

COMMUNITY RESILIENCE: DIVERSE ECONOMIES, COMMUNITY SUPPORTED AGRICULTURE, AND RESOURCE SHARING ON THE OSA PENINSULA

SCHOOL FOR ENVIRONMENT AND SUSTAINABILITY
UNIVERSITY OF MICHIGAN

Community Resilience: Diverse economies, community supported agriculture, and resource sharing on the Osa Peninsula

UM SEAS Master's Project

Project Team	Amanda Arendt
	Fynn Haney
	Shreya Mishra
	Laurel Petrides
	Samantha Wheelis
	Jenny Zhang
Project Faculty Advisor	Nathaniel Geiger
Project Client	The ReGenerOsa Collective

Master's Project submitted in partial fulfillment of the
requirements for the degree of Master of Science in
Environment & Sustainability

University of Michigan
School for Environment and Sustainability

Spring 2026

Acknowledgements

We are incredibly grateful to everyone who supported this project and helped make our time on the Osa Peninsula productive and meaningful. First, we thank our partners at The ReGenerOsa Collective, Tara Ruttenberg, Tricia Stapleton, and Iris Nekeman, for their guidance, trust, and providing us with tools and transportation needed to complete our research. We also extend sincere appreciation to our academic advisor, Nathaniel Geiger, for thoughtful feedback, consistent encouragement, and mentorship that strengthened this work at every stage.

We acknowledge the critical contributions of the local communities on the Osa in decolonizing this research, particularly during the participatory activities such as the Portrait of Gifts and Asset Maps. In particular, we would like to thank the communities of Puerto Jiménez, Rancho Quemado, and Matapalo for welcoming us as outsiders and joining hands with us in producing this important community-centered work.

We are thankful to Arturo for his translation expertise and for helping us communicate more clearly and respectfully across languages and contexts in Puerto Jiménez. We also warmly acknowledge Rob, Amalia, and Tom, whose generosity and care made our stay at the study site welcoming, comfortable, and fueled with delicious local food.

Thank you to Doña Eida and the women artisans at the market for sharing their time, creativity, and perspectives, and to the many market vendors and program volunteers who participated in conversations and surveys and contributed invaluable local knowledge. We also thank the Holi Cena crew for hosting Community Dinner Wednesdays and creating a space for connection and community.

Finally, we are grateful to the Los Higuerones Cooperativa for hosting us and providing a home base for learning, relationship-building, and fieldwork.

Positionality Statement

We are a team of six U.S.-based research students affiliated with the University of Michigan who conducted surveys, semi-structured interviews, participant observation, participatory action research, and geospatial mapping with human participants in Osa Peninsula, Costa Rica, in the month of June 2025. As short-term visitors from the United States, we recognize we were outsiders to local histories, cultures, and norms. Our U.S. nationality, institutional affiliation, and ability to leave the field site created structural power imbalances that may have shaped access, rapport, and what participants felt comfortable sharing.

Our team includes members with differing identities and levels of Spanish proficiency, which influenced how questions were asked and how responses were interpreted. We addressed this through reflexive practices (discussion of assumptions and biases, role-rotation, and regular debriefs) and by piloting and revising instruments in Spanish with input from ReGenerOsa and Los Higuerones. We also worked to participate respectfully in local cultural practices and social dynamics and to build conversational Spanish proficiency.

We prioritized ethical engagement and data protection. We obtained relevant approvals and permissions (PEERRS Certification and IRB approval), used informed consent and the right to skip questions, and ensured confidentiality through de-identification and secure data storage.

We have shared findings back in accessible formats (e.g., Spanish versions and non-technical presentations). Our results should be interpreted in light of these positionalities and limitations.

Table of Contents

Acknowledgements....3
Positionality Statement....3
Table of Contents....5
Executive Summary....7
PART I: INTRODUCTION....9
Context & Site Description....10
Literature Review....12
Conceptual Framework....22
Methodological Approach....25
- Surveys....25
- Interviews....25
- Participatory Action Research....26
- Portrait of Gifts....26
- Asset Mapping....26
- Geographic Information Systems Mapping....27
- Participant Observation....27
- Researcher Reflexivity....27

PART II: LOS HIGUERONES SOCIAL IMPACT ASSESSMENT....29
Introduction....30
Surveys....31
- Methodology....31
- Conclusions....37
- Limitations....37

Interviews....38
- Methodology....38
- Results & Conclusions....40
- Limitations....45

Overall Results & Conclusions....46
Recommendations for Future Work....49
PART III: ASSET MAPPING ACROSS THE OSA PENINSULA....51
Introduction....52
Asset Maps & Portrait of Gifts....53
- Methodology....53
- Site I: Los Higuerones in Puerto Jiménez....54
- Site II: Matapalo....55
- Site III: Rancho Quemado....56

Results & Conclusions..... 57
Geographic Information Systems Mapping..... 61
Methodology..... 61
Results & Conclusions..... 61
Limitations..... 62
Discussion..... 66
Narrative Map..... 68
Methodology..... 68
Results & Conclusions..... 68
Recommendations for Future Work..... 70
PART IV: CONCLUSION..... 71
Overarching Conclusions & Reflections..... 72
PART V: APPENDICES..... 75
Appendix A: Surveys..... 75
Survey Questions..... 76
Appendix B: Interviews..... 89
Interview Guide..... 89
Codebook..... 96
Appendix C: Portrait of Gifts Process..... 105
Appendix D: Asset Maps (Spanish Versions)..... 111
Site I: Los Higuerones..... 111
Site II: Matapalo..... 111
Site III: Rancho Quemado..... 112
Appendix E: Asset Maps (Original Paper Versions)..... 113
Site I: Los Higuerones..... 113
Site II: Matapalo..... 114
Site III: Rancho Quemado..... 115
Appendix F: Geographic Information Systems Process..... 116
PART VI: REFERENCES..... 118

Executive Summary

This report presents findings from a mixed-methods, participatory research project conducted on the Osa Peninsula, Costa Rica. In partnership with the Los Higuerones Cooperativa and other collaborators in the ReGenerOsa network, we examined how rural communities harness local assets to build resilience amid the long-term pressures of extractive development, ecological change, and uneven economic opportunity due to globalization. Using a postdevelopment lens and multi-capital frameworks (including the Eight Capitals Framework and a diverse economies approach), we documented forms of value and exchange (e.g. social, cultural, experiential, living capital) that are often underrecognized in conventional, market-centered accounts of "development," yet are central to community wellbeing on the Osa.

To explore these questions, we used surveys, semi-structured interviews, participant observation, participatory asset mapping, and geographic information systems (GIS). We administered Spanish and English Qualtrics surveys at recurring Los Higuerones events: Mercado Verde (Saturday farmers/artisans market) and the Holi Cena (Wednesday night community dinner), collecting responses across four iterations of each event. We also conducted and transcribed eight semi-structured interviews with participants in Mercado Verde and Manos Cambiadas (a community labor-exchange volunteer program), and analyzed transcripts in Dedoose using codings schemes based on (1) socio-ecological indicators and (2) the Eight Capitals. To broaden the analysis beyond Puerto Jiménez, we facilitated participatory asset mapping and "Portrait of Gifts" activities in Puerto Jiménez, Matapalo, and Rancho Quemado, then integrated community-identified assets with GPS point collection and GIS mapping to visualize sustainability-related initiatives and their geographic distribution.

Across surveys, interviews, and participant observation, the most consistent finding is that Los Higuerones functions as a significant social infrastructure for Puerto Jiménez: participants repeatedly described benefits related to friendship, collaboration, belonging, and "family-like" connection. Interview coding further supported this pattern: living capital (especially food and other life-sustaining resources) and social capital emerged as the most prominent value flows in narratives about Mercado Verde and Manos Cambiadas. Mercado Verde was widely valued as a place to socialize, support local livelihoods, and access fresher food, while Manos Cambiadas was described as reducing labor burdens for hosts, strengthening reciprocity, and enabling knowledge exchange. Participants also reported regenerative and sustainability-oriented practices (e.g., composting, organic fertilizers, intercropping, permaculture), while acknowledging that partial agrochemical use persists for some producers due to pest/animal pressures and yield risk.

At the same time, our findings indicate important participation gaps. In both Mercado Verde and Holi Cena survey samples, many respondents were foreign visitors or foreign residents, and local/Indigenous perspectives were underrepresented. It is possible that perceptions of accessibility and impact may disproportionately reflect the experiences of non-local attendees rather than the broader Puerto Jiménez community. Structural constraints also appeared repeatedly across the dataset: limited transportation and connectivity shape participation frequency, access to markets, and farmers' ability to distribute products beyond immediate areas.

Finally, asset mapping and GIS results suggest that community recognition of sustainability initiatives varies by place. Rancho Quemado participants identified the greatest concentration of sustainability-related assets, Matapalo identified a moderate number, and Puerto Jiménez identified the least, likely reflecting

differences in population size, community composition, and prior exposure to conservation research. Integrating participatory mapping with GIS strengthened interpretation by distinguishing what is locally salient from what is simply present on the landscape. Recommendations are provided to address these gaps. Conceptual asset maps, beyond sustainability organizations, further highlighted the diverse economies present across the Osa Peninsula.

Overall, this research reaffirms Los Higuerones as a community center within a broader, rich network of organizations that enhance the Osa Peninsula. The social impact assessment suggests that Los Higuerones' greatest measurable contribution is its role as a community connector that supports food sovereignty and social cohesion among other livelihood and ecological benefits. However, to claim broader community impact with confidence, particularly for long-term local and Indigenous residents, future work should prioritize expanded engagement strategies, and longer-term evaluation that better reflects the full diversity of experiences on the Osa Peninsula. The wide array of experiences are further reflected in the peninsula-wide asset mapping, which recognized a diverse economic reality among communities. To further draw out and assemble a useful record of diverse assets, future work should involve more comprehensive and in-depth engagement with community members to build on our foundational research.

Part I: Introduction



Context & Site Description

Costa Rica's diverse economies and cultures mirror its "highly unique combination of habitats and environmental setups" (Huettmann, 2015, p. 15). One of the most pristine and biodiverse areas of the country is the Osa Peninsula, to which 2.5% of the world's biodiversity belongs (Gutierrez et al., 2019; Hinton & Peters, 2021). The lives and landscapes in Costa Rica, and specifically the Osa, have been historically transformed by extractive practices such as deforestation and development (Hunt et al., 2013; Hunt et al., 2015; Galt, 2009; Huettmann, 2015; McMichael & Weber, 2020). These destructive practices are driven by capitalistic ideals of progress and economic stimulation, and have had numerous impacts on how ecological and human systems function within the region, such as the exhaustion of rural environments from agriculture and tourism-based development, and the subsequent social and economic implications of these endeavors (Hunt et al., 2013; Hunt et al., 2015; Galt, 2009; Huettmann, 2015; McMichael & Weber, 2020). While rural areas in the Osa have faced hardship from economic decisions led by the government, the pressures of a global economy, and the demands of a dominant capitalocentric hegemony, this region remains resilient in its social, cultural, and experiential capitals (Huettmann, 2015; Hunt et al., 2013; Hunt et al., 2015; McMichael & Weber, 2020).

This study examines how people in the Osa Peninsula harness community assets to create resilience in one of the most rural areas of Costa Rica. We examine economic, social, and cultural dynamics that are centered around regenerative agriculture and community. We also explore the intersection of these activities as a prospect for future sustainable endeavors. To understand how the unique economic and environmental conditions of the Osa inform its communities, we consider factors such as connectivity, local knowledge, sense-of-place, and information sharing. These communities possess diverse assets that span different types of capital which have characterized the diverse economies in the Osa, but often remain unrecognized in the traditional capitalistic world (Roland & Landau, 2013; Gibson-Graham, 2005; Coulson et al., 2015). Our goal is to identify these diverse assets and provide recommendations as a guide that assists the people of these communities in harnessing local agency and pursuing avenues for sustainable practices, and in strengthening community resilience in a post-development world.

In this project, we conducted an exploratory study, focusing on the rural communities of the Osa Peninsula in Costa Rica. The communities explored consist of Rancho Quemado, Matapalo, and Puerto Jiménez. These communities are heavily centered around a tourism-based economy and regenerative agriculture, and also possess strong social bonds that create community resilience (Hunt et al, 2013; Hunt et al., 2015). We employ several conceptual frames to analyze our fieldwork through a postdevelopment lens, identifying the types of resources, worldviews, and necessities that characterize and strengthen local Osa communities. The purpose of this literature review will be to identify existing knowledge and theory, define the conceptual framework used for this study, identify methods, and denote gaps.

Regenerative agriculture, local food, sustainability, social connection, and culture are assets that are highly valued in the Osa (Hunt et al., 2013). This study contends that community-based assets are integral to not only the identity of the communities within the Osa, but are often exchanged and shared through non-traditional forms of capital that surpass traditional exchanges of money (Gibson-Graham, 2005). These are experiential, intellectual, social, living, spiritual, material, and cultural capitals that have been underrecognized

for their role in the diverse economy of the Osa (Roland & Landau, 2013). We find that there is a large foreign resident population in the Osa's communities, and that this non-native population contributes substantially to local community initiatives such as those held at Los Higuerones in Puerto Jiménez. Additionally, many respondents for this study were non-native residents or visitors to the Osa. This should be considered when interpreting results, and may allude to important patterns surrounding local versus non-local values, participation, and perceptions of the community. While the communities who participated in our study are rich in social, cultural, and experiential assets, we observe that financial need is apparent in these rural areas, as well as greater connectivity between communities to support information and asset exchange.

In the next section, the ways in which the era of development has informed the current economic system in Costa Rica are briefly broken down and explored in terms of agriculture and tourism activities in the Osa, as these two sectors are vital to the region's economic wellbeing (Hunt et al., 2015; OECD, 2025; Country Report, 2019; Howler Magazine, 2023). Development and its inherent capitalistic characteristics are identified, such as the tendency to exploit local and native communities and their resources in favor of progress whilst often neglecting the desires and needs of these communities (Huettmann, 2015; McMichael & Weber, 2020; Hunt et al., 2013; Hunt et al., 2015; Escobar, 1992; Escobar, 1995).

Literature Review

Costa Rica's national economy is characterized by a dominant services sector which contributes to 70% of the country's gross domestic product (GDP) and includes tourism, as well as information technologies, finance, and customer support; advanced manufacturing, such as medical devices and electronics; and traditional export agriculture (Hunt et al., 2015; OECD, 2025; Country Report, 2019; Howler Magazine, 2023). Other major sectors include renewable energy, food processing, and textile production (Hunt et al., 2015; OECD, 2025; Country Report, 2019; Howler Magazine, 2023). Within this national economy, the Osa Peninsula maintains a distinct economic profile; it is dominated by ecotourism, which yields nearly double the income of other local activities (Hunt et al., 2015). Other activities in the Osa include African oil palm cultivation, artisanal gold mining, and an expanding eco-luxury real estate market (Hunt et al., 2015; Stanford Woods Institute, 2013). Especially within the ecotourism industry in the Osa, income generation is heavily reliant on the management and conservation of the environment (Hunt et al., 2015). While the country needs to support the natural environment to ensure economic productivity, conservation and development goals often clash under the backdrop of capitalism, a system which encourages income generation and economic productivity, often at the expense of other assets such as the environment and culture.

The world's history of colonialism, capitalism, and development has shaped how Costa Rica's economies appear and function in the modern day. Scholars note that agricultural development, in particular, has been characterized by widespread deforestation, soil degradation, and intensive pesticide use, which paradoxically sustain the export market while degrading the landscapes that are needed to ensure its productivity (Galt, 2009; Huettmann, 2015; McMichael & Weber, 2020). By shifting development and production to rural frontiers like the Osa Peninsula, a capitalist system may temporarily bypass the consequences of environmental exhaustion elsewhere. This cycle is an example of what geographer David Harvey (2003) refers to as a spatial fix, which occurs when production moves to new locations to 'resolve' issues such as resource depletion or falling profits. However, this fix only postpones or shrouds the inevitable conflict between market demands and environmental limits (Harvey, 2003). Additionally, disregard for sustainable practices (such as the harvest of sharks and disregard for sea turtle protections) have been documented in Costa Rica, showcasing conflicts between the need for material and financial gain over conservation and sustainability attempts (Huettmann, 2015). Conflicting priorities of conservation versus development and the obstacles they present are the result of the dominant ideologies of capitalism and development (Harvey, 2003; McMichael & Weber, 2020; Huettmann, 2015).

Hegemony is defined here as the dominant ideological framework of a ruling class, specifically the profiteers of the Global North (Bates, 1975; McMichael & Weber, 2020). We define the Global North as actors within Western and European regions that are more 'advanced' within the capitalist system (McMichael & Weber, 2020; Harvey, 2003). The Global South refers to regions perceived as 'less advanced,' largely within South America and Africa (McMichael & Weber, 2020; Harvey, 2003). These actors include both state powers and transnational corporations which assert Western and European ideals of capitalism, extraction, and progress as universal (Bates, 1975). Historically, these hegemonic actors transformed Central American landscapes through colonialism, a system that dominated lands, resources, and communities, where the ideals of the oppressor were imposed on the oppressed, resulting in the erasure or displacement of peoples, cultures, and ways

of life (Harvey, 2003; McMichael & Weber, 2020; Huettmann, 2015). Colonialism has displaced populations, often through violence and exploitation, justified in the name of "civilizational hierarchy" (McMichael & Weber, 2020, p. 72; Escobar, 1992; Harvey, 2003). This asserted "epistemic superiority" created a division between Western and non-Western knowledge, effectively displacing local customs to make way for colonial needs (McMichael & Weber, 2020, p. 72). In the 20th century, this exploitative framework informed the era of development, where the patterns of overt violence and domination of the past have become disguised by the structural pressures of globalization (Escobar, 1992; Escobar, 1995; McMichael & Weber, 2020; Harvey, 2003). Today, these same power dynamics inform the economic, social, and cultural landscapes of the Osa Peninsula, where the pressures of global markets dictate the functioning of the region's agricultural export and tourism economies at the expense of local autonomy (McMichael & Weber, 2020).

Modern development has further cemented the divisions between the Global North and Global South by deploying "civilizing missions" as necessary interventions for progress (McMichael & Weber, p. 72; Escobar, 1995; Huettmann, 2015). These interventions, often taking the form of large-scale land acquisition for tourism, the industrialization of agricultural production, and the imposition of foreign business codes, are frequently justified by a persistent hegemonic belief that Global South nations, like Costa Rica, lack the inherent skill to manage their own environments or economies (Huettmann, 2015). Consequently, the Global North's influence often forces the growth of unsustainable economies that neglect local socioeconomic values. In the Osa, for instance, traditional lifestyles, characterized by subsistence fishing, small-scale farming, and communal land use, have been "heavily interrupted" by these developmental pressures (Huettmann, 2015, p. 50). This disruption is both cultural and economic. As Huettmann (2015, p. 8) asserts, some argue the Global North is "basically stealing wealth from the South," creating an environmental and economic setting that makes it increasingly difficult for local communities to support their own autonomous development. This dynamic ensures that, while the methods of interaction have shifted from colonialism to development, the underlying exploitative epistemology of development remains largely unchanged.

In the modern world, the issues of exploitation that a development creates are becoming increasingly evident. In an attempt to continue to pursue development and chase endless economic growth, the sustainable development paradigm becomes an obvious "solution" (Ogryzek, 2022, p. 6). Furthermore, as society becomes more aware of human-environment interactions, sustainable development is presented as an avenue for "the most desirable socio-economic development" (Ogryzek, 2022, p. 6). Economic geographers and post-development scholars J.K. Gibson-Graham (2005) contends that the discourse of *sustainable development* often enforces capitalocentric perspectives and behaviors. Capitalocentrism is defined not only as the dominance of capitalism in global society, but as the tendency to "situate all economic activities in relation to capitalism" and to represent the Global South's communities as "repressed by, or lack[ing] the same systemic logic as capitalism" (Gibson-Graham, 2005, p. 56). By framing economic life this way, alternative frameworks that prioritize societal well-being, culture, and local livelihoods are rendered invisible or secondary. Scholars assert that, under the guise of alleviating poverty, international development actors, such as the World Bank, have worked to cement capitalism as savior, thereby perpetuating the extraction and displacement that characterize it (McMichael & Weber, 2021). Furthermore, these institutions emphasize export-led growth, which often serves to validate capitalist expansion over local needs (McMichael & Weber, 2021). From this perspective, capitalism constitutes what some researchers describe as "entirely inappropriate foundations" for conservation that marginalize ethical and non-market perspectives in favor of profit-driven outcomes (Huettmann, 2015, p. 125).

Ultimately, this capitalocentric framing suggests that the Osa's ecological value is only recognizable when translated into market commodities, a logic that fundamentally undermines the cultural and environmental systems it claims to protect.

In light of this seemingly inescapable capitalist system, ecotourism is an industry which has been positioned as a promising economic alternative away from more intrusive and exploitative forms of tourism, denouncing the exploitative nature of development (Hunt et al., 2013; Hunt et al., 2015; Huettmann, 2015). However, a majority of financial capital accumulated within this sector remains within a small elite group or is channeled outside the country instead of supporting local communities and economies (Huettmann, 2015). Additionally, because of Costa Rica's reliance on external income from the Global North, the tourism sector has transformed the Costa Rican environment in favor of external actors rather than local residents (Huettmann, 2015). Because of this, there is an emergent call to employ decolonial perspectives in the study and practice of ecotourism to redirect economic benefits toward local communities. For example, the emergence of Sustainable Surf Tourism (SST) against conventional surf tourism represents an evolution away from extractive economic practices toward more conscious, decolonial, postdevelopment practices (Ruttenberg, 2022).

Sustainable Surf Tourism embraces community-based interventions and harnesses its potential to contribute to environmental conservation and socio-economic development. It is characterized by a framework that empowers locals, expands cross-cultural knowledge between foreign residents, tourists, and locals, and encourages sustainable income generation (Ruttenberg, 2022). The postdevelopment framework that Ruttenberg (2022) employs in her studies describes a worldview beyond traditional capitalist epistemology, one that acknowledges the historical power imbalance between the Global North and South and seeks to denounce the hegemony of capitalism and promote local traditional knowledge (Ruttenberg 2022: Gibson-Graham, 2005; Escobar, 1995; Escobar & Harcourt, 2018; Kothari et al., 2019; Castree, 2009). Such modes of postdevelopment thinking are emerging elsewhere in the Global South and, furthermore, could be integrated to other ecotourism activities and potentially applied to the agricultural sector in the Osa. By employing a postdevelopment framework throughout this project, we highlight the importance of understanding the Osa's geopolitical context regarding socio-economic development. We also focus on the importance of local knowledge, sense of place, community, and interconnectedness that normative sustainable development frameworks neglect (Ruttenberg, 2022; Hunt et al., 2013; Escobar, 1995).

Agriculture & Economy

To gain a more complete understanding of the agricultural setup of the study area, we outline the context of agricultural development in the Osa Peninsula. Costa Rica's agricultural practices have faced vast transformations due to the formation of a globalized economy. The historical shaping of agricultural systems as a result of development, globalization, and the Green Revolution, are evident in the Osa Peninsula, whose economy is reliant on food production. For centuries, Central American food systems were defined by the milpa system—a form of sustainable agriculture centered around bean, corn, and squash production (Huettmann, 2015). However, this system of agriculture was disrupted by the Green Revolution, a product of development which interrupted diets and culture by reducing it to specialized export monocultures, through novel plant-breeding technologies and chemical agriculture (Huetmann, 2015; McMichael & Weber, 2020). Agricultural practices such as monocropping and pesticide use became a key feature of the agroeconomic shift

that took place and allowed for economic globalization. The Green Revolution caused bean and corn production to soar, as well as international exports of these crops out of Latin America (McMichael & Weber, 2021).

The Green Revolution created the mass production of food crops but, as urban development progressed, also led to what scholars term "urban bias" (McMichael & Weber, 2021, p. 131). Urban bias refers to the prioritizing of urban interests, such as needs for food, aid, employment, and education needs, above those of rural populations, largely on the basis that urban areas possessed higher populations, and therefore higher levels of need (McMichael & Weber, 2021, p. 131). Scholars discuss how urban bias channeled the Global South's societies away from peasantry—away from traditional agricultural epistemologies and the agency of food sovereignty. This cultural disruption of rural peasant populations, especially in Latin America and the Global South, eventually led to mass land reforms aimed at alleviating rural poverty and initiating "re-peasantization" (McMichael & Weber, 2021, p. 131). Such land reforms also occurred within the Osa Peninsula (Hunt et al., 2013; Hunt et al., 2015). However, academics argue that land reforms simply "relocated" rural poverty, as international profit-driven commercial cropping overshadowed small-scale peasant farmers and eventually led to the incorporation of small-scale farms into such projects (McMichael & Weber, 2021, p. 131).

The Green Revolution only furthered the development era's "idealized prescriptions" of productivity, "despite known social and ecological consequences" (McMichael & Weber, 2021, p. 128). Transnational companies such as Dole, Chiquita, and the United Fruit Company held substantial commercial power and political influence in Central American countries like Costa Rica (Huettmann, 2015). Plantations for pineapple and banana were found to be extremely profitable within the competitive global market. The Costa Rican economy became strongly tied to banana crops and pineapple, but such dependence on these crops resulted in great environmental and social damage (Huettmann, 2015). This is another example of Harvey's spatial fix (2003): the ecologically and socially degrading activities of development are paradoxically necessary to compete in the capitalist global market. For example, although the environmental and health concerns related to pesticide use are widely known, many farmers consider Highly Hazardous Pesticides necessary to maintain competitiveness and quality and, while they degrade soil and harm wildlife, are also increasing in use (Galt, 2009; Huettmann, 2015).

Because development strategies demand endless economic expansion under the hegemony of capitalism, when production wavers, stakeholders which previously took full advantage of the land will leave the region desolate in pursuit of more rewarding endeavors (Harvey, 2003). Most notably, agricultural development in the Osa was especially influenced by the United Fruit Company (UFC) in the mid-1900s, through banana exports and oil palm cultivation (Hunt et al., 2013). Based in Golfito, the UFC also operated within Puerto Jiménez and Cortes. Economic opportunity attracted migrants from nearby countries and other areas of Costa Rica, until 1985, when the company suddenly left the region, damaging the local economy, and continuing the cycle of exploitation (Hunt et al., 2013; Hunt et al., 2015). Academics voice that the UFC's interference in the area set the precedent for "top-down, heavy-handed" management that still influences the region, exhibiting that while the direct presence of corporations may have decreased in the peninsula, their hegemonic influence still works to inform economic, cultural, and social activity in the region under a developmentalist lens (Hunt et al., 2015, p. 219).

Along with the UFC's undeniable impact on the region, several other actors also contributed to the shaping of the Osa's environment, economy, and social setting. In the 1950's, the Osa Productos Forestales (OPF) company purchased a mass of land on the peninsula in an effort to create a sustainable forestry industry, aiming to achieve maximum economic return (Hunt et al., 2013). The OPF transformed the land through the construction of infrastructure such as roads and bridges to accelerate development in the region. Such activity was much against the will of local communities, which led to violent conflict in response (Hunt et al., 2013; Hunt et al., 2015). After much resistance, the OPF's lands were appropriated into today's conservation reserves such as the Corcovado National Park and the Golfo Dulce Forest Reserve. This, however, failed to improve relations with local populations, as the land preservation resulted in the displacement of 300 residents, and conflict persisted (Hunt et al., 2013; Hunt et al., 2015).

In an attempt to revive the agricultural economy in the 1980's, the Agrarian Development Institute (IDA) facilitated a national program which granted land for agricultural production to farmers (many of whom were former gold miners) (Hunt et al., 2015). This land required long-term payments over 15 years to establish ownership; however, farms needed to be productive in order for farmers to claim tenure, and the lots that were granted were not only small in size, but also possessed unsuitable soil for agricultural activities (Hunt et al., 2015). Fertilizer was vital in order to maintain production, but farmers were often unable to afford this necessity; as a result, many farmers ultimately chose to sell the land rather than risk low yields (Hunt et al., 2015). Intervention from the IDA, centered around agricultural production rather than agricultural communities, did not serve as a solution to the economic slump, but rather exacerbated the issue by undermining local communities.

Other factors that have impacted the Osa's economic activity include the National Production Council's (CNP) attempt to subsidize crops such as rice and beans, which encouraged agricultural production, and Ston Forestal, a paper and cardboard company (Hunt et al., 2015). Once CNP discontinued crop subsidies, crops became decommercialized, and, in tandem with external cattle production regulations from the U.S., rice, bean, and beef production in the Osa fell dramatically, and Costa Rica was forced to become a net importer of both rice and beef (Hunt et al., 2015). Ston Forestal in particular received backlash from the Costa Rican Ecologist Association (AECO) which resulted in Ston Forestal's restriction from building a marine port and wood chipping facility on account of environmental and social harms. However, such restrictions limited economic opportunity, and once again placed locals in a state of vulnerability without a means to earn income (Hunt et al., 2015).

These events highlight the contradictions of development, and how notions of productivity and growth have been imposed upon communities of the Osa in order to drive a larger, global economic engine while exhausting the people and places that run it, making the system fundamentally unsustainable (Harvey, 2005). In fact, participants in Hunt et al.'s (2013) study cited regional agriculture as *very* economically unsustainable, alongside mining, commerce, and fishing. This is unsurprising, partially due to the heavy use of pesticides in the agricultural sectors, which has been connected to human health issues and is detrimental to local environments and wildlife (Galt, 2009). Pesticide-related illnesses have been linked to food contamination, worker exposure, and pesticide drift affecting nearby populations; and while regulations exist regarding pesticide use, many farmers are unable to adopt food safety practices due to their cost (Galt, 2009). Additionally, deforestation in favor of agricultural activities has severely impacted the Osa region (Hunt et al., 2015). Much of the

deforestation is a result of palm oil cultivation which, as an incredibly reliable crop, has become very attractive to farmers, thus shifting Osa's production away from food crops (Hunt et al., 2015).

