

Considering Maya Identity in Economic Development Models in Southern Belize: an Interdisciplinary Approach

Kristina Baines, PhD Assistant Professor of Anthropology, Guttman CC, CUNY (corresponding author)

Kristina.baines@guttman.cuny.edu

561-827-2097

50 West 40th Street

New York, NY 10008

Sebastien Buttet, PhD Associate Professor of Economics, Guttman CC, CUNY

Abstract

Indigenous Mopan and Q'eqchi' Maya communities in southern Belize have sustained livelihoods in the lowland rainforests of southern Belize for many hundreds of years. Amidst changing climate, diminishing forest resources, and internationally-highlighted socio-political struggles, these communities continue their traditional agricultural practices, using systems of reciprocal labor and collective land management. While governmental and non-governmental organizations have encouraged economic development, promoting the adoption of cash crops as an example, these traditional systems persist. This paper offers an interdisciplinary approach to exploring these traditional systems and, ultimately, their value for community health and well-being in the context of sustainable development. Using ethnographic data from seven local communities coupled with a social anthropological framework, embodied ecological heritage, which links traditional ecological practices and health, the authors present an economic model exploring the value of Maya identity as a variable. They argue that standard economic models fail in sustainable development efforts because they lack the more detailed consideration of indigenous values, the relationship of those values to livelihoods and, ultimately, their nuanced connection to health and happiness through an intersection of social and physical mechanisms. They propose a new paradigm for economic development where Maya values and identity are key variables for decision-making in economic models and where the social benefits of traditional practices and collective decision-making are explicitly captured. Forefronting indigenous knowledge and practice, they develop a model of economic development and show that traditional farming systems are a rational livelihood strategy, even in the face of an increasing visibility of wage-labor opportunities, because the private and social benefits derived from traditional practices more than outweigh the private benefits of increased market consumption. Traditional practices, in this analysis, have the potential to enhance our understanding of resilience of these communities in the face of climate change and internationally-driven resource extraction. The authors demonstrate that Maya values and identity must be considered, and can provide an essential alternative economic view, if sustainable development models are to be used to inform programs and policies in the region and, potentially, in indigenous communities in similar ecosystems around the world.

Introduction

In a changing world, indigenous communities are presented with a convergence of issues on a global scale. Environmental degradation, resource exploitation, access to land and education, food insecurity- the list is long and the impacts are well-documented (Cantor et al 2017, Leatherman and Goodman 2005). Governmental and non-governmental initiatives at international and national levels aim to address issues and assist communities in achieving their goals of secure livelihoods through sustainable development initiatives. Many of these initiatives

are evidence-based, and implemented by people with formidable skills and the best intentions, and while many communities and individuals benefit, oftentimes these programs fall short (Escobar 1995, Robins 2003, Devine 2003). In this paper, we argue that interdisciplinary research, which explicitly accounts for the value of indigenous practices within a broader presentation of traditional economic models, can be an important part of designing a robust initiative. Using ethnographic data collected in southern Belize as a case study, and a sociocultural framework- embodied ecological heritage- as a tool of analysis, we present a way of understanding economic choices in the context of indigenous lives. We hope that the interdisciplinary nature of the research provides insights to better design and operationalize more sustainable development projects and programs in indigenous communities.

This work has grown out of many discussions over the course of several years, both independently and as co-authors. Our interdisciplinary collaboration, while fruitful we hope, was not without tensions rooted in the fundamental assumptions of our disciplinary approaches. Our rationale for this work, which has remained constant, is that the deep, micro-level analysis that the ethnographic work undertaken by sociocultural anthropologists could provide not simply a case study but a nuanced approach to understanding the way communities negotiate environmental and economic change, providing the rich detail and the on-the-ground realities. Immersed in daily life, ethnographers are able to highlight small changes and critical issues that take time and deep understanding to be revealed. While these nuances are critical, anthropologists can run the risk of their data becoming difficult to operationalize. Applying anthropological data requires specialized training and often the theoretical frameworks employed to frame the data are challenging for non-anthropologists to utilize. It is this challenge that inspired the incorporation of economic modeling. Our intention is that the models employed capture the nuances of the anthropological data in a way that is more clearly accessible to those designing development initiatives, moving beyond simply a critique of those initiatives. Focusing on what we have identified as the strengths and weakness of project designers utilizing research from both anthropologists and economists, ground-up detail and clarity in optimizing utility for development work respectively, we provide a blueprint for future collaborative models using the following case study, which formed the initial impetus for this work.

