Bridging Knowledge Through Exchange:

Expanding Community-Informed Sustainable Agriculture Education in

Chiquimula, Guatemala

A MASTER'S FINAL REPORT

Submitted to the Faculty of

the University of Wisconsin - Madison

in partial fulfillment of the requirements

for the degree of Masters of Science

By Meg Baker

Agroecology Program

University of Wisconsin - Madison

May, 2023

Masters Committee:

Dr. Claudia Irene Calderón García, Department of Horticulture, UW – Madison
Dr. Julie Dawson, Department of Horticulture, UW – Madison
David Kiefer, MD, Department of Family Medicine and Community Health, UW - Madison

Table of Contents

With Gratitude
- For the Land
- For the Community

Introduction
- Community-Engaged Scholarship and my Influences
- Agroecology
- Guatemala: Connection to the Land
- Indigenous Ways of Knowing

Background
- Ch'orti' Region
- Mancomunidad Copanch'orti'
- Camotán, Jocotán, Olopa, and San Juan Ermita

Project Overview

Methods

Results
- Demographics
- Medicinal Plants
- Agroecological Practices
- Knowledge Transfer

Outcomes
- Trainings
- Campesino-a-campesino Exchange
- Educational Resources
- Feedback

Dissemination

Limitations

Reflections
- Building Trust through Communication
- Logistics
- Cultural Humility
- Mental Health Abroad

Conclusion

References

Appendices
- Appendix A. Meg Baker's framework for community-engaged scholarship
- Appendix B. Interview Questions - English
- Appendix C. Interview Questions in Spanish
- Appendix D. Agenda for Part 1 Campesino-a-Campesino Exchange
- Appendix E. Agenda for Part 2 Campesino-a-Campesino Exchange

Appendix F. Educational Materials - Plant Functions and Medicinal Plants
Appendix G. Plant Guide for the Chiquimula Department, Guatemala

With Gratitude

Through working in environmentally focused community-engaged projects over the past six years, I am certain of the importance of people, the land we live on, and our relationships. Those relationships are the foundation, life force, and care needed for this work to outlast a grant funding cycle or master's program. Given their importance, putting the names of the people so integral to the work – the leaders, thinkers, and doers – at the end of a paper felt nonsensical. So before I begin talking about the work, let me talk about the land, the people, and the gratitude I have for them.

For the Land

Over the past two years I have worked on ancestral Ho-Chunk land in Dejope, what is now called Wisconsin, and on ancestral Ch'orti' land in what is now called Guatemala. Each place holds a distinct history, language, and way of knowing and living. I am grateful for the opportunities I have had to connect to soils that provide life sustaining foods, such as the varieties of corn that grow in either place, speckled with colors and brimming with different flavors. Grown from the earth and cared for by knowing hands, I have been lucky to sip a corn drink, atol de elote, from bowls shaped from dried gourds, while I listen to stories from elders. I want to thank the madre cacao trees that root deep into the ground, providing stability, structure, and nutrients for the plants around them and for those who breathe their air. The scars of a violent past and systematic erasure are present in both places and can not be forgotten. They

intermingle with new growth and continual resilience. To the soils, what grows and moves above and within, and the people who continue to be in relationship to them, thank you.

For the Community

Community-engaged projects are never done by a single person. If anything, I feel like a messenger for the incredible work done by others in Guatemala. Ing. Carlos Humberto Ramírez, along with his team, Ing. Julio Cesar Galicia Cobón, Ing. Gaby Nathaly Castillo, and Ing. Kevin Exalen Guerra Sanchez, were invaluable to the success of this work and the execution of all stages of this project. I am grateful for the time, transport, camaraderie, and openness to share their knowledge with me.

The members of the community are the life and breath of this project. Their work over the decades in their communities created the foundation for a project like this to occur. Encarnación Gutiérrez Esquivel, Vicenta Romero de García, and José María Gutiérrez each welcomed me to their home, shared time, food, and stories with me, along with the expertise each one holds. I want to thank them for their candor and their leadership in this project.

The videos created during this project would not have been possible without the help of Claudio Vásquez Bianchi, Mikel Sánchez Martínez, and Fernando Scheel. Claudio went out of his way to join me in the communities to capture the work being done. Mikel edited the videos and Fernando prepared the music specifically for this project. I am grateful for the time spent on this project and the care taken to present such beautiful work.

My committee, Dr. Claudia Irene Calderón, Dr. Julie Dawson, and Dr. David Kiefer helped guide me through this experience. I am grateful for their feedback, edits, and recommendations. Dr. Calderón in particular traveled to Guatemala multiple times with me, shared her connections and insight, and has encouraged me to continually reflect on my perspective of working with communities. Thank you Claudia, por todo.

Finally, this work would have been impossible without the financial support of the Center for Integrated Agricultural Systems, the Center for Culture, History and the Environment, 4W Women and Wellbeing Initiative, the Student Research and Travel Grants through the Graduate School, and CALS Global. Thank you for generous contributions to this work.

Introduction

Community-Engaged Scholarship and my Influences

Community-engagement, be it scholarship, research, participatory research, community-based or community informed, has a deep practical and scholarly history. Whatever the type of community-engaged, -informed, or -based work, I believe it is context dependent and requires transparent communication and flexibility. To better understand my approach to this project I want to cite the prominent scholars, thinkers, and educators who have influenced me.

Cynthia Gordan da Cruz's (2017) investigation into community engaged scholarship identified the following definition: "community-engaged scholarship (CES) encompasses mutually beneficial partnerships between universities and communities that seek to collaboratively develop and apply knowledge to address consequential public issues in our democracy" (p.154). I identify my work as falling within this definition.

The six components of CES laid out by Gordan da Cruz in "Community-Engaged Scholarship: Toward a Shared Understanding of Practice" are the bones of my approach which I then supplement with other thinkers including Pablo Freire, bell hooks, Linda Tuhiwai Smith and Eve Tuck and K. Wayne Yang.

Pablo Freire's seminal work, *Pedagogy of the Oppressed,* is necessary for anyone engaging in the field of CES. The book along with *Pedagogy of Hope*, discuss the power dynamics at play in our current society. Through his critical analysis of the oppressors vs. the oppressed, which can be exchanged for community engaged scholars and the community in the case of CES, Freire details a pedagogy that focuses on the humanization of the oppressed. He writes, "To surmount the situation of oppression, people must first critically recognize its causes, so that through transforming action they can create a new situation, one which makes possible the pursuit of a fuller humanity" (p. 47). Applying this to CES, it is necessary to understand the context of why I am working in a certain area, with a certain group of people, with a particular goal. I must first recognize the origin of the problem as well as my role, privilege, and power within that context.

Freire emphasizes dialogue as critical for progress but acknowledges it requires mutual trust, critical thinking, humility, and hope. To create the most effective dialogue, reflection and action are needed. He says within authentic dialogue we find "reflection and action, in such

radical interaction that if one is sacrificed—even in part—the other immediately suffers." (p. 87). The process of acting and reflecting is cyclical, iterative, and infinite.

bell hooks, author of *All About Love, Teaching Critical Thinking: Practical Wisdom* and many more texts is a thinker and educator who has encouraged me to include love in my CES practice. She wrote, "Love is a combination of care, commitment, knowledge, responsibility, respect and trust." These are all ingredients to a healthy relationship with community partners. Through reading her work I am reminded of the intention and practice necessary to building community and love is an action necessary for transformation.

Eve Tuck and K. Wayne Yang and, specifically, their article "R-Words: Refusing Research." In this piece they analyze the often used pain-centered research narrative used by those working in native communities. They note that although many researchers believe by using a participatory action framework they can avoid pain narratives, "It is a misconception that by simply building participation into a project—by increasing the number of people who collaborate in collecting data—ethical issues of representation, voice, consumption, and voyeurism are resolved." (p. 230).

In their second axiom title it states, "There are some forms of knowledge that the academy doesn't deserve." For me this means active listening and participation, recognizing the privilege I have to turn off the recorder, to instead learn from the people with whom I'm working, to reflect on if the information needs to be recorded and shared with the world. Tuck and Yang cite a Kahnawake scholar, Audra Simpson, who asks herself while doing ethnographic work with members of her nation: "Can I do this and still come home; what am I revealing here and why? Where will this get us? Who benefits from this and why?" These are questions we should all ask ourselves in CES.

Reading Linda Tuhiwai Smith's work on decolonizing methodologies has also enlightened my journey in community-engaged work. Among many other actions, she argues the decolonization of research requires expanding epistemologies to include other ways of knowing and researching, it requires transforming our methodological practices and expanding our reporting practices to be culturally sensitive and relevant, and it requires ethical and sustained relationships.

Within her book *Decolonizing Methodologies* (1999), Smith describes how "research is one of the ways in which the underlying code of imperialism and colonialism is both regulated

and realized" (p. 7). Her description of the colonial and imperialist history (and present) of research on indigenous peoples is important for us as researchers to reflect on and deserves to be quoted in its entirety. She says as Indigenous Peoples,

> "It galls us that Western researchers and intellectuals can assume to know all that it is possible to know of us, on the basis of their brief encounters with some of us. It appalls us that the West can desire, extract and claim ownership of our ways of knowing, our imagery, the things we create and produce, and then simultaneously reject the people who created and developed those ideas and seek to deny them further opportunities to be creators of their own culture and own nations (p.1)."

The power and privilege of the academy and my whiteness coupled with years of violence and manipulation by the United States government in Guatemala, made me hesitate to participate in this project as I did not want to be the Western researcher described above. In the end, through conversations with my advisor and community partners, we decided to move forward with the project.

As a means to stay accountable during this project I have kept reflection and open communication with community partners as cornerstones of my approach. Through reflecting early on, and engaging with work like Smith's, we made the decision to not complete a traditional research thesis but rather develop a collaborative project alongside community partners in Guatemala. This was a possibility given the University of Wisconsin - Madison Agroecology program's Public Policy Masters Track and allowed for more focus to be on relationship building, and project design and implementation than on concerns of (possibly) extractive data collection and publication of Indigenous knowledge.

More than any of these scholars though, I have been impacted most by the thinkers and doers who have been my community partners in Guatemala. They opened their homes and their minds providing me space to learn from their expansive knowledge on agroecological practices, medicinal plants, and community solidarity. They shared their food, their homes, and their time with me, showing me what generosity truly means. I can say for certain they have enhanced my perspective and worldview, added more meaning to how knowledge is created or passed on, and

inspired me to build intentional relationships with my community and the natural world around me.

Each of these scholars, thinkers, and educators, among others, mentioned above have shaped the way I engage with CES work and with community partners. I work to reflect and act throughout the process of a project, actively listening and learning from and with community members. During my master's work I created a document detailing my current, but ever fluid, framework for Community Engaged Scholarship (see Appendix A).

Agroecology

Often difficult to define explicitly, the term agroecology has been routinely cited by Wezel et al. (2009) as "a science, a movement and a practice" aiming to bring a holistic approach to food system needs. In academic scholarship, agroecology is often described by ecological principles (Altieri, 1987, Table1) and levels of food system transformation (Gliessman, 2007, Table 2) with the goal to reach ecological, economic, and social sustainability.

The ecological principles speak to agroecology's connection with the land, arguing the need to decrease chemical inputs and intensified monoculture farming, which create nutrient depleted and easily eroded soils, and increase the use of locally available nutrients and the knowledge of local practitioners. Agroecology works not to eradicate a part of the system, be it pests or native plants, for the benefit of another part of the system but rather works to a balance between all parts of the system to optimize health, for the plants, the soil, the people, and the community as a whole.

Table 1. Ecological principles of agroecosystems adapted from Altieri, 1987.

Ecological principles of agroecosystems
● Natural pest control ● Eliminate synthetic chemicals to decrease toxicity ● Rely on natural regulatory systems such as water balance, energy flow, nutrient cycling, population dynamics, etc. ● Focus on soil-water resources ● Enhance biodiversity conservation, and regeneration ● Long-term productivity is increased and sustained

Gliessman (2007) proposes a framework for a stepwise approach to food system transformation. The first three levels can be achieved on the farm scale and seek to move the industrial and conventional agricultural practices to more ecologically sustainable ones. The fourth and fifth levels go beyond the farm to the societal level, acknowledging the broader system within which food system transformation must take place.

Table 2. Levels of food system transformation adapted from Gliessman, 2007.

Levels of Food System Transformation
Level 1. Increase the efficiency of industrial and conventional practices in order to reduce the use and consumption of costly, scarce, or environmentally damaging inputs.
Level 2. Substitute alternative practices for industrial/conventional inputs and practices.
Level 3. Redesign the agroecosystem so that it functions on the basis of a new set of ecological processes.
Level 4. Re-establish a more direct connection between those who grow our food and those who consume it.
Level 5. On the foundation created by the sustainable farm-scale agroecosystems achieved at Level 3, and the new relationships of sustainability of Level 4, build a new global food system, based on equity, participation, democracy, and justice, that is not only sustainable but helps restore and protects earth's life support systems upon which we all depend.

In line with the fourth and fifth levels of Gliessman's framework, La Vía Campesina (LVC), an international organization working with groups to advocate for peasants rights, women rights, sustainable agriculture and more, emphasizes the additional layers of agroecology beyond the science. They say: "the concept of agroecology goes much farther than just ecological-productive principles. [Our organization] incorporates social, cultural and political principles and goals into its concept of agroecology" (Rosset et al. (2011:16, translated from the Spanish)). This is seen in comments from young farmers associated with LVC in 2017, who argue, "Agroecology is not just about how we work with the land, but also about how we work with each other as people."

These guiding principles, framework, and organizing efforts have been foundational for the science, practice, and movement that is agroecology. The field also continues to look forward

as noted by Wezel et al. (2020). They see the transformational potential agroecology has to move us to a more sustainable and just food system identifying four main entry points to move the field forward including diversity, circular and solidarity economies, co-creation and sharing of knowledge, and responsible governance.

Agroecological practices in Latin America have a long history. Although gaining momentum as a science since the 1970s, agroecology as a practice has roots extending back through time past current regeneration efforts and academic definitions to Indigenous peoples' communities across the globe, particularly in Latin America. The seminal role of Indigenous people is starting to carry a more prominent place in the discourse of agroecology today. It has long been absent, however, due to the violent colonization efforts and intentional erasure of cultural systems (Altieri, 1987). In spite of this brutal history, agroecology as a practice has maintained a place on farms in Latin America and is seeing a resurgence in the last few decades (Altieri and Nicholls, 2017).

Guatemala in particular has deep agroecological roots with Kaqchikel farmers in San Martín Jilotepeque, Chimaltenango working in the 1970s with World Neighbors, a US-based NGO, to develop and disseminate highly effective ecological agricultural techniques from farmer to farmer after their yields declined following the adoption of green revolution technologies

Field of corn at José María Gutiérrez's farm in Camotán, Chiquimula, Guatemala

(Copeland, 2019). Although later suppressed during the civil war (discussed in more depth later in this report), farmers were able to share the knowledge to others in Mexico and Central America. This was the catalyst for a vibrant agroecological movement in the region, with the funding of various organizations and initiatives.

Agroecology appears more as independent and localized efforts in Guatemala, but lacks governance and strong food, environmental and health policies. Agroecology has therefore not been a panacea for Guatemala as they continue to battle high child malnutrition rates and poverty. The current food crisis in the country is multifaceted and confronted by institutional barriers. Localized/individual movements in Guatemala have embraced agroecology as a way to revitalize Indigenous knowledge around agriculture and food sovereignty, however. Nicholas Copeland's (2019a) article, "Meeting peasants where they are: cultivating agroecological alternatives in neoliberal Guatemala" provides an excellent introduction to and analysis of this topic.

Guatemala: Connection to the Land

My advisor, Dr. Claudia Irene Calderón, once wrote to me, Guatemala is "a megadiverse and pluricultural country with richness in landscapes and ethnic groups which provides grounds to deep ancestral knowledge and connection to the land and living beings." In this sentiment she embodies what her home country of Guatemala holds: multitudes. Despite, or in response to, the violent history described above, Guatemalans also have a history of community care and traditional knowledge based on their relationship with the land.

As of the 2018 census by the Instituto Nacional de Estatistica Guatemala (INE) , Guatemala has a population of approximately 14.9 million people, with around 44% self-identifying as Indigenous. Guatemala is home to 24 distinct ethnic groups, 22 of which are Maya and the additional two are Garífuna (Afrodescendants) and Xinca. Twenty different languages are spoken within Guatemala and each ethnicity celebrates its own unique cultural heritage and practices.

Guatemala is the most biodiverse country in Central America. In 2008, Mario Esteban Véliz Pérez, Agriculture Engineer at the University of San Carlos of Guatemala, described 538 endemic species (including algae, lichen, mushrooms and liverwort plants) in Guatemala, about a quarter of which already have been identified to have some use be it comestible, fiber, dye, or

medicinal (Pérez, 2008). The fauna are equally impressive with Guatemala being home to 28 species of unique amphibians in the region, 18 reptiles, 3 mammals, and 138 endemic birds from Central America. The benefit of this diversity manifests in food, freshwater, raw materials, the regulation of biogeochemical cycles, erosion control, waste recycling and purification, wastewater management, disease and pest control, pollination, and damage reduction in natural disasters (Pérez, 2008).