Additionally, the economic and environmental fragility cultivated as a result of the shift away from local food crops and into the industrial global supply chain became overt during the COVID-19 pandemic. Without tourists, local farmers struggled to make an income, and without reliable shipments, residents struggled to access fresh food (Ruttenberg, 2025). The loss of a vital source of income highlighted the importance of food sovereignty, which refers to the right of a community to access healthy, sustainably produced, culturally-relevant foods produced within their own local agroecological system (Carlile et al., 2021). Regenerative farming practices are already beginning to replace monocultural industrial practices on the Osa Peninsula, marking a significant step towards food sovereignty for these communities (Ruttenberg, 2025). Regenerative agriculture and food sovereignty embody the principles of postdevelopment, in that they shift away from food production as a means to fuel the global economy and generate income, and instead envision it as a mode to serve the communities that uphold that system and enhance their well-being.

Regenerative agricultural practices in Costa Rica and the Osa have increased in response to the harmful effects of development and the extractive presence of corporations. These practices are based in maintaining a socio-ecological metabolism, where nutrients taken from the land are replenished in a sustainable cycle (Duncan et al., 2020). While regenerative agriculture had once been the traditional mode of production in the Global South and regions like the Osa, these practices were degraded and distorted by the mechanisms of capitalism, colonialism and development (Duncan et al., 2020; Huetmann, 2015; McMichael & Weber, 2020). One instance of regenerative agriculture in the Osa Peninsula is seed-sharing, which creates localized relations through seed networks, establishing alternative, oppositional, and sometimes entirely new agricultural socialities (Duncan et al., 2020). Scholars relate that, "in order to mend the rift created and constituted by the conventional farming practice of the Green Revolution... it is essential to consider the sovereignty of farmers in respect of seeds." (Duncan et al., 2020, p. 432). Seed sharing enhances the social connectivity and food sovereignty of communities while also engaging in a mode of re-peasantization that dethrones the capitalistic emphasis on income generation. In this study, we observe seed sharing as well as a number of other regenerative practices, such as circular farming, crop rotation, biofertilizer use, and production of priority food crops, which underscore the importance of postdevelopment agricultural strategies in promoting community resilience in the region.

Ecotourism & Economy

To match the shift toward regenerative agriculture in the Osa Peninsula, there has duly been a shift in attention toward ecotourism, which has emerged as the most dominant sector of the tourism industry (Hunt et al., 2013; Hunt et al., 2015; Huettmann, 2015). Ecotourism can be characterized by small-scale, nature-based tourism that enhances and sustains the local environment and the welfare of local people; (Honey, 2008; Hunt et al., 2015; TIES, 2015). The International Ecotourism Society outlines the principles of ecotourism, emphasizing "direct financial benefit" for communities as well as for conservation efforts, and for attention to be given to culture and political, social, and environmental climates (TIES, 2015). Honey (2008) highlights the postdevelopmentalist values and fountain of benefits from ecotourism:

> Around the world, ecotourism has been hailed as a panacea: a way to fund conservation and scientific research, protect fragile and pristine ecosystems, benefit rural communities, promote development in poor countries, enhance ecological and cultural sensitivity, instill environmental awareness and a social conscience in the travel industry, satisfy and educate the discriminating tourist, and, some claim, build world peace. (p. 4)

Ecotourism arose in the 1980s, and has been viewed as a means of inspiring connection and appreciation toward the environment, while also supporting local economies through employment (Honey, 2008; Huettmann, 2015; Hunt et al., 2015). Along with providing an ethical source of enjoyment for tourists and economic stimulus, ecotourism is intended to enhance the local environment and community wellbeing (Honey, 2008; Hunt et al., 2013). In Hunt et al.,'s (2013) study, participants cited the tourism industry in the Osa as both highly environmentally sustainable and economically sustainable. However, arguments have been asserted against ecotourism, claiming that it disturbs habitats and wildlife through urban development, increased human presence, and reproducing or exacerbating inequalities by following a neoliberal agenda (Hunt et al., 2015). Tourism development projects in Costa Rica have also been accused of favoring conservation, while neglecting the needs of communities (Hunt et al., 2015; Hunt et al., 2013). Despite these claims, research supports that ecotourism still offers employment opportunities for local residents, and has proven to increase quality of life (Honey, 2008; Huettmann et al., 2015; Hunt et al., 2013; Hunt et al., 2015). Ecotourism within the Osa has recently shifted toward increased local participation through employment, which has enhanced community prosperity as well as connectivity (Hunt et al., 2015; Hunt et al., 2013). Honey (2008) claims that, when practiced with the utmost care, ecotourism can transform the way the tourism industry functions and grows.

The ecotourism industry in the Osa plays a vital role in supporting local economies through income generation, knowledge access, economic opportunities and other benefits, as well as drawing international attention toward the region's conservation efforts (Hunt et al., 2015; Huettmann, 2015). Ecotourism primarily employs local people who seek an economic advantage from working in the industry and, importantly, local ownership of ecotourism businesses is growing in proportion to foreign ownership, showcasing the possibilities for local economic opportunities, growth, and advancements (Hunt et al., 2015). Alongside economic advantages, employees in this industry have cited gaining skills in English, as well as acquiring information on local development projects (Hunt et al., 2015).

However, local ecotourism businesses and livelihoods are threatened by government-driven expansion and development of large-scale conventional tourism facilities (Hunt et al., 2015). The government's vision for other large scale projects, such as the construction of an airport and development of the Diquis hydroelectric dam, threaten conservation efforts in the region and the viability of small-scale businesses (Hunt et al., 2015). Thus far, the airport project has only been proposed and resisted; officials are now trying to construct the airport in Sierpe rather than Palma Sur due to local resistance efforts (Tico Times, 2026). Having a greater awareness of

such projects allows for individual assessment of development projects and their possible negative impacts on the environment and local communities (Hunt et al., 2015).

There has been scholarly debate about whether ecotourism negatively impacts the environment. Human interference with wildlife and their habitats can incite ecological, biological and behavioral changes (Lopez Gutierrez et al., 2020). However, when practices are conducted with proper education and attentive awareness, as well as the maintenance and upkeep of parks and services, ecotourism can have a positive impact on the environment, while also promoting positive perceptions and awareness of the landscape (Honey, 2008; Lopez Gutierrez et al., 2020). Maintenance and attentiveness to ecosystems is a key element of ecotourism, and separates it from "green" or "adventure" tourism found in more urban areas of Costa Rica, practices that often are characterized by excessive disturbance in the environment, from encouraging high flow of human traffic and physically disturbing the landscape via construction and development (Lopez Gutierrez et al., 2020).

Within the Osa, Puerto Jiménez is of particular interest because it functions as a gateway for tourism via the domestic airport located within the town (Hunt et al., 2015). Unlike other tourism activities along the north and central Pacific coast of Costa Rica, which employ outside labor and non-locals, residents in the Osa are favored to work in local businesses, channeling benefits toward the community (Hunt., 2015). Local employment helps resist the outflow of youth from the Osa Peninsula, and works to disrupt cycles of poverty and resource degradation, while building community identity, sense of place, and attitudes toward conservation (Honey, 2008; Hunt et al., 2015). In some instances, ecotourism has also facilitated the growth of communities through the funding of community projects such as education centers and health centers (Hunt et al., 2015). Ecotourism is embedded in a web of economic activity in the Osa, as a vital piece of the region. Because income generated from tourism flows beyond the industry, without it, farmers, fishermen, and other workers would be left desolate and impoverished (Honey, 2008; Hunt et al., 2015). Therefore, ecotourism in the Osa has proven to be beneficial to more than just the region's economic development and conservation efforts—it also supports community wellbeing through increasing local residents' income, improving resource access, and knowledge sharing (Hunt et al., 2015).

Ecotourism in the Osa differs from activities located in more developed areas, such as Manuel Antonio, in the sense that tourism in areas with higher visitor densities does not solely rely on small-scale ecotourism. Higher road traffic to hotels and resorts, and other activities outside of ecotourism such as 'green' or 'adventure' tourism, compete with ecotourism, and thus apply an element of difficulty when evaluating the benefits and impacts of (eco)tourism in these locations (Gutierrez et al., 2020). In the Osa, much of the tourism industry is considered ecotourism, supported by small-scale, family owned businesses and therefore operating in the "appropriate setting" in which to effectively evaluate the net benefits of ecotourism (Gutierrez et al., 2020, p. 199). However, while the ecotourism industry is prevalent in the Osa Peninsula, there are still many rural communities that do not engage with tourism, and therefore lack the economic opportunities that the industry provides (Hunt et al., 2015).

Studies support the argument that ecotourism can actually increase biodiversity in the Osa with minimal interference with wildlife (Lopez Gutierrez et al., 2020). Interference such as poaching, logging, and agriculture expansion have decreased as a result of conservation efforts such as the Lapa Rios Ecolodge Private Nature Reserve (LRENR). This is in part because the area has been reforested and reestablished, and now

receives higher human traffic in the area which deters illegal activity (Lopez Gutierrez et al., 2020). Additionally, conservation and restoration efforts have connected endangered and isolated landscapes, allowing wildlife to recover from degradation (Lopez Gutierrez et al., 2020). Providing supervision, safety information, limiting tours, and limiting disturbance have allowed the LRENR project to reduce negative human impacts that have previously occurred at other sites (Lopez Gutierrez et al., 2020). Initiatives such as the ecolodge provide ethical guidelines regarding human activity and disturbances and such guidelines should be considered when pursuing eco-tourism development in other regions in the Osa.

Postdevelopment in the Osa Peninsula

As scholars discuss the nuances and detriments of the current global systems of colonialism, capitalism, development, and standing hegemonies, there has been a shift toward a postdevelopment perspective. Postdevelopment is characterized by the recognition that a neoliberal developmentalist epistemology is inadequate to address efforts to improve human and ecological well-being (Escobar & Harcourt, 2018; Escobar 1992). Postdevelopment scholars claim that working within a narrow capitalist system to achieve sustainable, just, and equitable outcomes is simply not plausible due to the fundamentally extractive nature of capitalism (Escobar & Harcourt, 2018; Escobar 1992). Postdevelopment is "generative, experimental, uncertain, hopeful, and yet fully grounded in an understanding of the material and discursive violences and promises of the long history of development interventions," (Gibson-Graham, 2005, p. 6). Postdevelopment allows us to recognize the differing politics, realities, and biases that have informed development. It aims not only to encompass ideologies from the top-down, but also by elevating grass-roots perspectives (Escobar & Harcourt, 2018). This perspective understands that development has been shaped by histories of colonialism, namely the erasure and displacement of peoples and cultures, and its contributions to the violent histories and the oppression of marginalized people (Escobar & Harcourt, 2018).

A major assertion of postdevelopment scholarship, including that of Arturo Escobar, argue that binaries, specifically the divisions between the global "North" and "South," must be overcome (2018). Postdevelopment scholars assert that the developmentalist perspective champions, too naively, the concept of universality, the idea that humanity exists in a "single, globalized, world," that development is the only path toward supposed "progress" (Escobar & Harcourt, 2018). Epistemologies must diverge away from the concept of universality and embrace pluriversality, the notion that we need to "live in multiple worlds" and construct forms of "re-existence" (Escobar & Harcourt, 2018; Kothari et al., 2019). For example, the re-localization of food can be viewed as a means of reexistence, as an indictment of the monoculture paradigm that has shaped the global South's agricultural productivity in the development era. Capturing re-existence entails the re-communalization of social life, re-establishing intra- and inter-personal relationships of communities, as well as relationships between humans and non-humans (Escobar & Harcourt, 2018; Kothari et al., 2019).

What is perhaps most important within postdevelopment discourse is the attention toward experimenting with and initiating place-based movements, where local identity, land, and culture are elevated to the forefront of sustainable considerations, "producing an emergent counter-hegemonic globalization" (Gibson-Graham, 2005, p. 6). This focus illuminates the power dynamics that have maintained current systems. Capitalist production, modernization, exploitation, and extraction have shaped contemporary societies (Escobar, 1992). Postdevelopment asserts the importance of traditional, non-scientific, local knowledge and practices, and culture of the *other*—the systems and beings which have been deemed unimportant or invisible

within the Anthropocene and its capitalocentric values (Escobar, 2018). Therefore, *sustainable development*, in order to truly be *sustainable*, needs to consider deep socio-structural transformations that account for the inequitable and unjust histories and contemporary practices of development (Gibson-Graham, 2005). Acknowledging diversity in knowledge, culture, and economies can ultimately serve to dethrone the dispossession and extractive capabilities of capitalism by allowing for locally self-determined futures (Ruttenberg, 2022). In this way, postdevelopment attempts to capture decoloniality, referring to the indictment of the hegemonic Global North and its principles of exploitation, extraction, and discrimination inherent in colonial knowledge systems (Kothari et al., 2019; McMichael & Weber, 2020; Gibson-Graham, 2005)

In the following section, we outline Roland and Landau's (2013) Eight Capitals Framework, Gibson and Graham's (2005) Diverse Economies Framework, and Kretzmann and McKnight's (1993) community-based asset building frameworks to connect to the themes of postdevelopment and sustainability in our study. These frameworks inform our study in the Osa Peninsula as forms of post-development literature and scholarship which guide our work and our positionality as researchers.

Conceptual Framework

In the Osa Peninsula, there is an abundance of local knowledge that can be used to combat the developmentalist cycles of dispossession and environmental degradation. Such knowledge is not found valuable in a "market-based" economy (Gibson-Graham, 2005; Hunt et al., 2015; Huettmann, 2015). Nevertheless, this local knowledge is highly intertwined with notions of traditional knowledge, which places emphasis on community and connection with the environment (Kothari, 2019). Respecting and maintaining local knowledge also allows for greater well-being of communities. Local knowledge, importantly, connects communities through information-sharing, a method of adaptation that is becoming increasingly necessary, especially for rural populations, in the face of climate change. Communities within the Osa Peninsula are highly isolated, which impacts the ways in which information and communication are transmitted in this region, largely impacting development (Hunt et al., 2015).

In this project, our work is largely based within a postdevelopment lens which considers alternative modes of capitals and diverse economies within a community, striving to enhance local resilience and reduce dependency on external forces (Gibson-Graham, 2005). Creating awareness and communication pathways that establish an "inventory" of assets allows for communities to participate in creating resilience (Ruttenberg, 2022).

Eight Capitals Framework

We focus on a multicapital framework that acknowledges diverse economies, largely based on the Eight Capitals Framework developed by Ethan C. Roland and Gregory Landau (2013). In this framework, the eight capitals are defined as:

- Social Capital: relationships, influence, and connection between members of a community.
- Experiential Capital: knowledge that is created through real-world personal experiences.
- Living Capital: natural assets such as water, air, soil and human/non-human health.
- Financial Capital: forms of currency, money and other modes of remuneration.
- Material Capital: often natural resources (lumber, metals, coal, etc.) that can be manufactured into other products or into new infrastructure, and technologies.
- Intellectual Capital: knowledges, truths, ideas, and concepts.
- Spiritual Capital: cosmological concepts such as karma and faith which elevate awareness of a greater whole.
- Cultural Capital: stories, songs, myth, art, and memory, which are shared within communities.

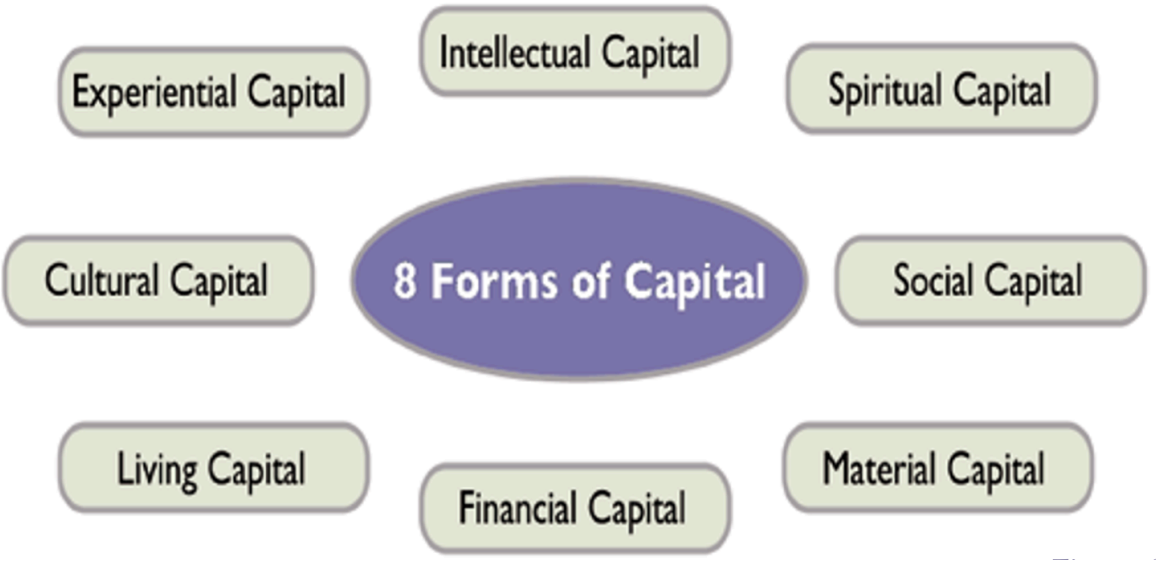


Figure 1. *"Eight forms of capital" published in Appleseed Permaculture (Roland et al 2011).*

One of the most vital forms of capital that is examined extensively in this report is social capital. Horizontal interplay is emphasized by Hunt et al., (2015) and is characterized by interactions between people at similar levels in society, such as between the communities of the Osa. In the Osa, residents form strong bonds to their local communities, but possess less connectivity to communities outside their immediate area (i.e., the greater Osa region) (Hunt et al., 2015). This disconnectivity limits the power and decision-making capabilities of residents within the region as a whole, forming a barrier for effective socio-economic development (Hunt et al., 2015). Many residents desire infrastructural improvements that would increase connectivity, such as roads and bridges, but this drastically differs from the government's desire for infrastructural improvements, which would be in the form of an international airport or major hydroelectric project (Hunt et al., 2015). Residents themselves feel that, by strengthening connectivity and forming a greater identity across the whole of the Osa, regional challenges and concerns may be addressed (Hunt et al., 2015). Furthermore, connections to larger actors at national or international levels may establish a stronger network to organize a greater community and relay immediate needs and desires for development, and ideally receive governmental funding (Hunt et al., 2015).

Diverse Economies Framework

We approached the conceptual asset mapping portion of our work through the lens of the Diverse Economies Framework, initially proposed by Gibson-Graham (2005) and expanded upon by Ruttenberg (2022). This postdevelopment framework expands the capitalocentric lens to include a wider array of sources that support community well-being (Gibson-Graham, 2005). Through the lens of a diverse economy, economic activities are divided into labor, enterprise, transactions, property, and finance so as to highlight pre-existing sources of development present outside western capitalist ideals (Ruttenberg, 2022). As illustrated in Figure 2, the overarching categories are further divided into subcategories that elucidate the broader nuances of local economies (Ruttenberg, 2022). To draw out these economic entities within a community, regional assets are divided into three nested parts within a larger asset map: people & practices, local associations & institutions, and businesses & physical infrastructure (Gibson-Graham, 2005). Although not in direct alignment with the

Diverse Economies Framework, listing assets within these categories in partnership with local communities highlights potential economic activities at play in a region (Gibson-Graham, 2005).

THE DIVERSE ECONOMY				
LABOR	ENTERPRISE	TRANSACTIONS	PROPERTY	FINANCE
Wage	Capitalist	Market	Private	Mainstream Market
Alternative Paid	Alternative Capitalist	Alternative Market	Alternative Private	Alternative Market
Unpaid	Noncapitalist	Nonmarket	Open Access	Nonmarket

Figure 2. *Diverse Economy Framework from Ruttenberg (2022) and informed by Gibson-Graham (2005).*

Methodological Approach

We utilized a mixed methods approach to respond to our principal research question: What are the socioecological impacts of community-based agriculture initiatives on the Osa Peninsula, and how can participatory diverse economies methods enhance regenerative networks and strengthen local resilience? We employed a variety of quantitative and qualitative methods, with an emphasis on participatory action research. Surveys, interviews, and participatory observations were utilized for the social impact assessment, while geospatial data collection and participatory community activities such as the Portrait of Gifts were employed for the asset mapping and diverse economies analysis. Self-reflexivity was incorporated throughout the research process.

Surveys

We developed two different surveys for our study, one was used during the Los Higurones market, Mercado Verde, and contained questions surrounding consumer and producer values and behaviors. With this survey, we wanted to gather information that provides an understanding of a non-traditional economy in Puerto Jiménez, and community perceptions of this initiative. The other survey was also employed at Los Higueorones during the community dinners with the Holi Cena. This survey focused specifically on how the event shaped perceptions of community in the area. Both surveys also collected information on residential status and event accessibility. We outlined this questionnaire by developing a set of questions and revising it several times. We used the University of Michigan Qualtrics platform to create a digital survey, for which we had a link and QR code for respondents to use to digitally complete the survey.

To analyze the results of our surveys, we used a Fisher's exact test for count data, which is employed for categorical data when there are too few responses for a Chi-square test. We had over the minimum for statistical significance (30 responses) for both surveys, but did not have at least five results per cell in the contingency tables. Results were determined as statistically significant if the p-value was less than the alpha value of 0.05.

Interviews

We conducted twelve interviews during the month of June 2025. The interviewees consisted of 3 individuals participating in the Mercado Verde, 2 individuals from Manos Cambiadas, 3 individuals participating in both Mercado Verde and Manos Cambiadas, 3 staff members from Los Higuerones, and 2 local farmers from outside of Los Higuerones. Our interview questionnaires were developed to gather insight into Los Higuerones's various programs' impacts on the community (see Appendix B). Specifically, we wanted to better understand how the participants of Mercado Verde and Manos Cambiadas felt about the programs. We also wanted to gather information on sustainable farming practices from market vendors and Manos Cambiadas recipients. Interviews were analyzed using codes derived from the Eight Capitals Framework as well as indicating socio-environmental trends (see Appendix B).

Only the interviews from Mercado Verde and Manos Cambiadas were analyzed using the software platform Dedoose. We did not include the Los Higuerones staff in our formal interview coding analysis because we believe there would be an inherent positive bias towards Los Higuerones, and our intention was to gather unbiased insights. However, the interviews with Los Higuerones staff gave us a background into their

aspirations for the organization, which helped us develop our remaining interview questions. We wanted to ensure we were asking the right questions to understand the community impact of Los Higuerones and whether or not what the Los Higuerones staff set out to do was being received well by the community.

Participatory Action Research

Our project was informed by participatory action research (PAR) methods where locals are involved in the study process to create results supported by community interactions (Ruttenberg, 2022). This study method was utilized as a tool to complement our project as we were intertwined with the social infrastructure of the Osa. PAR prioritizes the inclusion of people affected by the research process in developmental techniques which in turn gives them agency (Nogueira et al., 2020). In turn, our team gained social connections within the communities we worked, as a benefit of PAR to researchers is social and political access (Nogueira et al., 2020). Ultimately, our team found PAR to be the foundation of the work we conducted in the field and used local input to refine and conduct our research proceedings. We received input from members at Los Higuerones when designing our surveys and interviews and interacted with community members throughout our entire data collection process.

Portrait of Gifts

The Portrait of Gifts was a participatory research activity conducted within the community that directly aided in the creation of the asset maps. The objective of the activity was to draw or write out any personal "gifts" or talents. Participants of any age were invited to contribute. It created a space for individuals to express themselves creatively and discuss passions, hobbies, or skills, as well as other aspects of life that are fundamentally important to them (see Appendix C). Participants were given paper and colorful writing utensils and instructed with this objective. After finishing their drawings, participants shared their work with the group and explained why they included certain elements in their "portrait". We hosted this activity many times, including visits to the three communities where the asset maps were produced. Portrait of Gifts activities were held in Rancho Quemado at a community event, in Matapalo at a late-night artisan market, and in Puerto Jiménez at the Mercado Verde, an English school class, a young ballet class, and a jewelery making class.

Asset Mapping

We constructed our assets maps as physical 'maps' that were hand-drawn and administered to the communities of Los Higuerones, Rancho Quemado, and Matapalo, as an activity during site visits. We drew our maps similarly to those included in Gibson-Graham's (2005) figures, depicting separate but coinciding boxes labeled Businesses and Local Infrastructure (Empresas y Infraestructura), Institutions and Associations (Instituciones y Asociaciones), and People and Practices (Pueblos y Prácticas). For Los Higuerones, we only created a map for Peoples and Practices, while the other two communities filled in all three categories. Portrait of Gifts activities were used to to draw out individual skills and talents for the central Peoples and Practices section. Some items on the maps were filled out in English or Spanish; our team translated each item and synthesized both English and Spanish versions of each map. From here, we organized each item into digital maps. The numerous assets drawn out by this process were further organized into the Diverse Economy Framework, alongside economic sources gleaned from team observation and research.

Geographic Information Systems Mapping

We utilized Geographic Information Systems (GIS) mapping for data visualization and created multiple maps to display our study areas on the Osa. Initial GIS work began with collecting data points using ArcGIS Field Maps on our personal smartphones. Stored data points referred either to ecological organizations in study areas or for orientation purposes.

Data points were uploaded to ArcGIS Online from Field Maps where they were downloaded as shapefiles for analysis in ArcGIS Pro. Data points were filtered out to create feature classes corresponding to the three towns we conducted asset mapping: Rancho Quemado, Matapalo, and Puerto Jiménez. Overall, three maps were created to depict ecological organizations in each area and visualize where they are located in relation to the town center. Finally, an overarching map depicting the whole of the Osa was produced, featuring the three study zones.

Participant Observation

Participant observation refers to the action of researchers partaking in the daily life of a region, community, or culture, particularly as a method of gaining a deeper understanding of the context of their study (Musante, 2014). This method permeated our research process during our time spent on the Osa Peninsula, particularly when we participated in the Portrait of Gifts, Holi Cena dinners, Manos Cambiadas, and Mercado Verde. Participant observation is a unique method in that it is difficult to standardize, but offers a valuable throughline to reinforce additional methods (Musante, 2014). Even amongst our research team, participant observation falls on a spectrum. Despite being placed into the same context, each researcher brings a unique approach, style of observation, and analysis (Musante, 2014). Our primary method of observation was through field notes–either written, drawn, or visually recorded–encapsulating observations of day-to-day life in Los Higuerones and on the Osa. Observations guided the collection of data throughout and resulted in richer, higher-quality interpretations of the results (Musante, 2014). Within this report, participant observation is woven throughout our analysis and showcased via periodic journal entries from research members.

Researcher Reflexivity

Methodological reflexivity is a tool that illustrates the power relations inherent in the research process: it sheds light on the limitations imposed on academic research and the struggles and vulnerabilities of the researchers and their process (Anwar & Vicar, 2016). Awareness of these issues raises questions about the dynamic between researchers and their affiliate institutions, partner organizations, and community members involved. As student researchers from the University of Michigan, we need to understand how we are viewed by the stakeholders in these communities so we can carry out our research in a just manner.

During our fieldwork, we experienced mixed feelings of empathy, association, and discomfort as outsiders adjusting to living and working in a new community. Living at Los Higuerones, hosting community workshops around the Osa, and participating in program and research activities alongside other research participants forced us to reckon with the barriers associated with coming from a primarily English-speaking country and working primarily in the context of U.S. academic institutions. It also forced us to constantly re-evaluate the purpose of our work here: Is it for us and our institution's credibility? Is it for the client organizations and their ability to expand their role within their community? Is it to support local peoples

generally, whether or not they are served by our client organizations? Given our brief fieldwork period, how much of our work will matter, and would it be more impactful to instead be carried out by local researchers? We reflected on these questions and documented the biases in our research methods and reporting through personal journal entries and throughout this report *(see Acknowledgements, Limitations, and Recommendations for Future Work sections)*. We came to the conclusion that this work is to be shared with the communities on the Osa as a resource for their own decision-making processes, and ownership of this work is not vested in any singular individual or institution.

We began our community engagement by holding an introductory workshop at Los Higuerones where the public was invited. With the crucial help of our local partners, we gained permission to conduct our research through a clear explanation of the scale, scope, and intent. We relied on our local partners' Spanish fluency and place-based expertise to explain the purpose of our work in non-academic terms and invited discussions as to how the research benefits local communities. We then worked to update our research questions to be more meaningful, based on our conversations with these partners. To reduce researcher subjectivity, we incorporated team role-rotation and committed to regular debriefs throughout the entire 16-month research process.

Oftentimes, we ran into roadblocks during our fieldwork, such as experiencing difficulty with scheduling meetings or interviews with participants outside of public events. We quickly learned that the norms around living and working in this community are different from the United States, and we needed to adjust to the lives of local residents, not the other way around. In our interview and survey question guides, there was the inclusion of scientific terms that are not easily translatable, and while we did our best to find equivalent terms for certain social and ecological processes, this was difficult given the primary research team's lack of Spanish fluency. This likely made our findings less useful than they could have been. These constraints introduce subjectivity into our research process, but also allow for critical self-reflection of what can be improved moving forward. Being transparent about the limitations of our research deepens our understanding of our positionality, the nature of our community engagement, and improves the research process itself.