A result of both traditional disciplinary boundaries and diverging foundational perspectives, anthropology and economics have more found themselves in critique rather than collaboration. Anthropological critiques of economic development are also numerous, beginning half a century ago with an ongoing discussion of the post-colonial perpetuation of a capitalist worldview and, particularly and most recently, with respect to microfinance programs (Kellett 2011). Critiques of economics as a discipline from anthropology include problematizing its “top-down” approach and assumptions of human behavior, which lack an incorporation of the role that particular cultural and environmental variables play in decision-making across societies. Although it is widely understood that culture plays a central role in human behavior, economists started to study the impact of culture on economic outcomes only recently, largely because they lacked the tools to measure cultural and social factors (Guiso et al. 2006, Henrich et al. 2001). Hoff and Stiglitz (2016) advocates moving away from the rational agent paradigm toward a new class of preferences which evolve over time and are influenced by social contexts and cultural mental models. Bisin and Verdier (2011) propose a dynamic model where culture and preferences are intertwined and study the conditions under which cultural heterogeneity can exist in the long-run. Finally, Alesina and Guiliano (2015) study the two-way relationship between culture and institutions. We argue, and demonstrate here, that through collaboration with anthropologists, assumptions embedded in economic models can be refined to show how culture, traditional practices, and identity affect economic choices.

The Project: Barriers to Land Use Change

In the Fall of 2012, a local NGO in the Toledo district, Belize commissioned Baines to conduct research and produce a report to help them understand how local Q'eqchi' and Mopan Maya farmers make decisions about how they used the land in their villages and surrounding forests. At the heart of this desire for understanding seemed to be some frustration and confusion about why many farmers continued to plant corn, a traditional crop grown using slash and burn agricultural methods, which could be deemed, in particular circumstances, to be environmentally destructive and economically unproductive. Cacao agroforestry, which is commonly promoted as both environmentally sustainable and economically lucrative, seemed a better choice, particularly in light of the organization's mission to both manage protected forests in this part of Belize while simultaneously protecting the livelihoods of the indigenous Maya communities who have lived within those forests for hundreds of years. In an attempt to clarify this confusion and shed light on the barriers perceived by the organization to farmers adopting the farming practices they aimed to promote through the initiative, an ethnographic study including participant observation, informal interviews, community meetings, free listing and pile sorting was undertaken and a report with findings submitted (Baines 2012).

Summary of Findings

"Both we want- we want we money and we want we food"

The findings of the study were consistent with the larger research in Maya communities in southern Belize (Baines 2016, Baines and Zarger 2017, Stanley 2016, Wilk 1991). The need for cash income emerged as an important factor in decision making, especially in communities in which traditional communal land tenure was not supported. The need for money to support educational opportunities for children was a particularly common concern. While many of the community members reported working for wages out of their communities, the majority reported still keeping a family farm of their own, or participating in the keeping of an extended family farm. Making a farm to grow food for the family emerged as one of the most pivotal aspects of social life, distinct from making a farm to grow primarily commercial crops, cacao as an example. While it might be argued that growing some cash crops for sale is a traditional practice if "traditional" is considered flexible category (Baines 2016, Chan 2005), growing corn, beans and a select few other crops for the family to consume is an expectation that exists for most men in the study communities. If wage labor prohibits tending one's own farm, sharing the food from one's father's farm is a viable option. Growing corn, in this sense, is vital for being considered a successful farmer and a healthy Maya person. It is important to note that, although Maya community members routinely express that "corn is what Maya people eat," a distinction is made between actually growing the corn for your family's consumption and buying the corn that your family will eat. As illustrated in the multi-dimensional scaling analysis of the pile sort data (Figure 1), food for the family has a closer relationship with happiness and a good and satisfying life than money has with those elements of a "good life."