Protecting this biodiversity and the diverse cultural heritage are a wide variety of environmental advocates, primarily youth and women. Whether that is Topacio Reynoso Pacheco, a 16 year old who opposed a silver mine planned to operate near her hometown about 50 miles southeast of Guatemala's capital in Mataquescuintla, Jalapa (Encinias, 2022) or the community stewardship of tropical forests by the community of Petén, whose sustainable production of timber and non-timber forest products has led to improved housing, education and health, and overall livelihoods development while having a near zero deforestation rate (O'Connell, 2021). These and other efforts have led to over 32% of the country being designated as a protected area compared to the 12% protected in the United States (CBD, n.d.).

Guatemala is also the origin place of the campesino-a-campesino (CaC, farmer-to-farmer) movement, exemplified by horizontal knowledge transfer, or peer to peer learning, among community members to further community progress (Holt-Gimenez 2006). Terms associated with reciprocity practices, such as *kuchub'al* and *manovuelta* signify the deep ancestral roots of diverse forms of community cooperation (Calderón et al, 2022). In the 1960s and beyond, the campesino-a-campesino movement began building momentum as extreme poverty required necessary changes to peasant farmer livelihoods.

Eric Holt-Giménez in his book *Campesino a Campesino: Voices from Latin America's Farmer to Farmer Movement for Sustainable Agriculture* describes the *mera mata* or rootstock of the CaC movement from San Martín Jilotepeque in Chimaltenango, Guatemala and recounts stories of farmers from that area in the 70s and 80s. "...we had a great experience of CaC because it did not come from anywhere else, it was born here, in San Martín, through *kuchub'al*. The earthquake taught us to work in *kuchub'al* because one, by himself, could not lift the wooden beams, the tin roof….we needed help from others. We didn't have any money to pay for helpers so we had to help each other" (p. 47).

Despite the violent colonization beginning with the Spanish in the 16th century, revitalization efforts surrounding Indigenous peoples sovereignty and their knowledge has been building. Key to these efforts have been food and seed sovereignty as well as defense of territory movements within the country (Copeland, 2019b). These movements propose alternative models where indigenous land, foods, and governance are predominant and managed in culturally meaningful ways in contrast to the extractivism of current colonial and capitalist systems (Isakson, 2009; Copeland, 2019b).

Contextualizing Guatemala and Sustainable Agriculture Today

Guatemala is a country with a long history of traditional knowledge grounded in agroecological practices (Wilken, 1987; Morales and Perfecto, 2000; Einbinder et al, 2019). As the most biodiverse country in Central America, Guatemala's peoples have long centered their livelihoods and cultural celebrations around the land (CBD, 2020). Although the following section of history is important to contextualize the difficulties Guatemalans have faced and the role the United States has played, Guatemala is more than its violent history.

Guatemala's biodiversity and traditional knowledge structures have long been threatened by both foreign and internal interests. Einbinder (2017) in "Guatemalan Historical Context" describes the events shaping the intersection of Guatemala and agriculture. In 1542 the arrival of Pedro de Alvarado and his troop of Spanish Conquistadores began a long history of colonization.

Native plants of Guatemala incorporated in homegardens. Variety of native plants (left) and amaranth (right).

This led to displacement and resettlement of, primarily Indigenous Maya, peoples from their original lands to areas where they could be more easily controlled and their forced labor on *hacienda,* or agricultural plantations.

This trend continued even after independence from Spain in 1821 as Guatemala moved into international exports fueled primarily by large monocultures of coffee, sugar, bananas, and cotton, leading to widespread deforestation. Culturally important plants, such as amaranth, were banned in an effort to convert people to Catholicism and cut ties between Indigenous peoples and their ways of knowing (Nowell, 2021; Sauer, 1950).

The labor required to maintain these agricultural systems fell once again to Indigenous communities. During this time, as more land was expropriated for export production or under government control, the gap between the landless majority and land owners grew (Copeland, 2019a; Schlesinger and Kinzer, 1982). Today, Guatemala has the most unequal distribution of land in Central America, with 75% of agricultural land in the hands of about 2% of its people (USAID, 2010).

At the beginning of the 20th century, the Cabrera and Ubico dictatorships strengthened this pattern when they gave the United Fruit Company (UFCo), a U.S.-based corporation later rebranded as Chiquita, 40% of the country's land to grow bananas. During this time UFCo also monopolized the railroads and electrical systems, once again forcing Indigenous communities to be the labor force and providing no monetary benefit (Schlesinger and Kinzer, 1982).

In 1945, Guatemala voted for their first democratically elected president, Juan José Arévalo who enacted a number of social reforms from legalization of labor unions to initiatives on gender and racial equity and health care. His successor, Jacobo Arbenz Guzmán, followed in his steps with an ambitious agrarian reform program set to benefit up to 100,000 families. To do this, Arbenz began taxing UFCo and expropriating land owned by UFCo to return to peasant cultivators and the railways.

It was not long before the UFCo used its connections within the U.S. Eisenhower administration to label President Arbenz and his actions as a 'communist' threat, although many argue Arbenz was simply a threat financially. Regardless, soon a Central Intelligence Agency (CIA) backed campaign to oust President Arbenz was underway and in 1954 he was overthrown and a new president Colonel Castillo Armas who reversed many of the social reforms, once

again strengthening/deepening inequities between the wealthy and the peasant farmers, still seen today.

All the while, but peaking in the 1970s, the United States through USAID and other development organizations sold Green Revolution pesticides and fertilizers to Guatemala. Around two thirds of these pesticides and fertilizers at the time had been banned or restricted in the U.S. and Europe (Grandia, 2022; Copeland, 2019a). Coupling with the extensive deforestation (and loss of biodiversity) which had occurred since the Spanish colonization, the fertilizers and pesticides decreased soil fertility. Farmers' health was also affected, as many were not given proper safety equipment or training on how to handle these toxic chemicals.

After the ousting of President Arbenz, tensions formed under the Armas administration due to intensified exportation, exploitation and harassment of the disenfranchised Indigenous population, and increasing national debt. A socialist movement grew in response and rebellions began nationwide. The Guatemalan government, often backed by the U.S. through the CIA, used force to quell the uprisings through a scorched earth policy, massacring people and burning the infrastructure of entire communities thought to house rebels (Schlesinger and Kinzer, 1982). This period of time between 1960-1996 is commonly referred to as '*el conflicto armado*' o '*la guerra civil*'.

The Comisión para el Esclarecimiento Histórico (CEH) found that 93% of the war's violations were committed by state forces and their paramilitary groups, while only 3% were committed by the guerilla (1999). While historians and scholars debate how much the military, in its brutal scorched-earth campaign, specifically targeted Indigenous peoples for presuming their alliance to the guerilla counterinsurgency, the evidence of army destruction of 400 to 626 Maya communities is stark (Konefal, 2010; Nelson, 1999). The majority of the approximately 70,000 killed, 40,000 disappeared, and 1,000,000 displaced peoples during the most violent years of the war, from 1978 to 1984, were Indigenous (Comisión para el Esclarecimiento Histórico, 1999; Nelson, 1999).

Eventually a peace accord was reached in 1996. Despite the accord, the effects of the 36 year civil war, the numerous interventions by foreign countries, and the selfish acts of the Guatemalan oligarchies ripple through time into present day Guatemala where extortion, femicide, narco-related violence, and malnutrition continue to rise (Copeland, 2019a; Einbinder, 2017). Adding to the challenges of large agricultural productions in Guatemala, mines and dams,

and the violence associated with these enterprises, as well as intensified oil exploration and cattle ranching are having a renewed and continued effect, particularly on Indigenous peoples in Guatemala (Sveinsdóttir, 2021; O'Connell, 2021).

Indigenous Ways of Knowing

'Ways of knowing' refers to theories of how we come to know, and they are often referred to academically as epistemologies. Although the hegemonic epistemology of knowledge creation today favors "reductionist, mechanistic and quantitative methods" (Iaccarino, 2003, p. 223). Indigenous knowledge on the other hand observes the natural world from a holistic point of view, identifying all beings in relationship to each other and with them. Indigenous ways of knowing are personalized, relational, localized, and place- and community-based, which contradicts western sciences' foundational goal of objectivity (Ross et al, 2011).

As referenced early, main attributes of western epistemology are logic, reason, and the dichotomy of right vs. wrong (Welch, 2009). In the academic realm this manifests as positivist, hierarchical, and empirical approaches to science and knowledge creation. These approaches historically deemed Indigenous Peoples as non-human beings and their ways of knowing as nonsensical. Classification followed, placing Indigenous Peoples at a lower hierarchical level than European settlers allowing them to justify decisions like slavery (Smith, 1999).

Indigenous Peoples have not completely lost their knowledge systems despite the intentional and systematic erasure campaigns by colonial settlers. Indigenous Peoples of Mexico, for example, gained constitutional recognition of the right to self-determination in 1992 and continue to fight for culturally and linguistically appropriate education, and the recovery, recognition, and revaluation of their knowledge systems and history (Pérez Ruiz and Argueta Villamar, 2011). Mayan universities can also now be found throughout Latin America, teaching students about Mayan cosmovision with the goal to protect ancestral Mayan knowledge (Mato, 2013).

As academics we can do our part in uplifting and centering Indigenous ways of knowing. One way, Claudia I. Calderón (2022) notes, is through our citational practices. We often erase Indigenous voices and knowledge when we cite research learned from them as our own. We also run the risk of publishing information which is sacred, not meant to be in print, or that could make the knowledge holder vulnerable. Calderón advocates for an inclusive, conscious and

reflective engagement with our citational practices that may require a case-by-case basis but always involves working alongside our Indigenous community partners. This is one of many ways we can deconstruct barriers for Indigenous voices in academic scholarship.

Background

Ch'orti' Region

Near the eastern border of Guatemala lies a region where one of the 24 ethnicities in Guatemala, the Ch'orti', live (Figure 1). In 2018 the census found over 112,000 Ch'orti' live in the area, more than doubling their numbers from the 2002 census. Although found within the borders of Guatemala, the Ch'orti' population extends past recently placed lines on a map into what is Honduras and El Salvador (Metz et al, 2009). Today, Guatemala contains the largest population of Ch'orti'. Each of the three populations is working to revitalize their communities but this often manifests differently based on their country contexts.

Due to the effects of colonialism, discussed above, and globalization, the Ch'orti' population is what Metz et al. (2009) referred to as "culturally dynamic." Beginning with the arrival of the Spaniards, displacing Indigenous populations and sometimes intermingling with them (referred to as *mestizos*, those with Spanish and Indigenous ancestry), creating a stratified class system with the Indigenous population at the bottom.

Biological and cultural mixing continued through the 1800s until much of the Ch'orti' language was lost and a distinct ethnic group was difficult to parse out. This followed through the 1930s and 40s as state policies targeting Indigeneity were enacted. Eventually in the 1990s a resurgence was born with efforts to revitalize the language and culture of the Ch'orti' sweeping through Honduras and Guatemala. Today the numbers continue to grow and efforts by local organizations seek to expand access to resources for learning the language.

As described in the introduction, the effects of colonization and the history of violence and intervention by the United States and other countries were brutal on Indigenous peoples, including the Ch'orti'. These events resulted in high rates of landlessness and poverty compounded by climate change, increasing populations, and political corruption and repression. This causes many people in the area to migrate north. All of these challenges leaves the Ch'orti' who stay in the area, primarily subsistence farmers, with limited access to resources to ameliorate the situation.

Figure 1. The Chorti' area (Original map by Amy Henderson adapted by Brent E. Metz).

Today, the region spans about 675 km^2 with 84% of the area being mountainous (Mancomunidad, 2019). With 130 mil residents, not all identifying as Ch'orti', 91% of them live in rural areas. About one third of the region is dedicated to agriculture with the main crops grown being basic grains and coffee. Only 0.2% of the area is dedicated to growing vegetables and 22% of the area is covered by forests. Within the Ch'orti' region there are around 41,000 agricultural producers, 95% of which are less than one *manzana*, a unit of measurement equating to about 1.7 acres. There are only 21 health centers serving almost 60,000 families, who often need to travel over two hours to reach healthcare support.

Mancomunidad Copanch'orti'

Within the Ch'orti' Region, Mancomunidad Copanch'orti'(Mancomunidad) works with four municipalities: Camotán, Jocotán, Olopa and San Juan Ermita (Figure 2). Mancomunidad is an autonomous inter-municipal non-profit civil entity, founded in 2003. Their office is located in Jocotán, Chiquimula, Guatemala. As a non-profit in the area, they are funded through both public and private partnerships with each municipality contributing annually to projects. Their efforts are oriented on promoting sustainable community development of its municipalities by working in the following themes: the recovery of the environment, education, community security, health, culture, productivity, tourism and others that are necessary for development of the population. Agronomists, nutritionists, foresters, educators, veterinarians, and health care workers are employed by or partner with the organization to accomplish the efforts listed above.

In Mancomunidad's Rural Development Plan 2019 - 2027 their main focus areas are education, health, nutrition, economic production, and closing identified inequities within municipalities, between municipalities, and between Indigenous and Non-Indigenous populations (*Plan del Desarrollo Rural Integral Del Territorio Maya Ch'orti' 2019 - 2027*, 2019). Currently, the area they serve has 24 rural and 4 urban micro-regions, one per municipality. Each micro-region has a rural technical team in charge of promoting the integral development of communities (*Plan De Desarrollo Rural Integral Del Territorio Maya Ch'orti' 2019 - 2027*, 2019). Working with the technical team are rural development promoters, elected from the communities, who serve as delegates to energize and support the existing organizational structure, such as the Consejos Comunitarios de Desarrollo, or COCODE (Community Development Councils).

Figure 2. Four municipalities in the Ch'orti' Region where Mancomunidad Copanch'orti' works

Camotán, Jocotán, Olopa, and San Juan Ermita

The demographic and agricultural data for these four municipalities are described in Table 3. Around 4% own land between one to ten *manzanas* and only 1% of producers have land more than 10 *manzanas* in size. Of the just over 32,000 *mazanas* grown in the Ch'orti' region, 75% are growing basic grains including *maiz blanco* (white corn), *frijol negro* (black bean), *maicillo* (sorghum), and *maiz amarillo* (yellow corn). Within the Ch'orti' region, Mancomunidad works closely with four communities, one in each municipality: Limón in Camotán, Orégano in Jocotán, La Rinconada in Olopa, and Tasharja in San Juan Ermita (Table 4). Each community has less than 1,000 residents who are primarily subsistence farmers, often needing to rent land to grow food for their families.

Table. 3. General information on municipalities comprising Mancomunidad Copanch'orti'

	Camotán	**Jocotán**	**Olopa**	**San Juan Ermita**
Geographic Area	230.87 kms2	247.63 kms2	247.63 kms2	82.55 kms2
% Mountainous	82%	92%	76%	79%
Population*	42,310	54,407	19,213	14,224
Agricultural Area	31%	33%	35%	34.7%
Main crops grown**	Basic grains (24%) Coffee (7%)	Basic grains (30.5%) Coffee (2.7%)	Basic grains (24%) coffee (11.3%)	Basic grains (33.9%) Coffee (0.8%)
*as of 2006 **Basic grains include maize, beans, and sorghum				

Table. 4. Project Communities within Mancomunidad Copanch'orti' Municipalities

Community	**Population**	**Average Elevation**	**Approx. Distance from the City of Chiquimula**
Limón, Camotán	864	987 m	31 km
Orégano, Jocotán	788	498 m	37 km
La Rinconada, Olopa	205	1224m	85 km
Tasharja Abajo, San Juan Ermita	335	1000 m	30.5 km

Project Overview

Relationship building is a critical and continual piece of community-engaged and participatory work. The relationship building for this project is multifaceted with relationships between the university and community partner organization, the community partner organizations and community members, and the university connecting to community members.

My advisor Dr. Claudia Irene Calderón made contact with Mancomunidad General Manager, Ing. Carlos Humberto Ramírez in the fall of 2020 because she was interested in collaborating on a project with her master's student at the time on the effects of COVID-19 on

smallholder farmers in the area. As I was applying for graduate programs, Dr. Calderón mentioned the possibility of collaborating with Ing. Ramírez and Mancomunidad. We discussed my relevant background working and living in Mexico focusing on environmental education and my ability to speak Spanish as advantages for my participation. We also acknowledged my lack of experience in Guatemala specifically and reflected on the often extractive nature of graduate work in Central America, and began the conversation on ways we could avoid or reduce harm if I were to participate.

After I enrolled at the University of Wisconsin - Madison, Dr. Calderón and I began communicating more frequently with Ing. Ramírez, working to better understand how my skillset and the resources of the university could intersect with the needs and goals of Mancomunidad. Through virtual conversations, text messages and video calls, we were able to explore the possibilities of partnerships and gain a better understanding of the communities in general.

In addition to speaking with Ing. Ramírez, we reached out to other researchers who work or have worked in the area. This included. Dr. Brent Metz, an anthropologist with a 30 year history of working with the Ch'orti' people. We also had a conversation with Dr. Diego Pons Ganddini, a climatologist who studied rainfall variability in the dry corridor of Central America. Another contact was Silvia Sanchez, a PhD student who has also worked in the area. The goal of these conversations was to create a picture of the communities where we will work, what has already been done and what the current context holds.

