2 The *Milpa* Cycle as a Sustainable Ecological Resource

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Introduction: Human Influence in the Maya Forest

The ever-changing Maya landscape depended on the relationship between fields and forest and the natural resources of the Maya forest that provisioned ancient economies. For ancient Mesoamericans, all aspects of the landscape, including cultivation, were rainfall dependent (Whitmore and Turner 1992, 2005) and based on human labor, stone tools, and fire, in the absence of plow or cow (Denevan 1992; Toledo 1990). Clearly, demand for cropped fields inherently reduces land for forests, while at the same time, research indicates that more cleared land increases erosion and reduces fertility (Hooke 2000; Montgomery 2007). As Malthus (1798) wrote more than 200 years ago, the choice is cast for populations utilizing cultivated fields and forest, and today, there are still debates that question the incompatibility of food production and biodiversity (Green et al. 2005).

The ancient Maya civilization was based on an agricultural system engaged with the lived landscape (Ford and Nigh 2015; Martinez-Reyes 2016; Steggerda 1941) and associated with investment of labor, knowledge, and skill in directing exuberant tropical growth targeted towards human needs. The Maya civilization developed and expanded for millennia, and their livelihoods and economies were based on reliable land management practices, accommodating variations and change in climate and weather patterns across time and seasonal variability over the year with flexible and resilient strategies and practices.

The domesticated Maya forest has been managed, based on Traditional Ecological Knowledge (TEK) and practices, to meet all the basic household needs: farmlands with varying soil qualities, materials for construction and utensils, fibers and spices, resources for food production, and habitats for hunted animals (Ford 2020). Swidden farming, typified by the *milpa* cycle, is the deliberate agricultural practice that embeds the field in the context of the local environment (Conklin 1954, 1957, 1971; Dove 1983, 1993). The word *milpa* comes from the Aztec word for cultivated place, *milli pan*. As a contraction, it is commonly used to refer to a maize field. Curiously, however, a

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cultivated place could be an orchard, or even a well-managed forest. It was the prejudice of the Spanish to focus only on one part of the cultivation practice. The Spanish, with Western perceptions, considered cultivable land to be equated with *arable* land (see Wilson 2002); however, arable land means plowable land. Traditional land-use practices of the Americas (Mt Pleasant 2011) and small holders around the world do not use the plow.

The *milpa* cycle of land use is based on the cleared field, but involved the directed management of the succession of mature forests. It is flexible in the production of foods and household necessities even in the face of environmental challenges (Fedick and Santiago 2021). The topography and diverse landscape, comprising upland ridges and hills interspersed with wetlands and their ecotonal transitions, is an essential palette for the development of strategic land cover designs that mitigated vagaries of rainfall while maintaining soil fertility. Settlement patterns reveal a continuum of land-use intensity, from densely occupied uplands to sparsely inhabited lowlands (Ford and Clarke 2019). The graduation between uplands, lowlands, and wetlands provided access to diverse habitats that facilitated living in, and engagement with, the Maya forest, expanding knowledge of the landscape with every generation, century, and millennia. TEK builds over the longue durée, and mirrors the scientific practice of observation, skill, and trial and error.

Popular interpretations of Maya civilization often focus on their downfall – the idea that the ancient Maya outstripped their own resources leading to a "collapse" (Diamond 2005). Beginning with early Spanish accounts, Western narratives tend to downplay or ignore the Maya forest as a garden. Ironically, the plentiful resources that provisioned early Spanish armies were amassed from Maya forest gardens, and yet perceptions of an unpopulated and wild landscape have been the norm. Acknowledging the evident bounty available in forest gardens sets the stage for examining the resources upon which the Maya depended.

Unrecognized and maligned as "slash and burn" and shifting agriculture, the complex landscape management strategies that are embedded in the forest itself are consistent with traditional swidden sequences around the world (see Conklin 1957, 1954; Dove 1983; Gertz 1963). Burning is an important part of the practice that relies on strategic fire management skills. *Yum Ik'ob*, or Masters of Wind in Mayan, tells of the respect for fire (Nigh and Diemont 2013). Opening field spaces with fire enriches the soil with ash (Handelsman 2021) and systematically reduces fuel load on the landscape. Managed as a horizontal matrix with vertical variations of a heterogeneous mosaic of *milpa*-forest-garden cycles, the orchestrated sequence of succession, from annuals to perennials, is founded on TEK practices (Ford and Nigh 2015). These practices have developed with experimentation, building a regenerative cycle of sophisticated low tech practices (Watson 2020) that are resilient under variable climactic and ecological conditions.