Part II: Los Higuerones Social Impact Assessment



Introduction

This section presents the social impact of the Los Higuerones Cooperativa and its role within the Puerto Jiménez community. Los Higuerones serves as a vital gathering space and hosts a variety of events, fostering social connection and engagement. Through its programming, this community hub strengthens local social and economic networks. This assessment draws primarily on community surveys and semi-structured interviews of community members. Data collection centered around key recurring events: the Holi Cena community dinner, the Mercado Verde farmers' market, and the Manos Cambiadas volunteering program. All three of these programs foster community resilience and food sovereignty. The Holi Cena community dinner is a weekly Wednesday vegan dinner that uses primarily locally sourced ingredients and is free to the public. The Mercado Verde market began as Cajas Verdes, which sourced weekly harvest boxes from local farmers to deliver fresh produce to locals struggling during COVID (Sylvester & Little, 2025). The program evolved into a weekly market that continues to support local farmers and foster food sovereignty in the area. Manos Cambiadas is a reciprocal volunteering program that further strengthens the local agricultural community by rotating volunteer days between local farms. The resulting surveys and interviews from these programs revealed patterns of participation, notable benefits, potential gaps, and opportunities for Los Higuerones to further connect to the Puerto Jiménez community.

Jenny's Journal Entry: My First Holi Cena Community Dinner

June 4th, 2025

I didn't know the dinners were three-course meals. I also didn't know that Los Higuerones doesn't prepare them, they just provide the space. Another organization - Holi Haven - hosts the weekly vegan dinners. The setup was nice: tablecloths, glasses of water, beautiful vegan dishes. Instead of one big community table like I imagined, they set up separate tables like a restaurant.

There were maybe 20-30 attendees. A big group of them were foreign freedivers who were here for a competition in the local area (probably over half of them). Most of them spoke English; I spoke to some attendees from South Africa and France. Unfortunately, we did not translate the survey into Spanish in time for the Spanish-only speakers :(But we will correct that oversight next time.

The young man from France at our table knew *Ben. He was an engineering student doing several different internships throughout Costa Rica. His name was *Louis. He talked about how Los Higuerones connected him to the community here in Puerto Jimenez and introduced him to friends for the five weeks he's been here. He said during his first week here, he didn't know anyone and was pretty bored and isolated until he started connecting with people through Los Higuerones. I thought it's interesting how Los Higuerones connects not just local residents together but also to foreign visitors (like us).

*Names have been changed to preserve anonymity

Surveys

The surveys were designed to capture both quantitative trends and qualitative perceptions of Los Higuerones' community impact, focusing specifically on Mercado Verde and Holi Cena as recurring, high-participation events in the community. We aimed to (1) describe who participates in these events (2) assess perceived benefits, (3) identify barriers to participation and opportunities for improvement. Together, these data provide an evidence base for understanding how Los Higuerones functions as a community hub in Puerto Jiménez, while also identifying where targeted outreach or program adjustments could increase inclusivity and local relevance.

Methodology

We distributed surveys using a QR code that linked to a survey created on the University of Michigan's Qualtrics platform (Appendix A). We created two surveys – one for attendees at the Mercado Verde (farmer and artisan market) on Saturdays and one for attendees at the Holi Cena community dinners on Wednesdays. The surveys were offered in both English and Spanish. We distributed the surveys virtually for ease of access and analysis. Most residents of Puerto Jiménez had a phone with which to scan the QR code. In the event that participants did not have a phone with them, a member of the team would offer them another device to take the survey on. Since we were in the Osa Peninsula for one month, we collected survey results at four Mercado Verde events and four Holi Cena dinners.

Holi Cena Survey Results

The Holi Cena community dinner, held in the Los Higuerones community space, brought together visitors and residents from across the Osa Peninsula. The event primarily attracted young adults in their twenties or thirties. While we were there, a total of 32 respondents participated in the Holi Cena community dinner survey. Respondents had the option to skip questions if desired, so not all questions had 32 responses.

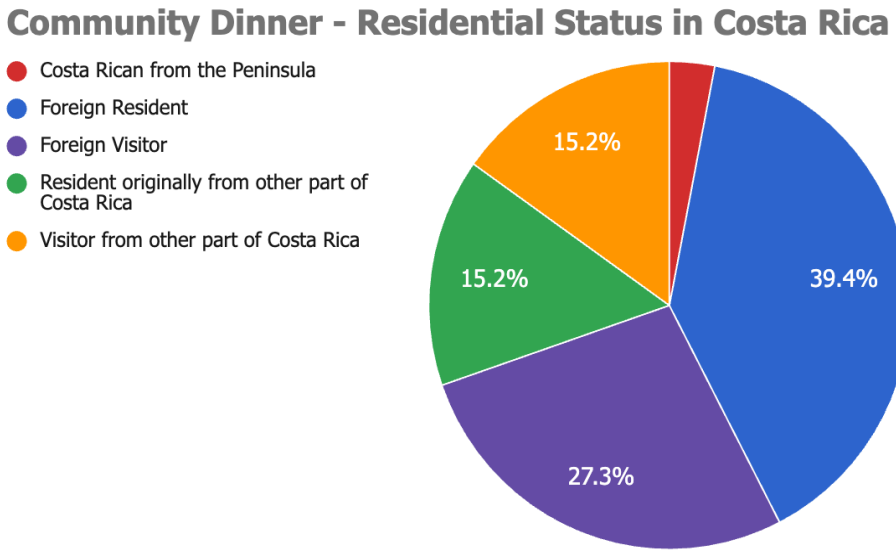


Figure 3. *Proportional representation of Holi Cena dinner participants based on residential status in Costa Rica.*

Residential Status

The majority (20 out of 27) of the community dinner respondents were either a foreign resident or a foreign visitor (Figure 3). The distribution suggests that the community dinners may disproportionately attract individuals who are not originally from Costa Rica. This pattern is not inconsistent with the area, as Puerto Jiménez and the Osa Peninsula itself hosts a large expatriate community. The team of chefs who host the dinners are also not originally from Costa Rica. Although the chefs and many attendees speak both English and Spanish, each of the dinner courses were presented in English during our time there. This structure may further contribute to the appeal among foreign attendees.

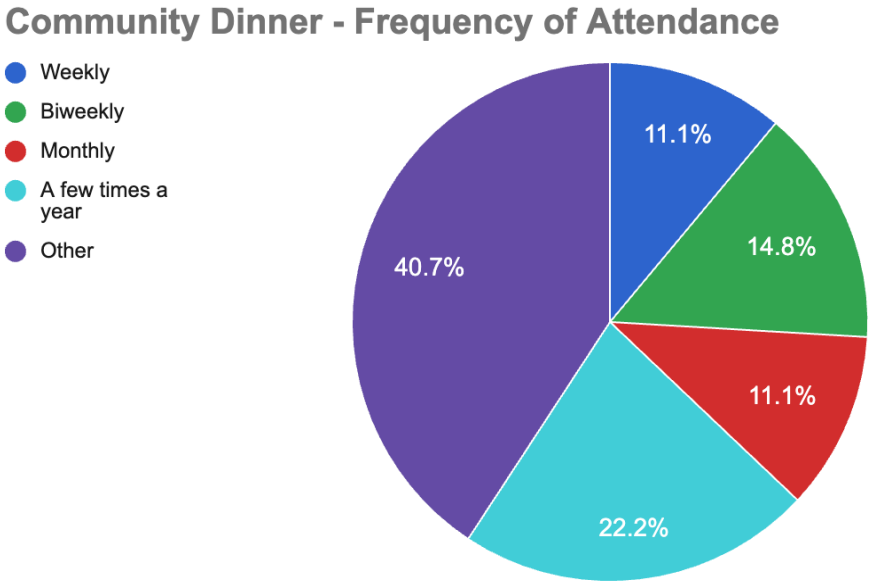


Figure 4. *Proportional representation of Holi Cena dinner participants based on frequency of attendance.*

Frequency of Attendance

Most respondents attended the community dinner only a few times a year or "other" (15 out of 21), with only a few (3 out of 21) attending weekly (Figure 4). When collecting responses, one of the four dinners had a uniquely large foreign free-diving group in attendance. Since most of these individuals were visiting from outside Costa Rica, their participation likely contributed to the higher number of respondents selecting "other" in reporting frequency of attendance. For many of these respondents, that was their first, and likely last, time attending the event.

Participation in Other Events

Over half of the participants also attended the Mercado Verde on Saturdays (17 respondents). This suggested that participation in one Los Higuerones event often leads to greater involvement in other activities hosted by Los Higuerones. It should be noted, however, that only a few (5 respondents) indicated participating in Manos Cambiadas.

Statistical Correlations and Context

Most survey questions were categorical, which called for categorical statistical tests. As many of these categorical questions had contingency tables with fewer than five results per cell, we used Fisher's Exact Test for Count Data. We judged statistical significance based on an alpha value of 0.05.

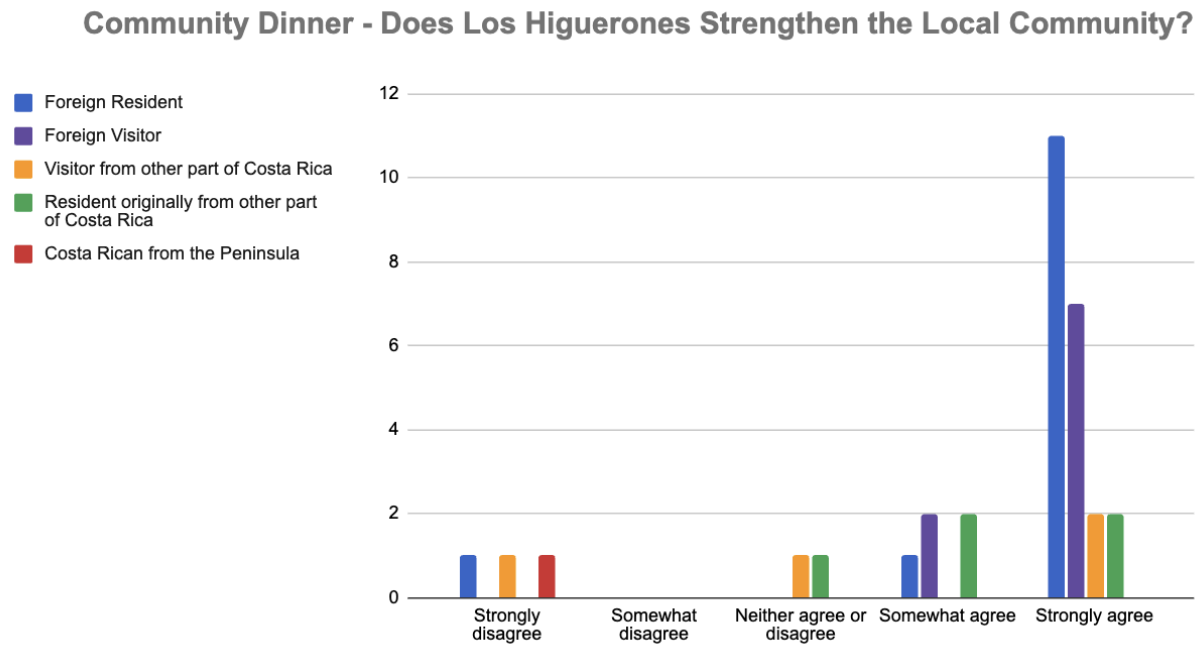


Figure 5. *Degree to which Holi Cena respondents agree or disagree with the statement: "Los Higuerones strengthens the local community," separated by residential status.*

We found a statistically significant correlation between residential status and opinion regarding whether Los Higuerones strengthens the local community (Fisher's exact test, p=0.04). This indicated that a respondent's residential status on the Osa Peninsula (Indigenous to the Peninsula, Costa Rican from the Peninsula, Resident originally from other part of Costa Rica, Foreign resident, Foreign visitor, Visitor from other part of Costa Rica) was correlated with how strongly the individual believes that Los Higuerones strengthens the local community (Figure 5). Foreign residents and foreign visitors were more likely to indicate that they "strongly agree" that "Los Higuerones strengthens the local community" (18 out of 22). Participants from other parts of Costa Rica were more likely to "strongly disagree" that "Los Higuerones strengthens the local community" (2 out of 4).

The time respondents spent as a resident on the Osa Peninsula (Indigenous / Ngäbe, Born on the Peninsula, Less than 5 years, 5-10 years, 10-20 years, 20-30 years, 30+ years, Not a resident) was significantly correlated with how strongly the respondents believed Los Higuerones contributes positively to their livelihood (Fisher's exact test, p=0.048). Those who identified as "Not a resident" were more likely to "strongly agree" that "Los Higuerones contributes positively to my livelihood" (11 out of 16). The only respondent who was born on the Peninsula "strongly disagree." Overall, this question had more variation as 3 respondents "strongly

disagreed," 7 were neutral, 5 "somewhat agree" and 17 "strongly agree." A key participant observation as a researcher is that respondents seemed more likely to ask for clarification on what the question was asking. Confusion around the phrasing of the question, therefore, may have influenced responses.

The time the respondents spent as a resident on the Osa Peninsula was also significantly correlated with the frequency of which the respondents attended the community dinners (Weekly, Biweekly, Monthly, A few times a year, Other) (Fisher's exact test, p=0.01). The majority of the respondents were not residents (16 out of 27) and most respondents only came a few times a year or other (15 out of 21). As mentioned previously, the one-time attendance of a large free diving group may have also influenced these results.

The distance the respondents traveled (0-5 km, 5-10 km, 10 or more km) was significantly correlated with the frequency with which the respondents attended the community dinners (Weekly, Biweekly, Monthly, A few times a year, Other) (Fisher's exact test, p=0.02). The 2 respondents who came weekly and 2 out of the 3 who came monthly all live within 0-5km of Los Higuerones. 3 out of 6 respondents who came a few times a year live 10 or more km away. 9 out of 10 respondents who selected "other" live 10 or more km away. These results suggest those who live closer to the dinner location are more likely to attend on a regular basis.

Free Response

In the free response questions, the majority of respondents mentioned either "food" or "people" as the largest draw for the event. The prevalence of people and socializing in the responses suggested that most of the participants are looking for the feeling of community the dinner provides. This communal atmosphere is typically encouraged through only a few long tables and creative events that encourage active participation, such as poetry night.

When asked what they would improve about the dinners, eight respondents suggested more activities or themed nights that expanded the event beyond food. The Holi Cena already arranges occasional themed dinners, such as poetry nights. Respondents also recommended open mic, karaoke, or an activity to meet people sitting at other tables. This suggests that participants of the dinners especially enjoy the community aspect, with food merely being the method to draw people together.

Mercado Verde Survey Results

A total of 35 respondents participated in the Mercado Verde survey, offering a range of demographic, opinion-based, and experiential data. The average age of participants was 39 years, with a broad range from 7 to 67 years old. When asked about their role at Mercado Verde, nearly all respondents identified primarily as consumers (31), with two who identified exclusively as producers and two who identified as both.

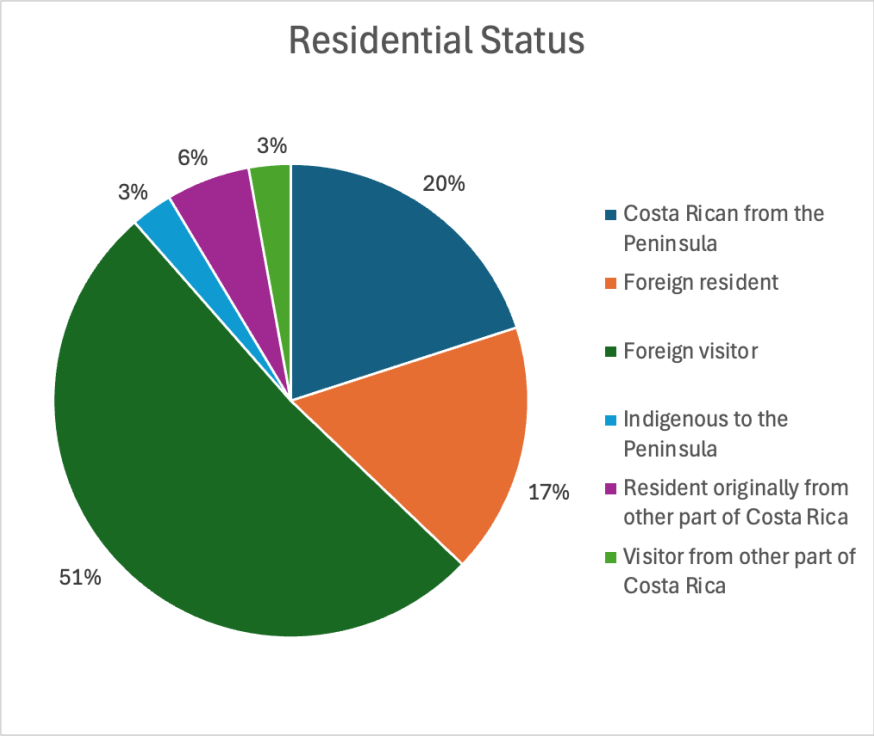


Figure 6. *Residential Status of those who attended Mercado Verde (Saturday Market)*

Residential Status

As seen in Figure 6, the community composition leans heavily towards visitors and residents not native to the Osa Peninsula. Of the respondents, 18 were foreign visitors, 6 foreign residents, and 7 Costa Ricans from the Peninsula. One respondent self-identified as Indigenous to the Peninsula. Further, 19 out of 35 respondents reported that they are not Osa Peninsula residents, and a handful reported long-term residence, with six people having lived in the area for over a decade.

Economic and Employment Context

Financial diversity was notable. Most respondents chose not to answer income questions (20) or fell into the lower brackets for monthly income (CRC 400,000 - 929,000, $787 - $1828 or below: 19 respondents). Employment status was split: 10 employed for wages, 11 self-employed, 3 unemployed, 6 students, 5 retired, and 3 stay-at-home caregivers. Households ranged from single-member (7 respondents) to over four people (6 respondents), indicating Mercado Verde attracts varied family structures.

Frequency and Sources of Food

Market attendance ranged from weekly (11), biweekly (5), monthly (1), to occasional (16), with most buying only some (10) or very little (19) of their weekly food at Mercado Verde. Only 2 respondents sourced "almost all" their weekly food from the market, indicating that while Mercado Verde is a valuable source of local produce, it is not a primary wholesale source for most participants.

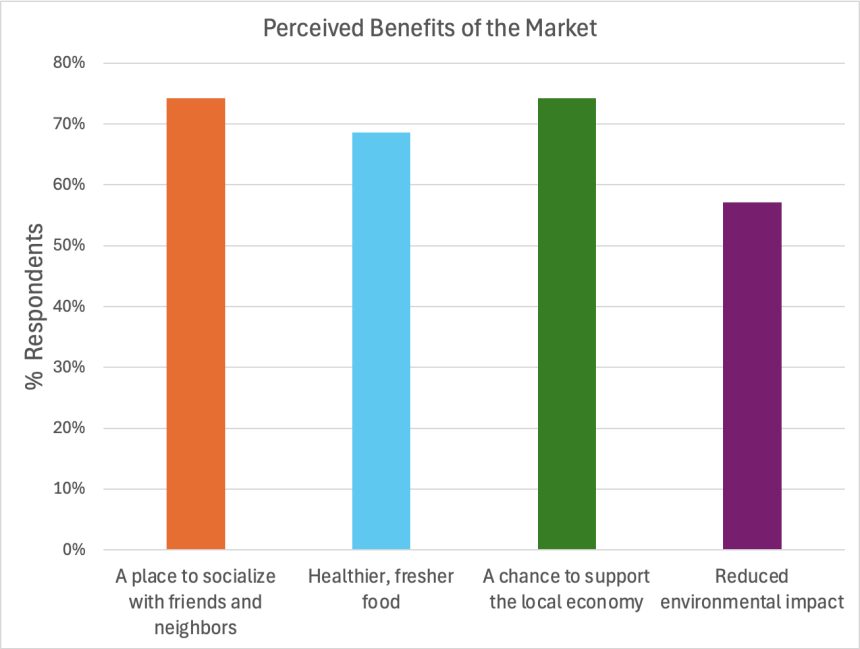


Figure 7. *Percent of respondents who selected these other benefits of coming to the market beyond getting food and groceries.*

Perceived Benefits and Accessibility

Figure 7 shows that the vast majority cited socializing (26) and a chance to support the local economy (26) as benefits, echoing the communal themes seen in the Holi Cena survey. Healthier/fresher food (24) and reduced environmental impact (20) were also prominent benefits. When asked about market accessibility, most (25 out of 33 responses) rated it as "very," "extremely," or "moderately" accessible. Free response and Likert-scale data reveal overwhelming support for increasing the number of vendors, with 21 "strongly agree" responses.

Statistical Correlations and Context

Resident status vs. market accessibility: There was a marginally significant correlation at the 0.1 level (Fisher's exact test, $p = 0.09$), indicating that how long or whether someone resides on the Peninsula affects their perception of the market's accessibility.

Market frequency vs. Los Higuerones contributes positively to my livelihood: Another significant correlation emerged at the 0.1 threshold (Fisher's exact test, $p = 0.052$), implying that those who attend the market more frequently tend to perceive greater benefits to their livelihood.

Resident status vs. belief that Los Higuerones strengthens the local community: Here, there was no statistically significant correlation ($p = 0.43$), perhaps because nearly all respondents expressed agreement or strong agreement.

Despite these encouraging results, a critical gap persists: most market participants were not native to the Peninsula, and only one respondent was Indigenous. This demographic skew should be considered when

interpreting claims about Mercado Verde's community impact or accessibility. Further research should incorporate more underrepresented local perspectives.

Discussion

Mercado Verde functions as a community and cultural hub that connects local residents, non local residents and visitors. Among the total of survey participants, most of the participants held a non-local status. As for food access, community members are getting some fresh local produce, but tend to supply this with BM (the local supermarket) for the majority of their groceries. To make the market more accessible, respondents recommended more public transport infrastructure and more vendors to enhance diversity of produce. In the survey results, participants report vibrant social benefits. Yet, the perceived accessibility and impact may be disproportionally driven by short-term residents and foreign visitors. As with Holi Cena, further efforts may be needed to engage local and Indigenous populations for a more inclusive market impact.

Conclusions

This analysis highlights the Holi Cena and Mercado Verde as an important community space, fostering social connections, demonstrating the local culture, supporting the local economy, and providing access to healthier, locally-grown food, especially for non-local residents and visitors. However, the limited representation of local and Indigenous voices among survey respondents suggests that current findings may not fully reflect the broader community's experiences or needs. To address these gaps, future research should consider surveying other community hubs in Puerto Jiménez for comparative insights, as well as including individuals who do not attend events held at Los Higuerones to better understand barriers to participation. Incorporating community input in the design of survey questions would also ensure the research aligns with local interests and concerns, and using native Spanish speakers to administer surveys will improve clarity and accessibility for those participants. Centering local and Indigenous perspectives in future studies will ultimately provide a more inclusive understanding of Los Higuerones' role and help inform initiatives that enhance its accessibility and impact for all members of the community.

Limitations

There were several key limitations across both of our surveys. Not all participants were digitally literate and/or struggled to read small text on a phone screen, which made it difficult to complete the survey. In such cases, we read survey questions aloud and recorded the responses for the participant. However, being privy to each response for those individuals may have influenced their responses by preventing anonymity. Further, our team members speak limited Spanish and come from a Western educational background. It is important to note that the surveys were developed within this context, which may have created a structural or cultural barrier for native residents taking the survey. Our clients reviewed the Spanish-translated surveys beforehand to help preempt these barriers. Our clients and local volunteers also assisted with translation during survey distribution to answer respondent questions. We also recognize that attendees for the Holi Cena dinners and the market were largely tourists or foreign residents in Puerto Jiménez. Lastly, since the student team spoke limited Spanish, bilingual speakers appeared more likely to take the survey in English. This may be because bilingual respondents believed this would make our analysis easier, but it also meant they were not always taking the survey in the language they were most comfortable with.

Shreya's Journal Entry: A Day of Community Farming at Finca Casa Pequeña

June 17th, 2025

Just a 40 minute drive from Puerto Jiménez to the other side of the peninsula, Drake Bay appears. Beautifully blue, calm waters surrounded by rainforest. Our car turns into Casa Pequeña and we immediately see about 15 people on our left, laughing together and adding compost fertilizer to the papaya, turmeric, and yucca plants. To the right, there stands a gentle and untethered horse.

We get right to work! Mindful of the fire ants, we carry wheelbarrows back and forth on the farm filled with rich compost soil. Using a shovel, we generously spread the soil onto the plants. As we work, we share stories with people around us. One is traveling from the UK to do her research on the animals in all of the national parks in Costa Rica. Another gentleman is a teacher and is simply on sabbatical, immersing himself in the community.

The owners and stewards of the farm take us on a tour during our break. We stop at a coconut tree and sip a light refreshment in the hot sun. A nice gentleman is using a sword-like tool to chop these coconuts, which is quite entertaining for the young boy who stands beside him. We continue the tour, as the owner climbs the 30 foot trees like it's a daily activity and shows us all the fruits and flowers growing in them. We stop by the shed that is FILLED with beautiful compost soil, becoming more nutrient-dense by the minute. I was tempted to take home a pouch with me for my houseplants! This day didn't feel like research at all. We made friends, ate delicious farm grown food, and used our manos to help keep this farm going. I also saw the coolest, most alien-looking fungi, Staheliomyces cinctus, on my way out!

Interviews

The purpose of incorporating interviews into the impact assessment was to gather qualitative data on the impacts that Los Higuerones has had on program participants and the greater Osa community that it is a part of. Interviews provide richer accounts of participants' experiences and allow for a deeper level of analysis than surveys alone can provide. Through interviews, we were able to gather information on the role of Los Higuerones in improving market access, promoting food sovereignty, and supporting the exchange of assets beyond financial transactions, all in the program participants' own words.

Our focus was to hear from stakeholders who are regularly involved in the Mercado Verde and Manos Cambiadas programs beyond the role of consumers, so we chose to interview market producers, artisans, farm hosts, and farm volunteers who regularly participate in one or more programs. These stakeholders are more likely to provide detailed accounts of how and why Los Higuerones has impacted their lives from the social, environmental, and economic perspectives. This rich qualitative data supplements the statistical analysis and breadth of consumer perspectives that the surveys in the previous section were able to provide.

Methodology

A total of eight interviews were conducted using the interview guide provided in Appendix B. The interview process was facilitated by our clients, who assisted with translation of questions and responses when necessary. With the consent of participants, interviews were audio-recorded and transcribed using Turboscribe software.

The interview cohort comprised three individuals from Mercado Verde, two from Manos Cambiadas, and three residents participating in both Mercado Verde and Manos Cambiadas. The interviews took place in June 2025, primarily on-site at Los Higuerones. Transcripts of all interviews are available in Appendix B.

For each interview, demographic information was collected, including occupation(s), gender, and duration of residency on the Osa Peninsula. This allowed for a richer understanding of participant backgrounds and facilitated identification of potential gaps among market vendors. Participants interviewed represented a range of vendor types, offering produce, prepared foods, and artisanal crafts at Mercado Verde. For those vendors who cultivated and sold their own foods, particular emphasis was placed on exploring sustainable agricultural practices employed on their farms. Through the interviews we aimed to understand the socio-ecological impact that Los Higuerones has on the local community in the Osa as well as identify challenges and potential for improvement.

Interview transcripts were subsequently subjected to thematic analysis using two methods of coding: (1) identifying emergent socio-ecological indicators and (2) applying the Eight Capitals Framework. All coding and analyses were performed using the Dedoose software platform.

Socio-Ecological Indicators

In order to assess the impact of Los Higuerones' programs on the local community and environment, we structured our interview guides to include questions that touched on agricultural practices, food sovereignty, obstacles to production, benefits of participation, and the realized effect of these programs on local livelihoods. Through an exploratory process of semi-structured interviews supplemented by our own participatory action in the programs, we were able to identify social benefits felt by participants as well as beneficial agricultural practices that support environmental regeneration. These are listed in Figure 8.

Eight Capitals Framework

The Eight Capitals Framework was adopted as outlined by Roland and Landau (2013). The version of the framework we used has emerged through experimentation and adaptation on the Osa Peninsula by ReGenerOsa Collective and in Vivero. This framework captures the multifaceted resources and assets referenced by participants during their interviews. Each transcript was coded according to eight distinct types of capital: Spiritual, Cultural, Intellectual, Experiential, Social, Financial, Material, and Living. A summary of these capitals and their coding criteria is provided in Table 1.

Type of Capital	**Descriptive Coding Definition**
Spiritual	Faith, connection to nature, belief system
Cultural	Art, language, rituals, practices
Intellectual	Knowledge, skills
Experiential	Shared knowledge from lived experience, identity

Social	Connections, networks, friendships, kinship, sense of taking care of and helping one another
Financial	Money, credits
Material	Physical assets other than money, housing, supplies, tools
Living	Food, water, air, things that sustain the body and mind

Table 1. *The eight capitals and associated coding definitions, used to code interview transcripts.Source: These definitions emerged from a ReGenerOsa-Local Food Forest Collective-Vivero initiative and are based on a graphic depiction by Spencer Vantress*

Results & Conclusions

Socio-ecological Indicators

Los Higuerones Programs	Benefits	
	Social	Ecological
Mercado Verde	Language Exchange Business Partnership Leisure Consistency Income	Natural pest maintenance Growth of native crops Intercropping Permaculture
Manos Cambiadas	**Efficiency** **Community** **Cultural Preservation** **Inter-class Exchange** Gratitude & Appreciation Skill-sharing Shared Responsibility Collaboration Financial Relief	**Organic farming** **Natural fertilizer** **Composting** Regeneration of soil Crop abundance

Figure 8. *Socio-ecological benefits identified by the researchers through interviews and participant observation. Benefits listed in bold font reappeared throughout conversation and participatory action in both programs.*

Mercado Verde

Social and livelihood benefits identified in the Mercado Verde program include the income generated by sellers, the practice of language exchange among people of different cultural backgrounds coming together, the growth of business partnerships between sellers, the opportunity for leisure, and the consistency and reliability of visitors every Saturday.

Sustainable agricultural practices were also identified through interviews with producers at Mercado Verde. Sustainable practices have widely been proven to yield ecological benefits such as soil regeneration, crop resilience to climate change, and increased crop yield. Thus we included specific agriculture practices mentioned by producers in the "ecological benefits" section of Figure 8. These include natural pest maintenance (as opposed to chemical pest maintenance), growth of native crops, intercropping, and permaculture.

