CHAPTER 5

Indigenous People, National Parks, and Biodiversity in the Maya Region

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Introduction

The Maya region, encompassing Guatemala and Belize, and parts of Mexico and Honduras, presents a multifaceted and challenging case for the study of protected spaces of nature. While the Indigenous presence in the area (both past and present) is one of the strongest in the Western Hemisphere, the region is also within one of the world's biodiversity hotspots,[1] creating a *biocultural diversity complex* where culture and biodiversity should not be separated, but, instead, studied as a whole.

How to cite this book chapter:
Kettunen, Harri, and Antonio Cuxil. "Indigenous People, National Parks, and Biodiversity in the Maya Region." In *Bridging Cultural Concepts of Nature: Indigenous People and Protected Spaces of Nature*, edited by Rani-Henrik Andersson, Boyd Cothran and Saara Kekki, 139–168. Helsinki: Helsinki University Press, 2021. DOI: https://doi.org/10.33134/AHEAD-1-5.

The region, divided between four countries, incorporates a multitude of protected natural areas with varying statuses. One of these is the Maya Forest, or *Selva Maya*: the second-largest reserve of tropical forest in the Western Hemisphere after the Amazon. The forest is exposed to a number of threats due to human activity in the area, including illegal logging, forest fires, and consequent fragmentation or discontinuity of the ecosystem, as well as dangers to cultural heritage, such as the looting of archaeological sites and black-market trade of pre-Columbian artifacts.

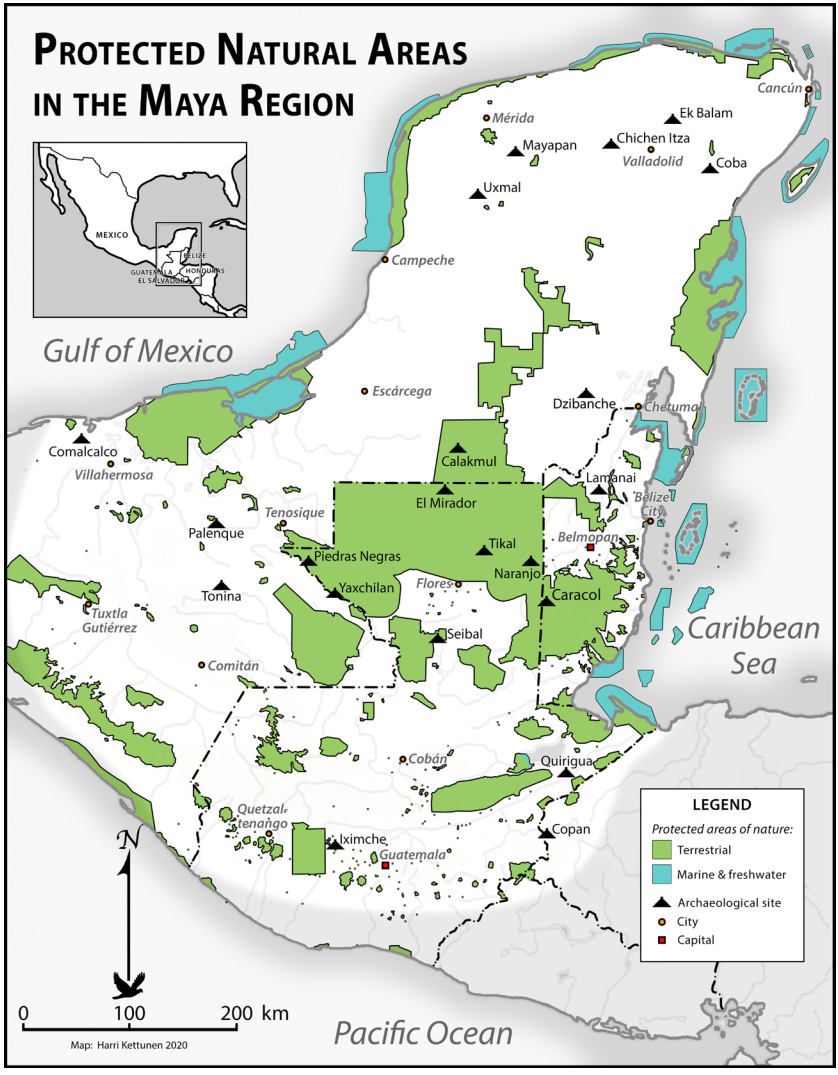
The reserve is divided between different countries and communities; therefore, its protection must be an inter-community, national, and international team effort. Furthermore, as parts of the protected areas are inhabited, sustainable use of the resources contained within them is in the common interest of everyone. This chapter seeks to present an overview of the protected areas in the Maya region, with an emphasis on the *Selva Maya* and the Maya Biosphere Reserve in northern Guatemala, and to propose long-term strategies for the preservation of the environment and sustainable use of the natural resources within the protected areas.