In March of 2022 we took a preliminary trip to Jocotán to meet face to face with Ing. Ramírez and community leaders who were available. We took this time to ask questions and gauge both interest and goals of the communities. We also spent time visiting two of the communities where we would work, noting the geography and various resources already in place in these areas.

Then, over the course of 11 weeks during the summer of 2022, I collaborated with Mancomunidad Copanch'orti' to work with the communities of Oregáno, Limón, Tasharja, and La Rinconada. The overall goal of the project was to understand knowledge transfer in communities, in particular in relation to medicinal plants and agroecological practices.

Methods

Information on knowledge transfer and the themes for peer-to-peer training were determined through a series of semi-structured interviews and informal conversations (See Appendix B and C). Prior to performing the interviews, we submitted our project plan which included interviews and content creation of the medicinal plant and soil conservation videos to the University of Wisconsin's the Institutional Review Board (IRB). We also provided the interview questions. We received an exemption (Submission # 2022-0534; Appendix D).

The interviewees were selected based on their participation in Mancomunidad's project at the time and if those interviewees knew of anyone else with relevant experience in their community. All interviewees named people we were set to interview, except one, a *curandera*, or midwife. Interviewees were selected this way due to time constraints around relationship building, and the safety risks and realities of transportation in the area, making it difficult to travel unaccompanied in the area. Primarily women were interviewed. This is because they are the primary holders of medicinal plant knowledge. They also tend to be more available during morning community visits while men are more likely to be working in the fields. The interviews consisted of 34 questions total of which 5 were demographic questions, 13 were questions on medicinal plants, and 16 were questions on agroecological practices.

I co-interviewed all participants with a local farmer and agriculture promoter for Mancomunidad Copanch'orti', Jose María Guitiérrez. During the interviews Mr. Guitiérrez helped me rephrase the language of questions to make more sense for participants. We also changed the order we asked the questions or skipped over questions altogether depending on how the conversation evolved. Interviews lasted an average of 30 minutes and were done in the communities where the respondents lived.

Results

Demographics

Interviews were conducted with a total of 39 people, seven men and thirty-two women. On a community level, twelve people were interviewed from Oregano, Jocotán, fourteen from Limón, Camotán, six from La Rinconada, Olopa, and seven from Tasharja Abajo, San Juan Ermita. They ranged in age from 18 years old to 71 years old with an average age of 42.

When asked about identity we included the 22 Mayan identities, Garífuna and Xinka (two non-Mayan Indigenous ethnicities in Guatemala), Ladino (mixed Indigenous and European

José María Gutiérrez and I co-interviewing community members about medicinal plants and agroecological practices.

ancestry), Afro-Indigenous, and Foreigner. Of the 39 respondents, 24 people (62%) identified themselves as Ch'orti', two people identified as Mestizo/a, and one person as Castellano. One participant did not answer. The remaining participants (n = 11) identified themselves as Campesino/a, which is not an ethnic identity. All participants spoke Spanish and none spoke Ch'orti'.

Medicinal Plants

When asked if respondents used medicinal plants frequently, 36 people (92%) answered yes, 2 people (5%) answered no, and 1 person (3%) said they do but more regularly buy medicine from the pharmacy. The 92% also answered that they have been using medicinal plants their entire lives. Of those who use medicinal plants (n = 37), 36 people (92%) named someone in their immediate family as the person who taught them about medicinal plants. 17 people (44%) named specifically a matriarchal figure (mother or grandmother) as the person who taught them. Two respondents also said they learned information through training programs and one respondent added that they found information on the internet.

When asked if they would teach or are teaching someone else about medicinal plants and who that would be or is, 34 people (87%) responded they are teaching or would teach their children about medicinal plants. One respondent named their neighbors, and another named their siblings. Three respondents said they would not teach anyone.

During interviews community members would walk us through their gardens naming plants and describing, or showing us, how they use them.

In terms of sourcing medicinal plants, four respondents (13%) said they only grow their plants in a home garden or *patio*, three respondents (10%) said they only find medicinal plants in the wild, and 28 respondents (72%) said they both grow plants in their home garden and find them in the wild. One respondent said they find their medicinal plants at the market in addition to growing them on the patio and finding them in the wild, one said they share with neighbors as well as finding them in the wild, and two respondents did not use medicinal plants.

Of the 32 respondents who answered the question of whether they perceived more or fewer medicinal plants growing in the wild in the area compared to the last 10-20 years, 17 respondents (38%) said they saw fewer medicinal plants grown in the wild in their communities, five people (16%) said more, nine people (28%) said they perceive the same amount, and one respondent said they did not know. Of those 32 respondents, when asked if they thought more or fewer people were using medicinal plants compared to 10-20 years ago, 12 people (38%) answered they thought fewer people were using medicinal plants, 14 people (44%) answered they thought more were using medicinal plants, one respondent said they did not know, one respondent said the same amount of people were using medicinal plants as before, one

respondent said it depends on the family, and one respondent's answer was inaudible on the recording.

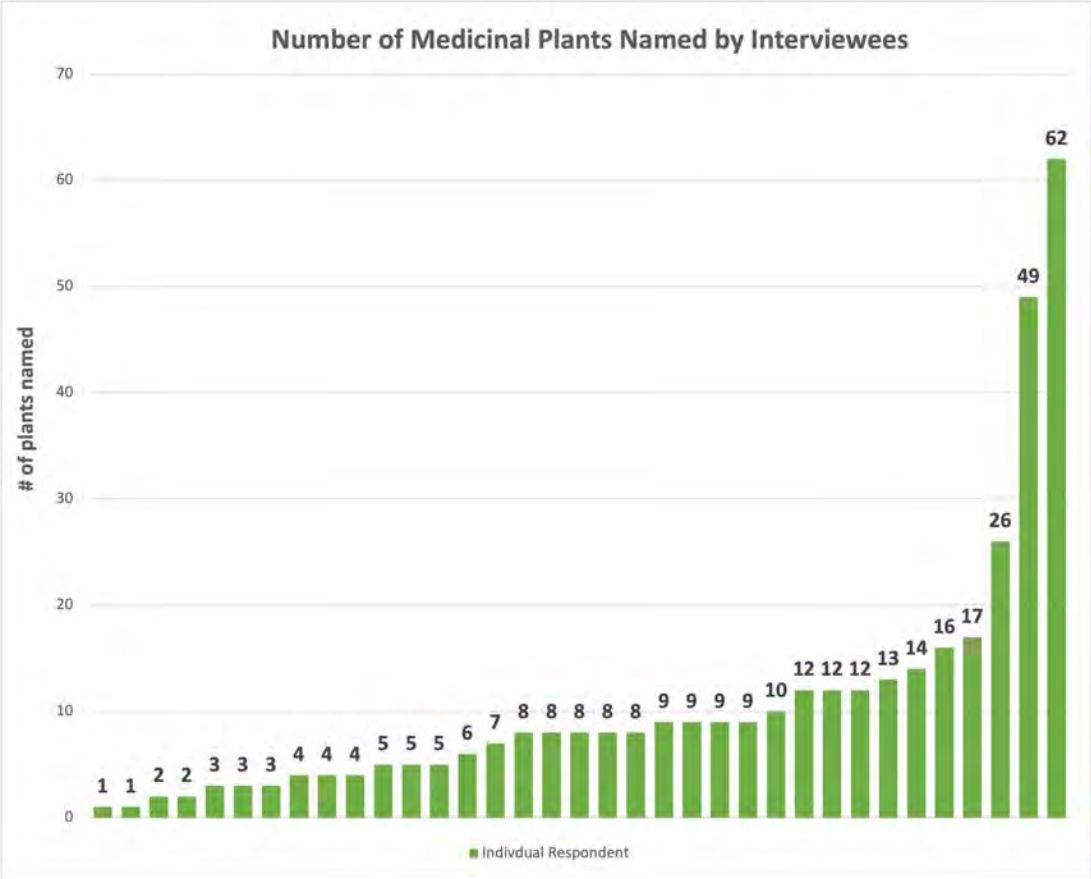


Figure 2. Number of medicinal plants named by interviewees across four communities.

The last question during the medicinal plants interview was often at the garden of the interviewee and we discussed medicinal plants in their garden and in the community in general. Between the 39 respondents, 80 distinct medicinal plants were named. On average respondents were able to name eight medicinal plants in their communities, but the range was between 1 and 62 plants named.

Agroecological Practices

When asked about agroecological practices on their farms, 24 people responded. Of the remaining 15 people interviewed, seven were interviewed in pairs as husband and wife who shared the same farm, and are only counted as one in the 24, and eight were not asked due to unexpected weather and time constraints. Of the 24 who were interviewed, 22 people (92%) said they save their seed to plant the next year, and the remaining two people did not answer the question. Half of respondents (n=12) said they use chemical fertilizers on their fields, 10 people (42%) use a combination of chemical fertilizers and organic fertilizer, and two people (<1%) apply nothing to their fields due to cost. For management of pests and pathogens, 18 people (75%) stated they use pesticides, while one respondent uses traps rather than pesticides, another respondent said they cannot afford pesticides, and four people did not answer the question. All respondents grew food for subsistence with only two respondents (both of which were in a pair) stating they also intentionally growing food to sell.

Knowledge Transfer

When asked what the preferred learning style was for respondents, 24 respondents (62%) said hands on training was the preferred method, four respondents (10%) said videos and trainings, two respondents (<1%) said books and one said the internet, and eight respondents chose not to answer or did not answer.

Outcomes

I began my time by visiting each of the four communities with team members of the Mancomunidad to introduce myself and the project. Fortunately, Mancomunidad was inaugurating various projects, such as water tanks and piping being installed in homes, meaning the communities were gathering together to celebrate. This allowed me time to meet with community leaders, explain the project to a large number of the community members in general, and spend time simply sharing meals and getting to know community members.

After those initial two weeks, I conducted interviews in each of the four communities with the help of a local farmer working as a liaison with Mancomunidad. In the end we completed 29 full interviews, averaging 30 minutes in length, which included questions around

ancestral knowledge and knowledge transfer on medicinal plants and agroecological practices. The goal was to understand how people learned information, who they were teaching, and how they wanted to learn new information – whether that was via videos, trainings, printed educational materials, etc.

Trainings

Using the conversations we had during interviews, we determined training was the most desired way to learn, followed by videos. We then planned and facilitated a field day on a local farm to highlight agroecological practices viable in the region and a medicinal plant training for women through MENACHOR, a local natural medicine non-profit.

Participation in the agroecological practices field day included members from two of the four communities with which I worked, La Rinconada and Limón, and included eight women, two men, and one adolescent. The day included a tour of a diversified farm where participants could see various demonstrations of soil conservation practices, composting, diversified crops, and artisanal goods.

While having informal conversations about the field day at its completion, the participants mentioned they enjoyed being able to leave their communities and see a realistic example of these practices in action. It helped them picture what they could do in their own land. They also mentioned in the future they would like to have hands-on practical as a part of the training to better understand the processes.

The medicinal plant training took place on the grounds of Medicina Natural Ch'orti', MENACHOR, a local organization promoting human, social and environmental health with biocentric and sustainable naturopathy. Ch'orti' healers work with patients to help provide natural medicines, selling made medicinal plant products at their storefront.

For the medicinal plant training, 13 women participated from the community of Limón. The training included a tour of the medicinal plant garden of MENACHOR followed by hands-on training of how to make a tincture using medicinal plants. A plant exchange, where each woman brought a plant from her garden to share with the other women in the group, occurred at the end. This experience allowed women the opportunity to learn how to make a product they could sell in the future from the plants they grow in their gardens. Women mentioned enjoying the opportunity to experience the hands-on process of making the tincture and learning about new plants through the medicinal plant tour.

Campesino-a-campesino Exchange

While in Jocotán, Mancomunidad, my advisor and I coordinated an event to provide the stage for farmers from the departments of Chiquimula and San Marcos to do a horizontal exchange of knowledge on agroecological practices, youth involvement in agriculture and medicinal plants. Six farmers from the Department of San Marcos traveled to Jocotán for a two-day, peer-to-peer training exchange (See Appendix E). The goal of the exchange was to expose farmers to new ideas and practices, and help expand the farmers' network within Guatemala.

Campesino-a-campesino (*Cac)* exchange part 1 (left) with Encarnación Gutiérrez discussing the use of medicinal plants in her garden and *Cac* exchange part 2 (right) with Otilio Bravo teaching how to make bocashi.

Six farmers from Chiquimula presented on the projects and products, including medicinal plants, soil conversation, worm composting, and women and youth in agriculture. At the end we held a farmers' *mercadito*, or market, where farmers could sell, barter, or trade products from their farms with the other farmers. During the process farmers from San Marcos and Chiquimula provided advice and suggestions to one another and had opportunities for network building.

In January of 2023, farmers from Chiquimula then traveled to the Department of San Marcos for the second part of the exchange where they were able to experience the farming conditions, practices, and marketing methods used in western Guatemala. Four farmers and their colleagues from various communities in San Marcos shared their experiences with those from Chiquimula as well as any community member who was interested in participating. The themes focused on women entrepreneurs, organic fertilizers, nurseries, and optimizing vegetable production (See Appendix F). At the end, we once again had a *mercadito*.

During both exchanges we completed a pre- and post-survey to evaluate the efficacy and interest in these types of exchanges. We had an overwhelmingly positive reaction with two participants telling me they had incorporated practices they had learned at the exchange. We also received ideas for feedback, with participants wanting the exchanges to be as hands-on as possible because they learned best by doing. In addition, participants shared their phone numbers amongst one another to continue conversations after the exchange and without our facilitation. More details can be found here.

Educational Resources

Additionally, I collaborated with a Guatemalan videographer and community members to film content for two videos, one on soil conservation practices and the other on medicinal plants. Along with our community partners at Mancomunidad we decided videos would be a good way to reach people outside the Ch'orti' region to help others understand the important work and needs in the área. The audience in mind for the videos was the local communities, as well as researchers and the general public interested in topics of agroecological practices and medicinal plants. The videos are in Spanish with English subtitles and will be distributed through aUW-Madison website.

I also worked with the personnel at the Academia de Lenguas Mayas de Guatemala to record names of medicinal plants in Ch'orti' to aid in their goal of preserving the Ch'orti' language within the region. We created videos using the recordings that they can distribute and use in educational programming.

In an effort to reach community members of all ages, I also created and adapted activities teachers can use in their classrooms around medicinal plants and plant functions in general. They include activities students from elementary through high school could use (See Appendix G).

Finally, community members were interested in having a plant guide created which would allow local plant knowledge to be recorded. Through conversations with community members and referencing Dr. Armando Cáceres' *Vademécum Nacional de Plantas Medicinales*(2009) I included the uses, preparation and medicinal properties of 5 medicinal plants. These five plants were decided as most important to begin with by community members. I also created a template so people can continue building on it and fill in more plants in the future (See Appendix H).

All of these resources, as well as the results from interviews, were uploaded to a dropbox. They were then downloaded and placed on a USB. I provided one USB to each of my community partners, including personnel at Mancomunidad Copanch'oti', MENACHOR, and Academia de Lenguas Mayas Guatemala - Ch'orti' as well as partners living in the four communities. I printed out and delivered plant guides and teacher' educational resources to each of the four communities, ensuring the local COCODE president knew how people could access the resources online. We are also working on a local digital repository so community partners will have access when they need them.

Feedback

In our trip in January of 2023, I was able to solicit feedback from our core group of community partners on the videos and plant guide we had created. The participants watched the videos and provided their suggestions through a discussion on how to improve the content.I showed our community partners the plant guide draft I had made, including the imagery I had established for each description such as a cup with steam rising to indicate tea and so on. I asked them what came to mind when I showed them these images and they determined if they were

accurate for their communities. Since I only had time to complete five plants for the guide, I asked which five were the most crucial to have first.

Unfortunately I was unable to print out the guides beforehand and had to show them on my phone. In the future, it would be much better to have printed versions so each person could edit them and also have a variety of images to represent the various components of the guide, such as three different ways to represent tea and have the partners determine the most accurate, or draw their own.

Dissemination

In May of 2023 I returned once again to deliver the plant guide, USBs, and teacher educational material to community partners. I delivered all the items to the offices of Mancomunidad Copanch'orti', MENACHOR, and Academia de Lenguas Mayas. We discussed the conclusion of the project and I answered any questions they had about the information I was providing.

Due to time, weather, and mobility constraints I was able to visit three of the four communities during my week in Jocotán, Limón, Tasharja, and Orégano. I was unable to visit La Rinconada. I gave Mancomunidad personnel the materials and they assured me they would deliver them on their next visit to the community. With the communities I was able to visit, we discussed what their desire for the local dissemination and beyond of the plant guide looked like and who they felt comfortable being a guardian of that information. I also confirmed their consent to have their names and photos appearing in the plant guide and in public presentations.

With all community partners we also discussed how our collaboration went, how we could improve upon it in the future, and what they would be interested in collaborating on in the future. This allowed us to know what possibilities our community partners were interested in pursuing if more opportunities became available.