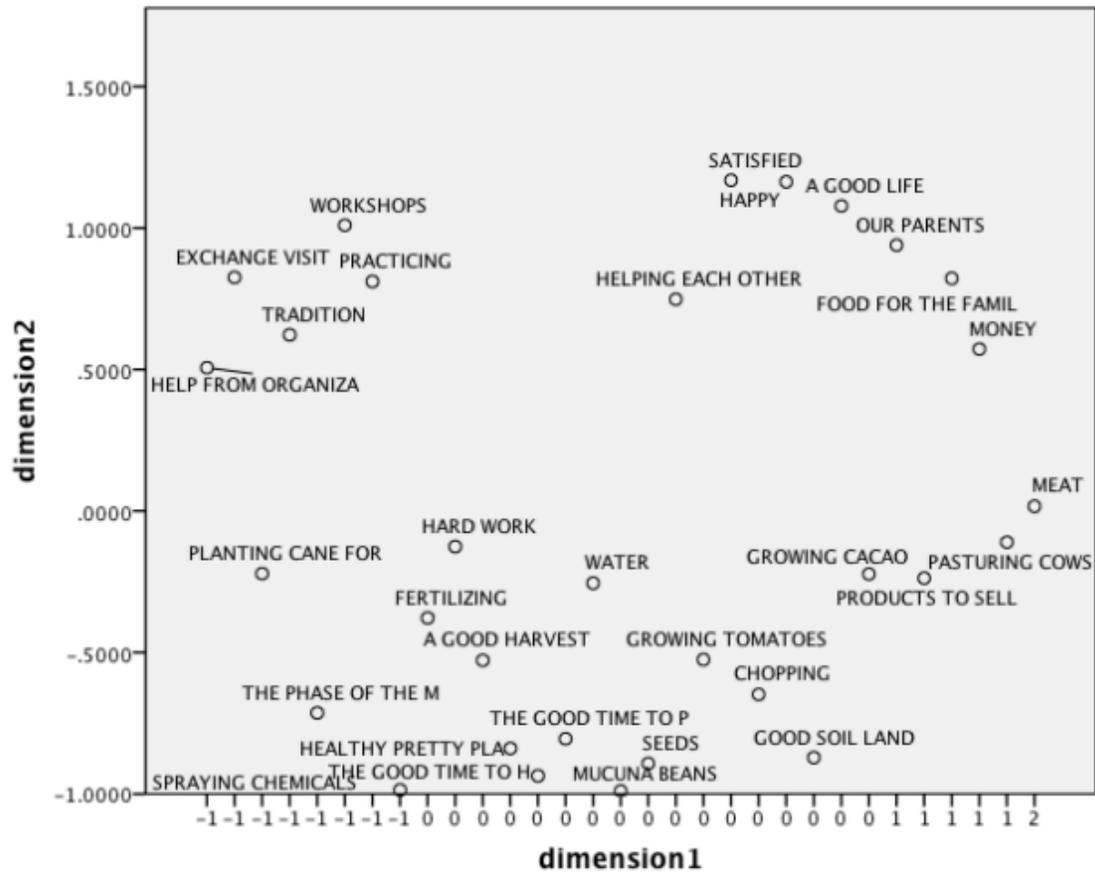


Figure 1. Community members pile sort responses (n=18) multi-dimensional scaling plot.

“the community don’t come all together [anymore]”

The proximity between food for the family, happiness and helping each other reinforces another significant finding of the study: the importance of the reciprocal labor system, and concern for its decreasing use with the increase of cash cropping. Community members routinely expressed that working together is one of the most important Maya values. In Mopan Maya, the system is known as *usk’inak’in*, or “a day for a day,” indicating how a farmer who wants to plant corn will ask several other members of the community, often but not exclusively extended family and friends, to help in the process. After helping in this process for a day, the farmer will be owed a day in return from the family he helped. This system extends to the wives, who will come and help prepare the meal that will feed everyone after the work has been completed. The reciprocal labor system operates with detailed organization and a clear understanding of the obligations associated with its use in communities. It is critical to accomplishing the time-sensitive work of clearing the forest, planting corn and, in some cases, harvesting the corn and also extends to other labor intensive and time sensitive activities, such as building a thatch house, in communities where cash income is unreliable. Concerns emerged during the study that more and more young men, even family members, are asking to be paid for their day’s work and this is compromising the ability of farmers to plant enough corn, while also eroding the social supports provided by this Maya value, discussed in more detail below.

These findings show that Maya farmers in these communities weigh multiple factors in their planting decisions, and value both the production of corn for home use and the production of cacao, primarily to sell.¹ Interested in considering how the decisions about where to invest farming time are made, we began by translating the findings using rational choice model where community members (agents) are both consumers and producers of corn and cacao and choose optimal allocations to maximize a well-defined utility function subject to budget and time constraints. The first model below outlines the choice between growing corn for consumption and growing cacao for sale and subsequently buying corn for consumption.

Model #1

Economic models are built to answer specific questions. In the case at hand and as documented above, the motivating question came from a local NGO that was struggling to understand why Maya farmers continue to plant corn when the attractive relative price of cacao suggests that planting cacao and using sales proceeds to buy corn on the market would seem to be more rational. We propose a stylized economic model with rational agents that explains the NGO's intuition about crop choices.