Manos Cambiadas

Social and livelihood benefits identified in the Manos Cambiadas program include financial relief from receiving volunteer labor on the farm, collaboration among community members, the exchange of knowledge and skills, feelings of gratitude and appreciation, and a shared sense of responsibility for each other and the greater community. Ecological benefits mentioned by program participants include soil regeneration and crop abundance.

Overall

One of the biggest takeaways from the interviews was the social benefits participants experienced during Mercado Verde and Manos Cambiadas. Efficiency, community, cultural preservation, and interclass exchange were evident across both programs.

Efficiency was described as saving energy and labor compared to how producers and farmers operated previously. Half of the producers that were interviewed at the market used to sell on the street. One seller explained that sitting at a booth in the shaded area of Los Higuerones was much less tiring than selling door-to-door under the sun as she used to; Los Higuerones' Mercado Verde program now brings consumers to her. Saving energy and labor is also a core benefit of the Manos Cambiadas program. Farmers who host volunteers have described gratitude for receiving all the extra help, with one claiming it is the best aspect of the program. Two participants emphasized how the help received from volunteers is especially meaningful to hosts who are senior or living with disabilities, as it is more difficult for them to do house or farm labor on their own.

[Original] "Yo a mí siempre me ha gustado sembrar, ser un agricultor pequeñito, digámoslo así. Y yo andaba siempre vendiendo en la calle. Y me dijeron de este lugar. Entonces yo vine y hablé con las personas y me aceptaron hace cuatro años. Entonces de ahí me quedé aquí en el mercado. No volví más a la calle."

[English translation] "I've always liked growing crops, being a small farmer, let's say. And I was always selling on the street. And they told me about this place. So I came and talked to the people, and they accepted me four years ago. So from then on, I stayed here at the market. I never went back to the streets."

In every interview of participants from both programs, friendship and a sense of community was brought up at least once. A vendor at the market said, "Here at the market, we see it as a family. We all see each

other as family."[1] Other participants echoed similar sentiments stating, "I love Saturdays, coming here to work and meeting people.", and "It's so beautiful to see the connections between the volunteers and the people helped through the program.", as well as referring to it as a "brotherhood". The aspect of coming together at the market and helping each other through the farming program strengthens both personal ties and a sense of togetherness among participants. Such community-led programs support local agencies, building resilience to external threats of overdevelopment.

Cultural preservation was another social component of both programs and an indication of community resilience. Manos Cambiadas is not only a formal program, but the continuation of a cultural practice passed on from previous generations. One participant described it as "a very old activity" and a cultural practice:

[Original] "Entonces, para participar en manos cambiadas, no tenía que recibir ningún entrenamiento formal, porque era algo que siempre hacían. Y lo que la gente hacía en los 60s, donde solo visitabas las plantas de los demás y ayudabas."

[English translation] "So, to participate in Manos Cambiadas (exchanging hands), I didn't have to receive any formal training, because it was something they always did. And what people did in the 1960s, where you just visited other people's plants and helped out."

At Mercado Verde, cultural presentations and activities occur on the mainstage throughout the day. One presentation we witnessed involved a youth member of Los Higuerones interviewing an elder, who retold their stories of growing up in the area. Another involved a singing performance from an elder who is also father to one of the vendors. During the Biriteca festival that was held during one of the weekly Saturday markets, multiple generations of women performed a cultural dance, with dancers ranging from young to elderly.

Positive interclass exchange was expressed through interviews with Manos Cambiadas participants and observed by us researchers at Mercado Verde. Positive interclass exchange is our paraphrased expression of the way a Manos Cambiadas participant described how program volunteers and hosts come from various homes and income levels, but it doesn't matter because there is a sense of equality between people when they're working together. Likewise, we as researchers observed plenty of positive exchanges between locals, tourists, and people from throughout the peninsula at Mercado Verde. A couple of these exchanges included joining hands in full community participation for a spiritual ritual at the beginning of the Biriteca festival, as well as a mix of long-term residents and newcomers showing up to the first community meeting we held at the market for our project. The income data collected from our consumer surveys and producer interviews supplemented our understanding that the market supports sellers and buyers of varying income levels. A sense of equality during these exchanges between people with different income levels is a positive indicator of community resilience.

The regenerative practice of utilizing natural fertilizer for agricultural production, such as homemade compost, was noted in our interviews across both Mercado Verde and Manos Cambiadas. Over half the Manos

[1] All participant quotations in this section were originally in Spanish and have been translated into English

Cambiadas participants interviewed mentioned working with volunteers to make organic fertilizer out of compost. One interviewee noticed that after switching to organic materials and manual weeding in place of chemicals, their crops would take longer to grow at first but ultimately produced more beautiful and abundant fruits and flowers. Some of the participants in Manos Cambiadas also sell their produce at Mercado Verde and utilize this learned practice of applying organic fertilizer to the crops they sell at the market. Other producers recycle animal waste from their farms, such as chicken and goat manure, to fertilize their crops. These organic farming practices contribute to healthier soils and in turn, more abundant crops.

[Original] "...esa habilidad de que nos enseñen a nosotros a hacer nuestros propios fertilizantes, abonos y todo eso, es una habilidad que nos ayuda"

[English translation] "...that skill of teaching us how to make our own fertilizers, compost, and all that, is a skill that helps us"

[Original] "Entonces ya gasto menos. Ellos nos enseñan cómo se hace, entonces ya no tenemos que comprar."

[English translation] "So now I spend less. They teach us how to do it, so we don't have to buy anything anymore."

Not all farmers at the market nor in the farming program utilize 100% organic practices. One of the market producers, who also owns oil palm plots, explained that their farm was about 60% organic. Due to the high number of animals in the region, they expressed the need for chemical pesticides as an animal deterrent to sustain manageable crop yields. Another farmer, who has hosted volunteers through Manos Cambiadas, uses chemical fertilizers in the form of granules about once a year. They used to utilize more agrochemicals but have recently switched to more organic practices.

Eight Capitals Framework

Figure 9 illustrates the frequency and distribution of references to each capital in the interview data. These results highlight the assets and resources most prominent in participants' narratives regarding their lived experiences and what they share within their communities.

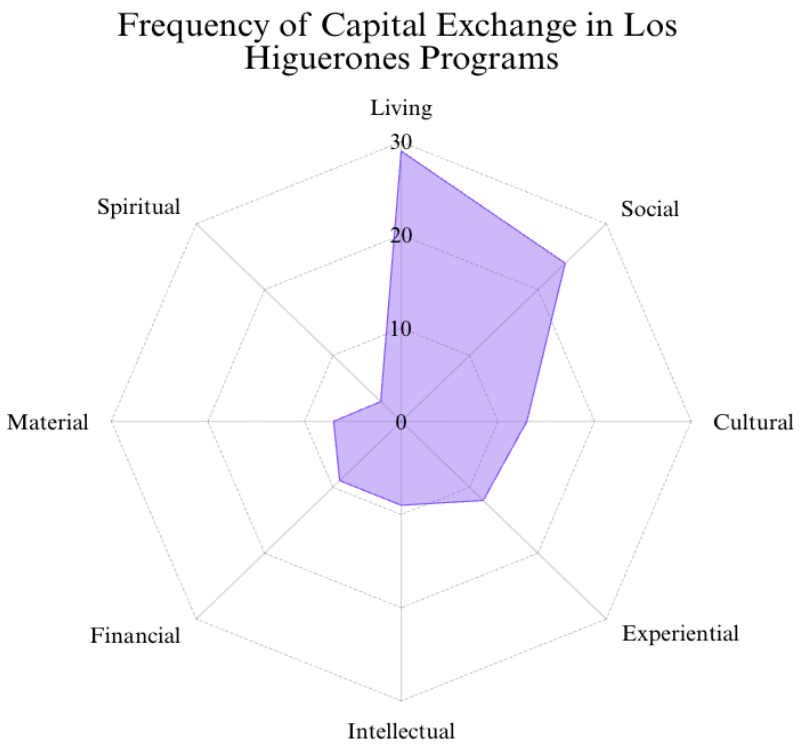


Figure 9. *Frequency distribution of coded references for each of the eight capitals in combined interview data from Mercado Verde and Manos Cambiadas participants.*

Interview responses indicate that *living* capital (i.e. food, water, and other life-sustaining resources) is exchanged most frequently within Los Higuerones programs. This finding is unsurprising given the primary function of the farmers' market, which centers on the sale of organic produce and other foods. *Social* capital was identified as the second most frequently exchanged resource. This aligns with participant discussions emphasizing the social dimensions of the market and community initiatives such as Manos Cambiadas, which foster interpersonal connections, relationships, and a sense of community among participants. This theme was also corroborated through our informal conversations with community members during field visits, further underscoring the abundance of social capital within these programs.

Elements of cultural and experiential capital were also referenced somewhat frequently throughout our conversations. Participants described the farmers' market and community programs as spaces where local traditions and ways of life are maintained and passed on. Experiential capital emerged in stories of lived experience, including what individuals have learned through farming, navigating environmental change, and their personal lives. Participants also explained that sharing these experiences with others expanded their support systems and fostered a sense of belonging. Many described the public market community as feeling "like a family."

Financial and material capital were referenced less frequently in conversations with participants. This outcome is understandable in the context of Los Higuerones, where community-driven programs and farmers' markets often prioritize non-monetary exchanges, collective resource sharing, and interpersonal relationships

over commercial transactions. While it is clear that participants depend on financial capital (i.e. income from selling goods) for their livelihoods and survival, this aspect was not emphasized as much during our interviews. This may reflect a cultural orientation towards community values and mutual support, or it was the nature of the interview questions and discussions. Nonetheless, it is important to recognize that financial support is essential for enabling the continued exchange of social, living, and cultural capital within communities. Especially in the face of climate change, which is contributing to increased unpredictability in crop yields and pest pressures, according to interviewees, adequate financial resources are critical to sustaining both farmers' livelihoods and agricultural practices, as well as the communal interactions and traditions that define these programs.

Limitations

Several limitations must be considered when interpreting our interview analysis. Although we developed a comprehensive interview guide, not all questions were asked of every participant, resulting in varying depth and coverage across interviews. The sample size was relatively small, with eight participants, and recruitment was based on availability and comfort with being recorded, which may have introduced selection bias and most certainly limited the representativeness of our findings. In cases where translation was necessary, there is a possibility that nuances or meanings were lost or altered, potentially affecting the accuracy of responses. The timing and location of the interviews, primarily conducted on-site at Los Higuerones in June 2025, further constrain the generalizability of our findings to other contexts or seasons. Informal conversations supplemented our data but were not systematically documented, introducing subjectivity.

Additionally, financial capital was not a primary focus in many discussions, possibly due to the nature of the questions, cultural factors, or social desirability bias; this leaves some gaps in our understanding of the economic challenges faced by participants. Sensitive topics such as income or financial hardship may have been underreported due to audio recordings or the presence of outside researchers.

Lastly, ecological benefits and drawbacks experienced by the farmers and producers who participated in the Los Higuerones programs were surmised based on qualitative interview results only. Although questions about perceived environmental impact were incorporated into the interview guides, the ecological impact of community-supported regenerative agriculture programs would ideally be assessed through field visits and ecological surveys in addition to interviews. Given the short time-frame that the research team was on-site at Los Higuerones, temporal ecological surveys of participating farms could not be conducted. Future research teams who have the ability to stay or make repeat visits throughout the course of several months may be able to conduct more robust environmental impact assessments.

Overall Results & Conclusions

Key Themes

Prefacing our overall conclusions is the fact that most of the farmers and producers interviewed are originally from Costa Rica, whereas most of the consumers surveyed are foreign residents and visitors. Our sampling methodologies recruited participants who are representative of the demographic distribution of the different stakeholder groups at Los Higuerones. While survey results accounted for a breadth of consumers' thoughts and opinions, focusing on the farmers' and producers' feedback through interviews allowed for more detail and depth of analysis of their experiences. Due to their long-term residency on the Osa and more regular involvement with Los Higuerones programs generally, the farmer and producer stakeholder groups were more likely to bear witness to Los Higuerones' evolving role in the local community and provide evidence of its long-term impact on their personal livelihoods. Below are key findings that emerged across surveys, interviews, and participatory observations.

Los Higuerones advances food sovereignty in the local community

One important expression of community resilience is food sovereignty. Offering a weekly farmer's market featuring local artisans and producers advances the ability of community members to access markets to buy and sell locally-produced, culturally-relevant foods grown on the Osa. A majority of consumers surveyed at the market cite access to healthier, fresher food (69%), a chance to support the local economy (74%), and reduced environmental impacts (57%) as benefits of attending (Figure 7). The community-supported farming program bolsters the adoption of organic, regenerative agriculture practices that have begun to replace the use of agrochemical pesticides and herbicides on small-scale farms, which in turn promotes the growth of nutritional crops that restore soil health and improve ecosystem resilience over time. One interviewee said, "the fruits and the different products that come out of that [organic] process are much more beautiful, because you can see the soil regenerating itself, too."[2]

Many exchanges, relationships, and forms of mutual support are occurring outside of purely financial transactions

A multi-capital framework is the best way to characterize the collective resource sharing, mutual support, and prioritization of interpersonal relationships over commercial transactions that are occurring at Los Higuerones. The frequency that living, social, cultural, experiential, and intellectual capital were mentioned over financial or material capital suggests that the diverse economies operating within Los Higuerones support the exchange of more non-traditional forms of capital. These non-traditional forms of capital are what has kept the organization operating and serving the community for so long without the presence of significant financial capital or material resources. Although monetary currency and tangible resources are necessary and present, other assets are notably exchanged such as crops grown, regenerative agricultural practices shared among farmers, business partnerships formed at the market, and local cultural practices that have been formalized and passed down from previous generations. These non-financial exchanges, interpersonal relationships, and mutual

[2] Original quotation has been translated from Spanish to English

support practices are rooted in both a strong sense of community (represented by social indicators) and connection to the natural environment (represented by ecological indicators).

Social impact is significant compared to the other indicators

While living capital was coded the most frequently across interviews, social capital stood out as the next most frequently mentioned form of capital, appearing far more frequently than the remaining six capitals. Many different forms of social benefits were identified throughout the interviews, ranging from gratitude and appreciation to shared responsibility and collaboration. The survey results also reported vibrant social benefits for program participants. Throughout the surveys, the majority of respondents mentioned either people or food as the main motivation for attending. Consumers' suggestions for improvement focused on activities that would expand the social atmosphere and further strengthen social connections made at the events. The study results reveal an appreciation and further appetite for social benefits beyond the focus on food, leading us to conclude that participants highly value the social connection and mutual support these programs bring to the community.

Program Recommendations

Throughout our surveys and interviews, we identified some ongoing challenges for participants in the Los Higuerones programs. We have formed recommendations to address these challenges, represented in the tables below. Challenges and recommendations are segmented by program and stakeholder – Table 2 addresses Mercado Verde while Table 3 addresses Manos Cambiadas. Recommendations were not provided for the Holi Cena; although the dinners are physically hosted at Los Higuerones, they are primarily run by a partner organization.

Table 2. *Stakeholder challenges identified and recommendations for Mercado Verde*

Stakeholder	Challenges	Recommendations
Producers	Production limited by climate changes *Hot summers require more irrigation* *Heavy rainy seasons damage crops*	• Support rain catchment infrastructure for storing and recycling rainwater: supply rain barrels and create rain gardens during Manos Cambiadas
	High cost of production *Pest management for crop production*	• Leverage Manos Cambiadas to share knowledge and tips for natural pest management among farmers who use 100% organic practices • Introduce trap cropping around perimeters (sacrificial plants that lure pests away from primary cash crops)
	Not enough market awareness/promotion *Not enough demand to sell full inventory*	• Integrate primary/secondary educational programs: create an after-school workshop or partnership with the local school that introduces kids to the market or local vendors

		and their craft • Place more signage in public spaces and businesses around town
	Vendor layout at the market *More space needed for some vendors* *Sub-optimal positioning of vendor booths*	• Organize vendors by product type: artisan crafts, fresh produce, specialty goods, etc. • Consider extending the market to 2 days: Produce Saturdays and Artisan Sundays, etc. (this recommendation comes with promotional/awareness considerations and needs to be assessed based on the organizations' capacity constraints)
	Soil degradation	• Community composting locations that get dispersed to local farmers who are struggling with soil damage • Offer community compost drop-off and pickup from Los Higuerones on program days • More Manos Cambiadas on building composting processes at farms
Consumers	Difficulty getting to & from the market *Limited transportation options available*	• Create a community network where people can give each other rides to/from the market (perhaps based on the assets map and offers & needs marketplace) • Advocate/lobby the municipal government for more public transportation infrastructure
	More produce diversity and food options *Need to supplement market purchases with food purchased at the supermarket & other stores*	• Discount space reservation fees for new vendors • Utilize any open classrooms and activity rooms at Los Higuerones to accommodate more vendors • 1-question surveys asking what products consumers would like to see at the market

Table 3. *Stakeholder challenges identified and recommendations for Manos Cambiadas*

Stakeholder	Challenges	Recommendations
Hosts	Getting access to markets to sell their produce	• Support farmer's markets and vendor markets in other regions of the Osa (i.e. Matapalo Friday vendor market) through cross-promotion and/or collaboration

		• Create a community network where people can give each other rides to/from the different markets (perhaps based on the assets map and offers & needs marketplace) • Advocate/lobby the municipal government for more public transportation infrastructure
	Getting more regular assistance	• Establish a regular manos cambiadas cadence (i.e. bi-weekly to start) with a schedule of which farms will host 2-4 weeks ahead • Hold monthly meetings with potential recipients to determine need and availability and come up with a plan of action for each farm
Helpers (Volunteers)	Engaging everyone in the work	• Assign each member of the crew to a small team or task, while keeping in mind a wide range of personal abilities and limitations • Establish a reward system for each manos cambiadas (i.e. 'verdes'/coupons for the market)
	More opportunities to do conservation work	• Partner with a local community conservation organization such as Tortugas de Osa or Raising Coral several times a year to host a manos cambiadas

Recommendations for Future Work

To collect sufficient data for statistically significant quantitative analysis and robust qualitative insights, we recommend future research teams spend a minimum of six weeks conducting an impact assessment for a regional organization of similar size and influence to Los Higuerones. Our ability to generalize more broadly and provide additional depth and nuance to our analysis was limited due to the relatively small sample size of surveys and interviews we were able to collect within four weeks. We recommend that researchers who are not indigenous to the region allow themselves ample time to adjust to a different way of life and collect enough data to represent the richness of the social, economic, and ecological environments on the Osa. If possible, repeat visits are encouraged. We hope that by documenting our learning process in this report, including both the successes and limitations, we can help inform the development and success of future impact studies in the area.

Further research should also extend to other community organizations in Puerto Jiménez to develop a more comprehensive understanding of asset exchange within the region. In addition to the Eight Capitals Framework, additional impact assessment frameworks can and should be used to evaluate other organizations on the Osa Peninsula. Impact assessments could be replicated and adapted to other community organizations

within the RegenerOsa Collective, such as Rancho Quemado, Peje Perro, Tortugas de Osa, Biriteca Agroecologica, Osa Wild, SUSPIRO, and Raising Coral. Future studies should also incorporate additional questions focusing on participants' dependency on income and the financial support required to sustain their activities. This expanded approach would help to clarify the economic challenges and resource needs of local producers and artisans, and provide a fuller picture of the dynamics shaping asset exchange in the area.

Part III: Asset Mapping Across the Osa Peninsula



Introduction

This section presents the participatory community asset mapping portion of our project. The purpose of asset mapping is to visually and spatially represent how communities see themselves. The process of asset mapping for this project refers to both the physical and conceptual mapping of assets across the Osa Peninsula. The framework used for the conceptual mapping process is found in Gibson-Graham's (2005) diverse economies approach and nested concepts of people and practices, institutions and associations, and businesses and infrastructure. To supplement the concept maps, we physically pinpointed key assets of the Osa Peninsula to visualize their geographic distribution. To enrich our analysis, we created an interactive narrative map that incorporated our personal experiences navigating and engaging with local communities.

Laurel's Journal Entry: Portrait of Gifts at the Library

June 12th 2025

Tricia leads Shreya, Fynn, and me across town from Los Higuerones, waving to nearly everyone we pass and reveling in the sunshine. We are scheduled to do a portrait of gifts activity with a local jewelry class. Opposite the soccer field and just off the main road lies our destination: the Biblioteca Pública de Puerto Jiménez. A jungle mural blooms along the side of the building and a tree guards the open entrance. Under its shade, I leave my shoes next to a dozen others and enter. Soft light spills over half-organized bookshelves. At the far end of the room, children sprawl across the floor playing with wooden dominoes. Beside them, partially hidden by a bookshelf, the all female jewelry class waits for us at a long table. To make up for our rudimentary Spanish, Tricia introduces us and translates as we explain the activity. Every time I present to residents of Puerto Jiménez, I feel a familiar knot of nerves–rooted in an embarrassment that I can't speak their language. Regardless, I am met again and again with more kindness and patience than I feel I deserve. Our broken introduction is met with warm smiles and eager anticipation to get started.

We scatter markers and papers across the table and leave the women to draw out what gifts and talents they feel they bring to the community. Our intent was only to take up a few minutes of their usual class time, but they became engrossed in their drawings–a testament to their creativity–so we let them continue for longer than usual. When they finish, Tricia invites the women to share and fill in any any gaps in their fellow jewelry-makers' portrait of gifts. Even across the language barrier, the love and admiration shared between the women brings me close to tears. "Filling in the gaps" turned into a chorus of admiration. One by one, the women tell each other how their unique gifts strengthen the group and uplift the community: a bright smile, an incomparable work ethic, deep compassion, quick humor, a power to bring out the best in people. These are all talents they struggled to identify in themselves, but were precisely the gifts the others cherished most. The portrait of gifts captured on paper–fashion, connections to nature, friendship, design, baking–only reflect a fraction of the true gifts shared in the community.

Asset Maps & Portrait of Gifts

The goals of the Asset Maps and Portrait of Gifts activity were to get the community involved both creatively and as valued members of the research and development team. The purpose was to identify assets already present in the community as well as potential needs in order to enhance connectivity between individuals and other people or associations that may already have the "assets" to fulfill those needs. For example, if an individual were to come to Los Higuerones needing tools, Los Higuerones already has a community tool borrowing program in effect. In addition, the asset maps help identify where there are potential gaps to fulfilling community needs and serves as a starting point for addressing those needs. The asset maps serve as visual aids so when a need arises in the community, they can consult the map to see whether there is already something available to address that need or they have to seek out something new. It can also serve as a starting point for planning how best to address the community's needs.

The other main goal of the activities was to identify "assets" and "gifts" in a more holistic, non-traditional way. By seeing what community members already perceive to be "assets" and "gifts", we can get a better understanding of how the community sees certain things in comparison to the typical western or academic view. By applying the Diverse Economies and Eight Capitals Framework to the completed asset maps, we can more intentionally recognize and validate forms of capital that are often overlooked by conventional economic analyses. It allows us to broaden our understanding of what constitutes "assets" and "wealth" within a community and how interpersonal relationships strengthen and build community resilience.

Methodology

For the asset mapping, we held two asset mapping tabling events in Matapalo, one asset map event in Rancho Quemado, and installed an asset map at Los Higuerones to be filled out throughout the month of June 2025. We created multiple poster-sized asset maps to be filled out at these events, primarily through discussions with participants about different assets in their communities that may belong in each category (businesses and infrastructure, institutions and associations, people and practices). We led groups and individuals in the Portrait of Gifts activity to draw out individual talents in order to fill out the central portion of the asset maps (people and practices). We conducted asset mapping activities at Martina's restaurant in Matapalo, a community event in Rancho Quemado, the Mercado Verde market at Los Higuerones, and a jewelry making class, a ballet class, and an English class in Puerto Jiménez (Appendix C). The Portrait of Gifts activities allowed participants to write or draw their individual talents, prompting discussion amongst the research team, community members, and their peers about how community talents connect and uplift each other.

Jenny's Journal Entry: Portrait of Gifts during Mercado Verde at Los Higuerones

June 7th, 2025

Our portrait of gifts activity was at 1pm. Tara made an announcement and a good-sized group of people came into the room (8-10) and joyfully participated in drawing their self-portraits. Tara also asked us to participate, and I didn't realize until now how much of our research would be us participating as students as well. We're not just researchers from the Global North observing the community activities, we're doing active, reflexive research by participating in everything we're asking the community to do as well.

Site I: Los Higuerones in Puerto Jiménez



Figure 10. *Los Higuerones Asset Map.*

Site II: Matapalo

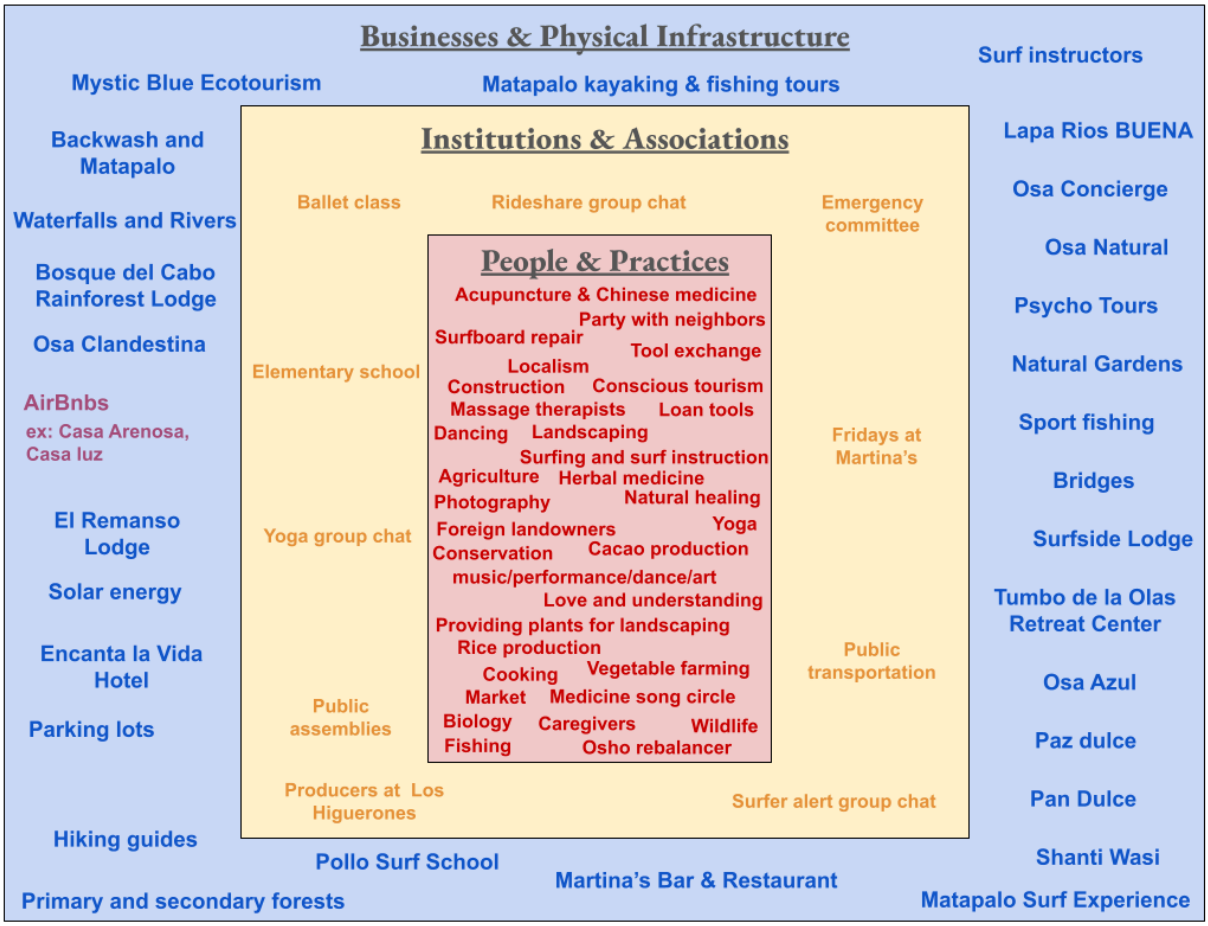
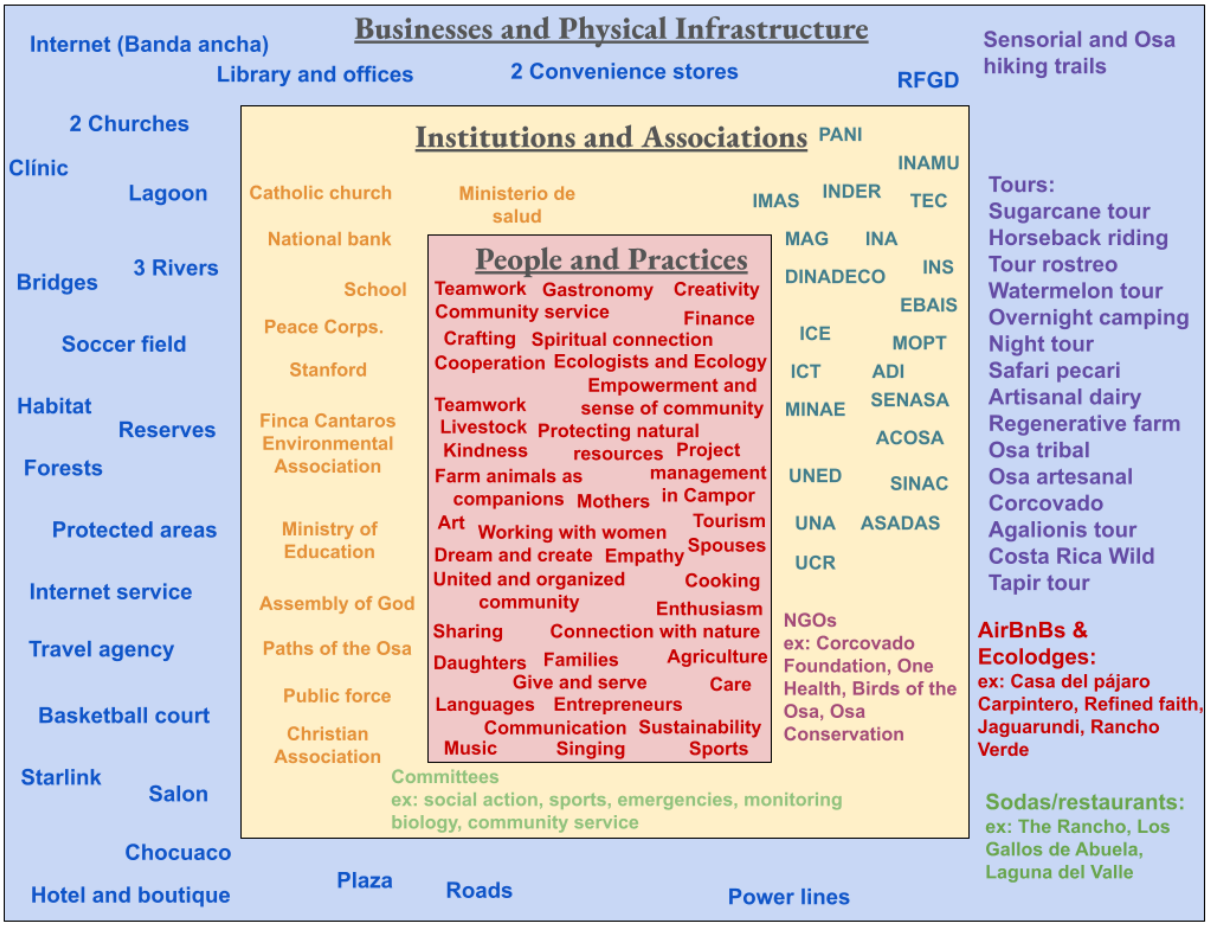


Figure 11. *Matapalo Asset Map.*

Site III: Rancho Quemado



ACRONYM KEY

ACOSA	Osa Conservation Area
ADI	Integral Development Association
ASADAS	Water and Sewer Systems Management Associations
DINADECO	National Directorate of Community Development
EBais	Basic Teams for Comprehensive Health Care
ICE	Institute of Electricity
ICT	Costa Rican Tourism Institute
IMAS	Joint Social Welfare Institute
INA	National Learning Institute
INAMU	The National Institute of Women of Costa Rica
INDER	Osa Rural Development Institute
INS	National Insurance Institute
MAG	Ministry of Agriculture and Livestock
MINAE	Ministry of Environment and Energy
MOPT	Ministry of Public Works and Transportation
PANI	National Children's Board
RFGD	Golfo Dulce Forest Reserve
SENASA	National Animal Health Service
SINAC	National Systems of Conservation Areas
TEC	Costa Rica Institute of Technology
UCR	University of Costa Rica
UNA	National University
UNED	Distance State University

***Figure 12**. Rancho Quemado Asset Map.*

Results & Conclusions

Asset Mapping & The Diverse Economies Framework

The conceptual asset mapping, paired with personal observation and research, illuminates the diverse economic forces at work in the Osa Peninsula (Table 4). Economic forces are present in every category, with the strongest presence in the labor and enterprise columns. Examples present in the community-made asset maps heavily informed these two categories. Tourism and agriculture lay the groundwork for the economic ecosystem of the Osa Peninsula, which here results in more prevalent wage (primarily tours), alternative paid (primarily self-employment), capitalist (primarily restaurants, lodging, and agriculture), and alternative capitalist (primarily government entities and NGOs) examples. The entities present in these categories may be more visible within the community due to advertising, connections to tourism, or other factors that influence visibility. The abundance of examples, however, does not necessarily indicate a higher prevalence of those forces in the region. Further asset mapping efforts and a greater understanding of a non-capitolocentric framework could result in a richer illustration of the economy as it is. Regardless, the quicker recall of examples of NGOs, government entities, restaurants, lodging, agriculture, and other heavily represented categories reflects the perspective of the Osa Peninsula community members that participated in our research. Results of our mapping and future mapping efforts may help both internal and external forces recognize the assets present in the community and their value in the wider economy.