Limitations

As always time and money were limitations in this community-engaged project. A master's project tends to not allow a person to engage sufficiently for long-term outcomes to be successful. The approach we took, by asking community partners what could be done in two years together, did allow for a project that, at the very least, has tangible outcomes desired by the

community. Funding was difficult to acquire. Larger and more frequent grants with requests for proposals focused on community-engagement would be helpful.

Reflecting on our questions for the interviews, we used some vague language that could have been more specific to help future work in the area. When asking about how people liked to learn, we said *capacitaciones,* or training, as an option. We did not follow up consistently with what kinds of training and who is best to lead them. Since training can be passive (through lectures, powerpoints, talks) or more active (with demonstrations, hands-on activities), we do not have which type they enjoy most. In regard to who best to lead the training, there are NGOs, extension agents, university faculty or students, farmers, and others in the area. It would have been valuable to know who to trust with leading those trainings. Anecdotally I heard several times that people were interested in hands-on, practical and active training activities.

Reflections

Building Trust through Communication

More than ever before I am understanding the importance of clarity for everyone involved in a project. In Campano et al's (2015) article, "Ethical and Professional Norms in Community-Based Research," they discuss the importance of equality from the beginning, co-designing research questions with community partners, valuing community partners' knowledge, ensuring research will benefit the community, and disseminating research in a clear and relevant way back to communities. Each of these norms requires intentional, transparent, and continual communication.

As the 'outsider' in the community, I am first and foremost a learner, positioning myself to understand the context of the place and people with whom I am collaborating. This stage of the project, although often difficult to measure and include in grant timelines, is crucial for trust building (Jagosh, 2015). Trust is a necessary ingredient for cooperation and transparency in projects (Diallo and Thuillier, 2005).

The trust building stage of a project has helped me in a variety of ways, including when misunderstandings arise between myself and community members or between community members themselves. On one occasion I had made an assumption that a local pick up driver, and son of one of the community leaders, who I had hired to drive people home from a training

activity would be able to be flexible with our pick up time since he had been in the past. With this unchecked assumption, I changed the time to an hour later than we had determined. He arrived with a pick up full of people and no room for the participants to get home. The participants and I had to find another way for them to return to their community. The pick up driver and I both left the situation frustrated. Due to the trust we'd built over the previous three months, however, we were able to have an honest conversation the next day about what had happened and decide how we can best communicate our needs moving forward so it would not happen again.

This is one of a handful of moments where the trust built allowed for transparency and vulnerability between myself and community partners. In regard to the mechanics of a project, my experience in these projects has also led me to realize I need to understand the strengths of the community and where they are looking to grow. Reciprocally, community partners need to know the skill set I possess so they better understand how I can help them and I also need to share the skills outside of my grasp. For example, I did not have any experience with the medicinal plants, or of flora in general, of Guatemala. I was in no position to give any training or provide expertise in that area but there were community members who were flush with that exact knowledge. I, on the other hand, had experience, as well as time and funding, to find the people in the communities who had that knowledge and connect them with others for training.

This project reinforced my need to use my voice, and respect the voice of others; to be confident in what it is I can provide and actively listen to what community partners need.

Logistics

Each time I participate in a community-engaged project, I learn something new about logistics. Logistics mean everything from communication between community partners and myself, to making sure community partners have enough to eat on trips and are paid if necessary, to adapting when more (or fewer) people than expected show up to an event, training, or meeting. During this project there were an average amount of last minute changes (e.g. people getting sick or bringing more children than expected) to more drastic obstacles (e.g. a road blockade by citizens protesting the unfinished highway conditions).

To expound on the more complicated logistical problem we faced during this project, the day before five community members were scheduled to leave Jocotán to travel to San Marcos for a CaC event, a road blockade formed on the only road out of Jocotán by citizens protesting the

unfinished highway. Since the highway construction began in 2019, slow advances had been made leaving the highway half finished and uneven. The January 2023 blockade was not the first time citizens had blocked the road demanding the highway construction be completed (La Hora, 2022) and it had been a successful method for getting the government's attention as the highway is an International route.

Although in solidarity with the protest, for us it meant the possible rescheduling of an event that took months to coordinate between two groups that live across the country from each other. There was not much either my advisor Claudia or I could do as we were outside of Jocotán at the time but we maintained continuous contact through phone calls with our driver and the community members. Around 6:00 AM our driver let us know he had found an alternative back route and they were leaving. Around 9:00 AM we were told they had made it around the blockade and we were only a few hours behind schedule.

Without the local knowledge of the area via our contacts and the connections we had made previously, I am unsure this would have come to fruition. It is in these moments that strong relationships with community partners are necessary and vital. Trust between our community partners and our team allowed us to navigate all obstacles that presented themselves because we had established consistent communication.

Cultural Humility

Foronda et al. (2016) conducted a concept analysis of cultural humility and found openness, self-awareness, egoless, supportive interactions, and self-reflection and critique as attributes associated with it. Described as a "lifelong process" they found the consequences related to engaging in cultural humility were "mutual empowerment, partnerships, respect, optimal care, and lifelong learning" (p. 211-212).

In a later article published by Foronda (2020), the author builds on their previous work to present a grand theory of cultural humility, meaning a theory that aims to describe a large portion of the environment of the human experience, with the intention of guiding individuals and groups alike to thrive in diverse communities. Based on five assumptions (Table 5), Foronda presents a Rainbow Model which helps guide individuals to the key concepts, context, interrelationships, influences, and outcomes of cultural humility. Foronda, applying this to their field of medicine, provides a list of positive outcomes resulting from engagement with cultural

Table 5. Assumptive Premises of the Theory of Cultural Humility by Foronda 2020.

Assumptive Premises of Cultural Humility
1. All humans are diverse from each other in some way yet part of a global community. 2. Humans are inherently altruistic. 3. All humans have equal value. 4. Cultural conflict is a normal and expected part of life. 5. All humans are lifelong learners.

humility including, “improved communication, satisfaction, empowerment, partnerships, respect, optimal care, health, and wellness” but notes this list is not exhaustive.

Foronoda does note that this theory has yet to be tested. Although untested, anecdotally, and in my experience, I have seen the assumptions and outcomes described to be accurate. The model allows me to visualize how I approached this project (very similarly to the model itself) and how I can improve in future work (by engaging more with my sense of ego and how that affects projects).

This project expanded my understanding of traditional knowledge and what knowledge generation looks like. I come from a majority white, cis, male academic background with a positivist lens. Surrounded by women who embodied the knowledge of their foremothers in the medicine they provided to their communities, moved mountains in me and made me see the diversity in knowledge creation, transfer, and guardianship.

Mental Health Abroad

In an article by Bierwiaczonek & Waldzus (2016) reviewing studies on adaptation in various groups of cross-cultural travelers they found that individuals living away from their ancestral home are at a higher risk of depression and mental health problems. Their work focused on expatriates and their spouses, on international students, and on first-generation migrants and also the gaps within those research areas. This study along with others on students studying

abroad (Lindsey & Struve, 2008; Lucas, 2009; Poyrazli & Mitchel, 2020) show similar results of mental difficulties while abroad.

Distance from one's family and social network, the dietary and cultural structures, as well as a language gap can contribute to feelings of isolation, unease and stress. I personally have felt this while living in Mexico for two years as a Peace Corps volunteer and while working in Guatemala the last two years. Although I was surrounded by community members who I trust, who I laugh with, who I see as friends, it can be difficult to be far from home. Although I exercised, ate well, and talked to my partner and family, I found myself working long hours with no discreet “weekends” or down time.

These moments are difficult and necessary to acknowledge. Mental health is becoming more acceptable to talk about but can still be stigmatized. Although I have lived abroad before and was only living in Guatemala for three months, I had trouble. I felt like I needed to work 24/7 to get as much done as possible while I was there. This led me to have a mental breakdown half way through where I felt unable to do anything correctly or achieve any goals we had to set to accomplish. Talking to my family, partner, and advisor helped me move through these feelings but I want to take this moment to acknowledge they existed and they continue to exist.

Being outside of our comfort zones allows for incredible growth but it can also be a great challenge. Acknowledging those difficult moments are real and having a circle of support, from advisors, family or friends, can help soften those moments of hard realities.

Conclusion

Guatemala is a megadiverse country – culturally, linguistically, and ecologically. The history of resistance and resilience in the country is found in the food sovereignty and defense of land movements and in the youth and women fighting against exploitation of oil and mining of natural resources. It is found in the hands of *campesinos* and *campesinas* planting their native seeds and the elders teaching family and neighbors about medicinal plants.

The United States has played a role in violence, past and present, in Guatemala. Understanding that history and how my positionality interacts within it has been crucial. Reflection and humility are practices I will take forward from this project alongside life-long friendships with people who have taught me so much.

Although I am grateful for my time at the University of Wisconsin - Madison and all I have learned on ancestral Ho-Chunk land, I have come to realize other ways of knowing apart from academia. Not all information must be peer-reviewed to be valid, not all information must be written down to be known.

The principles of community-engaged and -informed work will continue to shape my future collaborations. More than ever I am inspired to invest in the communities in which I belong, to deepen trust, to listen, and to expand my ways of knowing.

References

Altieri, M. (1987). Agroecology: the science of sustainable agriculture.

Altieri M. & Nicholls, C. (2017) Agroecology: a brief account of its origins and currents of thought in Latin America, *Agroecology and Sustainable Food Systems*, 41:3-4, 231-237, DOI: 10.1080/21683565.2017.1287147

Bierwiaczonek, K., & Waldzus, S. (2016). Socio-Cultural Factors as Antecedents of Cross-Cultural Adaptation in Expatriates, International Students, and Migrants: A Review. Journal of Cross-Cultural Psychology, 47, 767-817. https://doi.org/10.1177%2F0022022116644526

Cáceres, A. (2009). *Vademécum nacional de plantas medicinales / Armando Cáceres*. Editorial Universitaria, Universidad de San Carlos de Guatemala.

Calderón, C. I., Margaret, B., Roblero, O.M.B., Castillo Valle, G.N. & Ramírez Santiago, C.H.,(2022, August). Regresando a las Raíces: Lecciones Aprendidas de un Intercambio de Campesino-a-Campesino en Guatemala. *LACIS Review*. https://www.lacisreview.org/current-issue/regresando-a-las-races-lecciones-aprendidas-de-un-intercambio-de-campesino-a-campesino-en-guatemala

Calderón, C. I. (2022). Reimagining Our Citational Practices: Centering Indigenous and Campesino Ways of Knowing. Teaching Citational Practice: Critical Feminist Approaches, 2. Retrieved from *https://journals.library.columbia.edu/index.php/citationalpractice/article/view/10025*

Campano, G., Ghiso, M.P., & Welch, B. (2015). Ethical and Professional Norms in Community-Based Research. *Harvard Educational Review,* 85 (1): 29–49. doi: https://doi-org.ezproxy.library.wisc.edu/10.17763/haer.85.1.a34748522021115m

Comisión para el Esclarecimiento Histórico (CEH).. (1999). *Guatemala : memoria del silencio*. [Guatemala]: CEH.

Convention of Biodiversity (CBD). (n.d.). *Guatemala - Main Details*. Www.cbd.int. Retrieved April 20, 2023, from https://www.cbd.int/countries/profile/?country=gt#:~:text=Protected%20areas%20in%20Guatemala%20currently%20comprise%2032.37%25%20of%20the%20national%20territory

Copeland, N. (2019a). "Meeting peasants where they are: cultivating agroecological alternatives in neoliberal Guatemala." *The Journal of Peasant Studies* 46(4): 831-852.

Copeland, N. (2019b). Linking the defense of territory to food sovereignty: Peasant environmentalisms and extractive neoliberalism in Guatemala. *Journal of Agrarian Change*, 19(1), 21-40.

Einbinder, N. (2017). Guatemalan Historical Context. Dams, Displacement and Development: 29-39.

Einbinder, N., Morales, H., Mier Y Terán-Giménez Cacho, M., Aldasoro, M., Ferguson, B. G., & Nigh, R. (2019). Agroecology on the periphery: A case from the Maya-Achí territory, Guatemala. *Agroecology and Sustainable Food Systems*, 43(7-8), 744–763. https://doi.org/10.1080/21683565.2019.1585401

Encinias, S. (2022, June 7). Guatemalan Activists on the Frontlines of Social Change. Retrieved April 22, 2022, from https://www.refinery29.com/en-us/2022/06/10936180/guatemala-environmental-feminism-lgbtq-movements

Diallo, A. and D. Thuillier (2005). "The success of international development projects, trust and communication: an African perspective." *International Journal of Project Management* 23(3): 237-252.

Foronda, C., Baptiste, D. L., Reinholdt, M. M., & Ousman, K. (2016). Cultural Humility: A Concept Analysis. *Journal of transcultural nursing : official journal of the Transcultural Nursing Society*, *27*(3), 210–217. https://doi.org/10.1177/1043659615592677

Foronda C. (2020). A Theory of Cultural Humility. *Journal of Transcultural Nursing*. 31(1), 7-12.

Freire, P. (2000). *Pedagogy of the oppressed* (30th anniversary ed.). Continuum.

Gliessman, S. R. (2007). *Agroecology : the ecology of sustainable food systems*. Boca Raton :CRC Press.

Grandia, L. "Poisonous Exports: Pesticides, Peasants, and Conservation Paradigms in Guatemala." *Latin American Perspectives* 49.6 (2022): 124-152.

Gordan da Cruz, C. (2017). Community-Engaged Scholarship: Toward a Shared Understanding of Practice. *The Review of Higher Education, 41*, 147 - 167.

GuaTV. (January 16, 2023) Urgente Bloqueos en jocotán: Urgente: By Noticias Chiquimula. Retrieved May 6, 2023, from https://www.facebook.com/NoticiasChiquimula1999/videos/urgente-bloqueos-en-jocot%C3%A1n/1395374601268500/

Holt-Giménez, E. (2006). *Campesino a Campesino: Voices from Latin America's Farmer to Farmer Movement for Sustainable Agriculture*. Food First Books.
Iaccarino, M.. (2003). Science and culture. *EMBO Reports*, *4*(3), 220–223. https://doi.org/10.1038/sj.embor.embor781

Isakson, S.R. (2009). No hay ganancia en la milpa: The agrarian question, food sovereignty, and the on-farm conservation of agrobiodiversity in the Guatemala highlands. *The Journal of Peasant Studies* 36(4), 725–59.

Jagosh, J., Bush, P. L., Salsberg, J., Macaulay, A. C., Greenhalgh, T., Wong, G., Cargo, M., Green, L. W., Herbert, C. P., & Pluye, P.. (2015). A realist evaluation of community-based participatory research: partnership synergy, trust building and related ripple effects. *BMC Public Health*, *15*(1). https://doi.org/10.1186/s12889-015-1949-1

Konefal, B. (2010). For Every Indio who Falls: A History of Maya Activism in Guatemala, Albuquerque, NM: *University of New Mexico Press.*

Lindsey, J., & Struve, U. (2008, Summer). Practical strategies for addressing mental health issues within study abroad [Presentation]. British Universities Transatlantic Exchange Association Conference, Belfast, Ireland. Retrieved September 28, 2011 from http://www.butex.ac.uk

Lucas, J. (2009). Over-stressed, overwhelmed, and over here: Resident directors and the challenges of student mental health abroad. *Frontiers: The Interdisciplinary Journal of Study Abroad,* 18, 187–216.

Mancomunidad Copanch'orti' (2019). *Plan De Desarrollo Rural Integral Del Territorio Maya Ch'orti' 2019 - 2027.* 01 August 2021. Shared by Mancomunidad Copanch'orti'.

Mato, D.A. Universidades Indígenas en América Latina: Experiencias, Logros, Problemas, Conflictos y Desafíos.Inclusión Soc.Equidad Educ. Super.2014,14, 17–45.

Metz, B. E. (2009). *The Ch'orti' Maya Area: Past and Present.* University of Florida Press.

Morales, H., and I. Perfecto.2000. Traditional knowledge and pest management in the Guatemalan highlands.*Agriculture and Human Values,* 17: doi:10.1023/A:1007680726231.

National Institute of Statistics (Guatemala), United Nations Population Fund (UNFPA). Guatemala Population and Housing Census 2018.

Nelson, D. (1999) *A Finger in the Wound*. (Berkeley, CA: University of California Press.

Pérez, M. E. V. (2008). Chapter 6: Diversidad florística de Guatemala. In *Guatemala y su biodiversidad: Un Enfoque histórico, cultural, biológico y económico* (pp. 261–299). chapter, Consejo Nacional de Áreas Protegidas.

Pérez Ruiz, M.L., & Argueta Villamar, A.. (2011). Saberes indígenas y dialogo intercultural. Cultura y representaciones sociales, 5(10), 31-56. Recuperado en 20 de abril de 2023, de http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S2007-81102011000100002&lng=es&tlng=es.

Poyrazli, S. and M. A. Mitchell (2020). "Mental Health Problems of U.S. Students Studying Abroad." *Journal of International Students* 10(1): 17-27.

