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Edited by Gregory K. Ingram and Yu-Hung Hong

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Capturing Economic Rents to Pay for Conservation of Sensitive Sites

John A. Dixon

Conserving ecologically and culturally sensitive sites is a challenge. The costs of conservation often loom large, while the benefits from conservation—the continuing flow of services over time—are frequently quite diffuse and difficult to capture. This is especially true in developing countries, where the short-term costs of conservation (in terms of either lost development opportunities or the actual monetary costs of conservation and management) seem more than local communities (or even countries) are willing to pay. As a result, there is widespread degradation of unique or sensitive sites, including tropical rain forests, coral reefs, upland watersheds, landscapes, and cultural sites. This slow degradation is somewhat paradoxical, since the same sites often face increasing demand from national and international visitors, who are willing and able to pay for these services.

A potential solution to this problem is to change how these sensitive sites are considered. Rather than treating unique ecosystems or sites as management "burdens" that have to be paid for by scarce private or public monies, we can treat them as special forms of the environmental and/or cultural capital that forms part of a country's asset base. By using accepted economic tools and policies, these assets can be managed in ways that produce financial and ecological benefits for the country. In addition, they can increase in value over time. In other words, rather than "mining" these sites as we would mine oil, gas, or coal, we can treat

Many thanks to Alan Hong, Hanauma Bay manager, and Shawn Carrier, outreach education specialist, for helpful discussions on the management of Hanauma Bay.

them as the living, often potentially renewable resources that they are, and use sound economic approaches to reinforce this process.

This chapter considers some of the approaches being applied today to improve the management of sensitive sites by capturing part of the values associated with them, especially when tourism and recreational uses are involved. Additional financial resources can lead to investment in improved management and conservation, and perhaps increases in the carrying capacity of the sites, thereby potentially increasing economic benefits in the future. The focus is on developing countries, where public funding for conservation is frequently lacking. Although many of the examples relate to ecologically fragile sites (e.g., coral reefs and rain forests), the same lessons apply to the management of culturally rich sites embedded in the landscape (e.g., Machu Picchu in Peru, Angkor Wat in Cambodia, and the many sites found in Egypt). In each case, the cultural site is part of the landscape, and it is impossible to conserve the built site without also protecting the natural environment where it is located.

The Problem: Harnessing Market Forces to Conserve Unique Sites

Managing conservation lands or important historical/cultural sites is not a problem if financial resources are abundant. Threatened areas can be bought and set aside for conservation, or private property owners can be paid (bribed) to provide conservation services. In many cases, however, especially in developing countries, this preferred outcome is not possible, since (1) public or private resources to buy and conserve land are very limited or nonexistent; and/or (2) the economic pressures on landowners to convert or degrade unique sites are very powerful and lead to resource degradation over time.

In spite of the clear recognition of the value of these sites and the measured willingness to pay on the part of users, it has been difficult to capture parts of that willingness to pay in order to provide and protect the desired services. In part this is due to a disconnect between those who provide the services (often the state) and those who use them (national and international visitors). In an increasing number of cases, this disconnect is being bridged, thereby enhancing both conservation efforts and users' experiences.

The Solution: A Variation on the PES Approach

DIFFERENCES WITH THE PES APPROACH

The concept of payments for environmental services (PES) is one well-known approach to address this issue (see chapter 11). A PES system usually collects payments from the beneficiaries of some environmental service (e.g., water consumers in a city) and then uses some intermediary organization to manage these funds and make payments to those who provide the service (e.g., upstream watershed managers). Two of the most frequently cited examples are the New York

City watershed and the Heredia watershed in Costa Rica. PES schemes rely on establishing an indirect link between service providers and beneficiaries. However, as traditionally applied, PES is a targeted approach appropriate for certain situations. It is not a panacea for all sensitive sites. In fact, it is notable that the same PES programs appear over and over in the literature, including in my own writing on this issue (Dixon and Xie 2007). Clearly, the idea is very appealing, even if the implementation is still in its infancy.

This chapter considers a variation on PES called direct rent capture (DRC). In this approach, the service provider uses economic tools and policies to collect "economic rents" from the beneficiaries to help pay for conservation. DRC often takes the form of targeted admission or user fees and shows considerable promise for enhancing the conservation and management of certain sensitive areas, especially those where access can be restricted and where there is continuing use.

CHARACTERISTICS OF DRC SYSTEMS

DRC systems share a number of characteristics, including the following:

- Recognition of the direct link between users and providers of environmental or cultural services (often within a smaller physical area than is found in many PES systems).
- A realization by both users and providers that there is value in maintaining a flow of sustainable services.
- The ability of users to pay for services (even if there has not been any payment in the past).
- Established and recognized rules of the game on both sides.