Horizontal and Vertical Landscape Dynamics

An understanding of the Maya landscape starts with the geography (White and Hood 2004; West 1964). The karst limestone platform of southern Mesoamerica, including Mexico, Guatemala, and Belize, effects the spatial distribution of resources and relates to local variations in drainage and seasonal water distribution (Beach et al. 2009). Rain is absorbed into the permeable limestone bedrock foundation of the Maya forest. Precipitation varies from 500 mm in the dry northwest Yucatan Peninsula to 4000 mm in the southeast. The splendid ancient cities of Tikal and El Pilar are in the central area (see Figure 2.1), where rainfall ranges from 1,500 to 2,000 mm. Water drains from the rocky hills, ridges, and escarpments, where the densest ancient settlements and the famous hardwoods are located, to collect in scattered depressions and wetlands (Dunning et al. 2002, 2020; Ford and Fedick 1990). This environment provides the resource base used by the ancient Maya and contemporary society. Land cover differs with local climate, rainfall, and slope conditions; for instance, the upland forests are characterized by the tall trees that thrive in the fertile yet shallow soils. This is the landscape the ancient and contemporary Maya adapted.

Water, a critical resource for plants and animals, and water availability in tropical Maya forest environment, where surface water is scarce, is unevenly distributed over the year (e.g., Kramer and Hackman 2021). The supply is therefore an issue that must be resolved daily. This makes management of land cover essential, as well as vegetation cover which protects soil and contributes organic matter and stored water while inhibiting soil loss. This creates a matrix of diverse assets reflected in the uses of the area, both in the past and present.

The Development of the Maya Civilization

Climate and vegetation in the region have undergone many changes over the Holocene. Initially arid, the aridity gave way to a tropical warm wet environment around 8,000 years ago. These significant climatic variations in precipitation and vegetation are well reflected in the pollen record, which indicate expanding forests and high rainfall (Haug et al. 2003; Leyden 2002), resulting in the tropical characteristics of the region observed today. Minimal evidence of human occupation is recognized, yet we know these occupants were mobile horticulturalists (Ford and Nigh 2015).

Mesoamerica and the Maya area underwent major changes around 4,000 years ago with the widespread emergence of permanent settlements. This coincides with nearly 2,000 years of intensive environmental changes and climate chaos reflected in the precipitation data for the region (Haug et al. 2001; Medina-Elizalde et al. 2016; Mueller et al. 2009; Vela-Pelaez et al. 2018). The move to settle the landscape can be seen as a consequence

