land, water, minerals, or cattle, which initially led to fighting over resources (Anderson and Hill 2004). To help avoid conflict and free up time and energy for basic survival, individuals and communities created their own system of property rights. Cattlemen, for example, defined their rights to cows by branding them and registering their brands in books published by local associations. Without a formal process for claiming land, ranchers established customary grazing territories to prevent overgrazing of common areas and hired cowboys who lived in "line camps" to enforce rights to the territories until the invention of barbed wire made property boundaries even clearer. Water rights were established by diverting water in drought years to the earliest diverters and hence those with the highest priority rights. And miners implemented their own customs, codes, and laws, which morphed into the Mining Act of 1872. Prior to these efforts it would have been difficult to imagine how ownership would evolve, but through the entrepreneurship of people confronted with the need for efficient use of resources, property rights developed quickly.

In contrast to the resource-extraction-driven settlement of the American West, entrepreneurs today are taming the environmental frontier by leasing water to leave in streams for fish, creating conservation easements for land preservation, practicing mitigation banking for wetlands and wildlife conservation, and by establishing shares in a sustainable harvest of fish to help revitalize failing marine fisheries. Free market environmentalism is flourishing in the Westernized developed world where wealth and the property rights toolkit can easily be put to work. Interestingly, this approach can also flourish on a small scale in developing countries.

### **What is the big deal about property rights?**

Property rights provide the foundation for a market economy. Without private property rights there would be no exchange, without exchange there would be no prices, and without prices there are no clear signals to convey information to consumers and producers. The three P's of property, prices, and profit/loss provide the three I's of a dynamic economy: incentives, information, and innovation (Herbert 2012).

In simple terms, think about how you treat a car you own compared to how you treat a car you rent. Nobody washes a rental car, but everyone takes care of their own vehicle because it is a valuable commodity (Anderson and Huggins 2008). Similarly, until environmental resources

evolve from a liability into an asset, they will not attract attention for stewardship and investment from individuals. Consider the differences environmental economist Michael 't Sas-Rolfes (2011) points out between the black rhino in Kenya and the white rhino in South Africa. Black rhinos are "owned" by the government of Kenya, which banned wildlife market institutions such as hunting in 1977. It was immediately apparent that this institutional arrangement did not benefit local people who control the black rhino's destiny. The black rhino population dipped from a population of about 100 000 in the 1960s to a low point of 2500 in the 1990s due to poaching. By creating stronger property rights – that is, more direct ownership of rhinos – one can create ways for individuals and specific groups to benefit directly from rhinos. Such approaches include contractual agreements with communities, tourist viewing, and trophy hunting. These options would give black rhinos much greater asset value and a chance of recovering from their downward spiral.

In contrast, legal white rhino hunting started in South Africa in 1968. At the time there were about 850 white rhinos in the country. Today, rhino hunts make a significant contribution to the South African economy. There are currently nearly 19 000 rhinos, of which 25 percent are privately owned. The value of a live rhino has soared during this time, making rhino breeding a highly lucrative business, not only for private

owners but also for the state parks who sell their surplus rhinos to the private market. Private ownership and hunting has played a pivotal role in saving the white rhino, which is now the most common of all the rhino species.

### **If it pays it stays**

In South Africa the lesson is clear: When land-owners benefit from preserving endangered species habitat, they preserve it. Chapter 2, "Saving wildlife in Kenya and sub-Saharan Africa," elaborates on this lesson by first pointing out what happens when wildlife becomes a liability.

Kenya is known for its wide-open savannas, inhabited by some of the largest mammals and biggest migrations in the world. But behind this backdrop, problems are brewing. The rule of law has suffered in Kenya along with its wildlife. Populations of larger animals have declined dramatically and are fragmented due to illegal hunting, following decades of political instability and open warfare. It was not just the black rhino that plummeted after hunting was banned in Kenya, lion populations have dropped from 20 000 to 2000 (Anderson 2013). Kenya's farmers, many of them very poor, resent animals that are popular with tourists but that threaten their existence. Elephants, for example, can raid crops, break into houses for stored grain, and in some cases react aggressively causing human injury and death.

Other citizens have also grown bitter after being told to protect wildlife – and have even faced criminal prosecution for killing animals – but rarely see any benefit from the money that tourists pour into the economy. Local tribespeople, in response, lash out against wildlife. Fortunately, there are a few examples where entrepreneurs are creating a better institutional framework, primarily by getting property rights and market incentives working to pay to protect wildlife.