A major limitation of the DRC approach is that it may not be suitable for addressing overcrowding or carrying-capacity issues. Although pricing can be very effective in controlling demand (higher prices or fees lead to reduced demand), the actual price needed to markedly reduce demand at some sites may be more than is politically or socially acceptable if it means that only very rich people can afford to visit. In such situations, other approaches—for example, controlling the absolute number of visitors—may be required. As we will see, these policies can be combined with DRC approaches to address both issues—generating sustainable funding and respecting a site's carrying capacity.

SELECTED EXAMPLES OF DRC PROGRAMS

In the following sections, six specific sites and one area are examined to illustrate the opportunities as well as the limitations of the DRC approach. Two of the examples are marine parks: Hanauma Bay in Hawaii and the Bonaire Marine Park in the Netherlands Antilles. One is a large national park that combines terrestrial and marine elements: Galapagos National Park in Ecuador. (The special case of private safari parks in southern Africa is also briefly noted.) Another two examples are cultural sites set within the landscape: Petra in Jordan and myriad

sites in Egypt. The final example is a landscape managed at the national level: Bhutan. All of these sites share one characteristic: they are fragile or sensitive sites that are threatened by visitors and other users. The imaginative application of different DRC approaches, while not a panacea, does provide some promising options for improving funding for the sustainable management and conservation of these sites.

Marine Parks

HANAUMA BAY

Hanauma Bay, located on the southeast end of Oahu, Hawaii, is a collapsed volcanic crater open to the sea on its eastern side (see figure 12.1). It is a marine reserve with a protected coral reef and a large, tame fish population. It may contain the most valuable coral reef in the world—at least if value is measured by the economic rents generated by the site. The park is open six days a week and admits more than 800,000 visitors per year (an average of 2,400–2,500 per day). Most of these visitors come to snorkel and view the fish and other marine animals, including green sea turtles. Another 500,000 visitors per year are restricted to a special upper parking lot set aside for tour buses and vans, where they can stay for up to 15 minutes. These visitors pay no fee and cannot go down to the beach.

Hanauma Bay was not always so carefully managed. In the 1970s, only about 210,000 people visited the site each year. That number jumped to more than 2 million in the early 1980s and more than 3 million later in the decade. On busy days in the late 1980s, as many as 5,000–10,000 people visited the bay. The "open access" policy was leading to degradation of the site—both the beach and the reef. The large number of visitors exceeded any measure of the carrying capacity and created problems of solid waste and wastewater management, as well as physical impacts on the reef (e.g., from visitors standing on the reef to observe the fish) and the fish population (e.g., from visitors feeding bread or peas to the fish). The level of use was unsustainable.

The City and County of Honolulu, which manages the park, decided that action was needed to reduce stress on the ecosystem. The obvious solution was to reduce the number of visitors and increase visitors' awareness of their potential impacts on the ecosystem. County funds for management were limited, but visitors were willing to pay to use the park. Therefore, a threefold plan was created to address the problem: (1) improve the parking and reception facilities in the upper areas; (2) offer information services, displays, and other facilities in the upper areas; and (3) implement a fee system to help pay for ongoing education and maintenance services.

Hawaii has a strong tradition that all beaches and coastal areas (up to the high-tide mark) are public property and are open without charge to all users. However, because of the overcrowding and special management issues of Hanauma Bay, a DRC fee system was introduced there about 10 years ago. Visitors who

Figure 12.1
Hanauma Bay

The beach at Hanauma Bay, with the coral reef on the left, as seen from the upper parking lot.

Looking beyond the reef to the open sea from the upper parking lot.

enter by car pay a $1 parking fee, and almost all visitors now pay a $7.50 entrance fee to go down to the bay. There is no charge for residents of Hawaii, military personnel stationed in Hawaii, or children under age 12. Visitors are required to watch a brief informational video in a small theater in the upper reception area. The video describes the history of the bay, explains why the reef and fish population are sensitive, and tells how visitors can help protect the bay while still enjoying it. After watching the video, visitors can either walk down to the beach or take a tram for a small fee. The video is shown four times an hour, and the theater can accommodate 125 people. Thus, the maximum number of people entering the bay is 500 per hour.