Table 4. *Results of asset mapping within the Diverse Economy Framework (Ruttenberg 2022; Gibson-Graham, 2005).*

Asset Mapping within the Diverse Economy Framework				
Labor	**Enterprise**	**Transactions**	**Property**	**Finance**
Wage	**Capitalist**	**Market**	**Private**	**Mainstream Market**
Local farm, conservation, wildlife, bird watching, horseback riding, & night **tours** (e.g. Artisanal dairy, Tribal bear, Regenerative farm, Artisanal bear, Corcovado, Agalionis tour, Dantas tour, Costa Rica Wild, Trapich tour, Rostreo tour, Sanderas tour, La Fe, Overnight camping, Night tour, Pecari safari), school teachers (e.g. elementary school), construction, landscaping, management of field projects	**Sodas/restaurants** (e.g. Martina's Bar & Restaurant, The Rancho, Los Gallos de Abuela, Laguna del Valle), **Airbnbs & ecolodges** (e.g. Casa del pajaro, Carpintero, Refined Faith, Jaguarundi, Rancho Verde, Casa Arenosa, Casa Luz, Bosque del Cabo Rainforest Lodge, Tumbo de la Olas, Lapa Rios BOENA, Encanta la Vida Resort, El Remanso Lodge, Osa Azul), **agriculture** (e.g. cocoa & rice production), agroecology, livestock, Osa Natural, sustainable tourism (e.g. Caminos de Osa), tourism agencies (e.g. Osa Concierge), internet service (e.g. Starlink),	Markets, market producers (e.g. producers at Los Higuerones), market artisans (e.g. art/crafts), commercial retail, public transportation, fishing	Private property, shops, homes, vehicles, livestock, home gardens	Conventional bank financing (e.g. National Bank), foreign investment in local institutions, foreign landowners

	grocery stores, salons, sport fishing			
Alternative Paid	**Alternative Capitalist**	**Alternative Market**	**Alternative Private**	**Alternative Market**
Self employment (e.g.hiking guides, massage therapist, surf instruction, kayaking excursions in Matapalo, Psycho Tours, yoga groups, ballet class, street vending, beekeeping, entrepreneurs), employment in non-profit organizations, public employment	**Government entities** (e.g. ICE, MOPT, INS, MINAE, SINAC, MAG, SENASA, EBais, INAMU, DINADECO, PANI, INDER, IMAS, ICT, Ministry of Health, Ministry of Education), **public universities** (e.g. INA, UNED, UNA, UCR, TEC), **religious institutions** (e.g. Catholic church), **non-profit organizations** (e.g. ASADAS, Corcovado Foundation, One Health, Birds of the Osa, Osa Conservation), **natural healing** (e.g. acupuncture, herbal medicine), osho rebalancing, gastronomy, law enforcement, solar energy, clinics, schools, home-stay tourism	Tool exchange / lending, providing plants for landscaping, reciprocal work exchange (e.g. Manos Cambiadas program), alternative currency (e.g. Verdes currency at Mercado Verde).	Bridges, roads, trails, sports facilities / spaces (e.g. basketball court, soccer field), Golfo Dulce Forest Reserve (RFGD), Osa Conservation Area (ACOSA), paid public internet spaces, plazas, libraries, reserves & protected areas	Barter agreements, state banks, bioregional financing initiatives (e.g. ReGenerOsa), community insurance
Unpaid	**Non-Capitalist**	**Non-Market**	**Open Access**	**Nonmarket**
Housework (e.g. cooking, cleaning), caregivers, care networks among friends, conscious tourism, families, spiritual connection, sustainability, social action, community service, volunteers, unpaid interns & researchers	Libraries, schools, Shanti Wasi, Friday at Martina's Restaurant & Bar, neighborhood parties, public assemblies, alert chat for surfers, committees (e.g. emergencies, sports, monitoring biology, community service), foreign universities (e.g. Stanford University), Assemblies of God, ADI	Gifts economy & shared talents (e.g. knitting, embroidery, painting, photography, music, singing, performance, dance, art, surfboard repair), medicine song circle, donations (e.g.Holi Cena), home gardens	Ocean, beaches (e.g. Pan Dulce) wildlife, forest, rivers, waterfalls, wild vegetation, community land, natural gardens, open-source internet spaces (e.g. cafe), sharing of goods, services & information	Household exchange, donations (e.g. Holi Cena)

Asset Mapping & The Eight Capitals Framework

Another invaluable result of the participatory asset mapping was the illustration of individual gifts, present in the "People and Practices" section. As we compiled these skillsets, we organized them into the Eight Capitals Framework to identify the most prevalent or widely recognized values (Table 5). Upon compilation, social, living, and cultural capital emerged as the most prevalent values in the minds of community members.

Material, intellectual, and financial capital were the least prevalent at the individual level. These results are an interesting contrast to the assets mapped into the Diverse Economies Framework as the least prevalent of the eight capitals are often the most highly valued in the heavily populated capitalist economy section of Table 4. Although more research is necessary, this finding suggests a significant disconnect between the way communities value different capitals at the individual versus economic level.

Table 5. *Results of People & Practices section of asset mapping organized into the Eight Capitals Framework*

8 Capitals Framework Categories	Responses from the People & Practices Section of Asset Maps
Material	Tool exchange / lending, spaces
Living	Agriculture, agroecology, conservation, beekeeping, spices recreation, traditional Chinese cuisine, fishing, conservation, cocoa production, basil & vegetables, wildlife, providing plants for landscaping, rice production, ecology, environmentalism, connection with nature, livestock, protection of natural resources, farm animals, companion animals, herbal medicine
Spiritual	Happiness, natural healing, osho rebalancing, spiritual connection, medicine song circle, dreaming & creating
Cultural	Listening to music, knitting & embroidery, painting, nature, art, painting on fabric, music/performance/dance/art, medicine song circle, creativity, singing, crafts, dreaming & creating, sustainability
Intellectual	Working in classes
Experiential	Dancing, going for walks, yoga, hiking, surfing & surf instruction, surfboard repair, cooking, construction, photography, landscaping, sports, management of field projects
Social	Love & understanding, mothers, daughters, neighborhood parties, empathy, families, kindness, enthusiasm, working with women, languages, caring, sharing, giving & serving, empowerment, sense of community, community service, united & organized community, communication, teamwork, cooperation, caregivers, foreign landowners
Financial	Street vending, tourism, conscious tourism, market, finance, entrepreneurs

Osa communities as a whole possess various forms of living capital, such as crops that sustain the region, as well as the ocean as an organism, and vast forests (Hunt et al., 2015). Living capitals are transformed into material capital, for instance, through palm oil cultivation (Hunt et al., 2013). Communities are also embedded with experiential and intellectual capital: knowledge surrounding agroecology, nutritional value of local crops, community needs, and spatial and geographical knowledge of the peninsula itself. One example observed within our study was that individuals' knowledge often surpassed the need for maps due to their familiarity with the land. While these communities may be perceived as *less advanced* or *poor* due to their position in the global capitalist economy (Gibson-Graham, 2005), communities such as those that operated

within Mercado Verde at Los Higuerones have deployed local currencies (*Verdes)* to stimulate local exchanges. Traditional currencies (colones, U.S. dollars) were also present, but the *Verdes* allowed for community members to participate in a niche economy with a localized currency that exists outside of the traditional economy.

Social capital is vital within the Osa Peninsula. This capital takes the form of social relationships and connections, often formed upon trust, norms, social networks, and social organization (Hunt et al., 2015). Social capital is required to facilitate coordinated action, and to further drive and enhance economic prosperity and development (Hunt et al., 2015). In the Osa, social bonds allow for individuals to communicate needs, and subsequently receive the care and assistance that is needed in the face of an obstacle, such as lack of transportation or food and agricultural resources. Relying on purely economic (material, financial) capitals robs people of their wellbeing by relying on economic policies to support fulfilling lives while perpetuating cycles of impoverishment and wealth disparities (Hunt et al., 2015).

In a continued shift to valuing diverse assets within a community, the prevalence of values beyond those typically centered in a capitalist framework is a key finding. The community connection, found in social values, illustrates the resilience and interconnectedness already present across the Osa Peninsula. As a team, we traveled to communities across the Osa and can personally attest to the sense of community spread across towns. Within only a month, we recognized friendly faces in places miles apart as groups traveled from place to place to socialize, surf, and experience the natural riches of Costa Rica. This was further exemplified by the frequency of times our local contacts stopped by the side of the road while on a drive to pick up community members who were traveling along the same routes, reflecting informal ride-sharing practices in the absence of more accessible forms of public transportation. Bordered by Corcovado National Park, farms, and the Pacific Ocean, individuals on the Osa also greatly value living capital. This is reflected in the Diverse Economies Framework as well (Table 4) with the prevalence of nature-centered entities. Although not a perfect overlap, it is important to recognize how the prevalent themes in the Eight Capitals framework feed into the foundation of a diverse economy on the Osa.

Geographic Information Systems Mapping

The Geographic Information Systems (GIS) portion of our research sought to combine asset mapping with spatial analysis. We took the community asset maps and used them alongside ground-collected data to visualize assets on a geographic scale. Our partner organizations can utilize our maps to learn what ecological work resonates with community members, what they are aware of, and visualize where these organizations lie in relation to town inhabitants. Raising awareness of ecologically and socially oriented resources is key to fostering community resilience and participation in conservation efforts.

Methodology

Our project included the creation of multiple maps depicting three study zones of the Osa Peninsula: Puerto Jiménez, Matapalo, and Rancho Quemado. Our team collected spatial data through ArcGIS Field Maps using smartphones for GPS signaling. Points were collected both to highlight ecological organizations and to establish familiarity with the area for later analysis.

Upon collection of points, the data points were then transferred to ArcGIS Online where our team downloaded the points as shapefiles for input into ArcGIS. The points were then filtered out and used to create feature classes representing the study zone and organizations that focused on sustainability and/or an improved ecological impact.

Points were cross-checked with places listed by community members in each zone during their asset mapping activities and highlighted based on whether they were or were not mentioned. Next, ArcGIS Pro's python package, arcpy, was implemented to create buffer zones around our study areas based on the furthest organization mapped, thus narrowing the region our maps depict. Lastly, the data was aggregated and organized into three maps, one for each study zone. An overarching map depicting the Osa as a whole was also produced.

Results & Conclusions

Between three and ten ecologically impactful organizations were located for each study zone. Although each region demonstrated the presence of conservation-related organizations or initiatives, density of organizations varied by zone.

Rancho Quemado displayed the highest concentration of community-identified sustainability initiatives through the assets mapping activity. Locations mentioned resided both within and outside the buffer zone, suggesting a strong awareness of conservation measures amongst the local population. Community knowledge informed subsequent mapping of the area. It is relevant to mention Rancho Quemado's community has a mapped "Ruta Biocultural" landmark in their community that depicts different assets such as tours, lodging, and experiences.

Matapalo resulted in a moderate identification of sustainability initiatives. While spatial distribution was sparser than in Rancho Quemado, the buffer analysis confirmed that the majority of listed assets remained

within the study boundary. The assets mapping data was particularly informative as team-collected points in Matapalo were less detailed.

In contrast, Puerto Jiménez, the most densely populated of the three zones, resulted in the lowest number of sustainability-focused locations identified during the assets mapping. Although spatial data confirmed the presence of sustainability-related organizations, they barely appeared in the activity. Compared to the other two zones, the focus of how community members visualized their home was less centered on these ecological initiatives.

Matapalo's participant demographic was composed largely of residents who relocated from other areas which may partially explain the moderate level of identified locations. The perspective of immigrants can influence their ties to the community and how sustainability is centered in their daily lives. For example, practices from their home communities, previous experience with sustainability, personal beliefs and values, as well as expectations of local investments in the environment.

Our mapping illuminates that the recognition of ecologically impactful organizations across the Osa Peninsula is shaped not only by geographic scale but by community structure. The integration of participatory mapping with GIS-based spatial analysis strengthens the analysis of these findings. By cross-referencing GPS-collected data with community-identified assets, this study begins to identify how community members view and interact with the physical and social infrastructure around them.

Limitations

It is important to acknowledge limitations of analysis, such as GPS point collection being discretionary, resulting in potential sampling bias. Furthermore, using smartphone-based GPS accuracy may have led to minor positional errors in point data creation. Additionally, the buffer boundaries narrow observations to finite locations. Lastly, GIS mapping creates a snapshot of a set point in time of study and data is not reflective of changing landscapes and awareness.

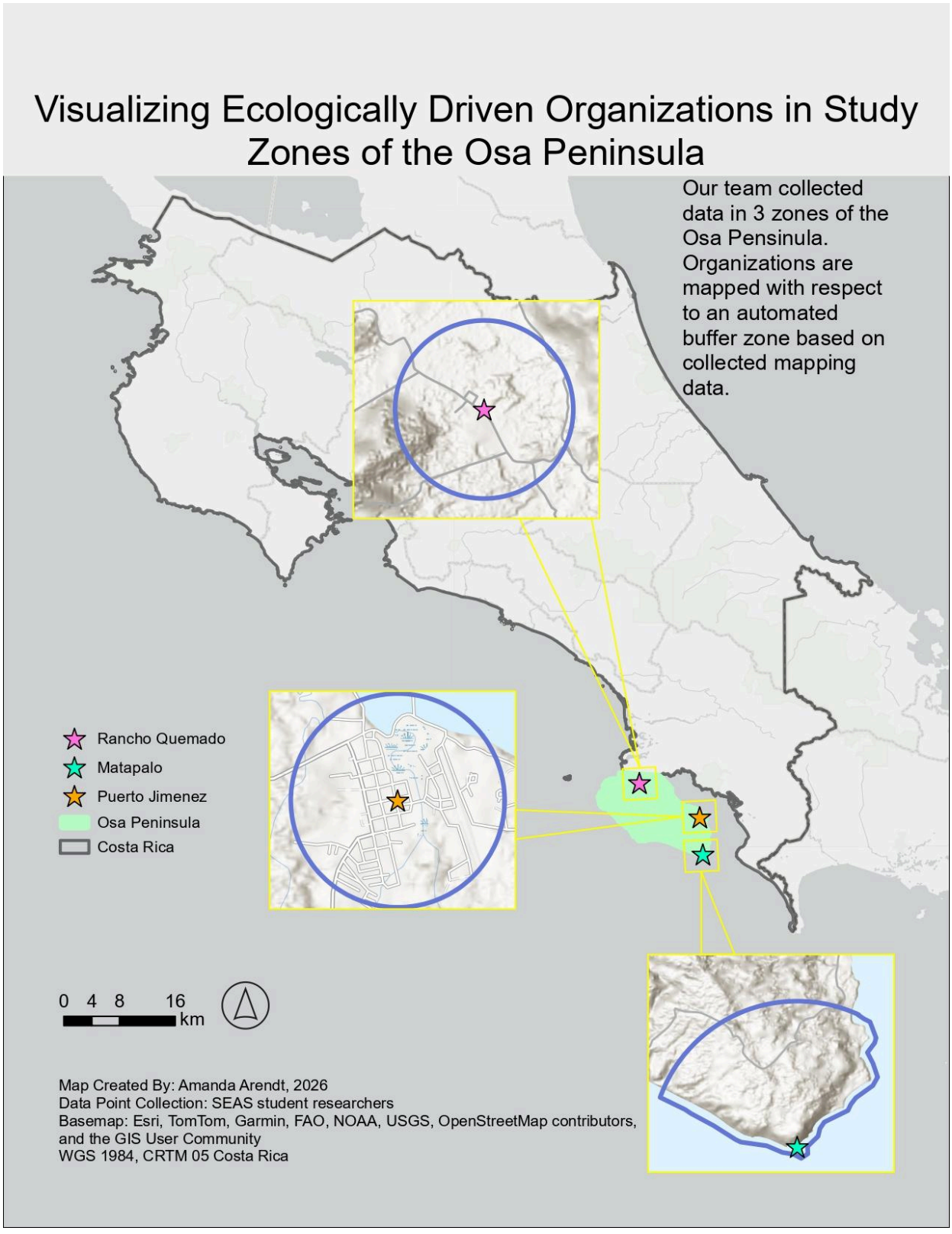


***Figure 13**. Map of Costa Rica & study zones on the Osa Peninsula.*

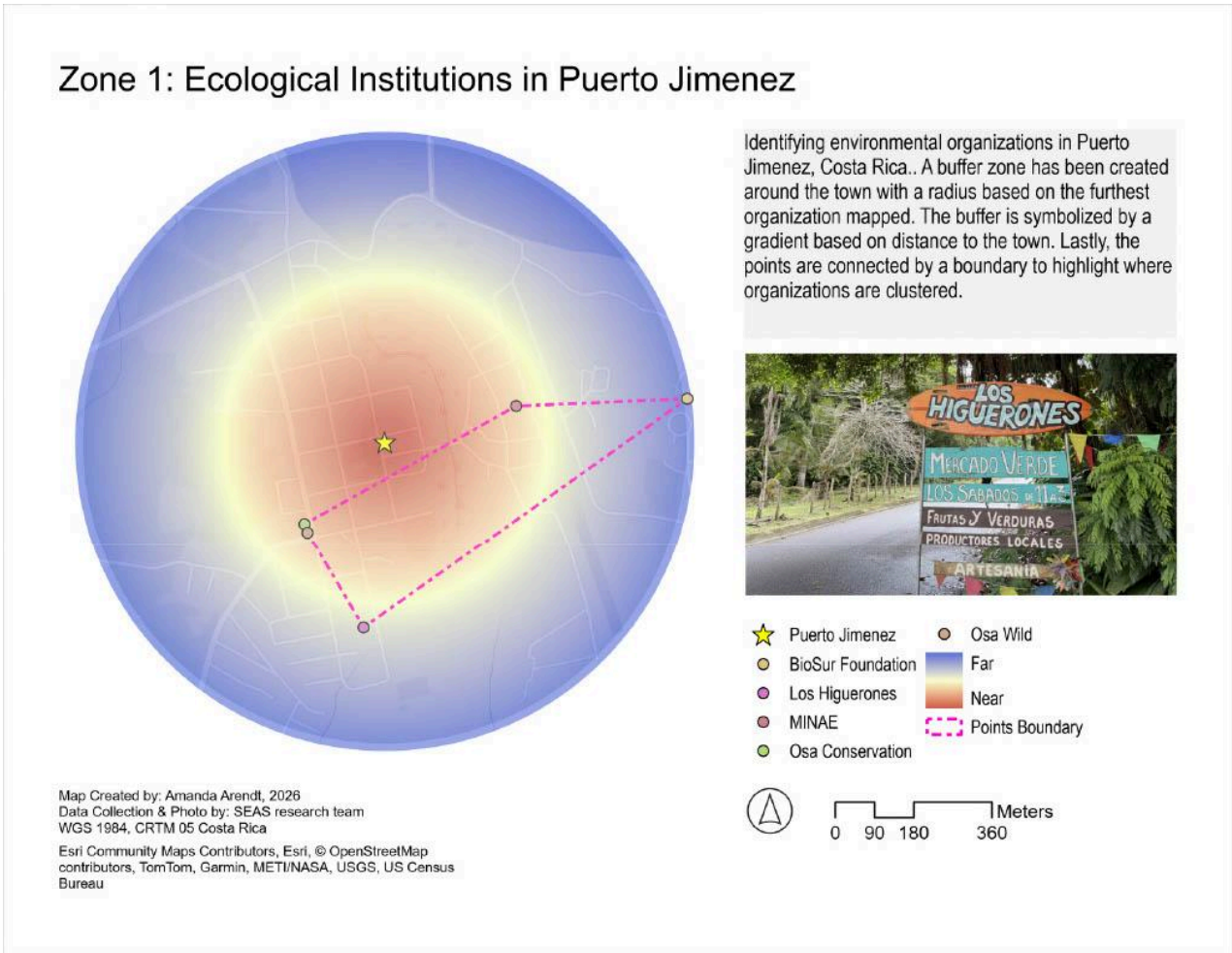


Figure 14*. Map of Puerto Jiménez.*

This map depicts environmental organizations in Puerto Jiménez, symbolized by points. The circle represents a buffer zone that is clipped to represent the distance of the furthest identified organization by community members and our research team. The gradient of the buffer illustrates the distance of organizations by their proximity to the town center.

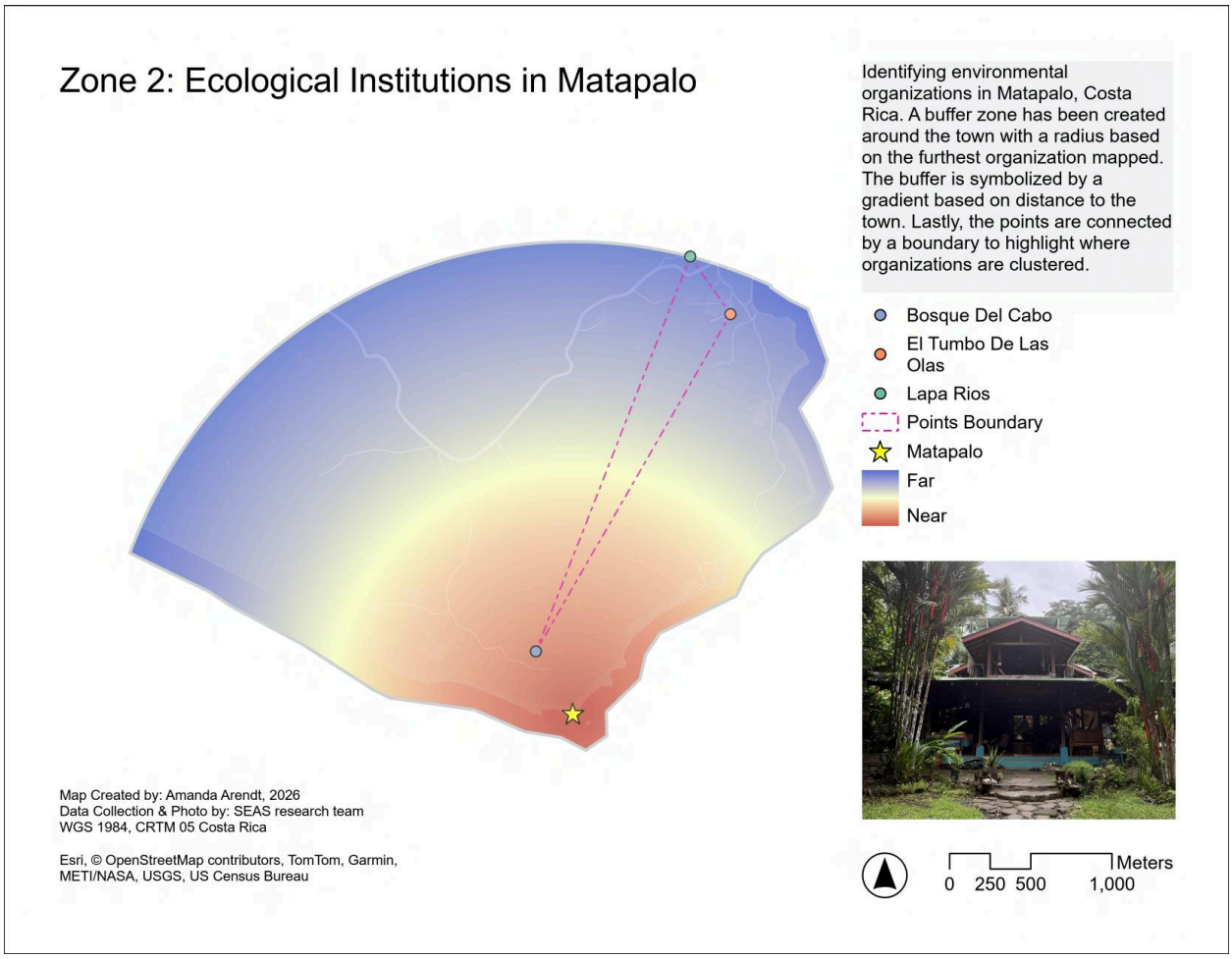


***Figure 15**. Map of Matapalo.*

This map depicts environmental organizations in Matapalo, symbolized by points. The buffer is clipped by the same parameters as the above map but because of Matapalo's coastal location the buffer was additionally clipped to only display land.