While it is beyond the scope of this chapter to provide a systematic survey of how natural resources in the Maya region are being managed in each country and jurisdiction, based on our 30 years of experience working in the region, we have observed both ebbs and flows in the management of protected areas. Despite the recent advancement of deforestation and other threats to the environment, we have also witnessed optimism in the form of educational programs, sustainable use of natural resources, reforestation programs, successful concession agreements, thriving cooperatives, and expanding community-based tourism.

Protected Areas in the Maya Region

> "[M]an's heart, away from nature, becomes hard."
>
> Mathȟó Nážiŋ (Luther Standing Bear)[2]

There are altogether 50 national parks in the Maya region, together with 81 to 390 other types of protected natural areas, depending



Map 5.1: Map of protected natural areas in the Maya region. Map: Harri Kettunen.

on designation and classification (see Map 5.1). Guatemala has 21 national parks and five biosphere reserves, along with 125 other types of protected natural areas and 184 private nature reserves.[3] Belize has 17 national parks, seven nature reserves, 16 forest reserves, and five natural monuments,[4] while Mexico features 12 national parks and 31 biosphere reserves, nature sanctuaries,

natural monuments, and other protected nature reserves that are located entirely or partly within the Maya region.[5]

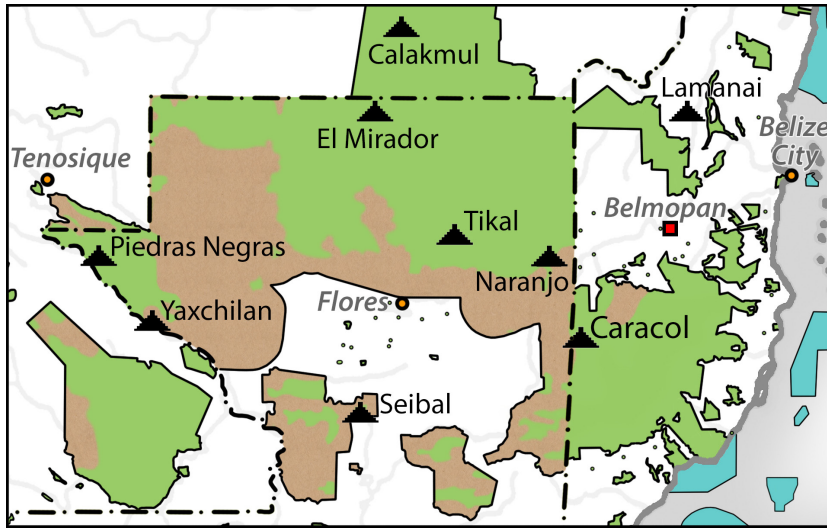
Honduras, situated on the extreme eastern rim of what is regarded as the historical and pre-Columbian Maya area, has two nature reserves within the area that can be regarded as belonging to the Maya sphere at any given time in history: Cerro Azul and the Trifinio biosphere reserve. The latter, officially named the *Reserva de la biosfera transfronteriza Trifinio-Fraternidad*, is composed of the Trifinio biosphere reserve in Guatemala, *Parque Nacional Montecristo-Trifinio* (Montecristo Trifinio National Park) in Honduras, and *Parque Nacional Montecristo* (Montecristo National Park) in El Salvador.[6]

Besides these, all countries within the current and past Maya region have countless archaeological sites whose protection, preservation, and conservation vary a great deal depending on available resources and the overall significance of the sites. Due to the vast number of archaeological sites, structures, and monuments in the area, resources to protect them from looting and other types of destruction vary significantly from place to place.

In Belize, the Institute of Archaeology is in charge of the protection of archaeological and historic monuments/sites in the country,[7] while in Guatemala, the *Instituto de Antropología e Historia* (IDAEH) is the governmental institution responsible for such protection. In Honduras, the *Instituto Hondureño de Antropología e Historia* (IHAH) is "dedicated to the protection, research, conservation and dissemination of the country's cultural heritage,"[8] and in Mexico, the governmental *Instituto Nacional de Antropología e Historia* (INAH) is responsible for the "protection and conservation of tangible and intangible cultural heritage,"[9] including archaeological, anthropological, historical, and paleontological findings, sites, and legacies.

In reality, designated "protected areas" lack protection in many regions. This is especially the case in northern Guatemala, but also in a number of other areas. Regarding Belize, Colin Young points out that:

> 26.2% of Belize's national territory is under some form of protection …. On the surface, it appears that Belize is doing an excellent job in protecting its natural resources. However, upon closer



Map 5.2: Map of deforestation within protected areas in northern Guatemala and adjoining areas. Map: Harri Kettunen.

> inspection, only 13% of the protected areas in Belize are reserved strictly for the conservation of biodiversity; the majority of the protected areas are extractive reserves that allow the removal of flora, timber, and fauna. The situation is worsened by the fact that some of these parks are "paper parks" with no visible on-the-ground management or no management plan.[10]

In Guatemala, 31.90 percent of the country is (at least nominally) composed of protected areas (see Map 5.1). However, the reality is very different, especially in the Petén Department, where deforestation has taken a heavy toll on a large portion of the protected areas (see Map 5.2 and Figure 5.1).