The system works very well on several levels. Since almost all visitors come by car, the capacity of the parking lot is the main device used to control access. The parking lot is open from 6:00 a.m. to 7:00 p.m. Once it is full (there are about 310 parking spaces), the entrance is closed. During busy periods, this often happens by 8:30 or 9:00 in the morning. Tour buses are not allowed to park or drop off passengers. As beach visitors leave, the lot is reopened, and additional visitors are allowed in. The entire bay is closed to visitors every Tuesday to allow for park maintenance and give the ecosystem a chance to rest.

The fees paid by visitors generate around $3 million per year. (It is estimated that 90 percent of visitors are not residents of Hawaii.) Another $1 million comes from rent paid by concessions, including the snorkeling gear rental operation on the beach, a gift shop in the upper reception area, the tram down to the beach, and a snack bar. These funds pay for the operation and upkeep of the bay as well as education and outreach activities at the visitor center. The visitor education program has helped reduce direct contact by visitors with the reef, and some coral regrowth has been noted. Bans on fish feeding (1999) and smoking (1995) also have allowed a gradual improvement of the land and sea environment.

Hanauma Bay is an excellent example of working with those responsible for managing a sensitive (and in this case unique) resource to capture some of the willingness to pay by users to help maintain and conserve the resource. Because of a court ruling, Hanauma Bay cannot generate more money than it needs for management and conservation. If this were not the case, a higher fee could be charged, and any surplus funds could be used for managing other sensitive areas, or they could go to the general City and County of Honolulu's budget.

Cesar et al. (2002) conducted a study of the economic value of coral reefs in Hawaii. They found, not surprisingly, that Hanauma Bay had the largest value per square meter of any reef in the state. They estimated annual economic rents of about $92 per square meter of reef ($117 in 2009 dollars), and a total annual value for the bay of about $50 million (in 2009 dollars). More than 90 percent of this value is due to the direct use by visitors. With the present fee structure, the City and County of Honolulu captures only a portion of this economic rent.

There are pressures from tour operators who resent the restrictions on bringing in large groups and their ability to sell tours to the marine reserve. These tensions will always exist because of the unique nature of Hanauma Bay, its limited

carrying capacity, and the fact that the admission fee charged nonresidents is much less than their willingness to pay. A higher admission fee for nonresidents could be used to further reduce demand, but it would have both social and equity implications. For example, a sharply higher entrance fee for nonresidents would mean that this unique natural resource was basically "for sale" and that visitors with lower incomes or larger families could not afford to visit. Although this is the way that private property markets work, it is questionable whether this would be acceptable to the people of Hawaii or to many of the visitors to this unique natural resource.

BONAIRE MARINE PARK

The Bonaire Marine Park (BMP) is one of the Caribbean's premier diving destinations. It includes all the waters around the island of Bonaire from the high-water mark onshore to a depth of 60 meters (almost 200 feet) offshore. The BMP was one of the first diving locations in the Caribbean to institute an entrance fee system. Although the fee system, a classic example of DRC, was strenuously fought by the diving industry—in both the Caribbean and the international commercial diving press—when first proposed, it has since become a model followed by other locations.

First instituted in the 1990s, the annual fee was initially set at $10 per diver. Each visitor who paid the fee received a plastic dive tag that could be attached to a buoyancy compensation device—BCD—(for divers) or worn around the neck (for nondivers). This served two purposes: it showed that the fee had been paid and was good publicity for the BMP when divers went to other locations (just as a lift ticket attached to a ski jacket is).

Dixon, Scura, and van't Hof (1992) examined both the economic carrying capacity of Bonaire's reefs and divers' willingness to pay for reef conservation and park management. We found that the $10 fee would generate significant revenues and have almost no impact on demand from divers. When first implemented, the fee produced revenues close to $200,000 per year and in fact appeared to have no impact on demand. Since that time, tourism has continued to grow in Bonaire. In 1992 some 18,700 divers visited the BMP. By 2003 the total number of visitors rose to 65,000, most of them coming for diving vacations, even if not all family members were divers (Cesar 2000; personal communication with BMP authorities, 2009).

The fee structure also has changed over time. In 2010 the fee was $25 per year for divers and $10 per year for nondivers. Divers could also buy a one-day pass for $10. The fee is called a "nature fee" to reinforce the idea that the monies collected help manage and conserve the marine park. The funds go directly to STINAPA, a nongovernmental organization (NGO) set up to manage the BMP. Visitors are willing to pay the fee because they value the excellent diving found in the BMP and the park's other resources. As is also true in the other examples presented here, even with the increase in the fee for divers, there is still consider-

able consumer's surplus left for visitors to enjoy (and operators to potentially capture).