Ross, A., Pickering Sherman, K., Snodgrass, J. G., Delcore, H. D., & Sherman, R. (2011). *Indigenous peoples and the collaborative stewardship of nature: Knowledge binds and institutional conflicts*. Walnut Creek, CA: Taylor & Francis

Rosset, P. M., Sosa, B. M., Jaime, A. M., & Lozano, D. R. (2011). The Campesino-to-Campesino agroecology movement of ANAP in Cuba: social process methodology in the construction of sustainable peasant agriculture and food sovereignty. *The Journal of peasant studies*, *38*(1), 161–191. https://doi.org/10.1080/03066150.2010.538584

Sauer, J.D.(1950) The grain amaranths: A survey of their history and classification. Annals of Missouri Botanical Garden, 37, 561–632

Schlesinger, S.C. & Kinzer, S. (1982). *Bitter fruit : the untold story of the American coup in Guatemala*. Garden City, N.Y : Doubleday

Smith, L.T. (1999). Decolonizing methodologies : research and indigenous peoples. London ; New York : Dunedin : New York :Zed Books ; University of Otago Press ; distributed in the USA exclusively by St Martin's Press,

Sveinsdóttir, A. G., Aguilar-Støen, M., & Bull, B.. (2021). Resistance, repression and elite dynamics: Unpacking violence in the Guatemalan mining sector. *Geoforum*, *118*, 117–129. https://doi.org/10.1016/j.geoforum.2020.12.011

Welch IV, J. (2009). Interdisciplinarity and the history of Western epistemology. Issues in Integrative Studies 27 : 35-69.

Wezel, A., Bellon, S., Doré, T., Francis, C., Vallod, D., & David, C.. (2009). Agroecology as a science, a movement and a practice. A review. *Agronomy for Sustainable Development*, *29*(4), 503–515. https://doi.org/10.1051/agro/2009004

Wezel, A., Herren, B. G., Kerr, R. B., Barrios, E., Gonçalves, A. L. R., & Sinclair, F.. (2020). Agroecological principles and elements and their implications for transitioning to sustainable food systems. A review. *Agronomy for Sustainable Development*, *40*(6). https://doi.org/10.1007/s13593-020-00646-z

Wilken, G. C.1987.Good farmers: Traditional agricultural resource management in Mexico and Guatemala. Berkeley: University of California Press. AGROECOLOGY AND SUSTAINABLE FOOD SYSTEMS

USAID Guatemala. 2010. Available online: **https://www.land-links.org/country-profile/dguatemala/** (accessed on 18 April 2023).

Appendices

Appendix A. Meg Baker's framework for community-engaged scholarship

A Framework for Community Engaged Scholarship

Created by: Meg Baker
Updated: December 14, 2022

Executive Summary:

My approach to community-engaged projects centers on community identified needs and goals, and strength-based frameworks with a deep commitment to social, racial, and environmental justice. While understanding financial and temporal limitations, I believe strong relationships built on trust are at the heart of sustainable projects and both time and intentionality are necessary. Within my work I strive to practice cultural humility, self-reflection, and evaluation, creating space for each iteration within a project to cultivate high-quality scholarship alongside communities.

Ongoing Approach:

Values:

- **Social justice** – a commitment to centering vulnerable and marginalized communities, focusing on individual and social well-being at the intersection of racial and environmental justice
- **Citizenship** – social and civic responsibility to engage with the wider society on issues of public relevance

Principles:

- **Community-Driven** - Real-life social problems are defined with and/or by the community and investigated in a scholarly way. Strong commitment to time and resources necessary to build and maintain genuine relationships keeping in mind the institutions timelines and limitations.
- **Reciprocal** - Partnerships are collaboratively and mutually beneficial, recognizing the spectrum of participation, and include a Memorandum of Understanding when appropriate.
- **Democratizing Knowledge** – Diverse ways of knowledge generation and dissemination within communities are valued and respected. Knowledge produced is accessible for all depending on established community guidelines.
- **High-Quality Scholarship** - Multi-inter-transdisciplinary approaches across disciplines and sectors alongside community partners are the best way to optimize impact of work by highlighting diverse team and partner skillsets.
- **Iterative, Non-Linear Process** - Self-reflection and community partner feedback through the process is a necessary part of every project.

Inspired by 1, 2.

Seminal Thinkers Framing My Approach:

Pablo Freire

- Freire, P. (2000). Pedagogy of the Oppressed (30th anniversary ed.). Continuum.
- Freire, P. (2014). Pedagogy of Hope. Bloomsbury Academic.

bell hooks

- hooks, bell, (2000). All about love: new visions. New York: William Morrow.
- hooks, bell. (2015). Yearning: Race, gender, and cultural politics. Routledge.

Eve Tuck and K. Wayne Yang

- Tuck, E. and Yang, K.W. (2014). R-words: Refusing Research. *Humanizing Research: Decolonizing Qualitative Inquiry with Youth and Communities.* doi.10.4135/9781544329611.n12.

Tools:

- Social Identity Wheel – Represents the wheel of privilege and power. Users can understand the various levels of privilege received from their intersectional identities.
- Cultural Asset Mapping - Identifies a community's strengths and resources through the process of inventorying tangible and intangible cultural assets.
- Reflection – Provides structured opportunities for those involved in community projects to critically reflect upon the work, its impact, and areas for improvement.
- Cultural Humility – Commits to critically reflect on positionality, assumptions, and the systems of power to increase one's capacity to embrace human dignity within all cultures

References:

1. Beaulieu M., Breton M., and Brousselle, A. (2018) Conceptualizing 20 years of engaged scholarship: A scoping review. PLoS ONE 13(2): e0193201. https://doi.org/10.1371/journal. pone.0193201
2. da Cruz, C.G. (2017). Community-Engaged Scholarship: Toward a Shared Understanding of Practice. *The Review of Higher Education, 41*, 147 - 167.

If research hasn't changed you as a person, then you haven't done it correctly. - Shawn Wilson

Once you do away with the idea of people as fixed, static entities, then you see that people can change, and there is hope. - bell hooks

Appendix B. Interview Questions - English

Interview Questions English

EVALUATION SURVEY OF "Building resilience in food systems through shared knowledge of communities in Chiquimula, Guatemala"

Interview Date: _____

Town (Department/Municipality/Village)

_____

Association (optional): _____

Unique code of the person interviewed:

_____

Interviews will be semi-structured and include some or all of these questions. Potential multiple-choice answers are given for some questions in indented bullet points.

Demographic Questions

1. What is your name?
   a. [will be removed from transcripts for participants who wish to remain de-identified]
2. According to your family history, how do you self-identify?
   a. Maya

   If Maya, what linguistic community do you pertain to? Select one below.

1. Achi	12. Mam
2. Akateka	13. Mopan
3. Awakateka	14. Poqomam

4. Ch'orti'	15. Poqomchi'
5. Chalchiteka	16. Q'anjob'al
6. Chuj	17. Q'eqchi'
7. Itza'	18. Sakapulteka
8. Ixil	19. Sipakapense
9. Jakalteko/ Popti'	20. Tektiteka
10. K'iche'	21. Tz'utujil
11. Kaqchikel	22. Uspanteka

b. Garífuna

c. Xinka

d. Afrodescendent/Creole/Afromestizo

e. Ladina/ladino

f. Foreign born

3. Where do you live?

a. Department > Municipality > Village

4. How old are you?

a. 18-24

b. 25-30

c. 30-40

d. 40-50

e. 50+

Medicinal plant questions

5. How frequently do you use medicinal plants?
    a. Daily
    b. At least once a week
    c. At least once a month
    d. A few times a year
    e. Rarely/never

6. How would you describe your ability to use medicinal plants?
    a. Expert: professional healer/ midwife / shaman or in training. Can identify a vast array of plants, knows how to use the plants to treat different ailments, knows where to obtain the plants.
    b. Adept: non-professional, but uses a variety of medicinal plants regularly
    c. Basic: uses some medicinal plants or knows about some medicinal plants, people in your family are knowledgeable but you only know a little or a few plants, may or may not know how to describe how to prepare or how to identify the plants or where to obtain them
    d. None: rarely use medicinal plants maybe only the most commonly used ones or have little knowledge, no one in your family use medicinal plants, you are unable to identify the plants or know where to obtain them

7. How long have you been using medicinal plants?
    a. Less than a year
    b. A short time, 1-5 years
    c. 5-10 years
    d. A long time, 10-20 years
    e. 20 years

f. I don't know

8. Who taught you to use medicinal plants?
   a. family member
      i. Grandma or grandpa
      ii. Mother or father
      iii. Aunt or Uncle
      iv. Cousin
      v. Other_____
   b. Friend
   c. Healer/shaman
   d. Other

9. Are you teaching/showing someone else how to use medicinal plants?
   a. family member
      i. Grandma or grandpa
      ii. Mother or father
      iii. Aunt or Uncle
      iv. Cousin
      v. Other_____
   b. Friend
   c. Healer/shaman
   d. Other

10. Where do you find your medicinal plants?
   a. Farm plot
   b. Garden
   c. Friends/Neighbors
   d. Market

e. I collect them from _____

f. Other

11. If you do grow medicinal plants, are the plants:

a. Planted yourself

b. "Volunteers" in the garden

c. Transplanted from elsewhere

d. Collected from _____

e. Collect from further away

f. Buy in markets

g. Get from friends

h. Other _____

12. Have you noticed a change in the physical presence of medicinal plants that can be found in this area in recent years?

a. More plants

b. More or less the same

c. Less plants

d. I do not know

13. Have you noticed a change in the number of people using medicinal plants today compared to years ago?

a. More people

b. More or less the same

c. Less people

d. I do not know

14. What is the medicinal plant you use most?

a. [open ended]

15. What are some of the challenges related to medicinal plants?
    a. Difficult to grow them
    b. Difficult to find them
    c. Need more information on them
    d. Other

16. How would you describe your relationship with medicinal plants?
    a. [open ended]

17. What are some of the most memorable times you used a medicinal plant?
    a. [open ended]

18. Would you be interested in learning more about medicinal plants?
    a. Yes
    b. No
        i. If yes, what would you like/need to learn more about?
            1. Identification of medicinal plants
            2. Properties of medicinal plants
            3. Preparation of medicinal plants
            4. Other

Questions about agroecological practices

19. Do you have a plot or a family garden?
    a. Yes
    b. No

20. What are the main crops that you grow?

a. Basic grains (corn, beans, others)
b. Vegetables
c. Medicinal plants
d. Spices
e. Honey and other bee products
f. Mushrooms
g. Ornamental plants
h. Plants for use in ceremonies or religious events
i. Trees for fruit
j. Trees for firewood
k. Trees for shade
l. Trees for providing nitrogen to the soil (legumes)
m. Trees for support
n. Chickens or other birds
o. Pigs
p. Cows
q. Sheep
r. Goats

21. In general terms, how would you describe your members' food production practices?

a. Traditional
b. Agroecological, with or without new practices
c. Conventional with fertilizers and/or pesticides
d. A mix (describe): _____

22. What are the practices employed by the members of your organization for food production? Please select all that apply.

a. We save seeds / we buy seeds from the community / we trade seeds / we have a seed bank / we buy commercial seeds / we practice a mix of seed saving and seed buying (describe): _____

b. We buy organic fertilizers / we make our own organic fertilizers / we buy chemical fertilizers / a mix of making our own and buying fertilizers

c. We manage pests with organic inputs / we remove pests mechanically by hand / we use pesticides / we don't have pests / we use a mixture of these alternatives

d. We produce for subsistence / We produce mainly to sell / We produce for both subsistence and sale

23. How do you access water for irrigation in your community?
    a. Rain water
    b. Well water
    c. River water
    d. Spring water
    e. Water from the mountain
    f. Other: _____

24. Do you use the Kuxur rum practice?
    a. Yes
    b. No

25. Who taught you to use this practice?
    a. Family member
        i. Grandma or grandpa
        ii. Mother or father
        iii. Aunt or Uncle

iv. Cousin

b. Friend

c. Healer/shaman

d. Other

26. Are you teaching someone else that Kuxur rum practice?

a. Family member

i. Grandma or grandpa

ii. Mother or father

iii. Aunt or Uncle

iv. Cousin

b. Friend

c. Healer/shaman

d. Other

e. I am not teaching anyone Kuxur rum

27. What are some of the challenges related to agroecological farming practices?

a. Expensive

b. Need more information/education

c. More labor than other practices

d. Time intensive

e. Other

28. Would you be interested in learning more about agroecological practices? If yes, what would you like to learn more about?

a. Yes

i. Apiculture

ii. Kuxur rum / agroforestry

iii. Polyculture

iv. Medicinal plants

v. Vegetables

vi. Other

b. No

29. What would be the most effective way to receive this information?

a. Workshops on agroecological practices

b. Connecting with farmers who perform agroecological practices

c. Educational videos

d. Other

Appendix C. Interview Questions - Spanish

Interview Questions Spanish

ENCUESTA DE EVALUACIÓN DE "Construir resiliencia en los sistemas alimentarios a través del conocimiento compartido de las comunidades en Chiquimula, Guatemala"

Fecha de la Entrevista: _____

Localidad (Departamento/Municipio/Aldea)

_____

Asociación (opcional): _____

Código único de la persona entrevistada:

_____

Interviews will be semi-structured and include some or all of these questions. Potential multiple-choice answers are given for some questions in indented bullet points.

Preguntas demográficas

1. ¿Cuál es su nombre?
    - [will be removed from transcripts for participants who wish to remain de-identified
2. ¿ Según su origen o historia, ¿cómo se considera o auto identifica:
    - Maya Si responde Maya, ¿A qué comunidad lingüística pertenece? (anote el Código abajo)

1. Achi	12. Mam
2. Akateka	13. Mopan
3. Awakateka	14. Poqomam

1. Achi	12. Mam
2. Akateka	13. Mopan
4. Ch'orti'	15. Poqomchi'
5. Chalchiteka	16. Q'anjob'al
6. Chuj	17. Q'eqchi'
7. Itza'	18. Sakapulteka
8. Ixil	19. Sipakapense
9. Jakalteko/Popti'	20. Tektiteka
10. K'iche'	21. Tz'utujil
11. Kaqchikel	22. Uspanteka

- Garífuna
- Xinka
- Afrodescendiente/Creole/Afromestizo
- Ladina(o)
- Extranjera(o)

3. ¿Dónde vive?
   - Departamento > Municipio > Aldea
4. ¿Cuántos años tiene?
   - 18-24
   - 25-30

- 30-40
- 40-50
- 50+

Preguntas de plantas medicinales

5. ¿Utiliza con frecuencia plantas medicinales?
    - Diario
    - Al menos una vez a la semana
    - Al menos una vez al mes
    - Un par de veces al año
    - Rara vez/nunca
6. ¿Cómo describiría su capacidad para usar plantas medicinales?
    - Experto: sanador profesional / chamán o en formación
    - Adepto: no profesional, pero usa variedad de medicamentos regularmente
    - Básico: usa algunos medicamentos o conozca algunos medicamentos
    - Ninguno: rara vez use medicamentos o tenga poco conocimiento
7. ¿Cuánto tiempo ha estado usando plantas medicinales?
    - Menos de un año
    - 1-5 años, poco tiempo
    - 5-10 años
    - 10-20 años, mucho tiempo
    - 20 años
8. ¿Quién le enseñó a usar plantas medicinales?
    - Miembro de la familia

- § Abuelo o abuela
- § Madre o padre
- § Tía o tío
- § Primo o prima
- § Otro _____

- ○ Amigo o amiga
- ○ Sanador/chamán
- ○ Otro

9. ¿Está enseñando/mostrando a alguien más cómo usar las plantas medicinales?

- ○ Miembro de la familia
  - § Abuelo o abuela
  - § Madre o padre
  - § Tía o tío
  - § Primo o prima
  - § Otro _____
- ○ Amigo
- ○ Sanador/chamán
- ○ Otro

10. 10. ¿Dónde encuentras tus plantas medicinales?

- ○ una Parcela
- ○ Jardín
- ○ La casa de mi familia. Anota quién _____
- ○ Amigo / amiga

- Mercado
- Las colectas en _____
- Otro

11. Si cultiva plantas medicinales, ¿cómo las cultiva?

- Cultivar plantas personalmente
- "Voluntarios" en el jardín
- Recolectar de
- Recolectar desde más lejos
- Comprar en mercados
- Obtener de amigos
- Otros

12. ¿Ha notado un cambio en la cantidad de plantas medicinales que hay en esta área en los últimos años?

- Más plantas
- Más o menos lo mismo
- Menos plantas
- No sé

13. ¿Ha notado un cambio en la cantidad de personas que usan plantas medicinales hoy en día en comparación con hace años?

- Más personas
- Más o menos lo mismo
- Menos personas
- No sé

14. ¿Cuál es la planta medicinal que más usa?

[open ended]

15. ¿Cuáles son algunos de los retos relacionados con las plantas medicinales?

a. Difícil de cultivarlos

b. Difícil encontrarlos

c. Necesito más información sobre ellos

d. Otro

16. ¿Cómo describiría su relación con plantas medicinales?

- [open ended]

17. ¿Cuáles son algunas de las ocasiones más memorables en las que usó una planta medicinal?