Although the protected areas are safeguarded by law in this area (at least on paper), the land itself is not always owned by the government; for example, in the case of Mexico, Nicolás Vásquez points out that the "actual land ownership remains at the community level" and that this "fragmentation requires continuing local-level negotiation among agencies and between agencies and communities, something the legal arrangements do not contemplate."[11] Consequently, we believe that a co-administration of archaeological sites and national/nature parks by the Indigenous

Figure 5.1: Google Earth image of northwestern Guatemala in 1984 (above) and 2016 (below). Dark green color indicates forested areas, while light green, yellow, and brown colors show various degrees of deforestation.

people, local communities, and governments is a strategy worthy of envisioning and pursuing. Besides governmental guardianship and supervision, these areas would benefit from the protection and maintenance by the local (or nearby) population, who would also participate actively in the development, management, and

preservation of the parks and sites.[12] Furthermore, part of the revenue would be used directly for community needs, improving the standard of living in the areas (see Peuramaki-Brown and Morton in Chapter 4, this volume, for the discussion of challenges regarding the co-management of protected areas in Belize).

On a governmental level, one solution to the problem is a more effective environmental taxation where the revenue would be targeted directly to the preservation of nature. Environmentally related (GDP-weighted) tax revenue was 0.02 percent in Belize, 0.96 percent in Guatemala, 0.96 percent in Mexico, and 2.3 percent in Honduras in 2018,[13] while the OECD average was 2.28 percent. Furthermore, as Clark Gibson and Fabrice Lehoucq have pointed out,[14] a balanced cooperation between the government and local authorities is the key to a successful protection of the environment. However, Gibson and Lehoucq also point out that the "success of decentralization hinges on the behavior of the local politician" and that while the pressure from the local community and the support of the central government ought to encourage mayors (in Guatemala) to value forest protection, the mayors usually "care about forests when it is in their political interest to do so."[15]

Sacred Places

Some sacred places are within national parks, while some national parks are simply national parks, and some sacred places are simply sacred places. Likewise, some sacred places are *in* archaeological sites and some archaeological sites *are* sacred places. Furthermore, Indigenous elders in some communities consider *all* archaeological sites to be sacred places, while others believe that all regions and countries that have remains of ancient cultures should be considered as sacred places.

Many Indigenous people in the Maya region grow up in touch with and in close relation to nature. Each person is considered to be part of nature and, as a result, grows up respecting all aspects of it. In the Maya calendar—still observed in various locations in the highlands of Guatemala—there are 20 days in each month and all of them are devoted to different deities or aspects of nature. All natural

Figure 5.2: Ceremony at Quirigua. Photo: Antonio Cuxil.

Figure 5.3: Ceremony at Cerro de Oro, Sololá Department, Guatemala. Photo: Antonio Cuxil.

resources, national parks, and archaeological sites, or any other places considered as sacred places, are respected as such. There are also places where many Maya people go to participate in ceremonies and to connect with the deities in order to ask for fertility, health, good crops, balance of nature, etc. (see Figures 5.2 and 5.3).

Case Study: The *Selva Maya* Region

In 2017, representatives of organizations from Belize (Corozal Sustainable Future Initiative [CSFI], the Forest Department [FD], and Program for Belize [PfB]), Guatemala (Consejo Nacional de Áreas Protegidas/National Council of Protected Areas [CONAP]), and Mexico (Comisión Nacional de Áreas Naturales Protegidas/ National Commission of Natural Protected Areas [CONANP]) met in Belize to discuss the strengthening of tri-national cooperation and preservation of the Maya Forest (*Selva Maya*). An agreement was made to strengthen the cooperation in: (1) biological monitoring; (2) bi- and tri-national cross-border patrols and surveillance programs; (3) capacity-building in areas such as conflict resolution, environmental legislation, and use of remote sensing equipment; (4) environmental awareness and education in key border communities; and (5) control and prevention of transboundary forest fires.[16]

The meeting was followed by a workshop in Chetumal, Quintana Roo (Mexico), to further a project titled *Support for the Monitoring of Biodiversity and Climate Change in the Selva Maya Region*, attended by representatives of the Central American Commission for Environment and Development (CCAD), the General Directorate of International Cooperation and Implementation of the National Commission for the Knowledge and Use of Biodiversity (CONABIO) of Mexico, the Mexican National Commission of Natural Protected Areas (CONANP), the Guatemalan National Council of Protected Areas (CONAP), the Forest Department of Belize (FD); the International Union for Conservation of Nature (IUCN), and the Environment Secretariats of Campeche and Quintana Roo, Mexico.[17] Subsequent meetings have been organized every year in Belize, Guatemala, and Mexico.