Terrestrial Parks

GALAPAGOS NATIONAL PARK

The Galapagos Islands constitute one of the world's unique places. Located about 1,000 kilometers (620 miles) off the coast of Ecuador, the islands are a world-class visitor destination, due to the combination of the volcanic landscape and amazing fauna and flora, all in a setting with only minimal contact with the outside world. More than 90 percent of the land area of the islands is protected as part of the national park and is intensely studied by various groups, including government agencies and NGOs (Bensted-Smith 2002; CDF 2006). Human settlement is confined to a few small areas, and most visiting is done from live-aboard boats. Tourism is strictly controlled by a permit system based on "cupos" that licenses boat operators. One cupo is equal to a berth on a tour boat. There is also a requirement that every 16 visitors have at least one guide. Only holders of cupos can offer boat-based tours and do business within the park.

Visits to the Galapagos vary from three to seven days on average and are not cheap: a boat-based tour costs $250–400 per person per day. Although there are some one-day tours on smaller boats based in the islands' few towns, most visits are multiple-day trips on boats that can accommodate at least 16 people.

Tourism has placed considerable pressure on the islands. The number of visitors grew from 66,900 in 2000 to about 172,400 in 2008, of which about 70 percent were foreigners (see table 12.1). More than half the visitors (almost all the foreigner visitors) stay on boats. The rest stay in hotels or with family members.

Table 12.1
Tourist Arrivals to the Galapagos (thousands)

Year	National Visitors	Foreign Visitors	Total
1980	4.0	13.5	17.4
1985	6.3	11.6	17.8
1990	15.5	25.6	41.2
1995	15.5	40.3	55.8
2000	12.6	54.3	66.9
2001	19.8	57.9	77.7
2005	35.6	86.1	121.7
2008	53.5	120.1	172.4

Source: FN WWF (2002); Galapagos National Park Web site.

Table 12.2
Entrance Fees for Galapagos National Park, 2006 (US$)

Foreign tourist	100
Foreign tourist under age 12	50
Foreign tourist from Andean Community or Mercosur country	50
Foreign tourist from Andean Community or Mercosur country under age 12	25
Citizen or resident of Ecuador	6
Citizen or resident of Ecuador under age 12	3
Foreign tourist (nonresident) attending a national academic institution	25
National or foreign child under age 2	No fee

Source: Drumm (2006).

Residents of the Galapagos are not charged visitor fees. Since almost all visitors arrive by air (with only a small percentage coming on large cruise ships) and it is assumed that they have come to visit the national park, all nonresidents pay an admission fee to the park at the airport. The fees are currently $100 for non-Ecuadorians and $6 for Ecuadorians, with reduced rates for children and students (see table 12.2). Revenues from the entrance fees are about $12 million per year. The money is divided among various stakeholders in the islands (see table 12.3) and provides a steady source of income for these groups. It also provides the political "buy in" of other stakeholders, including some government agencies and even the Ecuadorian navy.

Table 12.3
Distribution of Revenues from Entrance Fees Generated by Galapagos National Park (%)

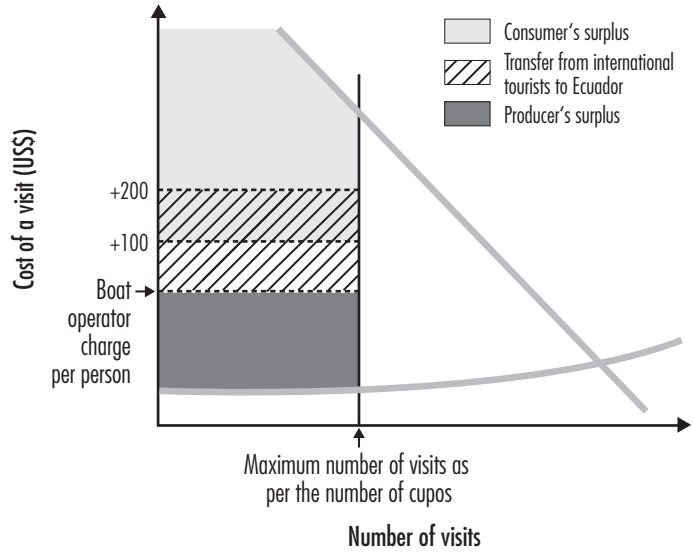
Galapagos National Park	40
Galapagos Marine Reserve	5
Galapagos municipalities	20
Galapagos provincial government	10
Ministry of Environment	5
Galapagos National Institute (INGALA)	10
Galapagos Inspection and Quarantine System (SICGAL)	5
Ecuadorian navy	5
Total	100

Source: Drumm (2006).