- [open ended]

18. ¿Le interesaría saber más sobre las plantas medicinales?

    - Sí
    - No
        - § En caso afirmativo, ¿sobre qué le gustaría/necesitaría aprender más?
            - § Identificación de plantas medicinales
            - § Propiedades de las plantas medicinales
            - § Preparación de plantas medicinales
            - § Otro

Preguntas sobre prácticas agroecológicas

19. ¿Usted tiene una parcela o un huerto familiar?

    - Sí No

20. ¿Cuales plantas siembra?

- Granos básicos (maíz, frijol, otros)
- Verduras
- Plantas medicinales
- Especias
- Miel y otros productos de las Abejas
- Hongos
- Plantas ornamentales
- Plantas para uso en ceremonias o eventos religiosos
- árboles frutales
- árboles para leña
- arboles para sombra
- Árboles para aportar nitrógeno al suelo (leguminosas)
- árboles de apoyo
- Pollos u otras aves
- Cerdos
- Vacas
- Oveja
- cabras

21. 21. En términos generales, ¿cómo describiría las prácticas de producción de alimentos de sus miembros?

- Tradicional
- Agroecológico, con o sin nuevas practices

- Convencional con fertilizantes y/o pesticidas
- Una mezcla (describa): _____

22. ¿Cuáles son las prácticas empleadas por los miembros de su organización para la producción de alimentos? Por favor seleccione todas las respuestas válidas.

- Guardamos semillas / compramos semillas de la comunidad / intercambiamos semillas / tenemos un banco de semillas / compramos semillas comerciales / practicamos una combinación de ahorro y compra de semillas (describa):
- Compramos fertilizantes orgánicos / hacemos nuestros propios fertilizantes orgánicos / compramos fertilizantes químicos / una combinación de hacer los nuestros y comprar fertilizantes
- Manejamos plagas con insumos orgánicos / eliminamos plagas mecánicamente a mano / usamos pesticidas / no tenemos plagas / usamos una mezcla de estas alternativas
- Producimos para subsistencia / Producimos principalmente para vender / Producimos tanto para subsistencia como para venta

23. ¿Cómo accede al agua para riego en su comunidad?

- agua de Lluvia
- agua de pozo
- agua de rio
- Agua de manantial
- Agua de la montaña
- Otro: _____

24. ¿Usa la practica de Kuxur rum?

- Sí

- No

25. ¿Quién le enseñó a usar esta práctica?

- Miembro de la familia
  - § Abuelo o abuela
  - § Madre o padre
  - § Tia o tio
  - § Primo o prima
  - § Otro _____
  - §
- Amigo
- Sanador/chamán
- Otro

26. ¿Está enseñando a otra persona esa práctica de Kuxur rum?

- Si
- No
- Si sí, ¿Quién?
  - § Miembro de la familia
    - · Abuelo o abuela
    - · Madre o padre
    - · Tia o tio
    - · Primo o prima
    - · Otro _____
  - § Amigo

§ Otro _____

27. ¿Cuáles son algunos de los desafíos relacionados con las prácticas agrícolas agroecológicas?

- Caro
- Necesita más información/educación
- Más mano de obra que otras practices
- Tiempo intensive
- Otro

28. ¿Le interesaría conocer más sobre las prácticas agroecológicas? En caso afirmativo, ¿sobre qué le gustaría aprender más?

- Sí
- No
    - § Apicultura
    - § Kuxur rum / agrosilvicultura
    - § Policultivo
    - § Plantas medicinales
    - § Verduras
    - § Otro

29. ¿Cuál sería la forma más efectiva de recibir esta información?

- Talleres sobre prácticas agroecológicas
- Conectando con agricultores que realizan prácticas agroecológicas
- vídeos educativos
- Otro

Appendix D. Institutional Review Board Letter of Exemption

Minimal Risk Research IRB
4/29/2022

Submission ID number:	2022-0534
Title:	Creating Resiliency in Food Systems through Shared Knowledge of Communities in Chiquimula, Guatemala
Principal Investigator:	Claudia Irene Calderon
Point-of-contact:	Julie Dawson, Meg Baker, Claudia Irene Calderon
IRB Staff Reviewer:	Laura Conger

The MRR IRB conducted a review of the above referenced initial application. The study was determined to meet the criteria for exempt human subjects in accordance with the following category(ies) as defined under 45 CFR 46:

(2)(ii) Tests, surveys, interviews, or observation (low risk)

NOTE: If the research under this exemption application becomes subject to FDA regulations, the exemption status no longer applies.

You have identified the following financial sources to support the research activities in this IRB application:

Center for Culture, History, and the Environment
4W Initiative
Center for Integrated Agriculture Systems (CIAS)

If this information is incorrect, please submit a change to modify your application as appropriate.

To access the materials the IRB reviewed and accepted as part of the exemption determination, please log in to your ARROW account and view the documents tab in the submission's workspace.

Appendix E. Agenda for Part 1 *Campesino-a-Campesino* Exchange

WISCONSIN

AGENDA Intercambio Campesino-a-Campesino: Prácticas Agroecológicas

Copanch'orti'

	El lunes, el 25 de julio 2022
6:30 AM a 7:30 AM	**Desayuno - Centro Payaqui**
7:30 AM a 9:00 AM	**Traslado a la Parcela "Renacer,"** Limón, Camotán
9:00 AM a 9:30 AM	**Bienvenida** ❖ Inge. Carlos Humberto Ramirez - Mancomunidad Copan Ch'orti' ❖ Dra. Claudia Irene Calderón y Lic. Maggi Baker - Universidad de Wisconsin - Madison ❖ Encarnación Gutiérrez Esquivel - Campesina, Dueña de la Parcela "Renacer" ❖ Vicenta Romero de Garcia - Campesina
9:30 AM a 10:30 AM	**Presentación de Participantes**
10:30 AM a 11:00 AM	**Refacción y Encuesta #1**
11:00 AM a 12:30 PM	**Recorrido de Huertos - Encarnación Gutiérrez Esquivel y Vicenta Romero de Garcia** ❖ Plantas medicinales y productos medicinales ❖ Lombricomposta
12:30 PM a 1.30 PM	**Almuerzo**
1:30 PM a 2:30 PM	**Productos del Huerto - María Vasquez Reyes y Elvira Suchite Ramirez de Suchite** ❖ Concentrado artesanal y atol de amaranto
2:30 PM a 3:45 PM	**Traslado a Centro Payaqui**
3:45 PM a 5:00 PM	**Descanso**
5:00 PM a 6:00 PM	**Cena - Centro Payaqui**
	El martes, el 26 de julio 2022
6:30 AM a 7:30 AM	**Desayuno - Centro Payaqui**
7:30 AM a 8:30 AM	**Traslado a la Parcela Integral "La Esperanza,"** La Libertad, Camotán
8:30 AM a 10:00 AM	**Ceremonia Maya - Valentín Albino Cubur Quexel, *Guía Maya***
10:00 AM a 10:30 AM	**Refacción**
10:30 AM a 12:30 PM	**Recorrido de "La Esperanza" - José María Gutiérrez** ❖ Prácticas agroecológicas, agroforestería, artesanías
12:30 PM a 1:30 PM	**Almuerzo**
1:30 PM a 2:00 PM	**Platica - Hellen Cristina Coronado Guzman y Elda Verónica Guzman Cuellar** ❖ Jóvenes y mujeres en agricultura
2:00 PM a 3:00PM	**El Mercadito - Venta / Trueque / Intercambio de Productos** ❖ Refacción y Encuesta #2
3:00 PM a 3:30 PM	**Clausura del Evento y Foto Grupal**
3:30 PM a 5:00 PM	**Traslado a Centro Payaqui**
5:00 PM a 6:00 PM	**Cena - Centro Payaqui**

Appendix F. Agenda for Part 2 *Campesino-a-Campesino* Exchange

AGENDA INTERCAMBIO CAMPESINO-A-CAMPESINO: PRÁCTICAS AGROECOLÓGICAS

el miércoles, el 18 de enero de 2023	
6:30 AM a 7:30 AM	Desayuno - Hotel Estrella Dorada
7:30 AM a 8:30 AM	Traslado a Union Reforma
8:30 AM a 9:30 AM	Bienvenida • Dra. Claudia Irene Calderón y Lic. Maggi Baker - Universidad de Wisconsin - Madison • Luzmila Velásquez, Coordinadora Red Kuchub'al • Otilio Marcelino Bravo Roblero - Miembro de Asociación Sibinalese para el Desarrollo Integral de San Miguel Arcángel
9:30 AM a 10:00 AM	Presentación de Participantes y Encuesta #1
10:00 AM a 12:00 PM	Recorrido - Parcela de Otilio Marcelino Bravo Roblero • Práctica elaboración de abono orgánico liquido Supermagro • Microorganismos de la montana y visita al bosque Plática - Keydi Marisol Roblero Escalante • Vivero agroforestal y plantas medicinales
12:00 PM a 1:00 PM	Almuerzo
1:00 PM a 3:00 PM	Recorrido - Parcela de Otilio Marcelino Bravo Roblero • Invernaderos y flores • Conservación de suelo
3:00 PM a 4:00 PM	Traslado a Tacaná - Hotel Madelin
5:00 PM a 6:00 PM	Cena

el jueves, el 19 de enero de 2023	
6:30 AM a 7:30 AM	Desayuno - Hotel Madelin
7:30 AM a 8:30AM	Traslado a la Parcela de Alvaro Nestor Ortiz González
8:30 AM a 12:00 AM	Recorrido - Parcela de Alvaro Nestor Ortiz González • Conservación del suelo - terrazas y barreras vivas • Hortalizas diversificadas
12:00 PM a 1:00 PM	Almuerzo
1:00 PM a 3:00 PM	Recorrido, Acopio de Red Kuchub'al - Asociación Desarrollo Integral de Medianos Agricultores (ADIMAG) - Roselvina Mayra de León Gonzalez • Emprendimiento de mujeres • Elaboración de té y huerto de plantas medicinales
3:00 PM a 4:00 PM	Mercadito, encuesta #2, y foto grupal
4:00 PM a 6:00 PM	Traslado a San Marcos - Hotel del Bosque
6:30 PM a 7:30 PM	Cena

Appendix G. Educational Materials - Plant Functions and Medicinal Plants

LECCIÓN de PLANTAS MEDICINALES de GUATEMALA



Creado: enero 2023
Por: Lic. Maggi Baker

Copanch'orti' Mancomunidad
Center for Culture, History, and Environment
CIAS
4W Women & Wellbeing in Wisconsin & the World

LECCIÓN de PLANTAS MEDICINALES de GUATEMALA

Introducción

¿Qué son las plantas medicinales?

Plantas medicinales son las plantas cuyas partes o extractos se utilizan como medicamentos para el tratamiento de alguna afección o enfermedad que padece un individuo o animal.

¿Para qué las usamos?

Guatemaltecos ocupan las plantas medicinales para curar los síntomas de los resfriados, el gripe, el estrés, la náusea, los parásitos, y muchas enfermedades más.

¿Cúales partes de las plantas usamos?

Dependiendo de la planta, podemos usar las raíces, flores, semillas, y hojas.

LECCIÓN de PLANTAS MEDICINALES de GUATEMALA

tres puntas

apazote

ruda

llantén

LECCIÓN de PLANTAS MEDICINALES de GUATEMALA

sábila

limón

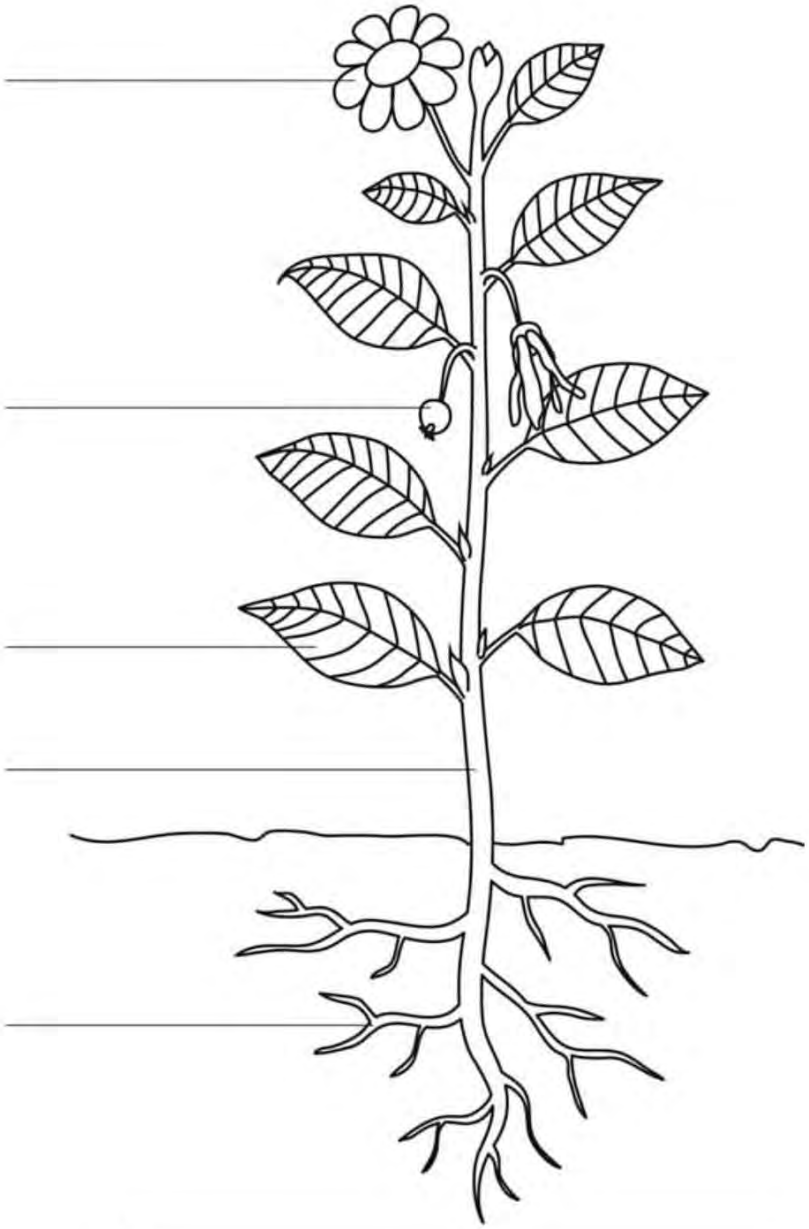
té de limón

hierbabuena

LECCIÓN de PLANTAS MEDICINALES de GUATEMALA

PARTES DE UNA PLANTA

Rotula cada parte de la planta y después colorea la planta.



flor	hoja	tallo
raiz	fruta	

SOPA DE LETRAS

Encuentra las palabras y rodealas.