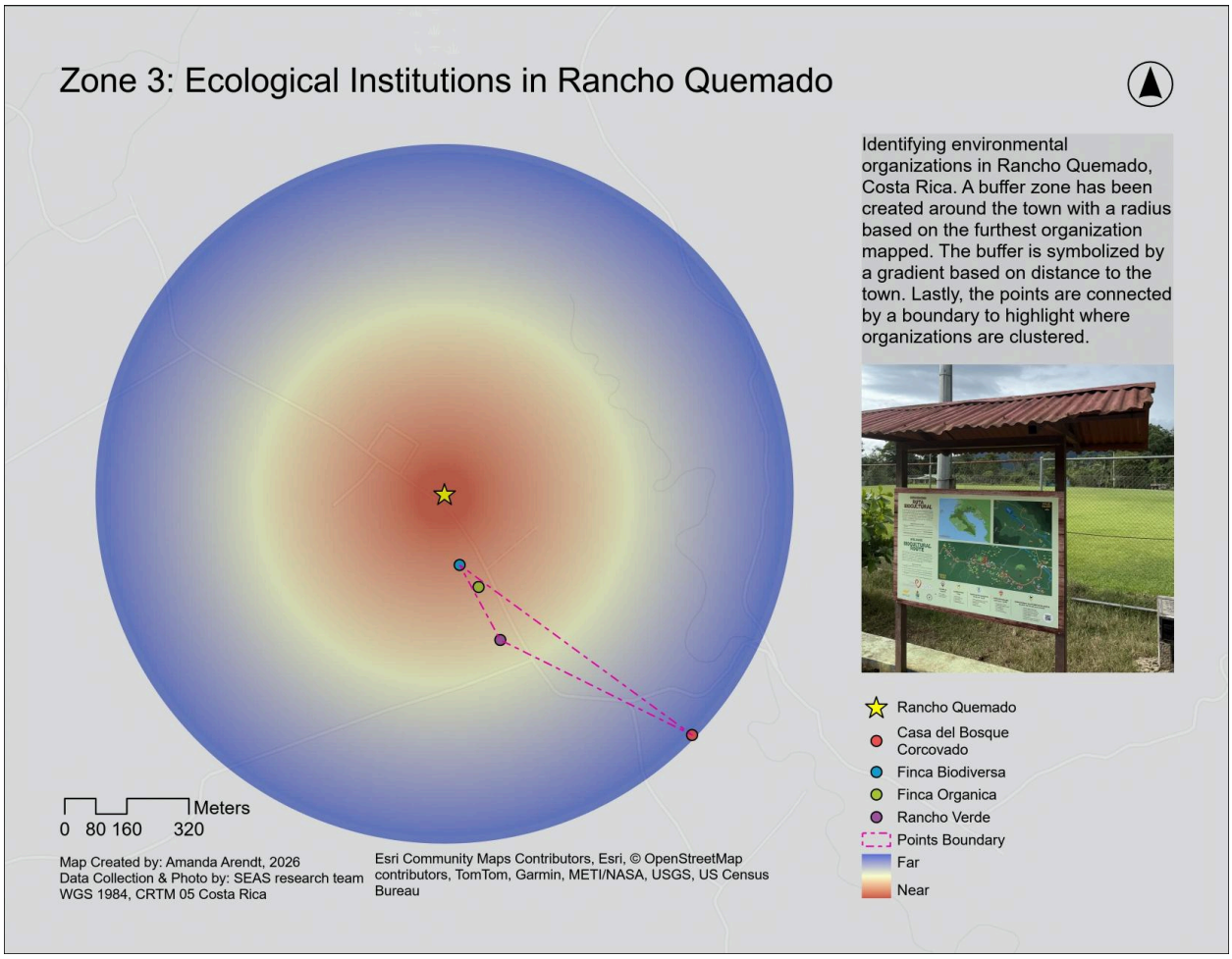


Figure 16. *Map of Rancho Quemado.*

This map depicts environmental organizations in Rancho Quemado, symbolized by points and created using the same parameters as the maps of Puerto Jiménez and Matapalo.

Discussion

Our team was particularly interested in the finding that Rancho Quemado's community identified more sustainability initiatives than Matapalo and Puerto Jiménez. We posit several factors that may account for this difference such as a prior mapping project with Stanford University and smaller population size leading to a more tight knit community and making knowledge sharing easier. It is worth noting these are not hard conclusions but hypothetical reasoning based on our observations and experiences in the Osa Peninsula.

Rancho Quemado's main street is marked with a biocultural route that highlights tours, ecolodges, and surrounding parks which allows for easier community recognition and involvement with ecological initiatives. Furthermore, the agricultural focus of Rancho Quemado's community likely depends on a strong awareness of environmental stewardship. Overall, we recognize the importance of Rancho Quemado's previous engagement

with participatory research and mapping through Stanford and further research might illuminate the role this research plays in long-lasting community awareness.

Looking at Matapalo, we noted that the participant demographic at the asset mapping activity was largely made up of either residents who had relocated from other regions or members who lived only part time in the area. This may account for the moderate identification of sustainability initiatives, however, looking at overall density in Matapalo is needed before drawing conclusions. Matapalo is located in a coastal region of Costa Rica so although the community may not be as permanent as Rancho Quemado's, the moderate identification of environmental organizations may be linked to the recognition that conservation and ecological work is key to the perseverance of the region.

Lastly, Puerto Jiménez had the lowest identification of environmental organizations which we believe is due to the size of the community. With Puerto Jiménez being Osa's largest city, the local economy is more complex and diversified. It is likely that having a broader range of assets leads to more focal points in community mapping beyond a singular enterprise such as sustainability. Additionally, the size of the community can make it more difficult for ecological work to have widespread awareness throughout the community. Hosting more asset mapping activities could function to clarify our results.

Overall, differences in asset mapping across communities displays the multitude of factors that affect how people view their communities and the world around them. We aim to have our research provide a baseline for continuing this work in mapping communities to create data-backed conclusions to the results we highlighted.

Narrative Map

Our team created a story map to be presented to locals with the goal of sharing our journey with the community. As researchers who lived amongst the community for a month conducting qualitative and quantitative research, we aimed to create an interactive display of our time in the Osa to create a visual narrative for our work.

Methodology

A narrative map using ArcGIS Online's storymap feature was created to document the team's journey during our time in Costa Rica. Points were created using spatial data from field mapping that were transferred to the storymap application. Photos from the trip were uploaded and explanatory text was created in Spanish for community members. The subsequent map was uploaded to ArcGIS Online as well as embedded into a presentation created by the core research team for Los Higuerones.

Results & Conclusions

The story map seeks to provide the Puerto Jiménez community with an insight into the journey of the team. During our time in Puerto Jiménez, we interacted with many people across the region and our faces became that of familiarity at Saturday markets, Wednesday dinners, and around town during the month we were there. We aimed to provide context to our work and a clear narrative to the local communities through the story map, as we frequently mingled in community spaces and engaged people through surveys, interviews, and participatory activities such as the Portrait of Gifts and Asset Maps. By creating a visual representation of our journey, we established a connection to our work with those who contributed to our research process.



La Comunidad y La Sostenibilidad en Osa

Un proyecto de investigacion entre la Universidad de Michigan y ReGenerOsa

Amanda Arendt, Fynn Haney, Shreya Mishra, Laurel Petrides, Samantha Wheelis, Jenny Zhang

June 21, 2025

Figure 17*. Link to the ArcGIS Online story map that was presented to community members at Los Higuerones during Mercado Verde.*

Recommendations for Future Work

Overall, our mapping seeks to link the value of participatory mapping to field collected spatial data. Mapping and evaluating sustainability in communities can lead to strengthening the bond between people and the conservation of their land. Future mapping efforts should continue to pair physical with participatory conceptual asset mapping to ensure an accurate illustration of assets.

Conceptual Mapping Process

Future conceptual mapping efforts would benefit from greater researcher-participant interaction. Voice recording asset mapping activities and asking participants to explain what they are writing would enhance the later analysis by clarifying the intention behind each map addition. This was done for the jewelry making and English class portrait of gifts events and allowed for a more accurate analysis without compromising the advantage of a creative, interpretive process. The larger, nested-concept asset maps pushed participants to expand the way they traditionally think about their community. The people & practices section seemed to come easiest, but it was more difficult to think at the institution or infrastructure level. Participation was more enthusiastic when there was a research member beside the map to clarify classification of assets and ask prompting questions about assets in their community. In addition to enhancing the quality of participation, this sort of interaction deepened trust between the research team and community members.

Future researchers – especially those from capitolocentric regions – should also prioritize a strong background of diverse economies and conduct a pilot or test mapping process in a community they are familiar with. This practice will broaden researcher perspective and aid in the recognition of diverse economic assets, particularly when working in tandem with community members not versed in the diverse economic framework.

Physical Mapping Process

Future research should implement in-depth surveying of community knowledge surrounding ecological and sustainable initiatives as well as more structured data collection. If possible, more advanced GPS technology should be employed to collect more precise and numerous data points. Increased data points can be paired with the increased spatial point collection from improved GPS field surveying. Creating heat maps throughout the peninsula that illustrate where conservation and social assets are most prevalent will also help identify community needs and promote resiliency. Including social organizations alongside environmental organizations will illustrate sustainability and connectivity, as well as identify gaps, throughout the peninsula. Further, it would be useful to overlay asset maps onto demographic data to reveal whether there is an equitable distribution of assets.

Intersection of GIS & Conceptual Mapping

When physical mapping is bolstered by community knowledge and participation, it results in a more accurate reflection of community assets. By combining asset mapping with GIS mapping, our partners can visualize underserved areas of towns as well as socioecological strongholds. Therefore we recommend future mapping efforts prioritize accurate recognition of the richness of local assets and enhance regional connectivity and resilience for the purpose of uplifting local communities.

Part IV: Conclusion



Overarching Conclusions & Reflections

Sam's Journal Entry: Life and Research at Los Higuerones

Living at Los Higuerones for a month under strict sustainability guidelines came with a bit of a learning curve. The way we were used to living sustainably in Ann Arbor, Michigan, is very different from living sustainably on the Osa Peninsula. Everything that was not eaten was composted, and it was everyone's responsibility on site to manage and help with the compost. Everyone was expected to contribute to the living situation and it was meant to be a reciprocal learning experience for all involved. At home, we are conditioned to be so individualized and the idea of this type of community living is so different from what we are used to. It was very powerful to be a part of and witness.

We were aided in our research process by many inspiring, strong women. To be able to work alongside them and learn from them was a priceless experience. They continuously emphasized the fact that they wanted us not to do research in an observational way, but a participatory one. This was a very non-traditional research project that wanted us to immerse ourselves in the community and include our own personal thoughts and reflections in the research. We did not want to shy away from the fact that we are outsiders, that this informs how we view things, and that we still have a lot to learn.

The Osa Peninsula's unique community, built upon principles of resource sharing and interpersonal relationships, frames wealth and capital in a different light, highlighting the need for a participatory, holistic process. In our research we explored how community resilience shapes the Osa Peninsula both through broad cross-community asset mapping and the focused lens of Los Higuerones.

Los Higuerones Cooperativa

A core goal and deliverable of our research was to explore the degree to which the current system of Los Higuerones aligns with their vision of community, sustainability, and resilience. After review and analysis, we provided recommendations addressing specific challenges or gaps brought up by community members during our research. Further, we aimed to record how communities harness local assets to build resilience amid long term pressures of overdevelopment, global climate change, and uneven economic opportunity due to globalization. Utilizing a post development lens as well as the frameworks of Diverse Economies and the Eight Capitals, this project highlights how community values and localized knowledge systems, outside of traditional capitalistic structure, offer more comprehensive and grounded approaches to sustainability, development, and resilience.

Our impact assessment revealed that the community views Los Higuerones as having a positive local impact. Participants enjoyed the programs in place and expressed a desire for more programs to be implemented or current ones to be expanded. Local vendors greatly enjoy Mercado Verde as it grants them a designated space to sell their products. Some interview respondents further clarified that they appreciate the stable schedule and not having to sell door-to-door or sit in the hot sun on a busy road. Vendors and consumers also expressed gratitude for the connections they form at the market, including deep bonds and friendships with other vendors as well as visitors. One interviewee even shared that she loves the market because it gives her the opportunity to meet people such as our team. Manos Cambiadas was also greatly valued and – while the practice has existed on

the Osa for generations – Los Higuerones serves as a hub to organize and facilitate Manos Cambiadas efforts. Interviewees noted that Manos Cambiadas alleviates financial stress associated with farm work and builds a sense of camaraderie and connection to volunteers and recipients alike.

The survey results found that there was a large number of foreign residents and visitors participating in Holi Cena and shopping at the Mercado Verde. Respondents expressed positive feelings toward both Los Higuerones activities and a desire for additional opportunities and expansion within the two activities. Survey results revealed a majority sample of English speakers, partially due to the actual demographic composition of program participants and also the research team's own limitations in Spanish language proficiency. There were also gaps in technological proficiency among respondents; a handful struggled with the online survey platform and at times required assistance to complete the survey. In the future, surveys should be made more accessible to residents with different levels of technological, language, and literacy skills by either providing paper copies or having a designated survey facilitator to verbally ask survey questions and record answers. Members of the research team did occasionally serve this role but were limited by the language barrier. Additionally, a focus group setting may yield better results as participants would be surrounded by more community members to foster insights that may not have had the opportunity to come up in surveys or individual interviews. Overall, results found that Los Higuerones is a significant social infrastructure for Puerto Jiménez that functions as a community connector supporting social cohesion and food sovereignty alongside livelihood and ecological benefits. Further, Los Higuerones revealed how community-fueled centers and initiatives lay the foundation for regional resilience. Our assessment was a magnification of the impact of just one of many engines of strength and adaptability in the Osa Peninsula.

Asset Mapping Across the Osa Peninsula

The people of the Osa have a unique connection to each other, the land, their culture, as well as their faith and spirituality that informs their economies and reliance on alternative forms of capital. Using the Diverse Economies Framework, we examined that the Osa Peninsula is filled with many examples of non-capitalistic forms of market. For example, asset mapping identified tool and seed exchange, alternative currencies, and reciprocal work sharing as forms of alternative market and gifts economy, and shared talents as a form of non-market. Economic forces were present in every category of the Diverse Economies Framework with the strongest representation being in labor and enterprise. Tours and agriculture were cited as the most prominent economic practices on the Osa, with examples fitting into the wage, alternative paid, capitalist, and alternative capitalist categories of the Diverse Economies framework. This is in part due to the nature of capitalism still being a prominent system and needing financial resources to be able to survive anywhere in the world, as well as a persistent capitalocentric understanding of economy. In addition, the communities where the asset mapping took place had varying degrees of recognition of sustainability initiatives. Rancho Quemado identified the most, with Matapalo identifying a median amount, and Puerto Jiménez identifying the least out of the three. There is also the chance that additional sustainability initiatives existed in these areas but were not recognized or identified as sustainable initiatives by the community.

GIS mapping allows for a visual representation of how these sustainability initiatives are spatially spread throughout their respective communities. The asset and GIS mapping broadens the scope of community resilience beyond Los Higuerones by including other communities in the Osa, revealing a broader network of institutions strengthening the peninsula. The asset mapping gives us a primary example of how resiliency works

from the inside-out – starting with individual skills and practices and spiraling outward to regional institutions and foundational infrastructure. The three categories: people and practices on the inside, institutions and associations in the middle, and businesses and physical infrastructures as the outermost square provide a visual representation of this idea. It emphasizes the importance of bottom-up and grassroots led initiatives over top-down governmental solutions.

Concluding Reflections

It is important to mention that the connections formed by our clients –Tricia, Tara, and Iris – were instrumental in the success of the research project. At the first Mercado Verde we attended, we held a meeting for any community members interested in learning about or participating in our research process. Over twenty members joined the initial meeting, largely drawn in by the support of our clients. Research on community resilience is difficult to enact without connections and established trust. Because all of our participants knew and trusted Tara, Tricia, or Iris, they were willing to participate and extend their trust and knowledge to us as well. Community involvement in ideation and execution enriched the quality of our research and experience, as well as the final deliverables. For future research, it is imperative to continue collaborating with community organizations that already have established rapport and who will hold the research team accountable for conducting research that benefits and serves the community.

The participatory nature of the project was integral to our research and resulted in a research experience outside the bounds of traditional western educational practice. In opposition to often extractive research processes, this project highlights the potential of reciprocal academic research where there is a mutual exchange of knowledge and benefit. The process and results used can serve as a guiding example of how to use participatory action research for future academic studies and assessments. Continuing to use a post-development lens when conducting international sustainability-adjacent research is critical for understanding how countries and their various communities function outside of a capitalist regime. It also ensures that communities retain autonomy and control over research being conducted in and on their communities.

The Osa Peninsula is home to a truly inspiring community full of individuals and organizations dedicated to uplifting the wellbeing of both people and the environment. Their efforts show a commitment toward collaboration, stewardship, and long-term sustainability while highlighting their individual and collective resilience. The findings of this study highlight that resilience is not only an individual quality but something built through everyday relationships, shared spaces, and systems of mutual support that strengthen both social and ecological well-being. This project also emphasizes that local initiatives are already actively participating in regenerative and sustainability-oriented practices in the face of climate change and globalization pressures. Continuing to recognize and support these forms of community-led organizing is critical for understanding how sustainability functions outside of dominant development frameworks. It reinforces the importance of centering local knowledge and experience when building strategies for resilience.

Part V: Appendices



Appendix A: Surveys

Survey Questions

Public Market Survey (English)

Introduction:

Hello! Thank you for taking Los Higuerones' market opinion survey. We would like to hear about your market experience and a bit about your background. The survey will take you about 15 minutes to complete. We appreciate all of your feedback! Please hit the arrow at the bottom of the page to continue on to the rest of the survey.

What is your age? (free response)

What is your gender? (multiple choice)

- Woman
- Man
- Non-Binary
- Not listed, please specify:
- Choose not to answer

Do you partake in local markets as a consumer or producer? (multiple choice)

- Consumer (customer)
- Producer (farmer, stall owner, etc)
- Both

What is your Residential Status on the Osa? (multiple choice)

- Indigenous to the Peninsula
- Costa Rican from the Peninsula
- Resident originally from other part of Costa Rica
- Foreign resident
- Foreign visitor
- Visitor from other part of Costa Rica

How long have you been a resident in the Osa Peninsula? (multiple choice)

- Indigenous / Ngäbe
- Born on the Peninsula
- Less than 5 years
- 5-10 years
- 10-20 years
- 20-30 years

- 30+ years
- Not a resident

What is your total combined family income per month? (multiple choice)

- Less than CRC 400,000 (USD $787)
- CRC 400,000 - 929,000 (USD $787 - $1828)
- CRC 929,001 - 1,363,000 (USD $1828 - $2682)
- CRC 1,363,001 - 2,392,000 (USD $2682 - $4704)
- CRC 2,392,000 - 4,783,000 (USD $4704 - $9413)
- Above CRC 4,783,000 (USD $9413)
- I don't know
- Choose not to answer

How accessible is the market to community members of various backgrounds (financial, physical, racial, ethnic, etc.)? (multiple choice)

- Extremely
- Very
- Moderately
- Slightly
- Not at all

If you would like to explain your answer to the question above, please do so here: (free response)

What is the highest level of education you received? (multiple choice)

- No formal education
- Less than a high school diploma
- High school degree or equivalent
- Some college, no degree
- Associate degree
- Bachelor's degree
- Master's degree
- Professional degree
- Doctorate

What is your current employment status? (Check all that apply)

- Employed for wages
- Self-employed
- Unemployed
- Stay-at-home caregiver
- A student
- Retired

- Not listed (specify):

What is your occupation? (free response)

What is your current marital status? (multiple choice)

- Single, never married
- Married

How many people live in your household? (multiple choice)

- 1
- 2
- 3
- 4
- More than 4

What community events hosted by Los Higuerones do you participate in? (Check all that apply)

- El Mercado Verde - producer/seller
- El Mercado Verde - consumer/buyer
- Manos Cambiadas - host farmer
- Manos Cambiadas - farmer volunteer
- Manos Cambiadas - organizational volunteer
- Community dinners
- Other events? Please specify:

How strongly do you feel a sense of community within the market? (multiple choice)

- Very strongly
- Strongly
- Neutral
- Little
- Very little

How often do you come to the market?

- Weekly
- Bi-weekly
- Monthly
- Occasionally

Do you bring other people to the market with you? (Check all that apply)

- No, I come alone
- I bring friends
- I bring adult family members/spouse

- I bring my children
- I bring my employer/employee

Who are you shopping for? (Check all that apply)

- Myself
- Friends
- Adult family members/spouse
- My children
- My employer/employee

How much of your weekly food do you get at the market? (multiple choice)

- Almost all
- Half
- Some
- Very little

Where else do you get your food? What are the differences between getting your food here compared to other sources? (Free response)

What do you like about the market? (Free response)

What would you improve about the market? (Free response)

Beyond getting your food and groceries, what other benefits do you feel you get from coming to the market? (Check all that apply)

- A place to socialize with friends and neighbors
- Healthier, fresher food
- A chance to support the local economy
- Reduced environmental impact
- Not listed, please specify:

How much do you agree or disagree with the following statements:

- Los Higuerones strengthens the local community. (multiple choice)
    - Strongly disagree
    - Somewhat disagree
    - Neither agree or disagree
    - Somewhat agree
    - Strongly agree
- Los Higuerones contributes positively to my livelihood. (multiple choice)
    - Strongly disagree
    - Somewhat disagree
    - Neither agree or disagree

    - Somewhat agree
    - Strongly agree
- I would like to see more vendors at Los Higuerones. (multiple choice)
    - Strongly disagree
    - Somewhat disagree
    - Neither agree or disagree
    - Somewhat agree
    - Strongly agree

End of Survey:

We thank you for your time spent taking this survey. Your response has been recorded.

Public Market Survey (Spanish)

Introducción: ¡Hola! Gracias por responder a la encuesta de opinión sobre el mercado de Los Higuerones. Nos gustaría conocer sobre su experiencia en el mercado. La encuesta le llevará unos 15 minutos. Agradecemos todos sus comentarios. Por favor, pulse la flecha en la parte inferior de la página para continuar con el resto de la encuesta.

¿Cuál es su edad? (respuesta libre)

¿Cuál es su género? (opción múltiple)

- Mujer
- Hombre
- No binario
- No está en la lista, por favor, especifique:
- Opto por no contestar

¿Participa en los mercados locales como consumidor o como productor? (opción múltiple)

- Consumidor (cliente)
- Productor (agricultor, propietario de un puesto, etc.)
- Ambos

¿Cuál es su estatus residencial en Osa? (opción múltiple)

- Indígena de la Península
- Costarricense de la Península
- Costarricense de otra parte del país
- Residente extranjero
- Visitante extranjero
- Visitante de otra parte de Costa Rica

¿Cuánto tiempo lleva residiendo en la Península de Osa? (opción múltiple)

- Indígena / Ngäbe
- Nacido en la Península
- Menos de 5 años
- 5-10 años
- 10-20 años
- 20-30 años
- Más de 30 años
- No residente

¿Cuál es el ingreso total combinado de su familia por mes? (opción múltiple)

- Menos de 400.000 CRC (787 USD)
- CRC 400.000 - 929.000 (USD $787 - $1828)
- CRC 929,001 - 1,363,000 (USD $1828 - $2682)
- CRC 1,363,001 - 2,392,000 (USD $2682 - $4704)
- CRC 2,392,000 - 4,783,000 (USD $4704 - $9413)
- Por encima de CRC 4.783.000 (USD $9413)
- No sé
- Elijo no contestar

¿En qué medida es accesible el mercado para los miembros de la comunidad de diversos orígenes (financieros, físicos, raciales, étnicos, etc.)? (opción múltiple)

- Bastante
- Muy
- Moderadamente
- Poco
- Casi no accesible

Si desea explicar su respuesta, hágalo aquí: (respuesta libre)

¿Cuál es el nivel más alto de educación que ha recibido? (opción múltiple)

- Escuela
- Secundaria o Colegio
- Título de bachillerato o equivalente
- Algunos estudios universitarios, sin título
- Diplomatura
- Licenciatura
- Máster
- Título profesional
- Doctorado

¿Cuál es su situación laboral actual? (Marque todo lo que corresponda)

- Asalariado
- Por cuenta propia / auto-empleo
- Desempleado
- Ama de casa
- Estudiante
- Pensionado
- No está en la lista (especifique):

¿Cuál es su ocupación? (respuesta libre)

¿Cuál es su estado civil actual? (opción múltiple)

- Soltero
- Casado/a

¿Cuántas personas viven en su hogar? (opción múltiple)

- 1
- 2
- 3
- 4
- Más de 4

¿En qué eventos comunitarios organizados por Los Higuerones participa? (marque todo lo que corresponda)

- El Mercado Verde - productor/vendedor
- El Mercado Verde - consumidor/comprador
- Manos Cambiadas - agricultor anfitrión
- Manos Cambiadas - agricultor voluntario
- Manos Cambiadas - voluntario de la organización
- Cenas comunitarias
- ¿Otros eventos? Por favor, especifique:

¿Hasta qué punto tiene un sentimiento de comunidad dentro del mercado? (Niveles) (opción múltiple)

- Muy fuerte
- Fuerte
- Neutral
- Poco
- Muy poco

¿Con qué frecuencia visita al mercado? (opción múltiple)

- Semanalmente
- Quincenalmente

- Mensualmente
- Ocasionalmente

¿Trae a otras personas al mercado con usted? (marque todas las que procedan)

- No, vengo solo
- Vengo con amigos
- Traigo a familiares adultos/cónyuge
- Vengo con mis hijos
- Traigo a mi jefe/empleado

¿Para quién compra? (marque todas las casillas que procedan)

- Para mí
- Amigos
- Miembros adultos de la familia/cónyuge
- Mis hijos
- Mis empleados

¿Qué proporción de su alimentación semanal compra en el mercado? (opción múltiple)

- La mayoría
- La mitad
- Algo
- Muy poca

De dónde más obtiene sus alimentos? ¿Cuáles son las diferencias entre obtener sus alimentos aquí y en estas otras fuentes? (respuesta libre)

Qué le gusta del mercado? (respuesta libre)

¿Qué mejoraría del mercado? (respuesta libre)

Además de comprar alimentos y productos de alimentación, ¿qué otros beneficios cree que obtiene al visitar el mercado? (marque todo lo que corresponda)

- Un lugar para socializar con amigos y vecinos
- Alimentos más sanos y frescos
- Una oportunidad de apoyar la economía local
- Reducción del impacto medioambiental
- No está en la lista, por favor, especifique:

¿En qué medida está de acuerdo o en desacuerdo con las siguientes afirmaciones?

- Los Higuerones fortalece la comunidad local. (opción múltiple)
    - Totalmente en desacuerdo
    - Algo en desacuerdo

    - Ni de acuerdo ni en desacuerdo
    - Algo de acuerdo
    - Totalmente de acuerdo
- Los Higuerones contribuye positivamente a mi subsistencia. (opción múltiple)
    - Totalmente en desacuerdo
    - Algo en desacuerdo
    - Ni de acuerdo ni en desacuerdo
    - Algo de acuerdo
    - Totalmente de acuerdo
- Me gustaría ver más vendedores en Los Higuerones. (opción múltiple)
    - Totalmente en desacuerdo
    - Algo en desacuerdo
    - Ni de acuerdo ni en desacuerdo
    - Algo de acuerdo
    - Totalmente de acuerdo

Fin de la encuesta: Le agradecemos el tiempo que ha dedicado a realizar esta encuesta. Su respuesta ha quedado registrada.

Community Dinner Survey (English)

What is your age? (Free response)

What is your gender? (Multiple Choice)

- Woman
- Man
- Non-binary
- Choose not to answer

What is your Residential Status on the Osa? (multiple choice)

- Indigenous to the Peninsula
- Costa Rican from the Peninsula
- Resident originally from other part of Costa Rica
- Foreign resident
- Foreign visitor
- Visitor from other part of Costa Rica

How long have you been a resident in the Osa Peninsula? (multiple choice)

- Indigenous / Ngäbe
- Born on the Peninsula
- Less than 5 years
- 5-10 years

- 10-20 years
- 20-30 years
- 30+ years
- Not a resident

What is your occupation and/or what do you do for a living? (Free response)

What is your role in the community dinners?

- I provide/cook the community dinners
- I attend the community dinners

How often do you come to community dinner? (multiple choice)

- Weekly
- Biweekly
- Monthly
- A few times a year
- Other

How far did you travel to get here (approximately)? (multiple choice)

- 0-5 km
- 5-10 km
- 10 or more km

How did you learn about the Los Higuerones community dinners? (free response)

What community events hosted by Los Higuerones do you participate in? (Check all that apply)

- El Mercado Verde - producer/seller
- El Mercado Verde - consumer/buyer
- Manos Cambiadas - host farmer
- Manos Cambiadas - farmer volunteer
- Manos Cambiadas - organizational volunteer
- Community dinners
- Other events? Please specify:

What do you like about the community dinners? (free response)

What would you improve about the community dinners? (Ex. More food, less food, more activities, etc.) (Free response)

Beyond the meals, are there other benefits you get from coming here? (Ex: A place to socialize with friends and neighbors, a comfortable place to work or plan activities, etc.) (free response)

How accessible do you think the community dinners are to people of different backgrounds? (Free response)

How much do you agree or disagree with the following statements?

- Los Higuerones strengthens the local community. (multiple choice)
    - Strongly disagree
    - Somewhat disagree
    - Neither agree or disagree
    - Somewhat agree
    - Strongly agree
- Los Higuerones contributes positively to my livelihood. (multiple choice)
    - Strongly disagree
    - Somewhat disagree
    - Neither agree or disagree
    - Somewhat agree
    - Strongly agree

End of survey: We thank you for your time spent taking this survey. Your response has been recorded.

Community Dinner Survey (Spanish)

Introducción: ¡Hola! Gracias por responder a la encuesta de opinión sobre las cenas comunitarias de Los Higuerones. Nos gustaría conocer sobre su experiencia en las cenas comunitarias. La encuesta le llevará unos 15 minutos. Agradecemos todos sus comentarios. Por favor, pulse la flecha en la parte inferior de la página para continuar con el resto de la encuesta.

¿Cuál es su edad? (respuesta libre)

¿Cuál es su género? (opción múltiple)

- Mujer
- Hombre
- No binario
- No está en la lista, por favor, especifique:
- Optó por no contestar

¿Cuál es su estatus residencial en Osa? (opción múltiple)

- Indígena de la Península
- Costarricense de la Península
- Costarricense de otra parte del país
- Residente extranjero
- Visitante extranjero
- Visitante de otra parte de Costa Rica

¿Cuánto tiempo lleva residiendo en la Península de Osa? (opción múltiple)

- Indígena / Ngäbe
- Nacido en la Península
- Menos de 5 años
- 5-10 años
- 10-20 años
- 20-30 años
- Más de 30 años
- No residente

¿Cuál es su ocupación y/o a qué se dedica? (respuesta libre)

¿Cuál es tu función en las cenas comunitarias? (opción múltiple)

- Yo preparo/cocino las cenas comunitarias.
- Asisto a las cenas comunitarias.