Although the entrance fee here is one of the highest access fees found anywhere in the world, large economic rents associated with tourism are still not captured (at least by the park authorities). The holders of cupos (like the holders of taxi medallions in New York City) possess a valuable resource that allows them to charge top dollar for tours. There is no formal price attached to a cupo, but informally it is valued at $20,000 or more. Holders consider cupos their personal property, even though by law the cupos are actually owned by Ecuador and could in theory be reallocated.

Many environmentalists believe that the number of people visiting the Galapagos must be controlled and perhaps even reduced. At present the major constraint on expanding tourism is the number of cupos available. Figure 12.2 is a stylized representation of tourism in the Galapagos, including a limit on boat-based tourism due to the cupo system. What is clear is that there is considerable consumer's and producer's surplus generated by tourism and that the current $100 entrance fee for non-Ecuadorian visitors captures only part of the consumer's surplus. My own "guesstimate" of the economic rents associated with the Galapagos indicates that current rent capture is at most one-third of the total consumer's surplus. This is implicitly shown in table 12.4: the total of fees collected is about $12 million, and this still leaves between $25 and $35 million of economic

Figure 12.2
Supply and Demand Curves for Galapagos Tourism, with Consumer's and Producer's Surplus



Source: Dixon (2007).

Table 12.4
Estimated Annual Gross Economic Flows Associated with the Galapagos, 2007

Sector or Activity	Gross Economic Flow, ca. 2005 (millions of US$)	Economic Rents (millions of US$)	Where the Money Is Predominantly Spent[a]
Tourism			
International tourism	250–350	25–35	N, I, L
National tourism	10	1–2	L, N
Fishing	3–6	Probably zero or negative	L, N?
Research and conservation	10		L, N, I
Public expenditures	12–15		L, N
Total	285–391	26–37	

[a] I = international; N = national; L = local. The order indicates relative importance by location for each type of spending.
Source: Author's estimates and Dixon (2007).

rents from national and international visitors (Dixon 2007). Even a doubling of the entrance fee to $200 would leave considerable consumer's surplus for visitors. This does not even consider the issue of the producer's surplus for operators who hold cupos. The producer's surplus is probably considerable, as indicated by the great sensitivity about the ownership, distribution, and value of cupos.

Although expanding visitor numbers by issuing more cupos would increase both the consumer's and the producer's surplus (at least in the short run), there is a legitimate concern about the carrying capacity of the ecosystem and the related danger of introduced species that argues for avoiding growth in visitor numbers. With such large economic rents on the table, however, there will be continuing tensions between groups that want to expand visitation (e.g., tour operators and the local population) and those that want to control or even reduce the number of visitors (e.g., scientific and environmental groups). One thing is clear: the present cupo system is better at controlling the number of visitors than it is at maximizing rent capture.

SAFARI GAME PARKS IN AFRICA

African game parks provide another interesting example. Large areas of conservation land are usually required to maintain healthy populations of various wildlife species. Migration, the availability of food at different times of the year, and complex population dynamics often mean that sizable areas of land (habitat) must be protected to provide wildlife services on a sustainable basis. These ser-

vices range from passive, nonconsumptive uses such as wildlife viewing to active, direct uses such as hunting for trophies or harvesting bush meat.

In East Africa, the major game parks are often large and under pressure from local populations, who may want to expand their livestock operations into the protected areas or poach the wild animals found therein. The dynamic of different groups following their own self-interests will result in an unsustainable result: habitat will be degraded or lost, and with that the environmental services that were formerly produced also will be diminished or lost.

Although the best-known game parks are publicly owned and supported by the collection of entrance fees (e.g., Kruger National Park in South Africa and the Masai Mara National Reserve in Kenya), there is an interesting trend toward the private provision of similar services. This is particularly true in southern Africa, where some private landholders have converted their land from agriculture or livestock operations to game parks. These private parks, though smaller than the national parks, can be quite large and make their money by selling various packages of services, including animal viewing, accommodations, and food.

This example of public and private provision of similar services is somewhat unusual. (One parallel in the United States might be both the public and private provision of winter sports sites, especially ski resorts.) In southern Africa, there are sensitive issues related to land ownership and competing uses for rangeland. Unlike ocean recreation sites, where it is exceedingly rare to have private ownership of coral reefs or marine resources, land-based safari tourism can be privatized, and land can be managed on a sustainable basis. Economic rents can definitely be captured. Whether this is a socially or politically viable model will depend on land ownership patterns and whether private game parks are seen as an inclusive or exclusive management approach. This is a major issue in parts of southern Africa, where it is felt that private game reserves would usually be owned by large landowners, who are often of European extraction, and not to native Africans, who tend to have smaller or communal landholdings.