Where entrepreneur Jake Grieves-Cook leases land from Maasai herders for tourist camps, cattle have been removed from the threat of lions, and the locals receive revenue and jobs in return for sharing habitat with large felines and other wild game. Today, Grieves-Cook's private conservancies encompass only 100 000 acres, yet they are home to more than 5 percent of Kenya's lions (Anderson 2013).

Rhino Ark Trust is another example of a private group successfully protecting wildlife in Kenya. The trust built a fence to protect wildlife around Aberdare National Park and is in the process of building a second fence around Mount Kenya. The group's success is based on collaboration involving private individuals, government agencies, and a network of community-based conservation projects in which landowners share profits from wildlife while assuming responsibilities for protecting it.

Chapter 3, "Fencing fisheries in Namibia and beyond," moves from wildlife to marine life in

the seas surrounding Africa – a rich resource that provides employment for millions of fishers, foreign exchange for governments, and food security for people in and out of the region. Yet, as the Food and Agricultural Organization of the United Nations reports, more than 75 percent of Africa's ocean fish stocks are either fully exploited or overexploited. The depleted state of this resource is a result of overfishing and the increased degradation of marine and freshwater ecosystems – due in a large part to a lack of property rights to fish stocks. This tragedy can be seen clearly in several African fisheries. In Namibia, however, virtually fencing fisheries with catch-share systems is creating positive results – witness the recovery of a hake fishery in Chapter 3.

Barbed wire is obviously not feasible in the deep sea but property rights are being defined through a combination of market approaches that are helping to improve both environmental quality and quality of life in Africa and beyond. Chapter 3 dives into the opportunities to replace open-access fisheries with limited access regimes, concentrating on individual fishing quotas off the shore of Namibia, but also exploring beach management units around Lake Victoria, and bottom-up, community-based cooperative agreements in India's artisanal fisheries.

In Chapter 4, "Ecosystems at your service in South America," Patagonians and Bolivians are using the same barbed wire approach to define

property as their neighbors to the north. Like the rugged cowboy of the American Wild West, the idea of the untamable gaucho is embroidered into the fabric of the Argentine consciousness. But this image is fading as the gauchos' traditional sheep grazing practices are turning Patagonian grasslands into a denuded desert.

Paradoxically, sheep – the slayers of the grasslands – could become the saviors of the same landscapes. By partnering business, environmental interests, and local ranchers, green can be grown on the ground and in pocketbooks while conserving one of the least protected terrestrial habitats. This case study involves the Nature Conservancy, Patagonia, Inc., and Ovis XXI, which together form the Patagonian Grasslands Conservation Project. Armed with local ranching expertise, scientific knowledge, and market experience, the trilogy, with entrepreneur Carlos Fernandez leading the charge, is working to conserve millions of acres of grassland in Patagonia over the next ten years.

The majority of the land targeted by this project is privately owned and clearly defined by barbed wire. But because landowners face political and economic challenges that affect their ability to stay in business, there has been little incentive for ranchers to manage resources for the long term. The ranchers need motivation to protect resources. In this case the carrot comes in the form of a cash reimbursement to individuals who voluntarily agree to graze less sheep and/or

use more environmentally friendly grazing practices. The wool from the ranchers who enter an agreement with the Patagonia Grasslands Conservation Project is then sold to the Patagonia clothing company with a percentage of the sales revenue going back into the project.

In Bolivia, property rights are less defined, which helps explain why locals want barbed wire as compensation for protecting native vegetation in a water-producing cloud forest. Natura Bolivia, an environmental group led by Maria Teresa Vargas and Nigel Asquith, are developing local capacity for a payments-for-environmental-services system. The system is simple; the users of an environmental service, in this case water, compensate the providers of the service, in this case the upstream farmers, for the opportunity cost of providing water. Implementing this system, however, is hard in a country that lacks strong property rights and an effectual legal system. Despite these obstacles, Natura Bolivia is proving that market solutions work by generating gains from trade for both upstream landowners and downstream farmers. Asquith and Vargas are now using their successful model to help protect other watersheds and communities in Bolivia and beyond.

Watersheds and water quality are also a big concern in China. The Yellow River has played a critical role in the growth of Chinese civilization. More recently, as described in Chapter 5, "The thirsty dragon," the Yellow River symbolized

much of what went wrong with China's environmental policies over the past 50 years. The river's pollution levels were off the charts and the lower reaches were so choked with sediment that the river bed stood several feet above the surrounding land – raising the risk of floods. Furthermore, the river was so overexploited that it failed to reach the sea for the majority of the year.