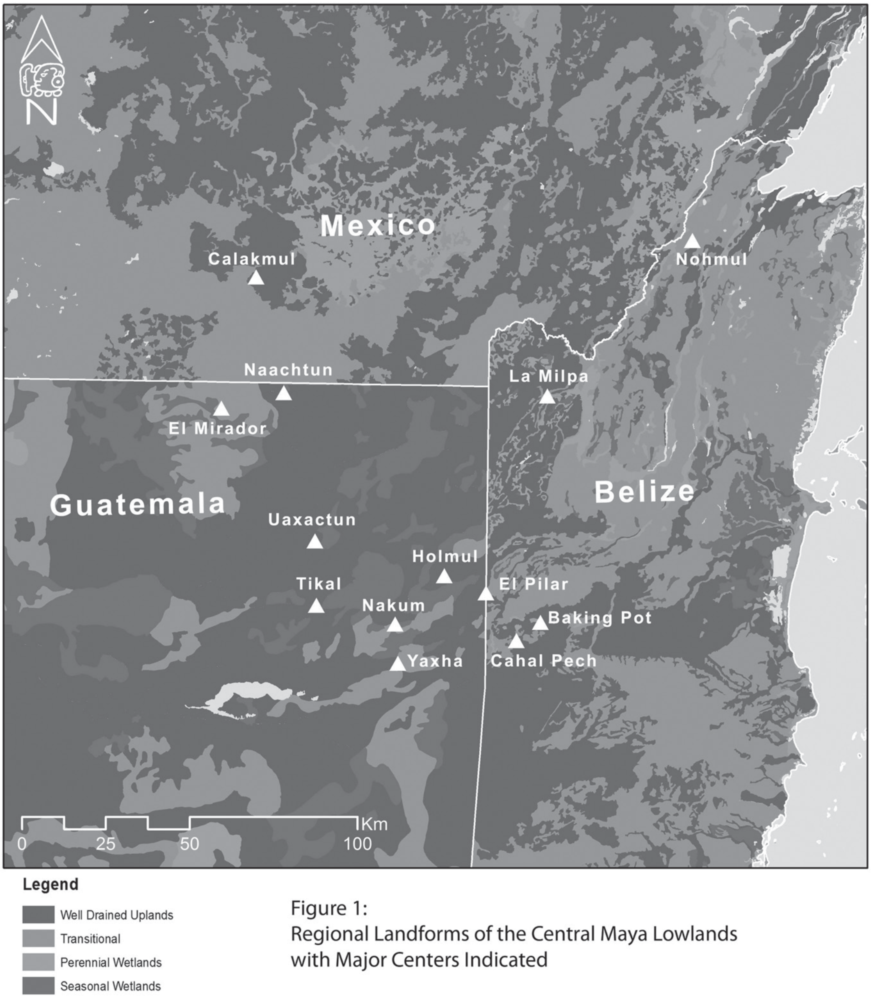

Figure 2.1 The Maya forest geography with ancient Maya sites indicated.

of climate uncertainty. The investment in the landscape is likely a response to the abrupt precipitation and consequent vegetation impacts, suggesting people shifted their focus to landscape management, creating incipient forest gardens. Only 1,000 years after the onset of the climate chaos, and in the context of an overall drying trend, permanent settlements dominated the Maya area. These settlements were the bases for Preclassic Maya cities, such as Mirador, and later the likes of Tikal and El Pilar and others. Small at the beginning, early centers later became major players in the administrative hierarchies that depict the Classic Period.

The emergence of the Classic Maya civilization is marked by the growth of settlements in the Late Preclassic and Early Classic periods bridging the first millennium CE. Successful adaptations are characterized by increasing social complexity and the emergence of culturally distinctive features, such as the famous Maya hieroglyphs. Settlements expanded in all well-drained uplands (see Figure 2.1). There is a distinct concentration of occupation in these well-drained areas that dominate the central lowlands of the region (Bullard 1960; Fedick and Ford 1990). This growth and expansion are evidence of subsistence intensification (Ford and Nigh 2009). Evidence shows that settlements expanded into the margins of wetland areas, the less preferred zones (Ford 1986; Ford et al. 2009). This transitional period from the Preclassic to the Classic period coincides with the stabilization of the precipitation regime, albeit at a lower, dryer level (see Table 2.1).

The Late Classic, between 500 and 900 CE (see Table 2.1), saw a systematic and consistent growth and expansion of residential settlements and civic centers (Culbert and Rice 1990). Preclassic civic centers attained their most extensive size at this time, as exemplified by the enormity of Tikal, which comprised more than 150 hectares of monumental architecture. Large and dense occupation of the well-drained ridges first settled during the Preclassic (Canuto and Auld-Thomas 2021; Ford 1986; Ford and Nigh 2015) were now filled.

Bearing in mind that lake core data emphasize wind borne pollen (Ford and Nigh 2009), scrutinizing the evidence demonstrates more of the complexity of the landscape. Details in the pollen data show a plethora of wind pollinated annual and perennial forbs. These are cast as disturbance, and rightly so, but these forbs are typically found in *milpa* fields and the succeeding regeneration. The proportion of forbs implies human influence, but in the form of land cover characteristic of second growth (Chazdon 2014).