¿Con qué frecuencia acude a la cena comunitaria? (opción múltiple)

- Semanalmente
- Quincenalmente
- Mensualmente
- Varias veces al año
- Otro

¿Qué distancia ha recorrido para llegar hasta aquí (aproximadamente)? (opción múltiple)

- 0-5 km
- De 5 a 10 km
- 10 km o más

¿Cómo se enteró de esta cena comunitaria? (respuesta libre)

¿En qué eventos comunitarios organizados por Los Higuerones participa? (marque todos los que correspondan)

- El Mercado Verde - productor/vendedor
- El Mercado Verde - consumidor/comprador
- Manos Cambiadas - agricultor anfitrión
- Manos Cambiadas - agricultor voluntario
- Manos Cambiadas - voluntario de la organización
- Cenas comunitarias
- ¿Otros eventos? Por favor, especifique:

¿Qué le gusta de las cenas comunitarias? (respuesta libre)

¿Qué mejoraría de las cenas de la comunidad? (Ejemplos: Más comida, menos comida, más actividades, etc.) (respuesta libre)

Más allá de las comidas, ¿hay otros beneficios que obtenga al participar en las cenas? (Ejemplos: Un lugar para socializar con amigos y vecinos, un lugar cómodo para trabajar o planificar actividades, etc.) (respuesta libre)

¿En qué medida cree que las cenas de la comunidad son accesibles para personas de distintas situaciones socioeconómicas? (respuesta libre)

¿En qué medida está de acuerdo o en desacuerdo con las siguientes afirmaciones?

- Los Higuerones fortalecen la comunidad local. (opción múltiple)
    - Totalmente en desacuerdo
    - Algo en desacuerdo
    - Ni de acuerdo ni en desacuerdo
    - Algo de acuerdo
    - Totalmente de acuerdo
- Los Higuerones contribuye positivamente a mi subsistencia. (opción múltiple)
    - Totalmente en desacuerdo
    - Algo en desacuerdo
    - Ni de acuerdo ni en desacuerdo
    - Algo de acuerdo
    - Totalmente de acuerdo

Fin de la encuesta: Le agradecemos el tiempo que ha dedicado a realizar esta encuesta. Su respuesta ha quedado registrada.

Appendix B: Interviews

Interview Guide

Public Market Interview Questions (English)

Introduction:

- *Introduce ourselves as social science researchers from the University of Michigan School for Environment and Sustainability*
- *Ask name, age, occupation, residency status, permission to audio-record*

I. Farmers/Producers
- Regenerative Agriculture
  - How do you decide what to grow and what to sell?
    a) Potential follow-up: Does what you grow and sell change based on the season? Or on other factors?
  - What things do you do on your farm to make your crops as successful and abundant as possible?
    a) Potential follow-up: Do you plant different crops together?
    b) Potential follow-up: Do you add anything to the soil to make it richer?
  - What [sustainability] practices or methods do you implement in your farm?
    a) Follow-up: How did you learn these practices or methods?
    b) Potential follow-up: Do you use any pesticides or fertilizers? Why or why not?
    c) Potential follow-up: Do you use circular farming or regenerative agriculture?
      (1) **Circular farming**: an approach to farming that minimizes waste and maximizes the reuse of agricultural byproducts. Waste is not discarded, but is instead reused. The principles are: optimum use of land and resources to meet food needs, production of priority food crops, planting successive crops for optimal use of fields, adding mixed products to the rotation, feeding livestock crop residue, using livestock waste as a biofertilizer
      (2) **Regenerative agriculture**: a farming approach that aims to improve soil health, enhance biodiversity, and increase water retention. The process of restoring degraded soils using management practices based on ecological principles
    d) Potential follow-up: Do you compost? If not, why not?
  - Are you thinking about climate change and sustainability during the process of growing, harvesting, and selling your goods?
  - Are there resources that you need or want to practice sustainability that you currently don't have access to?
- Food Sovereignty

        - How important is it to you to have locally sourced, healthy food?
        - How much of your crops do you sell at the market?
            a) What do you do with the crops that you choose not to sell at the market?
        - What do you do with the crops you have leftover from the market?
        - Do you have any cultural connections to the food you're growing or eating?
    - Questions about the role the market plays in their lives
        - How has the market changed the way you produce your goods?
        - How has the market changed the way you sell your goods?
        - What percent of your family's income comes from selling goods at the market?
            a) Follow-up question: Have you noticed a change in your income now that you're a part of the market?
        - How many people in the household are supported by the income earned from the market?
        - **Beyond the income that the market provides for you and your family, are there other benefits to coming here?**
            a) Make sure to follow-up on their answer, have them expand on it
        - How has the market changed the way you produce and sell your goods?
        - If you have employees or partners on your farm, how do you ensure fair wages and working conditions?
        - How do you feel about the verde money system?
            a) What challenges are associated with it?
            b) What are the benefits associated with it?
            c) Do you like this alternative approach to buying/selling or do you prefer traditional colones?
    - **Obstacles and Benefits to farming in a place like the Osa**
        - What barriers are there to farming in a place like the Osa? What benefits are there?
            a) Physical
            b) Financial
            c) Societal
        - Are there barriers that prevent you from selling produce?
        - If you don't experience any barriers to farming here, do you have any neighbors, friends, or peers that face barriers?
            a) Potential follow-up: Asking more about their neighbors, friends, obstacles those farmers have experienced

II. <u>Artisans</u>
    - Questions about what they sell
        - What do you sell at the market?
        - How do you decide what to sell?
        - Are you thinking about climate change and sustainability during the process of making and selling your goods?
    - Questions about the role the market plays in their lives
        - How has the market changed the way you produce your goods?
        - How has the market changed the way you sell your goods?

- What percent of your family's income comes from selling goods at the market?
- How many people in the household are supported by the income earned from the market?
- **Beyond the income that the market provides for you and your family, are there other benefits to coming here?**
    a) Make sure to follow-up on their answer, have them expand on it
- If you need labor beyond yourself for a given task, how do you approach that? (family assistance, manos cambiadas, volunteer labor, hiring labor, etc.)
- How do you feel about the verde money system?
    a) What challenges are associated with it?
    b) What are the benefits associated with it?
    c) Do you like this alternative approach to buying/selling or do you prefer

Public Market Interview Questions (Spanish)

I. Agricultores/Productores
- Agricultura regenerativa
    - ¿Cómo decide qué cultivar y qué vender?
        a) Posible continuación: ¿Cambia lo que cultiva y vende en función de la temporada? ¿O en función de otros factores?
    - ¿Qué hace en tu finca para que sus cosechas tengan el mayor éxito y sean lo más abundantes posible?
        a) Posible continuación: ¿Siembra diferentes cultivos juntos?
        b) Posible continuación: ¿Echa algo al suelo para enriquecerlo?
    - ¿Cuáles prácticas o métodos [de sostenibilidad] se aplican en su finca?
        a) Posible continuación: ¿Cómo aprendiste estas prácticas o métodos?
        b) Posible continuación: ¿Utiliza pesticidas o fertilizantes? ¿Por qué o por qué no?
        c) Posible seguimiento: ¿Utiliza la agricultura circular o la agricultura regenerativa?
            (1) **Agricultura circular**: enfoque de la agricultura que minimiza los residuos y maximiza la reutilización de los subproductos agrícolas. Los residuos no se desechan, sino que se reutilizan. Los principios son: uso óptimo de la tierra y los recursos para satisfacer las necesidades alimentarias, producción de cultivos alimentarios prioritarios, plantación de cultivos sucesivos para un uso óptimo de los campos, adición de productos mixtos a la rotación, alimentación del ganado con residuos de cultivos, uso de residuos ganaderos como biofertilizante
            (2) **Agricultura regenerativa**: enfoque agrícola que pretende mejorar la salud del suelo, aumentar la biodiversidad e incrementar la retención de agua; proceso de restauración de suelos degradados mediante prácticas de gestión basadas en principios ecológicos.

        d) Posible seguimiento: ¿hace compost? En caso negativo, ¿por qué no?
    - ¿Piensa en el cambio climático y la sostenibilidad durante el proceso de cultivo, cosecha y venta de tus productos?
    - ¿Hay recursos que necesita o desea para practicar la sostenibilidad a los cuales actualmente no tiene acceso?
- Soberanía alimentaria
    - ¿Qué importancia tiene en su vida la disponibilidad de alimentos sanos y de origen local?
    - ¿Qué cantidad de sus cosechas vende en el mercado?
        a) ¿Qué hace con los productos que no vende en el mercado?
    - ¿Qué hace con lo que le sobra del mercado?
    - ¿Tiene algún vínculo cultural con los alimentos que cultiva o consume?
- Preguntas sobre el papel que desempeña el mercado en sus vidas
    - ¿Cómo ha cambiado el mercado su forma de producir?
    - ¿Cómo ha cambiado el mercado su forma de vender sus productos?
    - ¿Qué porcentaje de los ingresos de su familia procede de la venta de productos en el mercado?
        a) Pregunta complementaria: ¿Ha notado algún cambio en sus ingresos ahora que forma parte del mercado?
    - ¿Cuántas personas de la familia viven de los ingresos obtenidos en el mercado?
    - **Además de los ingresos que el mercado les proporciona a usted y a su familia, ¿hay otras ventajas de venir al mercado?**
        a) Asegúrate de hacer un seguimiento de su respuesta, pídeles que la amplíen
    - ¿Cómo ha cambiado el mercado su forma de producir y vender?
    - Si cuenta con empleados o socios, ¿cómo garantiza salarios y condiciones de trabajo justos?
    - ¿Qué opina del sistema monetario verde?
        a) ¿Cuáles dificultades existen?
        b) ¿Cuáles ventajas tiene?
        c) ¿Le gusta este método alternativo de compraventa o prefiere los colones tradicionales?
- **Obstáculos y ventajas de la agricultura en un lugar como Osa**
    - ¿Cuáles obstáculos existen para cultivar en un lugar como Osa? ¿Cuáles son las ventajas?
        a) Físicos
        b) Financieros
        c) Sociales
    - ¿Existen barreras que le impiden vender sus productos?
    - Si no tiene ningún obstáculo para cultivar aquí, ¿tiene vecinos, amigos o compañeros que se enfrenten a ciertos obstáculos?
        a) Posible seguimiento: Preguntar más sobre sus vecinos, amigos, obstáculos que han experimentado esos agricultores

II. <u>Artesanos</u>

- Preguntas sobre lo que venden
  - ¿Qué vende en el mercado?
  - ¿Cómo decide qué vender?
  - ¿Piensa en el cambio climático y la sostenibilidad durante el proceso de fabricación y venta de sus productos?
- Preguntas sobre el papel que desempeña el mercado en sus vidas
  - ¿Cómo ha cambiado el mercado su forma de producir?
  - ¿Cómo ha cambiado el mercado su forma de vender sus productos?
  - ¿Qué porcentaje de los ingresos familiares procede de la venta de productos en el mercado?
  - ¿Cuántas personas de la familia viven de los ingresos obtenidos en el mercado?
  - **Además de los ingresos que el mercado les proporciona a usted y a su familia, ¿hay otras ventajas de venir al mercado?**
    a) Asegúrate de hacer un seguimiento de su respuesta, pídeles que la amplíen
  - Si necesita de más mano de obra para una tarea determinada, ¿cómo lo consigue? (ayuda familiar, manos cambiadas, trabajo voluntario, contratación de mano de obra, etc.)
  - ¿Qué opina del sistema monetario verde?
    a) ¿Cuáles dificultades existen?
    b) ¿Cuáles ventajas tiene?
    c) ¿Le gusta este método alternativo de compraventa o prefiere los colones tradicionales?

Farming Rotational Program (Manos Cambiadas) Interview Questions (English)

I. <u>Farmers who invite/host</u>
- Experiences and Behaviors
  - Do you also sell your goods at the Mercado Verde?
  - How often do you receive support on your farm?
    a) How long have you been utilizing this support?
  - What sort of activities or tasks do you seek help for?
  - How are you affected when you are unable to receive help from this program?
  - How has your experience as a farmer changed since you started participating in this program?
- Opinion/Values
  - What is the best part of this program?
  - What would you improve about this program?
  - Beyond the aspects of getting physical help, what other benefits do you gain from this program?
  - Do you feel a greater sense of community because of this program?
  - **Do you find that valuable skills are shared by participating in this program?**
    a) Follow-up: What are the skills that are shared?
- Farming Practices

        - What crops are grown on your farm and why?
        - Do you also raise livestock? If so, what animals?
        - Do you sell any of your crops?
            a) Potential follow-up: What percentage of your crops do you sell vs consume yourself?
        - **Walk-through**: Can you show us what practices you implement on your farm?
            a) Potential follow-up: Are there any unique practices you do that are different from other farmers?
            b) Potential follow-up: Do you implement any curricular farming or regenerative agriculture practices?
        - Do you utilize any pesticides or fertilizers?
    - Feelings
        - How does receiving help from local volunteers and visitors make you feel?

II. Farmers who participate as workers/volunteers

- Experience/Behavior
    - How long have you been volunteering with this program?
    - How much support or training did you receive prior to your volunteer experience?
    - Did you observe any environmentally sustainable practices during your volunteer experience with this organization?
        a) What types of environmentally sustainable practices did you observe?
- Opinions/Values
    - Why did you want to volunteer?
    - What has been the best part of your experience?
    - What has been the most challenging aspect?
    - What would you improve about this program?
    - How would you describe the sense of community amongst the farmers/volunteers?
- Feelings
    - How does helping local farmers through this program make you feel?

III. Organizational members who participate as workers/volunteers

- Experience/Behavior
    - How long have you been volunteering with this program?
    - How much support or training did you receive prior to your volunteer experience?
    - Did you observe any environmentally sustainable practices during your volunteer experience with this organization?
        a) What types of environmentally sustainable practices did you observe?
- Opinions/Values
    - Why did you want to volunteer?
    - What has been the best part of your experience?
    - What has been the most challenging aspect?
    - What would you improve about this program?
    - How would you describe the sense of community amongst the farmers/volunteers?
- Feelings

- How does helping local farmers through this program make you feel?

Farming Rotational Program (Manos Cambiadas) Interview Questions (Spanish)

I. Agricultores que invitan/anfitriones
   - Experiencias y comportamientos
     - ¿Vende también sus productos en el Mercado Verde?
     - ¿Con qué frecuencia recibe apoyo en su finca?
       a) ¿Desde cuándo utiliza este apoyo?
     - ¿Para qué tipo de actividades o tareas solicita ayuda?
     - ¿Cómo se ve afectado cuando no puede recibir ayuda de este programa?
     - ¿Cómo ha cambiado su experiencia como agricultor desde que empezó a participar en este programa?
   - Opinión/Valores
     - ¿Qué es lo mejor de este programa?
     - ¿Qué mejoraría de este programa?
     - Más allá del aspecto de obtener ayuda física, ¿qué otros beneficios obtiene de este programa?
     - ¿Siente un mayor sentido de comunidad gracias a este programa?
     - **¿Considera que se comparten habilidades valiosas al participar en este programa?**
       a) Seguimiento: ¿Cuáles son las habilidades que se comparten?
   - Prácticas agrícolas
     - ¿Qué cultivos hay en su finca y por qué?
     - ¿También cría ganado u otros animales? En caso afirmativo, ¿cuáles animales?
     - ¿Vende alguna parte de sus cosechas?
       a) Posible seguimiento: ¿Qué porcentaje de sus cultivos vende comparado al que consume usted mismo?
     - **Recorrido**: ¿Puede indicar cuáles prácticas de manejo y/o de sostenibilidad aplica en su finca?
       a) Posible continuación: ¿Existen prácticas únicas que sean diferentes de las de otros agricultores?
       b) Posible seguimiento: ¿Implementa alguna práctica de agricultura circular o regenerativa?
     - ¿Utiliza pesticidas o fertilizantes?
   - Sentimientos
     - ¿Cómo le hace sentir recibir ayuda de voluntarios y visitantes locales?

II. Agricultores que participan como trabajadores/voluntarios
   - Experiencia/Comportamiento
     - ¿Cuánto tiempo lleva como voluntario en este programa?
     - ¿Cuánto apoyo o formación recibió antes de su experiencia como voluntario?

        - ¿Ha observado alguna práctica medioambientalmente sostenible durante su experiencia como voluntario en esta organización?
            a) ¿Qué tipo de prácticas medioambientalmente sostenibles observa?
    - Opiniones/Valores
        - ¿Por qué quería ser voluntario?
        - ¿Qué ha sido lo mejor de tu experiencia?
        - ¿Cuál ha sido el aspecto más desafiante?
        - ¿Qué mejorarías de este programa?
        - ¿Cómo describirías el sentimiento de comunidad entre los agricultores/voluntarios?
    - Sentimientos
        - ¿Cómo te hace sentir poder ayudar a los agricultores locales a través de este programa?

III. <u>Miembros de la organización que participan como trabajadores/voluntarios</u>
    - Experiencia/Comportamiento
        - ¿Cuánto tiempo lleva trabajando como voluntario en este programa?
        - ¿Cuánto apoyo o formación recibió antes de su experiencia como voluntario?
        - ¿Ha observado alguna práctica ambientalmente sostenible durante su experiencia de voluntariado con esta organización?
            a) ¿Qué tipo de prácticas medioambientalmente sostenibles se observa?
    - Opiniones/Valores
        - ¿Por qué quería ser voluntario?
        - ¿Qué ha sido lo mejor de tu experiencia?
        - ¿Cuál ha sido el aspecto más desafiante?
        - ¿Qué mejorarías de este programa?
        - ¿Cómo describirías el sentimiento de comunidad entre los agricultores/voluntarios?
    - Sentimientos
        - ¿Cómo se siente al ayudar a los agricultores locales a través de este programa?

Codebook

Mercado Verde

Parent Id	Child Id	Code Title	Applications
	1	8 Capitals	0
1	2	Cultural	4
1	3	Experiential	6

1	4	Financial	7
1	5	Intellectual	3
1	6	Living	9
1	7	Material	0
1	8	Social	11
1	9	Spiritual	0
	10	Agriculture practices	0
10	11	Chemical pesticides	1
10	12	Chemical'-'free	2
10	13	Composting	2
10	14	Growing native crops	4
10	15	Helping each other on their farms	2
10	16	Intercropping	1
10	17	Irrigation	1
10	18	Monocultures	1
10	19	Natural fertilizer '-' animal waste	3
10	20	Natural fertilizer '-' compost	2

10	21	Natural pest maintenance	4
10	22	Organic farming	6
10	23	Permaculture	1
10	24	Pesticide'-'free	2
10	25	Regenerative agriculture	4
	26	Benefits	0
26	27	Business Partnership	6
26	28	Consistency and Predicitability	2
26	29	Financial	1
26	30	Language exchange	0
26	31	Leisure/Fun	3
26	32	Save energy and labor	4
26	33	Social Community	5
	34	Challenges	0
34	35	Costs are outweighing benefits of production	2
34	36	Growing with climate changes	5
34	37	High cost of production	2

34	38	Inconsistent income	1
34	39	Increase in monoculture practice	1
34	40	Market access	1
34	41	More space for vendors	2
34	42	More support from local communities	0
34	43	Pest control for farming	3
34	44	Pests	1
34	45	Promotion	1
34	46	Soil degradation	1
34	47	Table/stand positioning	1
34	48	Unable to sell enough at Los Higuerones	3
	49	How they got connected to Mercado Verde	1
49	50	Participant A	1
49	51	Participant B	3
	52	Income	7
	53	Seller of goods	0
53	54	Art/Accessories	1

53	55	Food products	2
53	56	Produce	3
	57	Trends	0
57	58	Adapting production practices based on mkt demand	8
57	59	Adapting production practices based on their land	4
57	60	Locals moving into tourism	1
57	61	Pricing organic produce higher	1
57	62	Tourism decreasing	2
	63	Verde System	0
63	64	Supporting other vendors	3
	65	Where they're from	0
65	66	Elsewhere in Costa Rica	1
65	67	Golfito	1
65	68	International	1
65	69	Osa Peninsula	1
65	70	Puerto Jiménez	3

Manos Cambiadas

Parent Id	Child Id	Code Title	Applications
	1	8 Capitals	0
1	2	Cultural	9
1	3	Experiential	6
1	4	Financial	2
1	5	Intellectual	6
1	6	Living	20
1	7	Material	7
1	8	Social	13
1	9	Spiritual	3
	10	Agriculture practices	22
10	11	Chemical fertilizer	1
10	12	Greenhouse	1
10	13	Growing space	1
10	14	Has livestock	5
10	15	No livestock	2
10	16	Organic fertilizer	1

10	17	Plants grown	6
10	18	Manual weeding	1
	19	Benefits	14
19	20	Abundance of crops	1
19	21	Inter'-'class exchange	1
19	22	Save energy/labor	5
19	23	Save money	2
19	24	Skills gained	5
19	25	Stronger community	4
	26	Best part about MC	12
	27	Challenges	3
	28	Community	8
	29	Community Values	0
29	30	Helping other farms	3
29	31	Helping the community	3
	32	Demographic info	0
32	33	Age	1

32	34	Currently reside	5
32	35	Jobs	4
32	36	Length of residence	3
32	37	Originally from	6
	38	Ecotourism	1
	39	Feeling	14
	40	Length of time with MC	1
	41	Manos Cambiadas aid received	11
41	42	Cleaning/preparing	4
41	43	Making fertilizer	4
41	44	Planting	6
41	45	Teaching new skills	6
	46	Needed aid	2
	47	Potential improvements	4
	48	Reason for joining	7
	49	Reasons for not using MC	1
	50	Selling	1

50	51	Percent sold	1
	52	Sustainable practices	6
	53	Training	3
	54	Trends	0
54	55	Consume more home'-'grown food	1
54	56	Return to organic farming	2

Appendix C: Portrait of Gifts Process

Portrait of Gifts was conducted at multiple locations across the Osa Peninsula. The following themes emerged in each of the locations and were used to inform the "People and Practices" portion of the asset maps:

Location	Themes, Talents, Gifts, & Practices
Puerto Jiménez Jewelry Making Class	Nature, home, women, family, water, fashion / design, baking
Los Higuerones Ballet Class	Family, friends, love, nature (rainbows, butterflies, trees, hummingbirds), companion animals (cat, dog), surfing, reading
Los Higuerones English Class	Music, beach, sun, water, boats, flowers, trees, wildlife (birds, toucan, butterflies), companion animals (dog), food (pineapple), fishing, music, books/reading, kites, house / home, football (soccer)
Los Higuerones Mercado Verde	Cooking, baking, community, animals (monkeys, macaws, insects), livestock (chickens, cows), the forest, nature, agriculture, gardening, music (guitar, musical instruments), fishing, driving, tourism, sustainability, protection of natural resources, crafts, languages, religion/spirituality, family, community, group facilitation, writing, intuition, teaching, finances, teaching, manage conservation field projects, representing women, problem-solving, creativity, personal growth, art, painting, walking, sports (football/soccer, skateboarding), surfing, swimming, snorkeling, dancing, yoga, learning and sharing
Matapalo Martina's Bar & Restaurant	Nature, hiking mountain trails and rivers, swimming in the ocean, soil biology, field work, physical strength, adventure, human nutrition, gardening, yoga, cooking, making chocolate, organic ingredients, ancestral medicine, osho rebalancing, cabins for rent, working with tools, dancing (salsa, belly dance), singing, music, understand animal and insect patterns, tropical fruits, cocos, surfing, fishing, teaching, sowing, sports (soccer, tennis, surfing), natural soaps, organizing, fast thinking, decision-making, bilingual, survival, being a good mother, being a good friend, sense of humor, making people laugh

Puerto Jiménez Jewelry Making Class
Portrait of Gifts



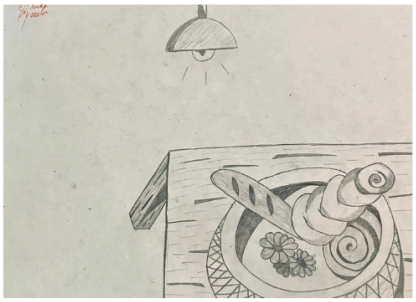






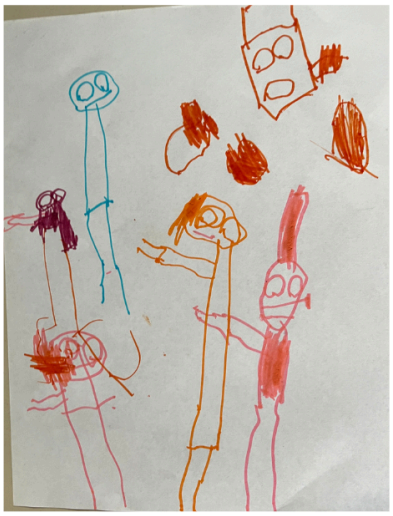








Los Higuerones Ballet Class
Portrait of Gifts







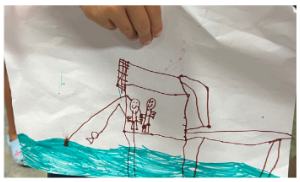
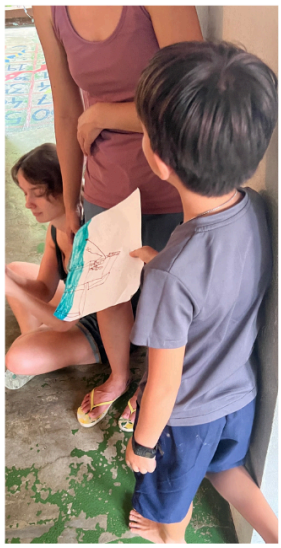




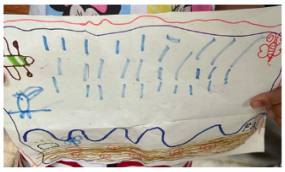
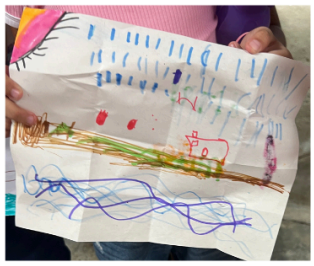


Los Higuerones English Class
Portrait of Gifts





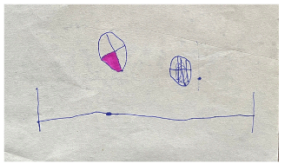



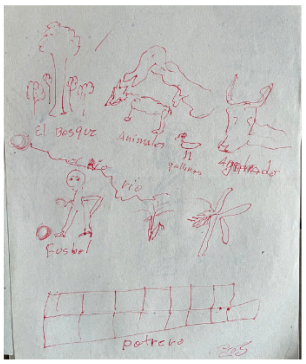


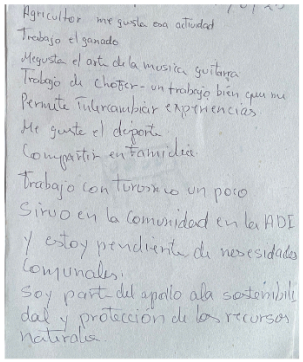




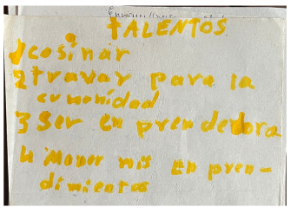
Los Higuerones Mercado Verde
Portrait of Gifts