Smaller-scale meetings have been regularly organized in the respective countries, such as the exchange of experiences between Belize and Mexico on the management of natural protected areas, involving the Corozal Sustainable Future Initiative (CSFI) in Belize and the Bala'an K'aax Flora and Fauna Protection Area/ Área de Protección de Flora y Fauna de Bala'an K'aax (APFFBK) in

Mexico.[18] Topics on the agenda included restoration of vegetation areas and, among others, knowledge of and practices in organic beekeeping. These opportunities for dialogue "promote collegial learning among peers who share their knowledge and experience of best practices."[19]

Other interesting connections and outcomes of the cooperation include an exchange of experiences of the projects *Environment and Peace of Colombia* and *Protection and Sustainable Use of the Selva Maya* in late 2019 in Petén, Guatemala, promoting the use of best practices of land use after a long internal armed conflict (the Guatemalan Civil War [1960–1996] and the Colombian conflict [from the 1960s to present]). The *Selva Maya* project offered ideas and solutions for the sustainable use of land and natural resources, as well as sustainable alternatives for generating income, such as agroecological practices, silvopastoral systems, and use of non-timber products, with the ultimate intention of generating "alternatives to illegal land use practices that combine biodiversity and sustainable management of forest resources."[20]

Furthermore, it can be demonstrated that up to 87 percent of the deforestation in the Maya Biosphere Reserve (MBR) is based on illegal cattle ranching, largely funded by drug traffickers[21] (and, consequently, labeled as "narco-cattleranching"[22]). In contrast, areas controlled by community concessions were largely intact. In 2017, the community concessions belonging to the Association of Community Forestry of Petén (*Asociación de Comunidades Forestales de Petén*, ACOFOP) had 398,300 hectares of forest under their responsibility in the Multiple Use Zone within the MBR while only 0.8 percent of all forest fires in the MBR took place in community concessions—although they control over 16.6 percent of the MBR.[23]

In addition, a concrete advancement and demonstration of successful projects and procedures are the certificates awarded to communities for promoting and conserving biodiversity within the *Selva Maya*. In May 2020, *ejido* Nuevo Becal obtained the first community certificate in Mexico (and the first certificate of its kind granted in North America) for the "demonstration of the impact on ecosystem services," granted by the Forest Stewardship Council (FSC).[24]

Figure 5.4: Temple V, Tikal National Park, Maya Biosphere Reserve, Guatemala. Photo: Harri Kettunen.

On Biocultural Diversity

The *biocultural diversity complex* mentioned at the beginning of this chapter draws from Luisa Maffi's concept, encompassing the total diversity of the world's natural and cultural systems.[25] In this way, biocultural diversity differs from existing narrower definitions of the concept, including "traditional ecological knowledge"[26] or agricultural aspects related to the diversification of farming and sustainable development[27] or "Indigenous knowledge" and "sustainable plants biodiversity conservation."[28] As a result, the concept is understood broadly as the relationship between nature and culture, reflecting Kenyan social, environmental, and political activ-

ist Wangari Maathai's Nobel prize speech in which she connected cultural biodiversity to cultural heritage and local biodiversity.[29]

According to Maffi:

> Cultural diversity is … profoundly interrelated and interdependent with biodiversity, through the co-evolutionary processes by which, over millennia, humans adapted to life in particular environments. In so doing, human societies needed to acquire in-depth knowledge of local species, ecological relationships, and ecosystem functions, and had to learn how to tailor their cultural practices to suit their ecological niches.[30]

The topic of biocultural diversity is timely because of ever-expanding deforestation and, consequently, diminishing habitats for flora and fauna—and local knowledge of them. This is especially the case in northern Guatemala, as explained above (see Map 5.2 and Figure 5.1). Moreover, alarming examples from Brazil remind us of the consequences of inconsiderate environmental politics.[31]

In addition, writing this during the COVID-19 pandemic, one cannot escape a reference to the pandemic and the connection between it and the environment. As Gómez Durán puts it, "[t]hose who are dedicated to the ecology of diseases have more and more scientific evidence that allows them to point out that deforestation, fragmentation of habitats, and loss of diversity increase the presence of emerging pathogens, causing major public health problems."[32] Furthermore, to quote David Quammen:

> We invade tropical forests and other wild landscapes, which harbor so many species of animals and plants—and within those creatures, so many unknown viruses. We cut the trees; we kill the animals or cage them and send them to markets. We disrupt ecosystems, and we shake viruses loose from their natural hosts. When that happens, they need a new host. Often, we are it.[33]