Macrobotanical remains in archaeological contexts provide a new line of evidence that demonstrates that the use of forest trees depended on trees comparable to patterns that are found today (Dussol et al. 2017, Machuca et al. 2020; Morell-Hart et al. 2022; Thompson et al. 2015). Adding the archaeological record to our analyses reveals greater diversity of peoples' use of plant and tree species than interpretations simply taken from the lake cores. Archaeobotanical data suggest the landscape reflected *milpa* cycle species, which would also explain the palynological data which emphasizes the presence of annual and perennial forbs. The representation of successional species and those that favor open canopy gaps dominate regional lake core pollen evidence (Ford and Nigh 2015).

The end of Classic Maya civilization, known as the Terminal Classic, dates around 900 CE, beginning around 1,100 years ago. This period is characterized by a decrease in monumental architectural construction and maintenance of the temples, plazas, and ball courts that were the highlight of the Classic. While there has been significant emphasis on drought (Douglass et al. 2015, 2016; Evans et al. 2018; Haug et al. 2003; Hodell

Table 2.1 Paleoenvironmental and Cultural Chronology

Years Before Present	*8000–4000*	*4000–3000*	*3000–2000*	*2000–1400*	*1400–1100*	*1100–800*	*800–500*	*500–Present*
Human Ecology	Hunting & gathering	Early settlement	Emergent centers	Civic center expansion	Center and settlement growth	Civic center demise	Settlement refocus	Conquest depopulation
Precipitation	Long stable wet	Initial climate chaos	Continued climate chaos	Return stability dry	Stable dry	Medieval warm wet	Little Ice Age extremes	Instability
Wind-Borne Plants	Moraceae dominate	Moraceae varies, forbs rise	Moraceae drop, forbs climb	Forbs dominate, pines peak	Forbs dominate, grass variable	Moraceae rise, forbs decline	Moraceae expansion forbs decline	Moraceae continuity, forbs drop
Land Use	Mobile horticulture	Settled horticultural forest gardens	Settled forest gardens	Expansion of *milpa* forest gardens	Centralized *milpa* forest gardens	Community *milpa*-forest-gardens	Dispersed *milpa*-forest-gardens	Disrupted *milpa*-forest-gardens
Cultural Period	Archaic	Formative Preclassic	Middle - Late Preclassic	Late Preclassic-Early Classic	Late Classic	Terminal Classic Postclassic	Late Postclassic	Colonial, national, global

et al. 2001; Hoggarth et al. 2015; Kennett et al. 2012, 2013; Roman et al. 2018 among others) and there is continual evidence of a drying precipitation trend, the resolution of these data make such interpretations unclear. The current driver provoking the beginning of the Terminal Classic is overpopulation, apparently the cause of deforestation and soil degradation (Turner and Sabloff 2012). Yet, the actual causes are difficult to match. The Classic Maya "collapse" is under constant reevaluation, more recently seen as an environmental transformation of economic and political disruptions (Demarest et al. 2004; Lucero et al. 2015; Yaeger 2020) with a concomitant redistribution of farming populations (Ford and Nigh 2015).

The Postclassic, dating from 1000 CE to Spanish conquest, is a time of political transformation and reorganization, following the upheavals that produced dilapidated monumental architecture in city centers across the Central Lowlands. Centers in the old Maya core area gradually fell into disuse as counterparts in the north expanded. During this period, farming populations, unconstrained by taxation and corvee labor, continued living in the tropical woodlands (Fisher 2020). Though suggested as a diaspora (Lucero et al. 2015), there is no direct evidence that farmers left this area with its well-developed natural resources. The populace endured social upheavals and changes until faced with the brutal Spanish colonization (Alexander 2006), which culminated in the ultimate disorganization of Maya society, under the weight of the oppressive colonial regime.

Historical–Ecological Perspectives on Maya Forest Products

The Maya forest was first encountered by Europeans when the Spanish conquerors invaded at the beginning of the 16th century. Confused by the diversity they faced, the Spanish could not appreciate the value of the forest they were traversing, seeing it as wild and untamed. Mystified by the variety, they focused on what was familiar: any agricultural field, the shelter of houses, waterways and lakes, and resources ripe for exploitation. Their thirst for valuable trade goods and resources drove their treks, and limited provisions for their armies kept them focused on short-term goals.