Cultural Sites Within Sensitive Landscapes

PETRA, JORDAN

Petra, the fabulous "hidden" city of the Nabataeans cut into the cliffs of a wadi in southern Jordan, is another of the world's premier tourist sites. Attracting many visitors to Jordan, Petra is heavily marketed and instantly recognizable (partly due to its appearance as a backdrop in films such as *Raiders of the Lost Ark*). The site itself was home to a Bedouin population that sometimes lived within the rock-cut buildings and traditionally derived its livelihood from selling services to tourists. The government of Jordan decided that in order to enhance visitors' experiences and to help protect this sensitive site from cooking fires and habitation, the Bedouins would have to move out of Petra and resettle in a new village nearby. This decision was not popular among the Bedouins, and a compromise

was reached whereby the local population could continue to sell souvenirs and food within the site.

Park authorities traditionally charged a uniform fee to all visitors—about 1 Jordanian dinar, or JD (equal to about $1.40 in 2010). In the 1990s, the pricing policy was changed, with foreigners paying about 20 JD ($28) per day and Jordanians still paying the original amount. Fees for foreigners have since gone up to 23 JD (about $32) for a one-day pass, 26 JD (about $36) for two days, and 31 JD (about $43) for three days. The results of the increased fees were not surprising: there was no measured decrease in foreign visitors, but revenues increased greatly and provided the bulk of the income for the entire national park system. Tourism has boomed, especially since Petra was chosen as one of the New Seven Wonders of the World in 2007. More than 580,000 tourists visited Petra in 2007, and the numbers have increased every year since then.

Although there has been some resistance to the higher entrance fees, especially from visitors who come from nearby countries (especially Israel) and from student groups, most visitors are more than willing to pay the fees. As this case shows, unique cultural sites can generate large economic rents, which can be captured to improve management of the sites and to help subsidize other parts of a struggling park system.

EGYPT

Egypt has some of the world's oldest and most spectacular cultural/historical sites, which are often embedded in the country's landscape. Thus, both the man-made monuments and the natural environment are part of the "package" visitors enjoy, whether it is the Giza plateau, with its Great Sphinx and pyramids; a Nile River cruise; Abu Simbel, on the shores of Lake Nasser; or the ancient capital of Luxor. Tourism in Egypt has always combined natural scenery and historical sites. In fact, it is one of the world's oldest tourism destinations; Greek visitors in 300 B.C. left detailed accounts of their travels there. The Egyptians recognize that their cultural heritage creates large economic rents and are quite proficient at separating visitors from their money.

Current pricing policies in Egypt are an excellent example of a sophisticated DRC system. Fees are set site by site and by special attractions within a site. It is very easy to spend $100 or more per day for entrance fees when visiting Luxor or Cairo. In the world-famous Valley of the Kings, the Theban necropolis on the west bank of the Nile across from Luxor, a general admission ticket costs £E80 (about $15) and is good for a visit to any three tombs. (There are 20 or more tombs here that have been developed for visitors, and the authorities rotate those that are open to visitors on any given day.) The most famous tomb is that of King Tutankhamen. Although it is also one of the smallest and plainest tombs, because of the fame of King Tut, an additional ticket is required to enter this tomb. It costs £E100 (about $23). Yet because many visitors will not pay for the extra ticket, King Tut's tomb is actually much less congested than the "pick three" tombs.

A similar pattern is repeated all over Egypt: hefty admission fees to major (and even minor) historical sites, aggressive pricing of special attractions, and price differentiation between Egyptians and non-Egyptians. Admission fees for Egyptians are posted only in Arabic and may be 10 percent or less of the fees for non-Egyptians (see figure 12.3). It is interesting to note that the price differential for sites that are capacity constrained, such as entrance into the Great Pyramid of Cheops, is much smaller. The number of visitors allowed to enter the Great Pyramid is restricted because of the temperature and the small space. More visitors are allowed inside during the cooler winter months (500 per day) than during

Figure 12.3
Admission Fees for the Giza Plateau and Pyramids

the warmer summer months (300 per day). Whereas at other sites Egyptians are charged just a small percent of what foreigners pay, at Giza Egyptian adults pay half as much as foreigners to enter the pyramid: £E50 versus £E100. The Supreme Council of Antiquities seems well aware of rent capture and revenue maximization under conditions of supply (capacity) constraints.