Biocultural Diversity and the *Selva Maya*

With regard to the *Selva Maya*, although a large part of it is located in areas where there are no human settlements in close proximity, people do still present a threat to the rainforest and to the cultural heritage through illegal logging, expansion of settlements, and looting

of archaeological sites. All these are done even though people are aware of the importance of preserving the natural environment and cultural heritage. The *Selva Maya* is a home to a number of endangered, vulnerable, or threatened species of flora and fauna, including the following animal species: jaguar (*Panthera onca*), Baird's tapir (*Tapirus bairdii*), spider monkey (*Ateles geoffroyi*), white-lipped peccary (*Tayassu pecari*), ocellated turkey (*Meleagris ocellata*), harpy eagle (*Harpia harpyja*), scarlet macaw (*Ara macao*), great curassow (*Crax rubra*), and the orange-breasted falcon (*Falco deiroleucus*).[34] Furthermore, the *Selva Maya* is home to numerous archaeological sites, many of which remain unexplored or unexcavated. At the same time, however, many of them have been heavily looted. Well-known sites include Calakmul and Yaxchilan in Mexico, El Mirador, Naranjo, Piedras Negras, and Tikal (see Figures 5.5 and 5.8) in Guatemala, and Caracol in Belize, connected by the Maya Forest Corridor.[35]

Another challenge, besides the threatened biodiversity in the *Selva Maya* in general, is the large expanse of monoculture in the area, such as the (African) oil palm, *Elaeis guineensis*, especially in northern Guatemala. Although these plantations are not within the Maya Biosphere Reserve, they are located close to many smaller protected areas and they threaten the natural biodiversity in the area. Furthermore, ever-expanding deforestation (see Map 5.2) is an ongoing threat to the environment, demonstrated noticeably during the writing of this chapter by numerous forest fires in the area (see Figures 5.5 and 5.6).

Yet another challenge is the population growth as well as migration and settlement of people who are not originally from the area and who, consequently, in many cases, lack the knowhow to manage the environment in the lowlands. Furthermore, lack of education of—and connection to—the history of the area disconnects people from the past and may fuel the destruction of archaeological heritage. This development is relatively recent. Northern Guatemala had witnessed a population growth in the Classic Period (ca. AD 250–900), near abandonment after the Classic Period Collapse, sparsely populated settlements throughout the Postclassic Period via the Spanish Conquest (1697) into the 19th century, and growing migration and settling in the area from 1960s onwards.

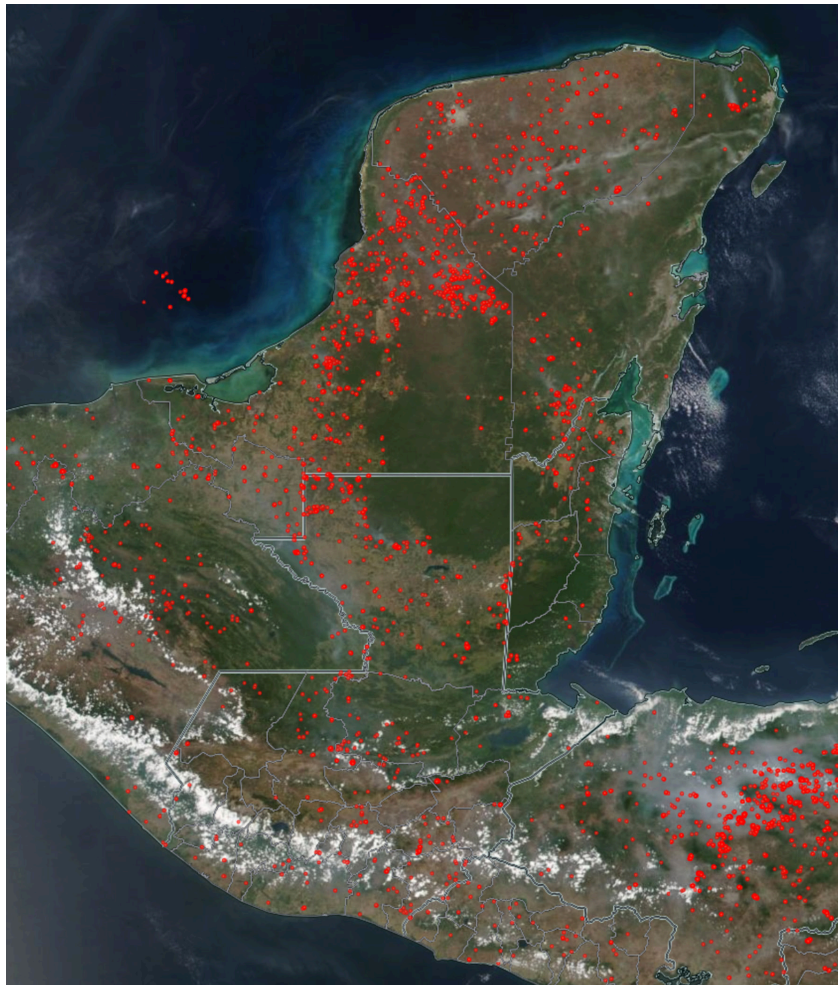


Figure 5.5: NASA Worldview image of fires and thermal anomalies in the Maya region and adjoining areas, April 9, 2020. Overlays: day and night fires and thermal anomalies based on Visible Infrared Imaging Radiometer Suite (VIIRS) Corrected Reflectance Imagery on the Suomi NPP satellite, and on Visible and Moderate Resolution Imaging Spectroradiometer (MODIS) Corrected Reflectance Imagery on Terra and Aqua satellites. Coastlines and borders © OpenStreetMap contributors, Natural Earth. Source: https://worldview.earthdata.nasa.gov.