Rational choice theory is based on the premise that fully informed agents decide how to allocate finite resources (usually time and money) to maximize a well-defined utility function, a proxy for the agent's well-being. As highlighted in Baines' report and summarized in Figure 1 above, corn plays a special role in Maya's culture and growing corn to feed one's family is very different from using cash to buy corn in the market place.

Our model captures this important nuance about corn production and identity as agents can decide to either produce corn at home (home good) or use cash to buy corn in the market place (market good). We denote by c_1 consumption of corn bought in the market place at price p_1 and by c_2 the amount of corn grown and consumed at home. Total food consumption allocation c which consists of the sum of corn bought in the market and produced at home, $c_1 + c_2$, must remain greater than a subsistence level \bar{c} for agents to remain alive and well.

Beside corn, agents produce cacao and sell it at price p but do not consume it.² Rather they spend the income earned from selling cacao on either corn $p_1 c_1$ or the market good c_m .³

The time constraints are as follows. Agents are endowed with one unit of time which they split between producing either corn or cacao. We denote by l the time allocated to corn production and as a result the time allocated to cacao production is equal to $1 - l$. Given the time input, corn and cacao output are equal to $r(l)$ and $s(1 - l)$ respectively where both r and s are increasing.

¹ It is important to note that, although we are treating it as a choice for producing cash income in this paper, cacao is also a very traditional crop among Maya communities. Families will often have a few trees for home consumption.

² Maya community members do consume part of the cacao they produce. For example cacao plays an important role in the reciprocal labor tradition and is used by Maya farmers to thank community members that came to help them planting or harvesting corn. Community members however sell a large fraction of their cacao production to multinational corporations and cacao plays a very minor role in dietary daily choices. As a result, we are fine with modeling cacao as a cash crop and not something that agents consume on a daily basis.

³ We normalize the price of market good to one.

The last part of the model is the utility function. Consistent with standard economic theory we first assume that agents derive utility from consumption of both market good and total food consumption with the utility equal to $u(c_m, c)$.⁴

Given the prices of corn and cacao, agents choose time allocation and food and market good allocations to maximize utility. That is,

$$\max_{(c_m, c, c_1, c_2, l)} u(c_m, c)$$

$$\text{s.t.} \begin{cases} c_m + p_1 c_1 = ps(1 - l) \\ c_2 = r(l) \\ c = c_1 + c_2 \geq \bar{c} \\ 0 \leq l \leq 1 \end{cases}$$

Note that we made an important assumption that only total food consumption matter for utility not whether the corn consumed was produced at home or bought in the market. This simple and stylized model captures the NGO intuition in the following manner. For given utility function u and production function (r, s) there exists a solution to the above maximization problem where when the relative price of cacao p/p_1 is high enough then farmers allocate all their time to producing cacao $l = 0$ and all corn consumed is bought in the market place with $c_2 = 0$.

The result of this model is if price of cacao is high enough, corn production is zero and people buy all their corn.⁵ This result shows the assumption that the project managers held and led, in some cases, to their confusion and frustration. Not surprisingly, therefore, the research findings did not support this outcome. To understand this, we employed a framework, which allowed us to understand the ways in which farming and labor practices might be understood in the context of social benefits- and extended to their relationship to health, broadly defined to include well-being and happiness. This framework, a summary of which follows, then allowed us to incorporate a consideration of social benefits (to include cultural identity and well-being) into the model.

Embodied Ecological Heritage: A Framework for Understanding Social Benefits

“Taking control of the forest is a Maya value”

Maya communities in southern Belize have historically practiced swidden, or slash and burn agriculture, planting corn as a primary subsistence crop once or twice a year in a seasonal pattern of shifting cultivation. As the system is rainfall dependent, it requires the mobilization of

⁴ Under standard assumptions, the utility increases with consumption of market and home good, albeit at a declining rate.

⁵ For the sake of argument, we ignore supply-side effects. In a closed economy where the price of corn is determined endogenously by the forces of supply and demand and where farmers have heterogeneous preferences, one can imagine an equilibrium where a fraction of farmers specialize in producing corn while the remainder of farmers produce cacao and buy corn in the market place. In such economy, the relative price of corn would increase until the supply of corn produced is equal to the demand of corn.

large groups of community members during short windows of time during key moments in this cycle, notably planting and harvesting. Other practices, which have a high demand for labor such as building a traditional thatch house, also require this mobilization of these labor groups, within the reciprocal labor system described above.