M H S G V B X M I J U F Y H G D M D S A
Y V E D A I I D E B S O A C A Ñ Ñ Z G V
T R G U L S K Ñ G L Z C Z G P R E C O Y
P Ñ Ñ Q E N E D P V E W T V R V I F H I
F H V X R Y L L X R W C P O E A W N M E
R B M J I E Y V M A O O L A X O C J A V
S K W X A G T P J R H F A P O B S F J V
L I M Ó N N L D E R W P N A R O Á M V Q
I L S O A V I M E N H T T Z A Q B K Ñ T
S R U D A Q O A C C L K A O I I I M Ñ D
E E I D J R X M S I Ñ Z S T Z K L W R A
Q R E H E S J I N I I A K E F W A Q B X
Z X D O R K Q N D E N Ñ K R C L Y Q R J
Q L M J I B É F T I M N R P I B A Q S O
K L R A B T E O C U M E N T A G W V E O
Q C Z P N X I I I O R É G A N O Z E B U
L L E A V H D Z L Ñ W U Q I O H N D J X
W P L B C E G D M Ñ R C R Q J D L U A P
L L Ñ A M Q L O I Z I O B N G Y H R M N
U Y X C Ñ C N X V G M C U V F E P H Ñ A

PLANTAS
MEDICINA
FLOR

RAIZ
HOJA
MENTA

RUDA
LIMÓN
LLANTÉN

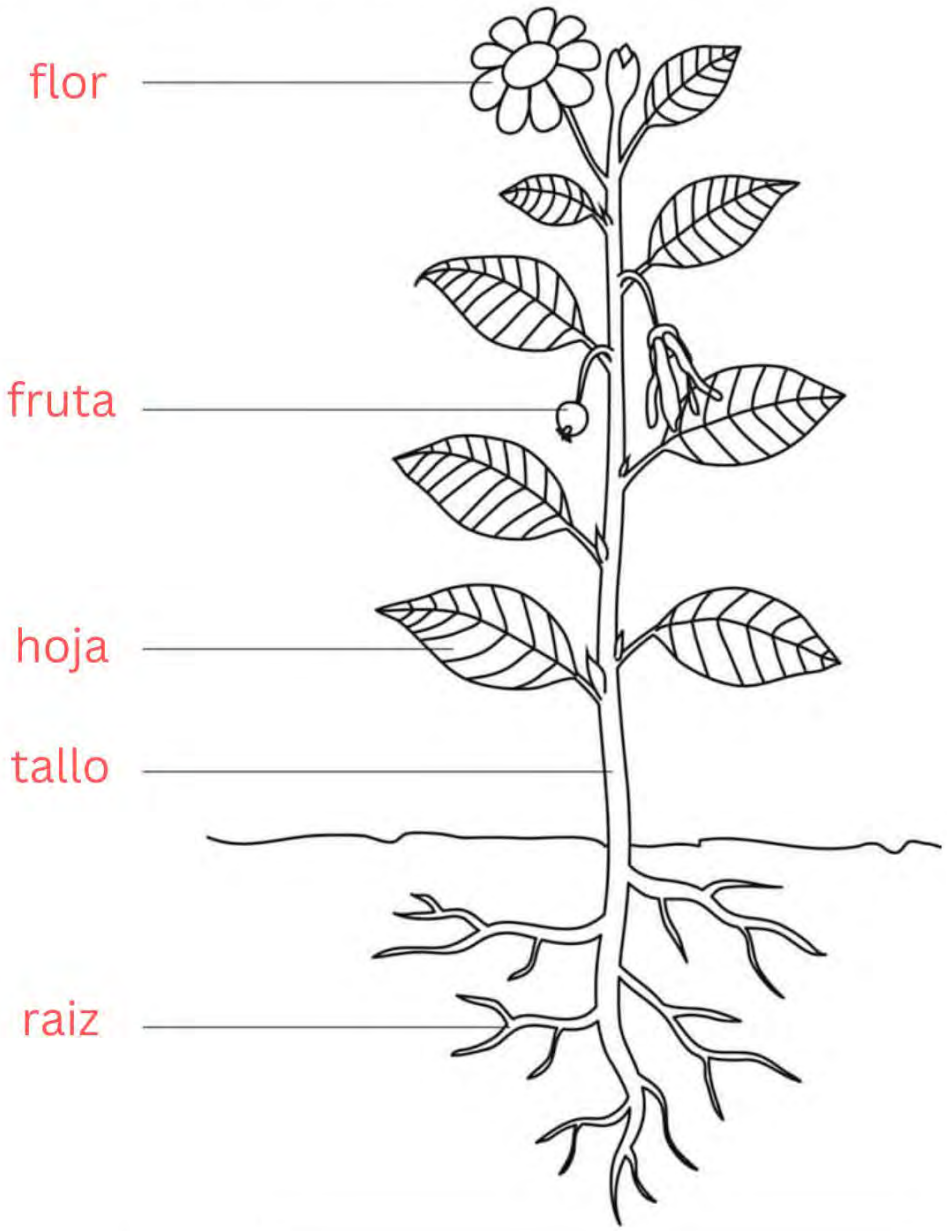
ACHIOTE
VALERIANA
MORINGA

ORÉGANO
ROMERO
SÁBILA

LECCIÓN de
PLANTAS MEDICINALES de GUATEMALA
CLAVE DE REPUESTAS PARA MAESTRXS

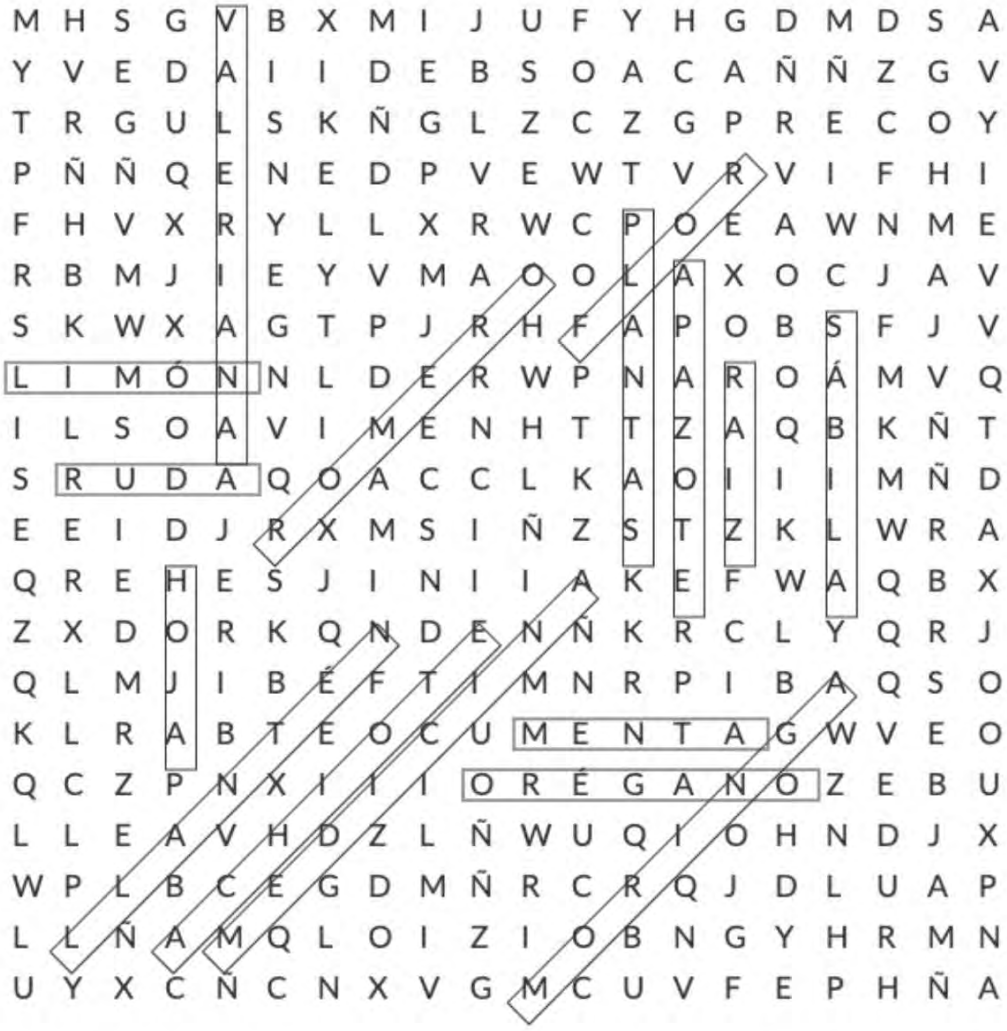
PARTES DE UNA PLANTA - RESPUESTAS

Rotula cada parte de la planta y después colorea la planta.



flor	hoja	tallo
raiz	fruta	

SOPA DE LETRAS - RESPUESTAS



PLANTAS
MEDICINA
FLOR

RAIZ
HOJA
MENTA

RUDA
LIMÓN
LLANTÉN

ACHIOTE
VALERIANA
MORINGA

ORÉGANO
ROMERO
SÁBILA

WISCONSIN FASTPLANTS® PROGRAM

Actividad de tarjetas - Estructuras y funciones de plantas

El Objetivo

- Esta actividad utiliza dos tipos de tarjetas iguales que contienen
  - Las Estructuras - representaciones de estructuras vegetales
  - Las Funciones - descripciones de la función de las estructuras de la planta
- Imprima un juego de tarjetas por grupo de estudiantes y los estudiantes pueden recortar sus propias tarjetas.
- Relaciona cada carta de Estructura con la carta de Función correspondiente.

Clave de Repuestas
1 y 7 - raíz
2 y 8 - vástago
3 y 9 - hoja
4 y 10 - brote
5 y 11 - flor
6 y 12 - semilla

Instrucciones

- Esta actividad puede valerse por sí sola, este documento contiene todos los tipos de tarjetas necesarios para la impresión.
- Las tarjetas están numeradas para facilitar el debate en el aula.

Instrucciones de impresión

- Cada una de las siguientes páginas contiene 6 frentes de cartas o 6 reversos de cartas.
- Para permitir el corte de tarjetas, la impresión debe realizarse de modo que las frentes y los reversos de las tarjetas estén en el anverso y el reverso de una sola página impresa.
- Todas las impresoras alimentan el papel de formas diferentes, por lo que es posible que deba alimentar manualmente las páginas para alinear correctamente las tarjetas impresas.

Impresión a doble cara automática

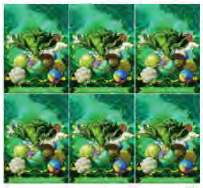
- Si su impresora es compatible con la impresión dúplex, es posible que pueda imprimir con alimentación automática de papel.
  - Nota 1: no todas las impresoras admiten la impresión dúplex
  - Nota 2: incluso si su impresora admite la impresión dúplex, la dirección de alimentación del papel puede afectar la orientación de la tarjeta
- Utilice su software de visualización de documentos para comenzar a imprimir este documento.
- Establezca su rango de impresión en las páginas 2-5 (esto imprimirá las páginas de la tarjeta, pero omita esta página de instrucciones)
- Habilite la impresión dúplex (a veces llamada impresión a dos caras)

Impresión manual de papel

- Si su impresora no admite la impresión dúplex, puede imprimir sus tarjetas imprimiendo manualmente cada página.
- Comience usando su software de visualización de documentos para comenzar a imprimir. Establezca su rango de impresión en la página 2 solamente.
- Después de que se imprima la página 2, tome esa página y vuelva a colocarla en la bandeja de papel de la impresora. Es posible que deba experimentar e intentar este paso varias veces para determinar la orientación correcta de la página en la bandeja de papel. Cada impresora alimenta el papel de forma ligeramente diferente. El objetivo es orientar la Página 2 impresa para que la Página 3 pueda imprimirse en el reverso de la misma hoja de papel.
- Después de colocar la Página 2 impresa en la bandeja de papel de la impresora, use su software de visualización de documentos para imprimir solo la Página 3.
- Examine su primera impresión a doble cara y verifique que las tarjetas estén correctamente orientadas. Si las tarjetas no están correctamente orientadas, vuelva a imprimir la Página 2 e intente orientar la Página 2 en una posición diferente en la bandeja de papel antes de imprimir la Página 3.
- Cuando haya orientado correctamente sus páginas, proceda a imprimir la Página 4 y la Página 5 de la misma manera.

Card Overview


Page 2 Page 3
Structure Card Fronts Card Backs


Page 4
Function Card Fronts


Page 5
Card Backs

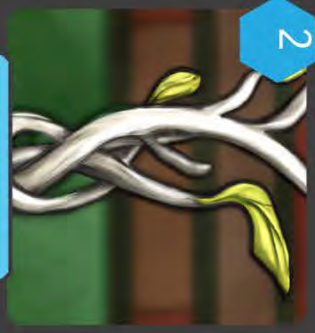
Traducida por Meg Baker, Universidad de Wisconsin - Madison, marzo 2023

WISCONSIN FASTPLANTS® PROGRAM

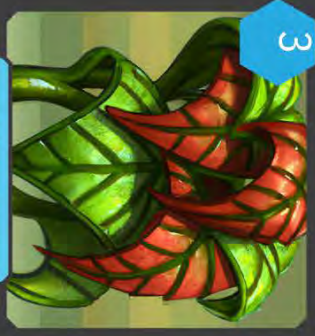
Página 2 - Frentes de tarjetas de estructura

1
estructura
la raiz
una de las primeras estructuras en surgir

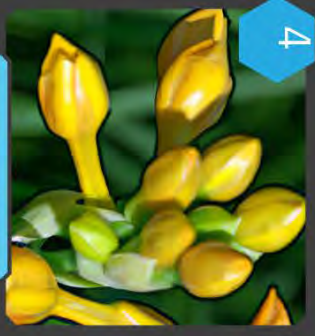
2
estructura
el tallo
Puede crecer alto, a veces bifurcarse



3
estructura
la hoja
varían en forma y tamaño



4
estructura
el brote
no siempre presente, varían en forma y tamaño

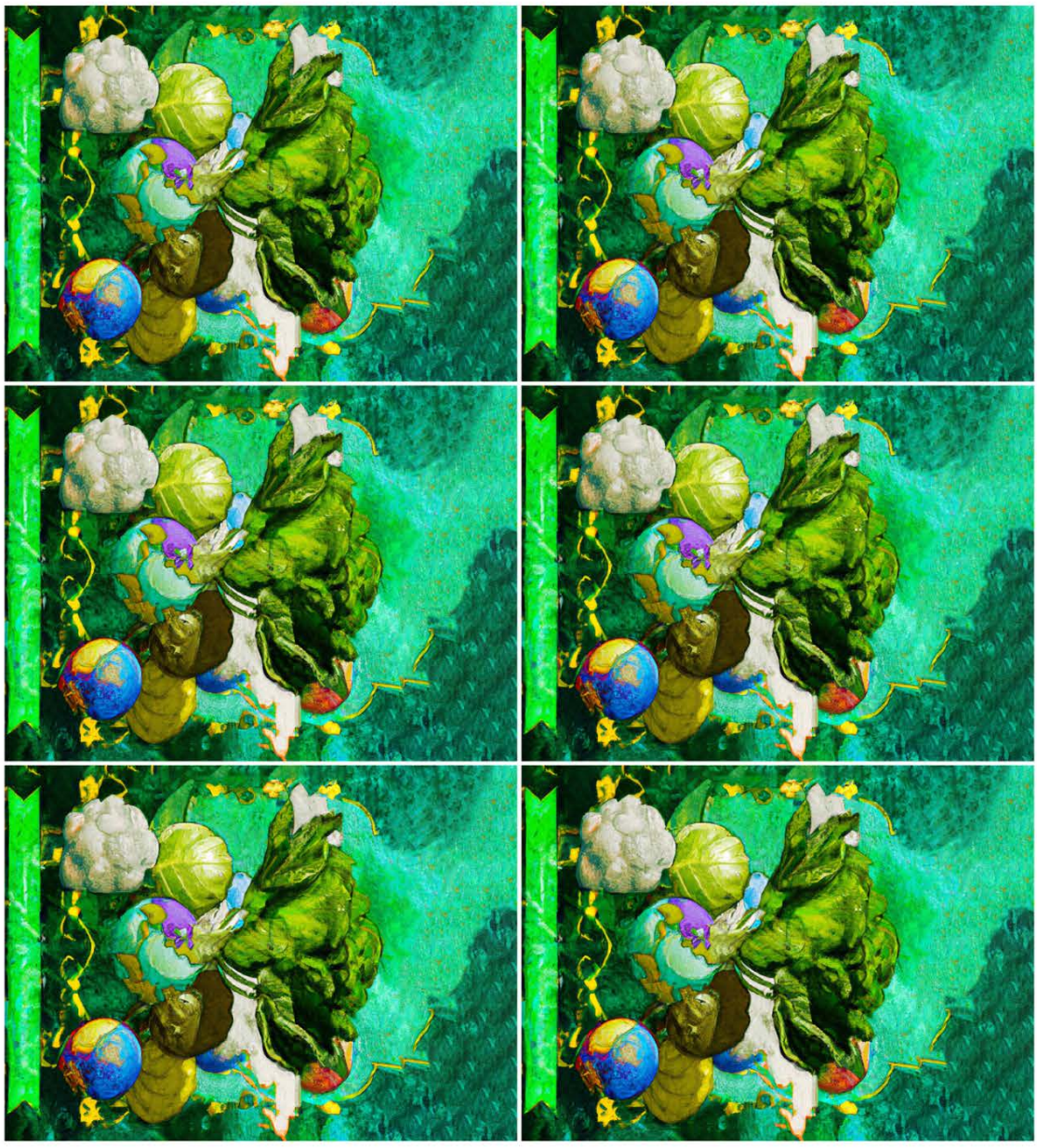


5
estructura
la flor
se puede observar en una variedad de colores, formas y tamaños