As Cortez and his entourage were in possession of a map (Prescott 1879: 269) mentioning gigantic trees, plentiful wild fruit, and cacao orchards, they were able to adequately house and feed their expedition with appropriated stores encountered along their way (Cortés 1971; Diaz del Castillo 1927). Writings of these early conquistadores, and later explorers of greater Petén (Jones 1998; Schwartz 1990), note that the world they encountered was largely forested. Early on in the Yucatan, after the conquest, the first governor of Yucatan did not appreciate the Maya relationships with plants and issued an ordinance in 1552 disallowing trees and fields in towns, ordering them to be destroyed:

> *… they should* ***not sow any*** **milpas** *within the town that they construct houses close to one another, that all shall be clean,* ***without sown land or groves****; and if there were any, they should be burned.*
>
> (after Roys 1952: 157, emphasis mine)

Spanish confusion with annual cropped *milpa* infields and scattered *milpa* outfields within the forest led to the misrepresentation of the Maya *milpa*-forest-garden cycle – a system that intervenes in and works with natural regeneration cycles. Preparation and use of fields within the forest, as the basis of a land cover mosaic that sustained life in the Maya forest, was largely invisible to Western eyes.

While there continued to be attempts to suppress the *milpa* practice, the *milpa*-forest-garden cycle has persisted as an important land management practice. As recognized from the conquest and colonial times to the present (Teran and Rassmusen 1995), the landscape created by the *milpa* cycle embraces infield home gardens, and the diverse accessible outfields interspersed among secondary growth and mature, closed canopy forests (Ford et al. 2021). There is a patchwork that is created by the field-to-forest cycle that demonstrates resources accessibility that could fulfill daily requirements of food, condiments, fiber, oils, fuel, gum, furnishings, supplies, medicine, toys, construction materials for buildings, household utensils for cooking, spinning, baskets, and habitat for animals. In other words, it met all everyday needs.

Envisioning the Maya Forest Cropscape

Classified as a biodiversity hotspot (Mittermeier et al. 2000), botanists studying the alpha diversity of the Maya forest show that the well-drained uplands are replete with ethnobotanically salient species (Campbell et al. 2006; Ross 2011). The Maya *milpa*-forest-garden was intensively managed, as reflected in the composition of perennial forest plants, tall trees, and understory shrubs that are economically important. Documented Maya resource management appears to have influenced forest structure and composition in observable ways. The well-drained uplands preferred by the ancient Maya farmers (Ford et al. 2009) are associated with a relative homogeneity of species, indicated by high beta diversity. This is best explained by human selection revealed in the economic utility of the dominant plants of the Maya forest today (see Table 2.2). These dominant plants have persisted in the native environment and are adapted well to the climatic vagaries of the Maya forest.

Rainfall agriculture (Tuxil 2004; Whitmore and Turner 2005) obviously requires rain. Yet, in the Maya forest, too much rain is just as ominous as too little (Lundell 1978). For Maya farmers, bad years are measured by the timing of rain as related to the harvest. If a deluge is delivered at a time when maize

Table 2.2 The Top Twenty Dominant Plants of the Maya Forest

Common Name(s)	*Scientific Name*	*Pollinator*	*Primary Use*
Wild Mamey, Mamay Silvestre, Ts'om	*Alseis yucatanensis*	moths	food
Milady, Malerio, Kibche	*Aspidosperma cruentum*	insects	construction
Cohune, Corozo, Tutz/Mop	*Attalea cohune*	insects	oil
Breadnut, Ramon, Yaxox	*Brosimum alicastrum*	wind	food
Tourist Tree, Gumbolimbo, Chaca	*Bursera simaruba*	bees	medicine
Give-and-take, Escobal, Kum	*Cryosophila stauracantha*	beetles	production
Monkeyapple, Cabeza de Mico, Succotz	*Licania platypus*	moths	food
Cabbage Bark, Manchich, Manchiche	*Lonchocarpus castilloi*	insects	construction
Sapodilla, Chico Zapote, Ya	*Manilkara zapota*	bats	food
Wormwood, Palo de Gusano, Jabin	*Piscidia piscipula*	bees	poison
Yellow Zapote, Mamey Cireula, Caniste	*Pouteria campechiana*	insects	food
Black Zapote, Zapotillo Hoja Fina, Box Ya	*Pouteria reticulata*	insects	latex
Bay leaf palm, Guano, Xa'an	*Sabal mauritiiformis*	insects	production
Redwood, Palo Colorado, Chaltekok	*Simira salvadorensis*	moths	instruments
Hogplum, Jobo, Huhu	*Spondias mombin*	insects	food
Mahogany, Caoba, Chacalte	*Swietenia macrophylla*	insects	construction
Mayflower, Maculiz, Hokab	*Tabebuia rosea*	bees	construction
Kinep, Guaya, Wayum	*Talisia oliviformis*	bees	food
Fiddlewood, Flor Azul, Yaxnik	*Vitex gaumeri*	bats	construction
Drunken Baymen, Paragua, Tamay	*Zuelania guidonia*	bees	medicine