For the past 30 years, the Chinese government focused on large-scale engineered solutions to increase the supply of water. When water ran out or became polluted, they drilled deeper wells or built longer diversion channels to tap fresh resources. But the Yellow River has shown the limitations of the old-style approach and forced an alternative way of thinking that blends science, local knowledge, and market mechanisms.

The Loess Plateau Project transformed four poverty stricken Chinese provinces from wastelands to productive farmland, tripled local incomes, and reduced the sediment load in the Yellow River by 60 million tons a year in ten years. This case study is about property rights, aligning institutional interests, and keeping technical solutions simple. There is still a long way to go before the Yellow River is off life support but the Loess Plateau and Grain for Green projects highlighted in this chapter serve as an example of how markets can flourish – even within the construct of communist China.

Chapter 6, “Un-American Indian reservations and resource management,” moves from water to the forests of North America. One might not think of Native Americans as part of the developing world, but in reality American Indian tribes and First Nation bands in Canada are often stuck in reservations resembling areas in very poor developing nations. The explanations for poverty and poor environmental quality in the developing world are the same for American Indian reservations – the problems begin and end with the structure of property rights and the rule of law.

American Indian tribes are the largest landholders in the United States; together, reservations make up nearly 100 million acres – an area just smaller than California. And much of this land is rich in natural resources. Along with timber, grazing, and crop lands, other resources include oil, natural gas reserves, coal, and uranium deposits. Most people assume such resource abundance equates to prosperity, but this is not so for developing nations, generally, or for Indian nations, particularly. The North American native populations face an entrepreneurial problem that is grounded in the “frozen capital” of the reservation system (de Soto 2000). This arrangement forces collective ownership on cultures that are historically non-collective. It also creates legal barriers that increase both organizational and transaction costs.

Hernando de Soto (2000) made the forceful argument that economic development requires the establishment of institutions that protect property rights and the creation of a legal system sophisticated enough to allow for the efficient transfer and development of these rights, as well as the ability to extract the full benefit from them. In de Soto's discussion of the economic problems confronting the poor of South America, he argues that the entrepreneurial initiatives of these groups are severely restricted by their inability to access the most basic and important source of capital – their land. American Indian reservation land is largely held in trust, meaning individuals living on reservations have no personal ownership of their land but are considered wards of the state, a system historically established to help “civilize” the native peoples.

Despite political antics and a complex web of laws, new institutional arrangements are emerging and encouraging investment and economic development on some reservations. Beginning with the Self Determination Act in 1976 and followed by a series of compacts, a few tribes have taken the lead in assuming management responsibility for *their* land. The Confederated Salish and Kootenai on the Flathead Reservation in Montana have been successful at starting small businesses and have proven better at managing their timber resources than surrounding federally managed lands.

The outlook remains unclear with the evolving federal tribal trust relationship, but modern models of successful tribal forestry programs are proving that there are rewards for self-determination. Moreover, the continent's first inhabitants have a rich institutional background, illustrating their ability to effectively manage themselves. The key is for Congress and federal bureaucrats to return to American Indians the same respect and secure property rights and freedoms that have encouraged investment, conservation, and prosperity outside the reservation borders.

The Zapotec Indians of Mexico offer an additional example south of the US border of an indigenous group who has reclaimed territorial rights and control of their forest resources. The outcome thus far: a stream of economic and environmental benefits for their local community. Insights into reservation property and institutional arrangements in this chapter help shed light on problems surrounding stewardship and economic development worldwide.

## **Conclusion**

It is in the developing world where big property rights battles are being waged and where the biggest victories stand to be won for less poverty and more conservation. The good news is that, despite facing predatory governments and political instability, small wins are taking place across

the globe. Environmental entrepreneurs are gaining ground by creating markets for the environment. The solutions are not always optimal but they are a good start and are gaining traction from watershed to watershed in South America and rural China, from wild game preserve to wild game preserve in Africa, from fishery to fishery in Namibia and India, and from tribal forest to tribal forest in North America.

This monograph only touches on a few examples from some of the poorest parts of the world. The various institutional environments offer a gold mine for pragmatic case studies of the ways in which property rights and markets can evolve to enhance local economies and local environments at the same time. That said, it is important to keep in mind that although entrepreneurs are bringing about improvements on a small scale, it is clear that their efforts are still hampered by the insufficiencies of their governments. In the end, the search for meaningful environmental policy is a search for ways to strengthen property rights, free markets, and the rule of law. This search begins by learning from local examples tailored to local situations and settings.

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