The system of subsistence farming and reciprocal labor is critical in the socio-cultural organization of daily life and activities. Women are typically involved in the preparation of meals for the men who are contributing labor and children also share in the meal hosted by the family for which the work is being done. The labor of processing of corn and other food items is also shared in much the same way with women returning back their day of labor along with their husbands. Without refrigeration or other ways to prepare large amounts of food in advance of consumption, the coming together of women allows for the preparation of large amounts of food and the processing of larger animals, such as pigs, again reinforcing the interconnectedness of ecological and social practices.

The activities associated with the shared labor system guide the rhythm of daily life and are described as having a close relationship to Maya identity or “being Maya.” Planting, harvesting and building a house are all labor-intensive, oftentimes requiring upwards of 20 men to complete the work. Returning back a day of work to each of the men is becoming increasingly difficult for households in southern Belize. As the pressure to engage with the market economy increases, with providing a high school education for children as one of the most discussed factors, the need for men to leave the village to work for cash wages increases. Balancing the responsibilities of returning work days and earning a wage is a nuanced process, affected by multiple socio-political, economic, cultural and environmental factors. The decision to return back a day of work or work for a wage and return back that day in cash is becoming increasingly one that community members need to consider. Returning the day as cash rather than in labor allows a laborer to be hired in your place but also exposes the community to the social risks in losing traditional systems in which economics is so closely linked to cultural values and identity.

Maya agricultural practices, and ecological practices more broadly such as harvesting of wild plants and animals for consumption, house building and other daily activities, have benefits that go beyond the economic benefits of the reciprocal labor system. To understand the scope of these benefits, Baines has outlined a framework, embodied ecological heritage, which links a health and wellness, broadly defined, with traditional ecological knowledge and practices (Baines 2016:5, Baines and Zarger 2017). The “embodied” component of the framework captures the importance of the physical work- an importance which was stressed throughout Maya communities in southern Belize. Work, and working together, was not simply a social benefit in which labor was supplied, it was also critical to “not let laziness come into our body” and the process of sweating, moving the body through the forest, the physicality of the hard work of agricultural production, all contribute to a healthy, strong body. Understanding about how the process of embodying traditional practices, actually “doing” and not just “knowing” can, in the context of the study discussed here, help us understand both how social benefit is linked to physical benefit and, more specifically, how growing corn differs from buying corn on multiple levels. Essentially the social benefit is deeply rooted and the healthy body is at the heart of traditional practice in this sense.

The “heritage” component of the framework allows for an understanding that what constitutes traditional or heritage practices are intertwined with healthy bodies and healthy communities and, as such, have an element of flexibility. As it is practiced and defined, heritage is articulated in different ways. This element is salient for the discussion present here because it allows for changes within those practices considered by communities to be heritage practices, which has

implications for the incorporation of new practices within the scope of what it considered heritage, contrasted with a more static view of traditional ecological knowledge being something that is easily documented as a discrete list. It is helpful to consider that, although what constitutes Maya ecological and cultural heritage may flex through practice, because these practices are embodied, and linked to the maintenance of health, they are not easily cast off. Embodied ecological heritage practices, such as planting corn using reciprocal labor, are not just part of the social structure, which has its own documented health benefits, but they are central to individual identity and wellness. Using this framework to deepen the conception and understanding of the multi-faceted and interconnected nature of “social benefits” in the context of Maya communities in southern Belize, we add this variable to the modeling of the choices shown above.

Model #2

“I no buy corn- I always have corn for my family”

The first model was built around Western values and failed to capture the nuances of Maya culture on crop choices. Not surprisingly it led to the result that farmers chose not to grow corn when the price of cacao is high enough, a result at odds with the data about time use and crop choices in the Toledo district (Baines, 2016).

Based on the ethnographic work in Baines (2016) we propose a simple but unconventional tweak to the utility function - that farmers derive utility from producing corn. The tweak is unconventional because utility functions in standard economic models only depend on quantity consumed while production - here time spent growing corn - is treated as a cost. The fundamental result of Baines’ (2016) embodied ecological heritage framework however is that the social and health benefits from being part of the Maya community are real and tangible and play an important role in farmers choices to grow their own corn. As a result the proposed tweak in preferences is not ad hoc but instead the ethnographic data collected in the Toledo district using well-established research methods inform the assumptions made in the economic model.⁶