Egypt receives millions of visitors each year, and its admission fee system is nuanced and sensitive to demand and supply factors. It is designed to extract maximum economic rents directly from visitors to help support the conservation of cultural and historical sites—both the man-made monuments and the surrounding natural environment. More broadly, tourism is one of Egypt's major sources of foreign exchange (along with the Suez Canal and some agricultural and oil and gas exports). Egypt received 12.8 million tourists in 2008 and revenues of around $11 billion, or just under $1,000 per tourist, accounting for around 7 percent of its gross domestic product (GDP).

Extracting economic rents is one matter; effective management of sites and resources is another. In general, major tourism sites in Egypt are well managed, and commercial activities are separated from the historical sites themselves, usually in a separate bazaar outside each site. Public services (e.g., restrooms and snack bars) are also available, and direct impacts from visitors on the sites is reduced as much as possible. Visitors enjoy a better, more controlled experience and can also see that visitor facilities are being improved. However, with so much money being generated, and with such a high level of international interest in and support for cultural site conservation and management, it is not always clear what share of these "site and service" investments are paid for by the Egyptian government and what share comes from international organizations.

Landscapes and Agricultural Lands: Bhutan

Tourism in Bhutan began in 1974, and in marked contrast to the mass tourism approach of nearby Nepal, the country has followed a very restrictive policy. The government is aware of the potential impact of visitors on the cultural and natural environments and sees both as sensitive resources that need to be protected. In fact, Bhutan, a rather poor country based on income statistics—a gross national income (GNI) of $1,250 per capita in 2007 (Dixon and Xie 2007)—has promoted the concept of "gross national happiness" in place of the more traditional measures of wealth, and has taken very "green" positions with respect to issues such as bans on smoking and the use of plastic bags. From a few hundred visitors in 1974, tourism increased slowly to about 6,000 visitors annually in the late 1990s and about 13,000 in 2005. The past few years have seen a dramatic increase, with 27,000 visitors in 2008. Bhutan still has the cachet of being one of the world's more unusual (and less visited) places, a distinction shared with Antarctica, Greenland, and a few other remote locations.

Bhutan uses a unique national pricing mechanism to limit tourism. Rather than capturing rents through admission fees and other direct pricing mechanisms,

it requires that all visitors prebook their tours. Bhutan sets the basic fee ($250 per day in 2011), payable in advance. There is also a modest visa fee (about $20). All visitors except Indian nationals pay the same fee, although there are discounts for children and students. This fee covers hotels, meals, and admission to sites; guides and other basic services; and travel within the country. There may be additional charges for fancier hotels or special excursions. In effect, the country is like an all-inclusive resort or a cruise ship. The Tourism Council of Bhutan estimates that the average visitor spends $500 per person in addition to the basic fee (Tourism Council of Bhutan 2009).

Statistics from 2008 indicate that about 34 percent of the daily fee is considered a "royalty" that goes directly to the government. This DRC portion of the fee is referred to in the marketing literature as "internal taxes and charges (including royalty)." In 2008, for example, gross earnings from tourism were reported as $38.8 million, with $13.3 million listed as royalties (Tourism Council of Bhutan 2009).

The Bhutan model is very different from that of Nepal—its closest competitor in terms of both location and attractions. In Nepal, once a visitor is in the country and has paid the modest visa fee, daily expenses can range from less than $10 per day to several hundred dollars per day, depending on what the visitor does and the level of services desired. Nepal captures economic rents via excise and income taxes on service providers, a very imprecise method. In Bhutan, money from the visitor fee goes directly to the government's exchequer.

Bhutan can follow such a restrictive policy for several reasons. The country is unique in terms of landscape and culture; access is difficult, with only a few points of entry; the government is a strong supporter of controlled tourism and has managed the situation accordingly; and, perhaps most important, this has always been the policy, so there is no powerful (and wealthy) tourism industry lobby to fight the policy. It is possible to argue that Bhutan is losing economic benefits by not promoting mass tourism, but this seems to be something that Bhutan has considered and accepted. The country has clearly not chosen a tourism policy designed to maximize economic rents. Although it would probably be impossible for a country that has traditionally been open to tourism to adopt such a policy, it is possible to imagine using this approach for unique or sensitive sites that are just being developed.

Lessons Learned

The DRC approach does not fit all areas. It works best where there is an existing visitor industry and where some level of use is acceptable and environmentally sustainable. Property rights should be clearly defined so that the owners of the resource (usually the state in the examples here) are able to collect the economic rents and use them for management and conservation. The DRC approach is better at raising revenues than at controlling numbers of visitors. If carrying capacity is a major issue, other approaches will need to be combined with DRC.