The population of Petén (elevated from a district to the status of department in 1866) was 14,000 in the early 1880s,[36] while in 2002 it was 366,735 and in 2019 it was 833,679.[37] The migration into

Figure 5.6: Forest fire near Sayaxche, Guatemala. Photo: Antonio Cuxil.

the region—and the subsequent population growth—took place during and after the Guatemalan Civil War. This is also when the Maya Biosphere Reserve was created (in 1990), expanding the protected area of 222,760 hectares in 1989 to a tenfold 2,629,766 hectares in 1990.[38] This area has subsequently been threatened by illegal logging and overexploitation of the environment that continues today. Unfortunately, as in many other areas, the interest (and governmental budget) to preserve nature is not sufficient to meet these challenges. Furthermore, the fact that the largest percentage of productive and fertile land is in the hands of a few people is a severe socioeconomic problem.

However, engaging local Indigenous people in the development of projects or programs in the area helps to preserve the parks and natural resources. This involvement includes concession agreements, cooperatives, associations, cultural groups, forest incentive plans, etc. Many of these concessions and cooperatives are found in the lowlands, where the *Selva Maya* is also located (see Map 5.3). The products obtained from the jungle by the families that are part of these cooperatives and concessions include mahogany (*Swietenia macrophylla*), cedar (*Cedrela odorata*), xate (*Chamae-*

Map 5.3: Map of the Maya Biosphere Reserve zones and management units. Source: McNab et al., "Evaluating Conservation Agreements," Figure 1.

Figure 5.7: Breadnut products from Alimentos Nutrinaturales, a women's cooperative in Ixlu near the Maya Biosphere Reserve. Photo: Antonio Cuxil.

dorea elegans, *C. oblongata*, and *C. ernesti-augusti*), breadnut (*Brosimum alicastrum* [as well as *B. costaricanum*]), allspice (*Pimenta dioica*), and chicle (*Manilkara* spp.). In 2017, these cooperatives and concessions acquired nearly US $1 million in revenue.[39]

Independent of the concession agreements, there are also cooperatives, including a women's cooperative, dealing with breadnuts that are used for beverages and cookies. Breadnut is rich in protein, folate, calcium, potassium, magnesium, phosphorus, fiber, and vitamins A and C, and has higher total phenolic contents than almonds, peanuts, or walnuts, and functions as an important natural antioxidant source.[40] Other than the collection of the nut from the jungle, the entire production process is conducted by women in the village of Ixlu, Petén (see Figure 5.7). One important aspect of this activity is that they do not damage the tree or the vegetation; instead, they only collect the breadnut from the ground and bring it to the small workshop to be used for different products.

Furthermore, the cultural history and traditional use and knowledge of different species within Indigenous or local cultures includes not only the flora and fauna per se, but also the derivatives of them, including a myriad of local food recipes and foodways. As stated in the World Wildlife Foundation (WWF) Mexico campaign "Our Gastronomy, An Echo of Our Biodiversity": "in the last 50 years, the multiplicity of ingredients that have given life to our cuisine have decreased, some have disappeared, and others are threatened."[41] One way to improve the situation is to promote local foodways and to protect the natural environment that surrounds them.

Another important topic in national parks management is tourism. At present, there are different ways to take tourists into a national park: regular tourism, ecotourism,[42] and community (or community-based) tourism.[43] Usually, the last two involve the communities. This is also the way to enable communities to participate in the tourism industry, either through associated services (such as providing food or accommodation) or as local guides. This idea of such tourism-related small projects began as an alternative for communities, so that their income does not depend solely on agriculture. This also helps to protect, promote, and preserve the natural resources due to the simple fact that the preservation of natural resources or cultural heritage will assure a future income for the families.

Opposite to small-scale community-based tourism is mass tourism and its side-effects. Thus far, most of the Maya area has avoided the effects of mass tourism, save Cancún, Riviera Maya, and adjacent areas, including archaeological sites such as Tulum and Chichen Itza. However, smaller-scale tourism that penetrates protected areas without restrictions can also have far-reaching consequences. One imminent threat to the environment, as well as the cultural heritage and Indigenous rights, is the *Tren Maya* (Mayan Train) project.[44] According to Meaghan Beatley and Sam Edwards, "many Indigenous groups, and their conservationist and academic allies … warn that the train will not only devastate southern Mexico's ecosystem but also trigger unsustainable development and further marginalize the communities living there."[45]