We posit that the amount of home grown corn is a good indicator of the state of the Maya culture and thus model the social and health benefits through an all encompassing function $V(c_2)$. With this addition to the model, the utility function becomes $u(c_m, c) + V(c_2)$ and Maya farmers choose time and resource allocations to solve the new maximization problem:

$$\begin{aligned} & \max_{(c_m, c, c_1, c_2, l)} u(c_m, c) + V(c_2) \\ & \text{s.t.} \begin{cases} c_m + p_1 c_1 = ps(1 - l) \\ c_2 = r(l) \\ c = c_1 + c_2 \geq \bar{c} \\ 0 \leq l \leq 1 \end{cases} \end{aligned}$$

⁶ Hoff and Stiglitz (2016) advocates using insights from anthropology to broaden economic discourse

The fundamental result of our second model is when the benefits derived from being Maya reflected in the function V are high enough then all corn is home grown and no corn is bought in the market ($c_1 = 0$).

Here the value of interdisciplinary research becomes clear. When ethnographic research of Baines (2016) informs the assumptions embedded in the economic model, the model is able to explain why Maya farmers continue to grow corn at home even though the economic cost benefit analysis seems to suggest otherwise. Note that the two economic models yield very different predictions about Maya' society. The first model, built upon Western ways of thinking and traditional economic assumptions that utility is derived from consumption only could not account for the fact that Maya farmers continue to grow corn when planting cacao seems more economically attractive. When assumptions about the utility function are tweaked based on the ethnographic work of Baines (2016), then the second model is able to account for the fact that Maya farmers predominantly continue to grow corn.

Discussion

“a small disaster [is] striking our culture- people start to change traditions- start to think about getting money”

It is clear from this study that Maya farmers in southern Belize are making choices about their ecological activities, particularly their agricultural practices, through the incorporation of a complex and deeply rooted set of social benefits, which are explicitly linked to identity, health and happiness. The result shown in the model is dependent on the defining of the V function, which we have done here using ethnographic data interpreted through the embodied ecological heritage framework. For future work, further defining and quantifying the V function will assist in illustrating how it comes to carry so much weight in the decisions Maya communities make about their lives and livelihoods.

The exercise in modeling this ethnographic study serves to simultaneously simplify and deepen our understanding of the relationships between social benefits and economic choices. Through the use of the embodied ecological framework, which links these social benefits to health, happiness and identity, we demonstrate that culture is not simply a “add-on” or impediment to rational decision making but an integral component of how individual communities develop sustainable livelihoods. In context of continuing research at a global scale, which shows that happy, healthy lives are more closely linked to social relationships than to economic status, we argue that it is imperative for models of economic development at every scale to deepen their definition, measurement and incorporation of socio-cultural variables.

This model is designed as a starting point to further examine the specific data documented in Baines' report. We argue that it can be developed and modified to address other important issues and questions, and incorporate other variables. For example, we ask if farmers spend the same time working and their yields are lower, would this change the value of the V function? Issues incorporating variables such as land ownership and education, both of which are particularly salient among indigenous communities in southern Belize, is promising in the context of sustainable development initiatives.

Models are, by definition, a simplification of the process of decision-making and behavioral choice. In the case of Maya farmers in southern Belize, it is important to note that many farmers plant both corn and cacao. Indeed, growing small amounts of cacao is a traditional practice, and preparing and drinking cacao has been a very important part of traditional practices for

hundreds of years. Supplying the body with energy for work, eating and drinking cacao is a prime example of embodied ecological heritage. Selling cacao to often foreign-based chocolate-makers has not traditionally been part of this heritage practice but the care and maintenance of cacao trees could certainly be identified and practiced as heritage. Maya farmers have historically used a “mosaic” of livelihood strategies to manage their lands and provide for their families’ needs (Zarger 2009) and, we argue, that the data presented here does not mean that a merging of the farming activities discussed cannot take place. Indeed, farmers in different communities have adopted a variety of ways of incorporating new ideas. One suggestion in the report outlined how supporting the reciprocal labor exchange system in the planting and maintenance of cacao rather than simply reinforcing the cash labor model may be a positive step in making projects more sustainable and promoting resilience through a consideration of critical cultural practices. When money runs out, farmers can still rely on each other for labor exchange.

To conclude, indigenous communities have long had complex relationships with development organizations. It is our hope that forefronting traditional ecological practices, demonstrating their nuanced relationship with health and happiness, and modeling their social benefits, this research can help organizations move past understanding traditional practices as static, irrational or impediments to both economic security and understand them as vital to choices communities make to support healthy, sustainable livelihoods.

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