It is instructive to consider the lessons learned from these examples. Table 12.5 summarizes some of the facts about the six locations where data are available. Each case is special, and the differences between them are striking: visitor numbers range from fewer than 30,000 per year in Bhutan to 12 million per year in Egypt, and the access fees charged range from a low of $7.50 per person in Hanauma Bay to $100 per person in the Galapagos. (The Bhutan fee, while higher, is bundled into the overall cost of the package, not per site or activity.) However, by examining these examples it is possible to draw a number of conclusions.

Table 12.5
Summary of Sites, Fees Charged, and Annual Number of Visitors

Site	Fee Charged per Person (economic rent captured), ca. 2010 (US$)	Approximate Number of Visitors (ca. 2010)	Comments
Hanauma Bay, Oahu, Hawaii	$7.50 per visit	800,000	Plus 500,000 visitors on tours who view the site from the upper parking lot for free, but are not allowed to go down to the beach.
Bonaire Marine Park, Netherlands Antilles	Divers: $25 per year Nondivers: $10 per year	25,000–30,000	There were an estimated 18,700 divers in 1992.
Galapagos National Park, Ecuador	Foreigners: $100 per visit Ecuadorians: $6 per visit	140,000	More than 80 percent are foreigners.
Petra, Jordan	Foreigners: $32 for one day; $36 for two days	580,000	The majority of visits are for one day.
Egypt	$5–25 per site (depending on site)	12 million (all tourists to Egypt)	Visitors come for both historical/cultural tourism and "sun and sea" tourism.
Bhutan	Implied charge of $64 per day	27,000	Based on information from the 2008 Bhutan Tourism Monitor (Tourism Council of Bhutan 2009) and a daily all-inclusive charge of $250 per person in 2011.

Source: Author's estimates based on his research and references cited in the chapter.

1. Unique and/or sensitive sites produce important ecological and/or cultural services. Consequently, these locations are often in high demand for tourism or direct use. This demand is in part reflected in the creation of large economic rents and visitors' willingness to pay to help conserve and protect the sites. Revenues collected can help ensure the continuing provision of the desired services, both ecological and cultural, over time.
2. The use of entrance fees and charges, a DRC approach, results in a surprisingly robust system that can be applied at many different levels. This approach differs from the classic examples of PES in that DRC creates a direct link between the user of the resource or service and the provider. This in turn creates a direct market between supply and demand. Although the use of entrance fees has a long history in some locations, there has been a tradition of thinking of natural resources as "gifts from God" and therefore not something to be bought and sold. However, recent developments illustrate a much more aggressive use of the DRC approach, capturing a larger share of the consumer's surplus, or economic rent.
3. Successful examples of this more aggressive form of DRC often share certain characteristics: well-defined property rights; the ability to control access to the site; awareness on the part of users and providers that the site is vulnerable or threatened; a familiarity with market mechanisms and a visible link between the collection of fees and the provision of services; and a more mature partnership among the different groups involved in management and conservation—government, civil society, and private groups.
4. Although pricing (rent capture) is one important approach to generating new revenues for improved management while also rationing use and reducing pressure on a resource, it is often not enough by itself. Other management approaches are usually required to control visitor numbers, especially for environmentally sensitive sites. Examples of these non-price-rationing approaches include restriction of the number of visitors admitted (e.g., entrance to the Great Pyramid by time of day and season); limits on parking spaces or other permits (e.g., parking restrictions at Hanauma Bay and the cupo system in the Galapagos); or limits on the number of firms that are authorized to offer tour packages (e.g., Bhutan).
5. Even with a recent trend toward significantly increased entrance fees, these fees are often still relatively low. In fact, underpricing may be a more common problem than overpricing. Practical considerations may limit the use of entrance fees as a management tool. For example, if there are major differences between the income levels of visitors and nationals, a two-tiered pricing system can be used to address equity concerns. Even if this is not the case, using pricing alone to limit access (and impact) to a site is often seen as unfair if it means that only the rich can afford access. Therefore, if carrying capacity is an issue, some other form of capacity management may still be required.

In the end, managers of unique or sensitive sites face three questions: (1) Who captures the economic rents generated by the site—the site itself and/or the country, or the visitor and/or the service provider? (2) Are the captured rents ultimately used to help conserve and protect the site? (3) How can carrying-capacity issues be addressed in an effective and equitable manner? Answering these questions is the real management challenge for these sites.

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