In contrast, small-scale community-based tourism is, as a rule, socially and environmentally sustainable. Moreover, people from

local communities are valuable because they know the area and the customs and, at present, the interest in alternative programs for tourism is increasing; for example, there are trekking trails in the jungle, alongside archaeological sites, utilized by local tour guides. Furthermore, several other activities are being developed in the jungle, such as bird watching that involves the local population as guides. An important fact to consider is that the more preserved and protected the environment is, the more chances there are to see different types of birds, along with more variety of flora and fauna in general. Consequently, tourism—if controlled adequately—plays an important role in the interaction and preservation of the rainforest. In 2019, Guatemala had 2.5 million visitors; however, the numbers in 2020 are a lot lower due to the global pandemic.[46]

Incorporating the local population and cooperatives in the tourism industry by promoting community tourism and ecotourism has mostly beneficial results. When visitors are in touch with the local communities and benefit from local knowledge, the local Indigenous population profits from tourism revenue more equitably. However, although community-based tourism has been regarded mainly positively in a number of studies,[47] there are also critical voices. According to Mitchell and Muckosy, community-based tourism by itself is not the answer to alleviate poverty but, instead, "it is working with mainstream tourism to strengthen links between tourism and local people—often indigenous populations who are located in disadvantaged regions and have vulnerable livelihoods."[48]

Furthermore, although community tourism and ecotourism have increased in Guatemala, there is room for expansion in order for the local communities—deprived of adequate opportunities for food, health care, and education—to thrive. While archaeological projects hire people from nearby communities, which helps during the field season, it is not enough for the families to make ends meet. However, in well-managed archaeological projects, the awareness of the preservation of environmental and cultural heritage is high, which adds to the overall understanding of the importance of the preservation of biocultural diversity and, potentially, leads to new opportunities for sustainable management of the environment, as described in the following section.

Figure 5.8: A pair of keel-billed toucans (*Ramphastos sulfuratus*) flying in the distance over the Great Plaza, Tikal National Park, Maya Biosphere Reserve, Guatemala. Photo: Harri Kettunen.

Best Practices?

Besides the aforementioned cooperation and co-administration, a more effective networking between different local communities (and not only between different governmental agencies) would open up a new avenue for sharing ideas, initiatives, and practices. At the local level, we have seen that the knowledge of sustainable use of the natural ecosystem is well-received in some communities. Although the dissemination of best practices is a slow process, strengthening networks and promoting grassroots-level cooperation would undoubtedly empower people in rural communities. Furthermore, networking between different *Indigenous* communities for the preservation of biological and cultural diversity is of utmost importance due to the depth of knowledge within the communities. To do this, we can go beyond the borders of the research area and learn from the practices and strategies of other projects and communities, such as the African Biodiversity Network that focuses, among other things, on biodiversity protection, Indigenous knowledge, and social and ecological problems in Africa.[49]

Figure 5.9: Sucely Melisa To Cholotio, Ajtoʼooneel Ixoq Cooperative, San Juan La Laguna, Guatemala. Photo: Antonio Cuxil.

Moreover, enhancing the spread of local knowledge beyond the local borders, promoting education and awareness, and providing tools for teachers—from elementary schools up to higher learning—can nurture biocultural diversity in the communities. A good example of local Indigenous ingenuity of combining fair-trade economics, local culture, and tourism is the "bottom-up" approach of the Tz'utujil village of San Juan la Laguna on the shore of Lake Atitlán in the Sololá Department of the southwestern Guatemalan highlands. The village, unlike most neighboring towns in the area, is almost free of waste. The elders of the village teach the young to appreciate nature, recycle, and not to litter. They also have a rule: "If you cut down a tree, plant two in its place." The village has several fair-trade cooperatives and naïve art galleries that not only sell local farmers' and artisans' products, but also educate the local community, as well as visitors, on Indigenous plants and their use, beekeeping, and traditional backstrap weaving using local organic color sources (Figure 5.9).

All in all, the Indigenous idea of human beings being inseparable from nature[50] is closely connected with the interrelatedness of people and biodiversity. Bringing in the knowledge, perspectives, cultural mindset, and worldview of the Indigenous people to the discussion of conservation, preservation, and management of national parks and other protected natural places are practices that should be further encouraged. Similarly, the sustainable use of natural resources is an issue that ought to be discussed from a governmental level all the way to that of local communities. Deforestation and other threats to the environment will undoubtedly have long-lasting negative repercussions for biodiversity and for the people living in the area.

Concluding Remarks

Co-administration of national and nature parks by Indigenous people and the government is a forward-looking strategy: part of the revenue is used for community needs, and the nearby population will continue to protect the parks and participate in contributing ideas in order to improve the management and preservation of the parks. Yet, there remain issues that need to be resolved, such as insufficient funding for the preservation of the parks, population growth and spread to(ward) the protected areas, social and economic inequality, accelerating spread of monoculture, and the overall low interest in preserving nature. However, we believe that a balanced national and international cooperation among governments, local authorities, non-governmental organizations, and local communities is the key to successfully protecting the environment. Furthermore, there are ways to improve the panorama by promoting education and awareness. Nurturing local and/or Indigenous knowledge and its diffusion in schools can lead to a generational shift and long-lasting enhanced learning and awareness. While this ties in with the slow rate of dissemination, it will ultimately lead to more long-term, sustainable, and self-sustaining change.