is maturing, it is devastating. With tropical storms and hurricanes (Kramer and Hackman 2021), crop damage is always a possibility. Successful crop yields have to do with the timing of rains, not necessarily the amount.

While the annual climate has been easily defined by wetness and dryness, the annual cycle is more complex. Precipitation, from which average rainfall is estimated, is connected to distant influences. The warm wet period is dependent on the movement of the Intertropical Convergence Zone (ITCZ), while the intensity and frequency of rain is contingent on the frequency and intensity of storms and hurricanes. The Atlantic heralds the cool wet period, coinciding with the North America winter locally known as *nortes*. The intervening dry season varies in length according to the persistence of *nortes* and emergence of hurricanes and is the cause of many uncertainties when initiating the *milpa* field plantings. The predictability of the dry period, when fields are prepared by selecting, cutting, and burning, is a critical point of departure. Sufficient rain at the critical growing phases is required for crops to mature. Nevertheless, there must not be too much rain to flood fields or to damage crops. These three distinct seasons are acknowledged by local farmers. The wet seasons are divided by the dry season that begins around March, known as *Yaax K'in*, or first sun. This is a time to prepare the *milpa* fields. The field preparation is in anticipation of the warm wet period of May–June, known as the *Noh Pak'al*, the principal planting period for the Maya (Victoria Bricker, pers comm 2017). From November to December is the cool wet period called the *Yaax Pak'al*, or first planting. This period is not expected to be as reliable as the *Noh Pak'al*.

The asynchronous cycling of fields to forests develops a landscape mosaic that, at any one time, presents diverse fields amid building perennials and mature closed canopy. There is an important environmental interaction among the embedded fields in the regenerating forests. Nascent perennial trees are nurtured in the fields below the maize canopy. As the perennial trees and shrubs gain ascendency over the maize, they take over the canopy, at first low second growth and then higher canopy (Ford et al. 2012). It is the canopy that is different: the diverse field crop canopy is largely maize while the forest garden canopy is composed of valued trees.

From the farmer's point of view, too much or too little rain is *not* measured annually. Annual measures of rainfall, while telling of the overall precipitation, misses critical factors that farmers must consider (Kramer and Hackman 2021; Tuxill 2004). At the intimate scale of the field, the weather is evaluated based on daily observations of insects, birds, and other animals (see also Whitaker's chapter in this volume).

While farmers may expect the annual cycle to give two maize yields corresponding to the two wet periods, the largest and most reliable will be from the May–June planting with a September–October ripening, depending on the selection of the maize race (Reina 1984; Tuxill et al. 2010). There may be an opportunity for a dry season planting depending on rainfall and other indicators, so variation and unpredictability are ever present (Reina 1967).

Intentionally located to take advantage of variability in drainage, outfield *milpa* plots are placed heterogeneously across landscapes that may be too wet or too dry. The catalog of edible plants numbers nearly 500 species (Fedick 2020), and many edibles are drought tolerant (Fedick and Santiago 2022). This includes specific maize varieties (Tuxill et al. 2010; Fenzi et al. 2017).