6
estructura
la semilla
vienen en una variedad de formas y tamaños

WISCONSIN FASTPLANTS® PROGRAM

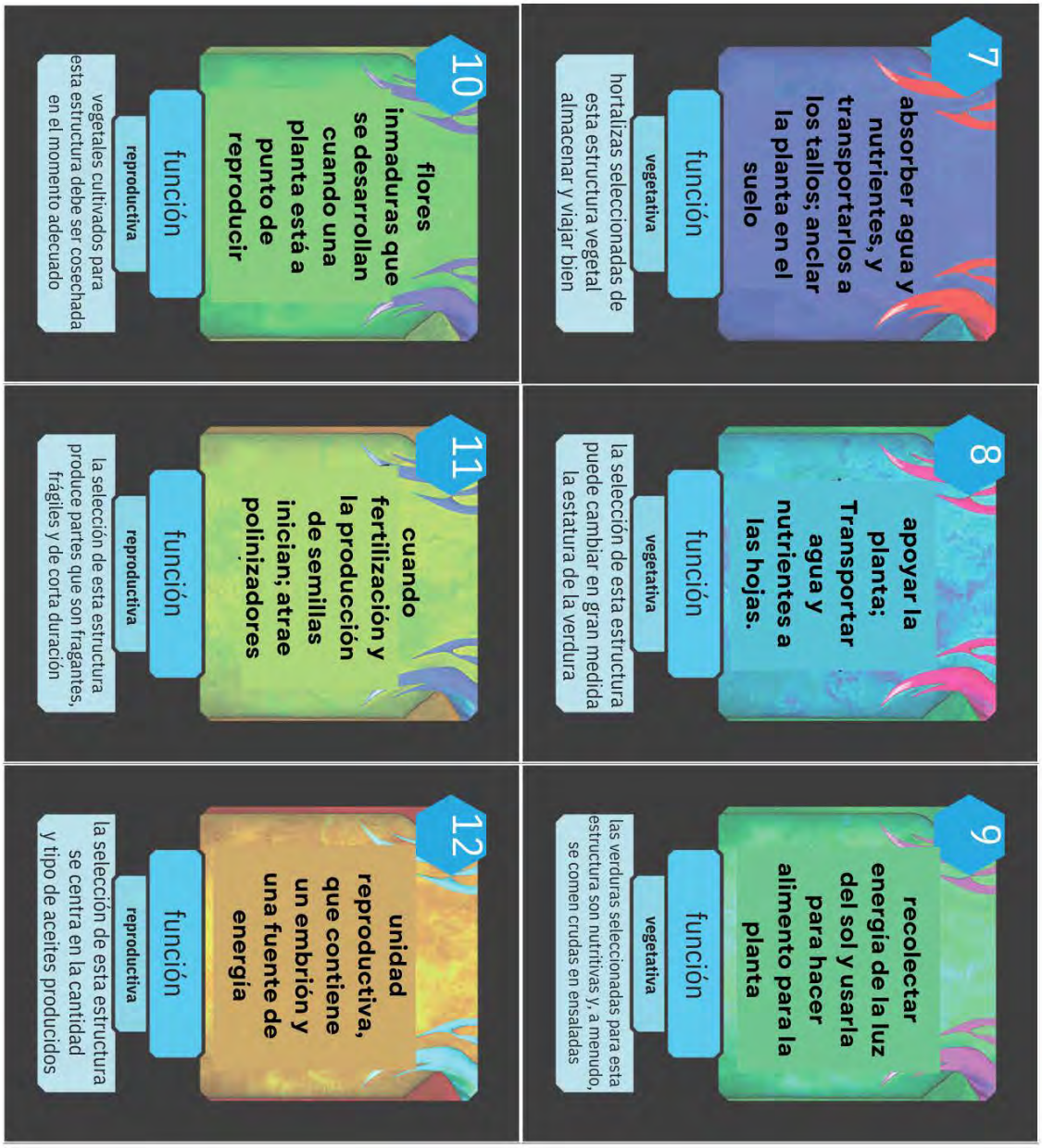
Página 3 - Dorsos de tarjetas de estructura



Traducida por Meg Baker, Universidad de Wisconsin - Madison, marzo 2023

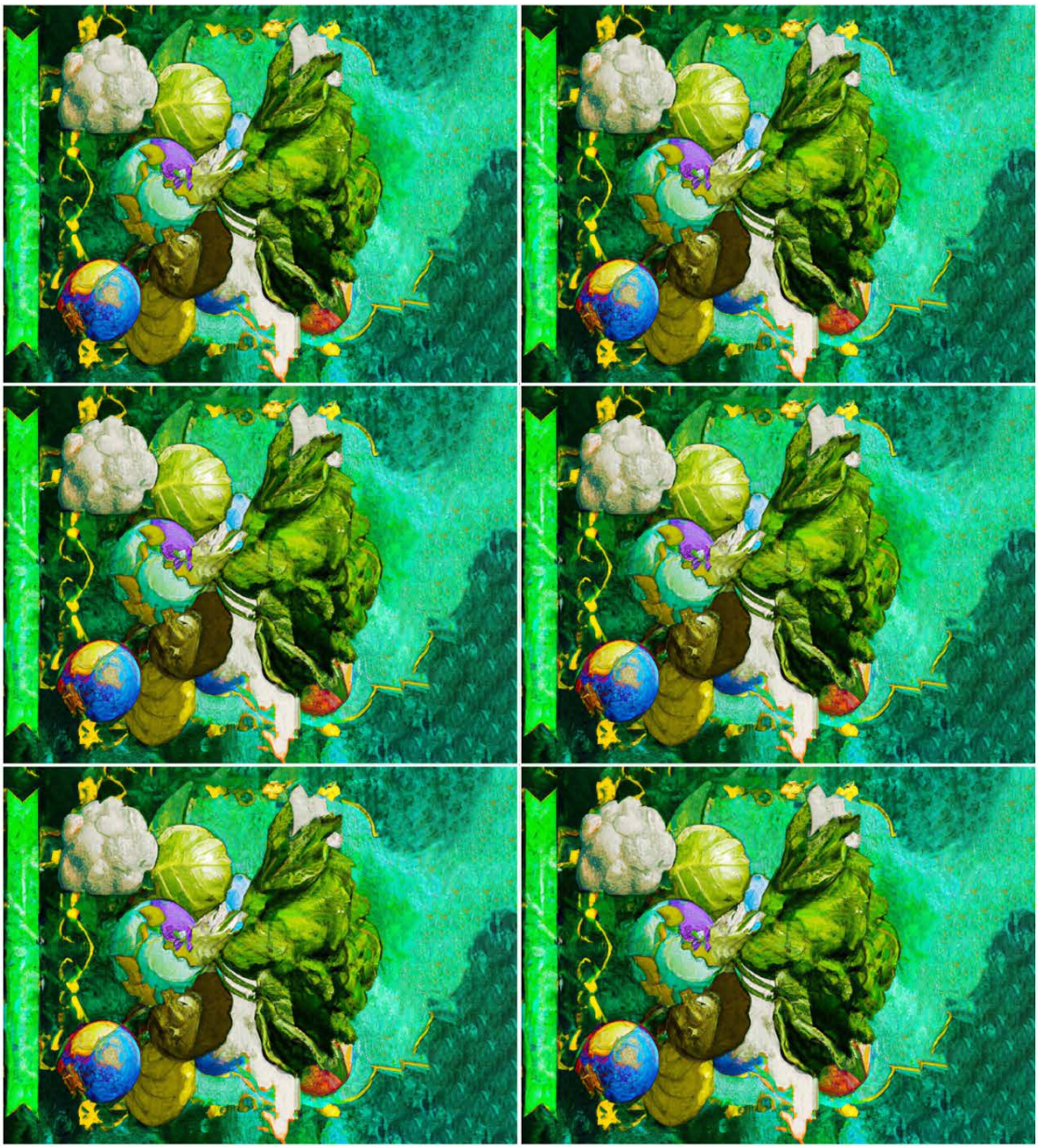
WISCONSIN FASTPLANTS® PROGRAM

Página 4 - Frentes de tarjetas de función



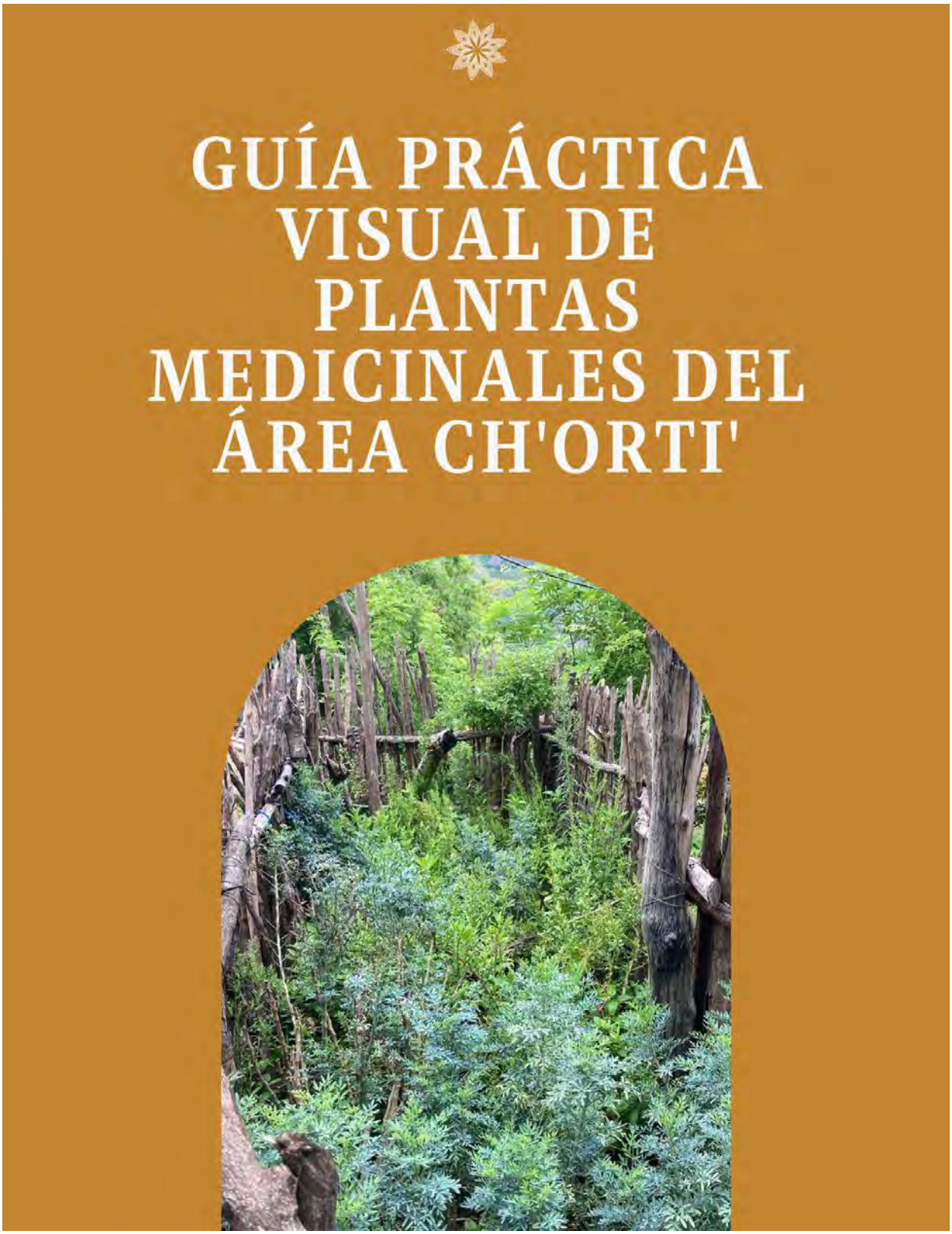
WISCONSIN FAST PLANTS® PROGRAM

Página 5 - Dorsos de tarjetas de función



Traducida por Meg Baker, Universidad de Wisconsin - Madison, marzo 2023

Appendix H. Plant Guide for the Chiquimula Department, Guatemala



INDICE

INTRODUCCIÓN
Una descripción del proyecto

LEYENDA
Símbolos representando los usos y partes de las plantas

PLANTAS MEDICINALES
- Apazote
- Llantén
- Ruda
- Sábila
- Tres puntas

MODELO - EJEMPLO
Una plantilla explicando el formato y contenido recomendado para agregar más plantas medicinales a esta guía.

MODELO - PARA LLENAR
Una plantilla vacía para agregar más plantas medicinales a esta guía.

NOMBRES DE PLANTAS MEDICINALES - CH'ORTI'
Nombres de unas plantas medicinales con su nombre en Ch'orti'

REFERENCIAS

- Bernardino Diaz Diaz. (2022). Nombre de Plantas en Ch'orti'. Comunicación Personal. Academia de Lenguas Mayas Guatemala - Ch'orti'.
- Cáceres, A. (2009). *Vademécum nacional de plantas medicinales / Armando Cáceres*. Editorial Universitaria, Universidad de San Carlos de Guatemala.
- Kufer, J., Förther, H., Pöll, E., & Heinrich, M. (2005). *Historical and modern medicinal plant uses--the example of the Ch'orti' Maya and Ladinos in Eastern Guatemala.* The Journal of pharmacy and pharmacology, 57(9), 1127–1152. https://doi.org/10.1211/jpp.57.9.0008

INTRODUCCIÓN

La idea de esta guía fue desarrollada a través de conversaciones entre la organización Mancomunidad Copanch'orti, miembros de investigación de la Universidad de Wisconsin - Madison, y miembros de las siguientes comunidades: Limón, Camotán; Orégano, Jocotán; La Rinconada, Olopa; La Libertad, Camotán; y Tasharjá Abajo, San Juan Ermita en el Departamento de Chiquimula, Guatemala.

Esta guía es un modelo que captura solo una parte de la rica diversidad de plantas medicinales en Chiquimula. La intención es proporcionar una forma ilustrada y simplificada para que las personas identifiquen las plantas y aprendan sobre los diversos usos medicinales asociados con las plantas. La guía representa algunas de las plantas más utilizadas y de ninguna manera pretende ser exhaustiva. Existen otros estudios que han captado el rico conocimiento ancestral sobre plantas medicinales de personas de Chiquimula.

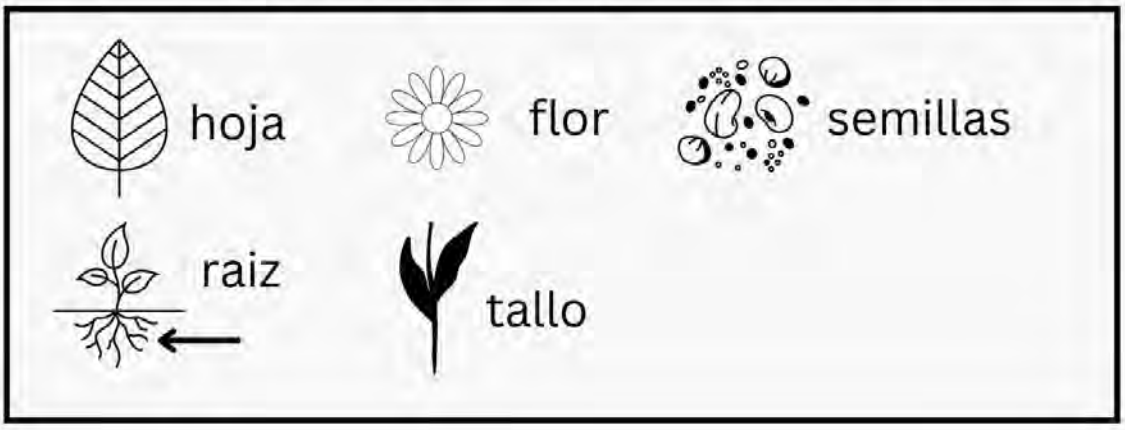
Esta guía puede ser utilizada por maestros, ONG, poseedores de conocimientos para iniciar conversaciones sobre el conocimiento amplio que tienen las personas en esta región de Guatemala sobre el uso de plantas medicinales.

Gracias a
Encarnación Gutiérrez Esquivel
Vicenta Romero de García
José María Gutiérrez
y todas las personas en esas comunidades por sus conocimientos y amor por nuestra Madre Tierra.

La guía fue elaborada por Meg (Maggi) Baker, una estudiante de maestría de Agroecología de la Universidad de Wisconsin - Madison, mayo 2023.

LEYENDA

Partes de las plantas que se pueden usar



Modos de preparación


NOMBRE DEL PLANTA EN ESPAÑOL / NOMBRE EN CH'ORTI' - EJEMPLO
Nombre científico: Busquélo por internet o pregunte a (Meg) Maggi Baker si tiene interés
EJEMPLO
Dibuje planta aquí.
¿Cuáles partes de la planta usas? Trace un círculo alrededor de las que apliquen or dibuje otra parte de la planta.
hoja
flor
semillas
raiz
tallo
¿Cómo la prepara? Trace un círculo alrededor de las que apliquen or dibuje otra manera de preparar la planta.
té
licuado
comida
bálsamo
tintura

NOMBRE DEL PLANTA EN ESPAÑOL / NOMBRE EN CH'ORTI' - **EJEMPLO**

Nombre científico: Búsquelo por internet o pregunte a Meg (Maggi) Baker si tiene interés

Propiedades medicinales: agregue las propiedades que conoce

Preparación y usos: Llene la tabla con información sobre la planta medicinal

¿Qué parte de la planta usa?	¿Cómo la prepara?	¿Qué cura o alivia?

/

Nombre cientifico:

¿Cuáles partes de la planta usas? Trace un círculo alrededor de las que apliquen or dibuje otra parte de la planta.

¿Cómo la prepara? Trace un círculo alrededor de las que apliquen or dibuje otra manera de preparar la planta.

/

Nombre científico:

Propiedades medicinales:

Preparación y usos:

¿Qué parte de la planta usa?	¿Cómo la prepara?	¿Qué cura o alivia?

NOMBRES DE PLANTAS - CH'ORTI'

Español	Ch'orti'
1. albahaca	1. alwajaka
2. apazote	2. pasujt
3. ayote	3. ch'um
4. bledo	4. mux k'uruy
5. café	5. kajwe
6. chacté	6. ch'aj te'
7. flor de muerto	7. sampwer
8. fluxión	8. julusyon
9. hierba del toro	9. k'opot wakax
10. hierba mora	10. majk'uy
11. incienso blanco	11. saksak ujtz'ub'
12. limón	12. pajpaj
13. madre cacao	13. k'an te'
14. maíz	14. ixim
15. plátano	15. ja's
16. ruda	16. tuj tuj ixik
17. tres puntas	17. ch'aj k'opot
18. yuca	18. tz'inte'

14. 18. 7. 12. 5. 9. 13.


WISCONSIN
UNIVERSITY OF WISCONSIN-MADISON