Notes

[1] Myers et al., "Biodiversity Hotspots," 853–58.
[2] Standing Bear, "Indian Wisdom," 201–06.
[3] SIGAP, *Dirección de Desarrollo del Sistema Guatemalteco de Áreas Protegidas*.
[4] Meerman, "Belize Protected Areas Policy"; Meerman, "National Protected Areas Policy"; Meerman and Wilson, "Belize National Protected Areas System Plan"; Salas and Shal, "National Protected Areas System Plan."
[5] CONANP, 2020.
[6] Carrera de la Torre, *Plan de desarrollo regional fronterizo trinacional Trifinio*; MARN, "Parque Nacional Montecristo"; Plan Trifinio, *Reserva de Biosfera Trifinio Fraternidad*.
[7] NICH, "Archaeological Sites and Parks."
[8] IHAH, 2020.
[9] INAH, "Misión y vision."
[10] Young, "Belize's Ecosystems," 29. See also Peuramaki-Brown and Morton, Chapter 4, this volume.
[11] Nicolás Vásquez, "Legal Protection," 277.
[12] CONAP, "Política de Administración Conjunta." See also, e.g., Chajón Aguilar et al., *Plan de Desarrollo Turístico*.
[13] OECD, *Environmental Taxation*.
[14] Gibson and Lehoucq, "Local Politics," 28–49.
[15] Ibid., 29, 32, 42.
[16] Selva Maya, "Strengthening Trinational Cooperation."
[17] Selva Maya, "Planning Workshop," 3.
[18] Selva Maya, "Intercambio de experiencias México."
[19] Ibid.
[20] Selva Maya, "Intercambio de experiencias proyecto Ambiente y Paz."
[21] Devine et al., "Drug Trafficking"; Pearce, "Parks vs. People."
[22] Paullier, "¿Quiénes son los 'narcoganaderos'?"
[23] Davis and Sauls, *Evaluating Forest Fire*, 1, 10.
[24] Hernández Flores, "Comunidad en la Selva Maya."
[25] Maffi, "Introduction"; Maffi, "Introduction: On the Interdependence."
[26] Belay, Edwards, and Gebeyehu, "Culture as an Expression," 10–14.
[27] Bérard and Marchenay, "Local Products."
[28] Kingston et al., "Indigenous Knowledge," 196–200.
[29] Maathai, "Nobel Lecture."

[30] Maffi, "Introduction," 4.
[31] Pereira Martins, Pereira Martins, and Figueiredo, "Ten Actions."
[32] Gómez Durán, "Deforestación."
[33] Quammen, "Opinion."
[34] IUCN, "Red List."
[35] Selva Maya, "Endorsement."
[36] Conkling, *Appletons' Guide to Mexico*, 334.
[37] INE, "Poblacion menu."
[38] INE, "Estadisticas ambientales."
[39] Dionisio, "Conservación y desarrollo," 55–56.
[40] Ozer, "Phenolic Compositions."
[41] WWF Mexico, "#DaleChamba."
[42] Defined by The International Ecotourism Society as "responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education." TIES, "What Is Ecotourism?"
[43] Giampiccoli and Saayman, "Community-Based Tourism," 16; Richards and Hall, "Community," 1–13. Giampiccoli and Saayman state that community-based tourism "is about social justice, empowerment, equity of benefits, redistributive measures, ownership of tourism sector and holistic community development" and that it "arose to offset the negative impacts of conventional or mass tourism … such as leakages and falling of local control of natural resources." Giampiccoli and Saayman, "Community-Based Tourism," 1–2.
[44] Benítez and Alexander, "Elementos de Evaluación"; Camargo and Vázquez-Maguirre, "Humanism, Dignity and Indigenous Justice."
[45] Beatley and Edwards, "Mexico's 'Mayan Train.'"
[46] INGUAT, *Boletín estadístico anual 2019*.
[47] Giampiccoli and Saayman, "Community-Based Tourism"; Richards and Hall, "Community."
[48] Mitchell and Muckosy, "Misguided Quest," 1.
[49] *African Biodiversity Network*.
[50] In Mayan languages, as in many other Indigenous languages worldwide, there is no (traditional) word for "nature" (see also Guttorm, Chapter 8, this volume). The lack of such terminology stems from the fact that the division between human beings and the environment they live in and the division between populated and unpopulated areas, has not historically or culturally been as separated as it is in the modern world. While there is no traditional word for "nature" in Mayan languages, some languages use neologisms that are translated

as "nature" in dictionaries or use descriptive terms. Examples include "face of the earth" as in K'iche' *uwach uleew*, or use of the dichotomy "town" vs. "forest" or "wilderness," as in Yukatek *kàah* "town" vs. *k'áax* "forest." Furthermore, we should remember that all languages and societies are in constant motion. There can be no universal concept or terminology for "nature" in the world's numerous languages and cultures, including Indigenous ones.

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