Favored trees are protected and cared for in the forests and the fields (Ford and Nigh 2015), and, along with resprouting saplings in the open fields, provide shade that reduces temperature as they speed the regeneration process and maintain biodiversity. These dynamic land-use practices enhance flexibility and adaptability under unpredictable and changing rainfall and other climate conditions. The mosaic of land cover from field to forest moderates temperature and manages water, past and present, for both drought and deluge. These ingrained and multidimensional low-tech practices dependent on TEK enhance resilience and flexibility and enable nimble responses to short term and erratic shifts in weather regimes as well as more persistent climatic trends.

The *Milpa* Cycle

The result of ancient Maya cultivation has enriched the landscape by prioritizing useful species and intervening in natural forest cycles. Collaborating with contemporary Maya farmers has revealed a sophisticated knowledge-base that contributes to the continued maintenance of the forest as a garden (see Ford and Nigh 2015). A simple focus on the agricultural field does not credit the importance of wider land-use patterns and cycles. The open fields provide gaps that that are adjacent to perennial second growth and mature forest. By selectively cutting trees to promote resprouting, choosing those species that accelerate the conversion to succession perennials, the landscape is always in motion. Fields that are cut in the dry season are burned, creating an area for annual sun-loving food crops selected from hundreds of edibles (Fedick 2020). The newly burned fields are fertilized by nutrients left in the soil from ash. Maize, beans, and squash, the "three sisters" of New World fame, lead the species that are grown, but are no means the limits. An average of 30 crops may be found in a cropped *milpa* field; this is only a selection from hundreds of edibles available to the Maya. Companion plants are managed for attracting pests and for their contribution to soil properties (Gliessman 1983). The result is a polyculture field that can be sustained for about four years, rotated within an estimated 20-year cycle, fostering perennial trees that emerge with the natural cycle of forest succession and the culturally directed growth towards useful ends (Campbell et al. 2006).

The Products of the Forest

Forest products derived from the Maya *milpa*-forest-garden complex were managed to mitigate climatic variability and environmental changes that are experienced over the course of a single year as well as over multiple years. The endurance of the Maya forest gardens is largely related to the integration with the natural cycles and rhythms of the landscape. The key practices are designed to conserve water, moderate temperature, build soil fertility, and check erosion. Temperature is moderated by the tree canopy that at the same time reduces evapotranspiration from the understory and retains moisture in the soil. Perennial cover increases root penetration, which helps to mitigate erosion and increases organic matter, improving soil fertility. The mosaic of the system builds tree cover with each asynchronous and regenerative cycle.

The mosaic landscape produced by the *milpa* cropscape ensures reliable access to goods and provides environmental services to meet the basic needs for food, fodder, fuel, and overall well-being of people and their environment. These were available because local inhabitants invested in forests *and* gardens. The result is a dynamic mosaic landscape that immediately surrounded homes and communities. Rarely would something need to be found more than an hour from the home base. Even remedies derived from forest plants cover most ailments encountered in the household.

Discussion

Tropical forests are regularly dismissed as fragile landscapes with resources that are inadequate for sustaining large populations without substantial alteration (see Gourou 1980). This is the very attitude currently putting these environments at risk. Yet long-surviving food-production practices, involving sophisticated understandings of forest ecology and the benefits of managing vegetation for land cover, suggest Indigenous populations in the tropics did indeed develop sustainable practices, strategies, and methods to support themselves in such environments. The example of the Maya *milpa*-forest-garden is one case among many, which is worthy of detailed investigation to identify Traditional Ecological Knowledge from the past that can inform development programs and policies of the future.

The historical outcome of ancient Maya land use, and the resilience of Maya forest, is related to historical ecology and traditional land use. With the expansion of ecological imperialism, the inappropriate and unsustainable "conventional" farming (Sumberg and Giller 2022) based on cattle ranches and plowed monocrops has expanded at the expense of the forest. This was not the trajectory of the ancient Maya, and there are lessons to be learned. Calls for conservation have promoted the creation of protected areas that restrict access to the forest and guarantee no Maya forest cropscape in the future. The real threat to the Maya forest is the loss of traditional Maya farming practices. Indigenous strategies and TEK, preserved in the archaeological record and documented in ethnographies, illustrate the value of exploring the past to develop innovative solutions to address the critical sustainable development goals.

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