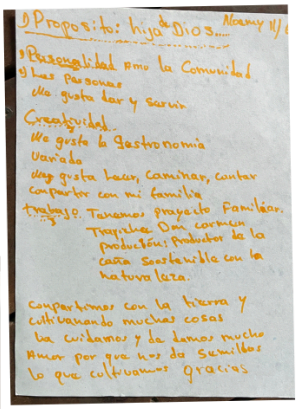




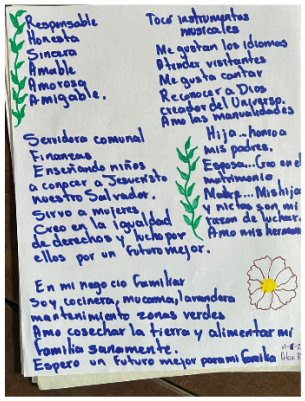


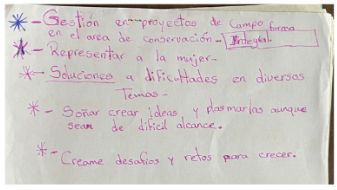


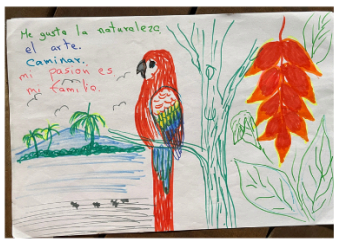




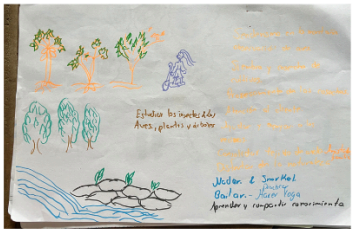






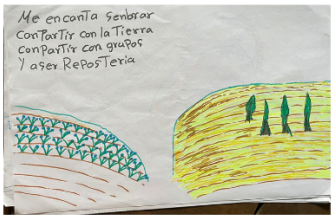


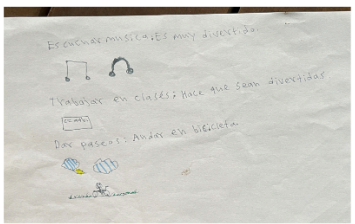






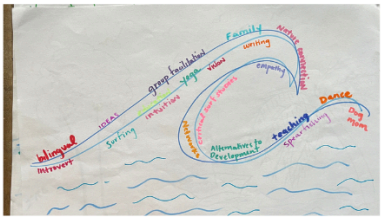




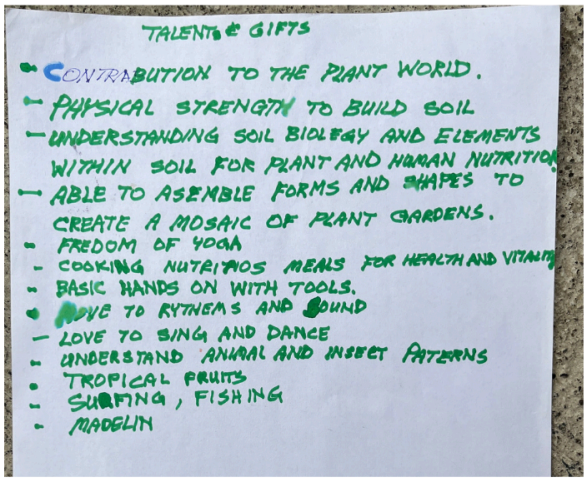


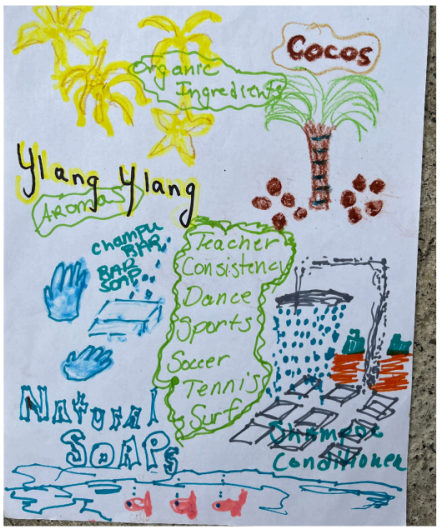


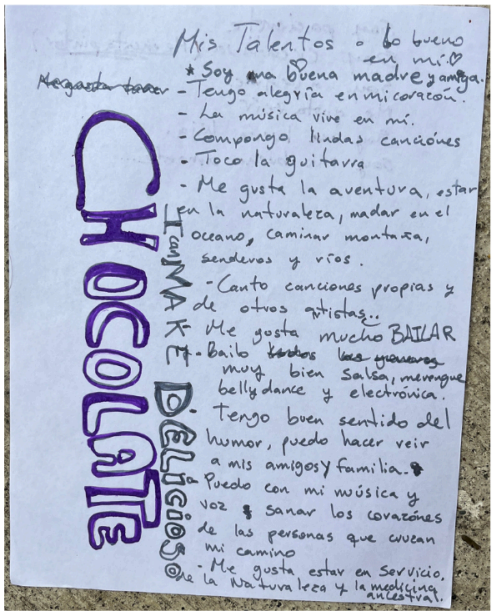


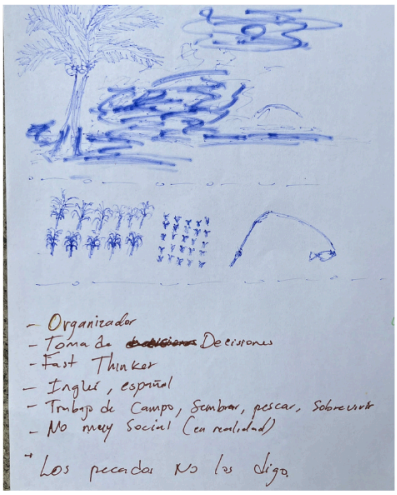


Matapalo Martina's Bar & Restaurant
Portrait of Gifts











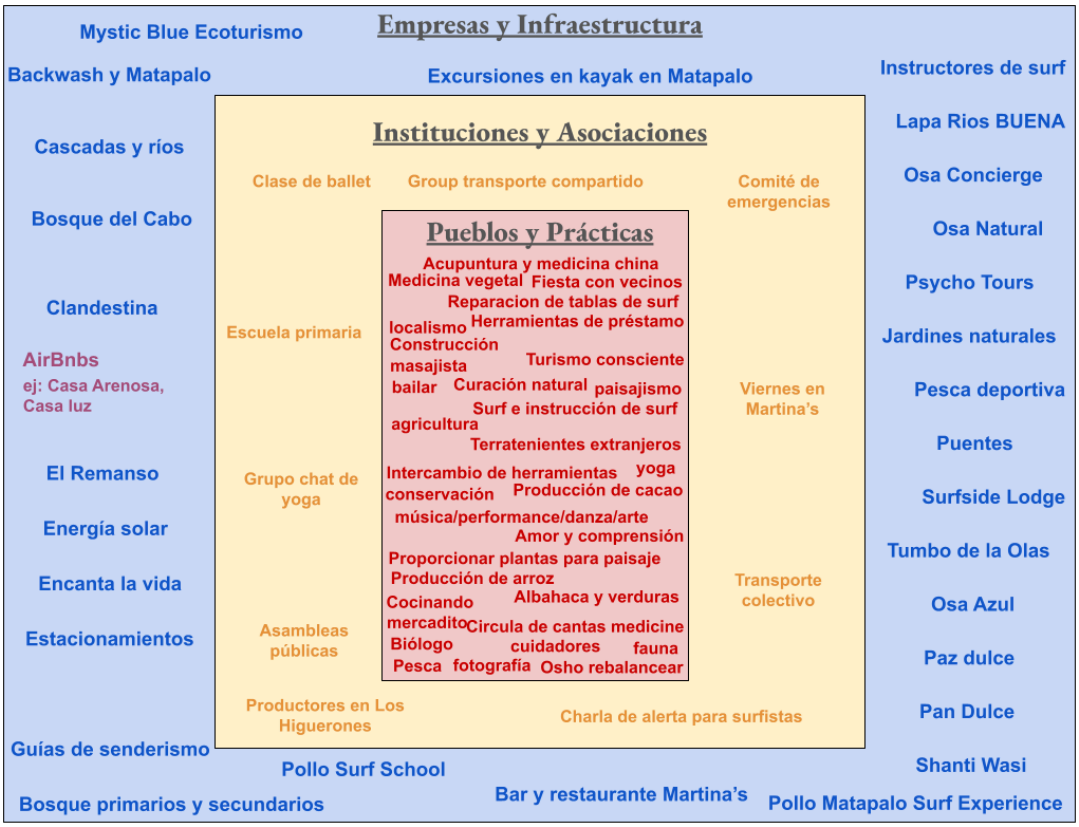


Appendix D: Asset Maps (Spanish Versions)

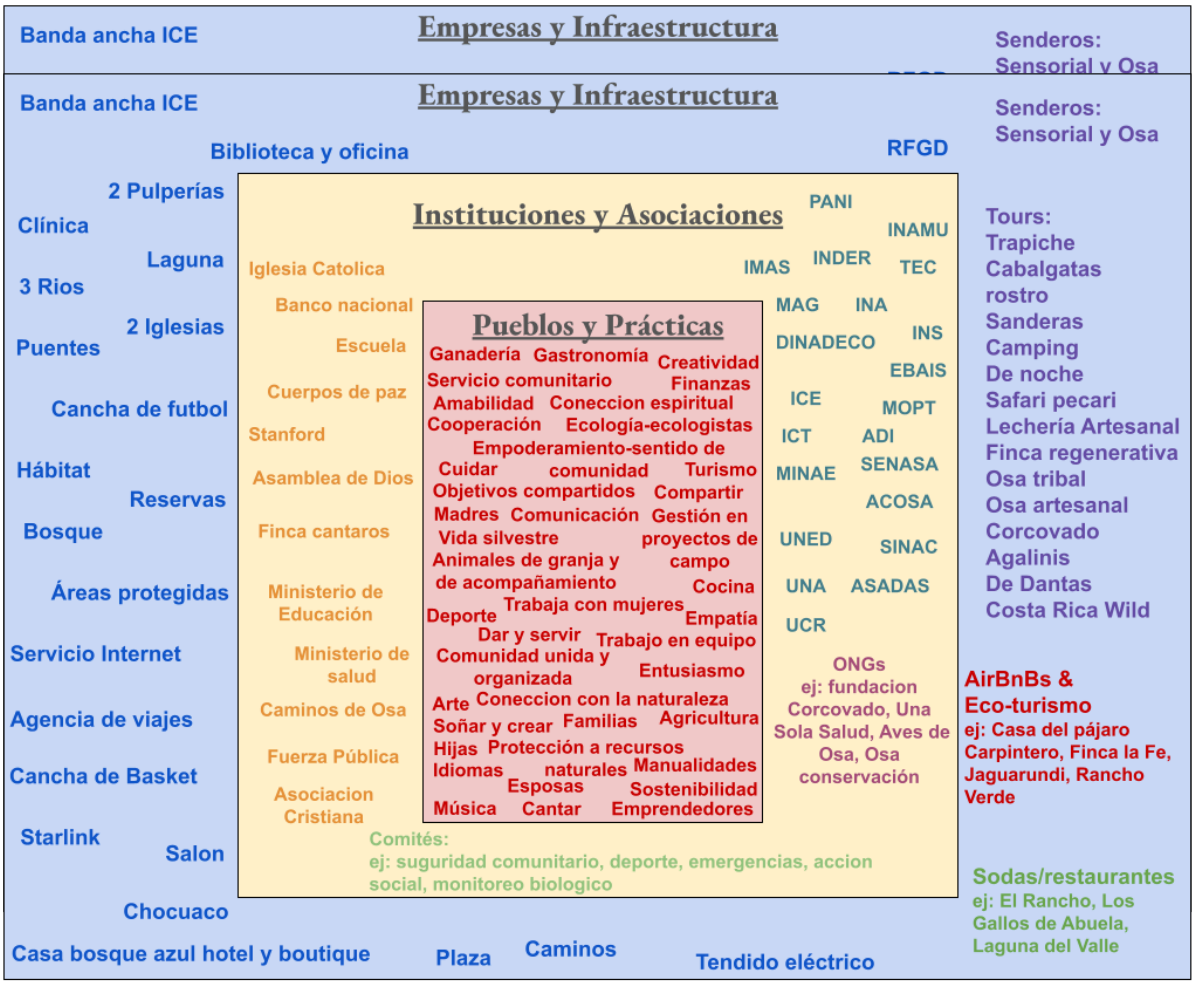
Site I: Los Higuerones



Site II: Matapalo

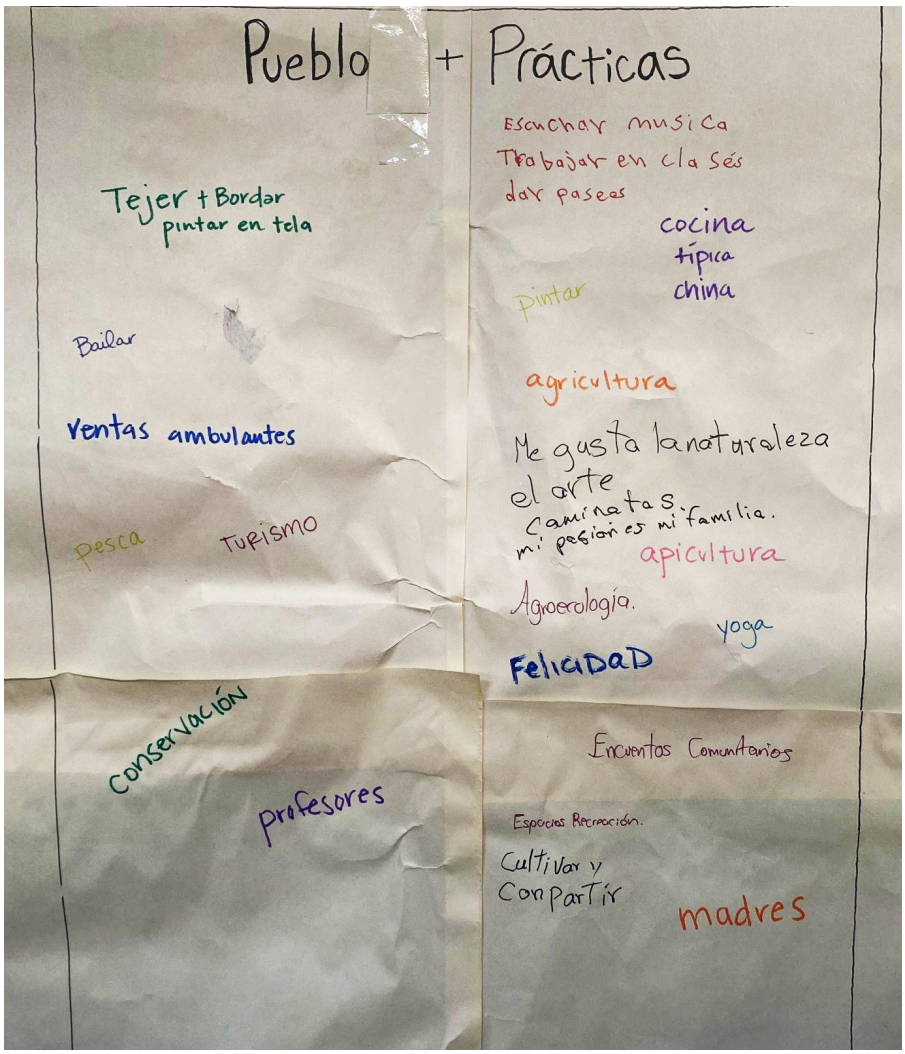


Site III: Rancho Quemado

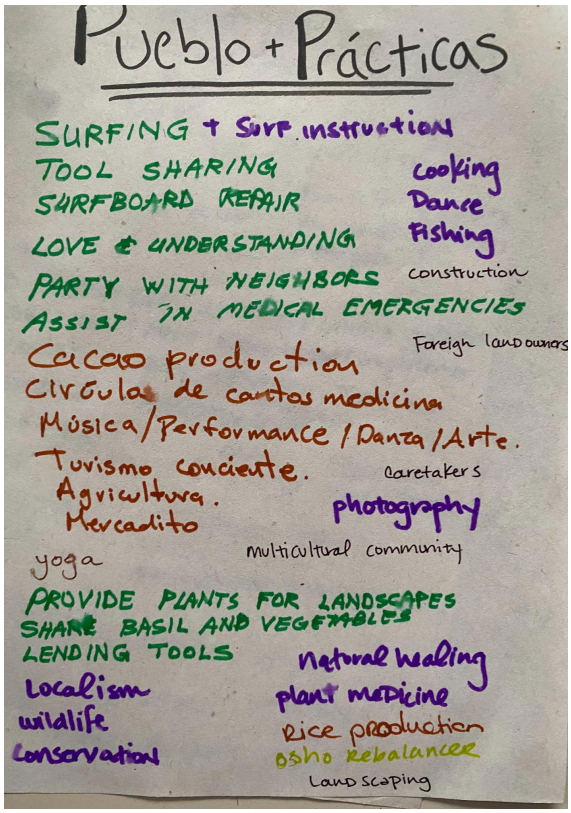


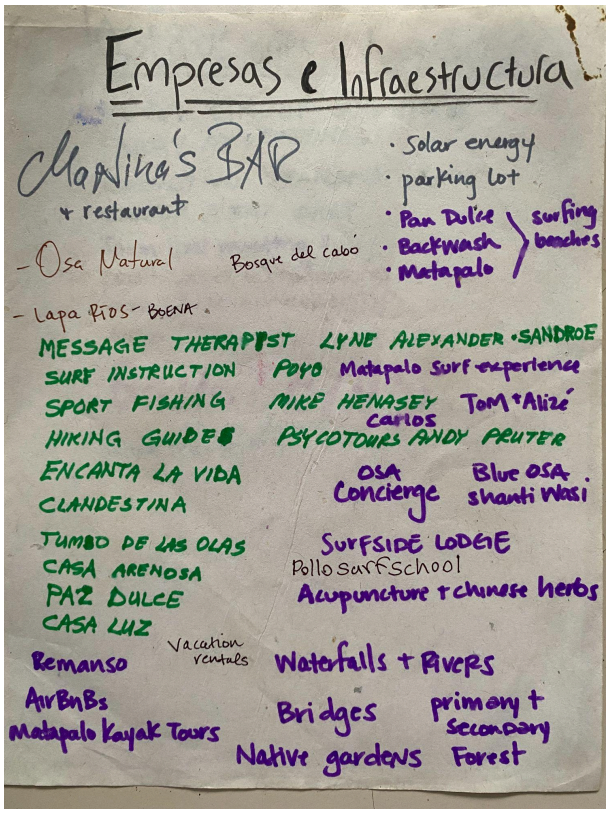
Appendix E: Asset Maps (Original Paper Versions)

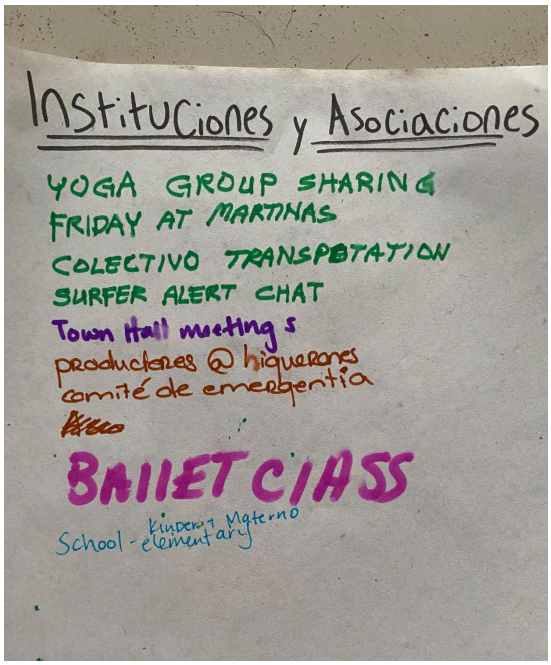
Site I: Los Higuerones



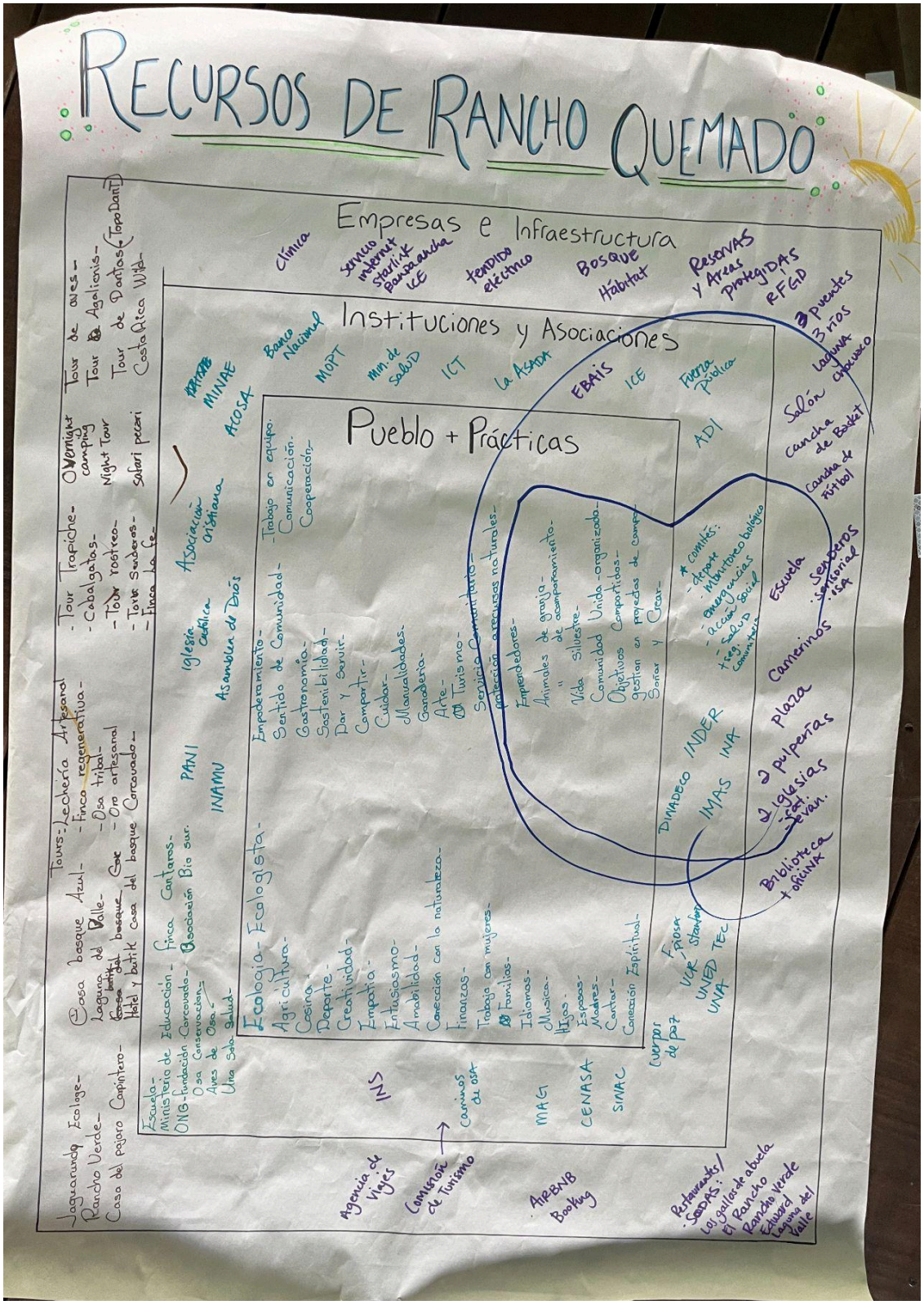
Site II: Matapalo







Site III: Rancho Quemado



Appendix F: Geographic Information Systems Process

The following section contains the python code that was run in ArcGIS Pro's arcpy in order to create our buffer analysis.

```
# Open ArcGIS and load notebook

import arcpy

arcpy.env.overwriteOutput = True

# Set up buffer zone by connecting to work environment

center_fc = r"C:" # input pathway to single point feature or town center

target_fc = r"C:" # input pathway to feature class with multiple points or environmental organizations

out_buffer = r"C:" # designate where to save buffer in geodatabase

# Get center geometry

with arcpy.da.SearchCursor(center_fc, ["SHAPE@"]) as cursor:

  center_geom = next(cursor)[0]

center_sr = center_geom.spatialReference

# Compute farthest distance

max_dist = 0

with arcpy.da.SearchCursor(target_fc, ["SHAPE@"]) as cursor:

  for row in cursor:

    geom = row[0]

    if geom is None:

      continue
```

```
    if geom.spatialReference.name != center_sr.name:
        geom = geom.projectAs(center_sr)
    dist = center_geom.distanceTo(geom)
    if dist > max_dist:
        max_dist = dist
print(f"Max distance: {max_dist}")
# Create buffer geometry object
arcpy.analysis.Buffer(center_geom, out_buffer, max_dist)
print("Buffer created")
```

Part VI: References

Ankersen, T. T., Regan, K. E., & Mack, S. A. (2006). Towards a bioregional approach to tropical forest conservation: Costa Rica's Greater Osa Bioregion. *Futures*, *38*(4), 406–431. https://doi.org/10.1016/j.futures.2005.07.017

Anwar, N. H., & Viqar, S. (2016). Research assistants, reflexivity and the politics of fieldwork in urban Pakistan. Area, 49(1), 114–121. https://doi.org/10.1111/area.12307

Bates, T. R. (1975). Gramsci and the Theory of Hegemony. *Journal of the History of Ideas*, *36*(2), 351–366. https://doi.org/10.2307/2708933

Bradshaw, C. J. A., Ehrlich, P. R., Beattie, A., Ceballos, G., Crist, E., Diamond, J., Dirzo, R., Ehrlich, A. H., Harte, J., Harte, M. E., Pyke, G., Raven, P. H., Ripple, W. J., Saltré, F., Turnbull, C., Wackernagel, M., & Blumstein, D. T. (2021). Underestimating the Challenges of Avoiding a Ghastly Future. *Frontiers in Conservation Science*, *1*, 615419. https://doi.org/10.3389/fcosc.2020.615419

Castree, N. (2009). The Spatio-temporality of Capitalism. *Time & Society*, *18*(1), 26–61. https://doi.org/10.1177/0961463X08099942

Coulson et al. (2015). Exploring Metaphors of Capitals and the Framing of Multiple Capitals: Challenges and Opportunities for <IR>

Costa Rica's economy moves at two speeds. (2019, August 21). Country Report: Costa Rica. https://link-gale-com.proxy.lib.umich.edu/apps/doc/A602689637/AONE?u=umuser&sid=bookmark-AONE&xid=c16d7f08

Duncan, J., Carolan, M., & Wiskerke, J. S. C. (2020). *Routledge Handbook of Sustainable and Regenerative Food Systems*. Taylor & Francis Group. http://ebookcentral.proquest.com/lib/umichigan/detail.action?docID=6269459

Escobar, A. (1992). Reflections on "development": Grassroots approaches and alternative politics in the Third World. *Futures*, *24*(5), 411–436. https://doi.org/10.1016/0016-3287(92)90014-7

Escobar, A. (1995). *Encountering Development: The Making and Unmaking of the Third World*. Princeton University Press. (This is the standard citation for his work on the "era of development" and the 20th-century shift).

Escobar, A. & Harcourt, W. (2018). "Post-development Possibilities: A Conversation," Development, Palgrave Macmillan; Society for International Development, vol. 61(1), pages 6-8, December.

Friedlander, A. M., Ballesteros, E., Breedy, O., Naranjo-Elizondo, B., Hernández, N., Salinas-de-León, P., Sala, E., & Cortés, J. (2022). Nearshore marine biodiversity of Osa Peninsula, Costa Rica: Where the ocean meets the rainforest. *PLOS ONE*, *17*(7), e0271731. https://doi.org/10.1371/journal.pone.0271731

Galt, R. (2009). "It just goes to kill Ticos": National market regulation and the political ecology of farmers' pesticide use in Costa Rica. *Journal of Political Ecology*, *16*(1). https://doi.org/10.2458/v16i1.21689

Gibson-Graham, J.K. (2005) "SURPLUS POSSIBILITIES: POSTDEVELOPMENT AND COMMUNITY ECONOMIES." *Singapore Journal of Tropical Geography*, vol. 26, no. 1, 2005, pp. 4–26, https://doi.org/10.1111/j.0129-7619.2005.00198.x.

Gutierrez, B. L., Almeyda Zambrano, A. M., Mulder, G., Ols, C., Dirzo, R., Almeyda Zambrano, S. L., Quispe Gil, C. A., Cruz Díaz, J. C., Alvarez, D., Valdelomar Leon, V., Villareal, E., Sanchez Espinosa, A., Quiros, A., Stein, T. V., Lewis, K., & Broadbent, E. N. (2020). Ecotourism: The 'human shield' for

wildlife conservation in the Osa Peninsula, Costa Rica. *Journal of Ecotourism*, *19*(3), 197–216. https://doi.org/10.1080/14724049.2019.1686006

Gutierrez, B. L., Almeyda Zambrano, A. M., Almeyda Zambrano, S. L., Quispe Gil, C. A., Bohlman, S., Avellan Arias, E., Mulder, G., Ols, C., Dirzo, R., DeLuycker, A. M., Lewis, K., & Broadbent, E. N. (2019). An island of wildlife in a human-dominated landscape: The last fragment of primary forest on the Osa Peninsula's Golfo Dulce coastline, Costa Rica. *PLOS ONE, 14*(3), e0214390. https://doi.org/10.1371/journal.pone.0214390

Harvey, D. (2003). *Globalization and the "Spatial Fix."*

Hinton, C. R., & Peters, V. E. (2021). Plant species with the trait of continuous flowering do not hold core roles in a Neotropical lowland plant-pollinating insect network. *Ecology and Evolution, 11*(6), 2346–2359. https://doi.org/10.1002/ece3.7203

Honey, M. (2008). *Ecotourism and sustainable development, second edition : Who owns paradise?*. Island Press.

Howler Magazine. (2023). *Costa Rica's economic engine: The 10 industries driving growth*. https://howlermag.com/costa-rica-top-industries-services-manufacturing-agriculture-renewables/

Huettmann, F. (2015). *Central American Biodiversity: Conservation, Ecology, and a Sustainable Future*. Springer New York. https://doi.org/10.1007/978-1-4939-2208-6

Hunt, C., Menke, C., & Durham, W. (2013). *Sustainable Development Centered on Human Well-being in Osa and Golfito, Costa Rica: A Social Diagnostic Analysis*. Stanford University. https://inogo.stanford.edu/sites/default/files/SOCIAL%20report%20Engl%20March%202013.pdf

Hunt, C. A., Durham, W. H., Driscoll, L., & Honey, M. (2015). Can ecotourism deliver real economic, social, and environmental benefits? A study of the Osa Peninsula, Costa Rica. *Journal of Sustainable Tourism*, *23*(3), 339–357. https://doi.org/10.1080/09669582.2014.965176

Hunt, C. A., Durham, W. H., & Menke, C. M. (2015). Social Capital in Development: Bonds, Bridges, and Links in Osa and Golfito, Costa Rica. *Human Organization*, *74*(3), 217–229. https://doi.org/10.17730/0018-7259-74.3.217

Jacobson, D., & Mustafa, N. (2019). Social Identity Map: A Reflexivity Tool for Practicing Explicit Positionality in Critical Qualitative Research. *International Journal of Qualitative Methods*, *18*, 1609406919870075. https://doi.org/10.1177/1609406919870075

Kothari, A., Salleh, A., Escobar, A., Demaria, F., & Acosta, A. (Eds.). (2019). *Pluriverse: A post-development dictionary*. Tulika Books.

Kretzmann, J., & McKnight, J. (1993). Building communities from the inside out: A path toward finding and mobilizing a community's assets. evanston: The assets-based community development institute, institute for policy research, northwestern university

McMichael, P., & Weber, H. (2021). *Development and social change: A global perspective* (7th ed.). SAGE Publications.

Musante, K. (2014). Participant Observation. In H.R. Bernard & C.C. Gravlee (Eds), *Handbook of Methods in Cultural Anthropology* (pp. 251-292). Bloomsbury Publishing.

Nogueira, A., Ashton, W., Teixeira, C., Lyon, E., & Pereira, J. (2020). Infrastructuring the Circular Economy. *Energies*, *13*(7), 1805. https://doi.org/10.3390/en13071805

OECD (2025), *OECD Economic Surveys: Costa Rica 2025*, OECD Publishing, Paris, https://doi.org/10.1787/048cf07b-en.

Ogryzek, M. (2022). The Sustainable Development Paradigm. *Geomatics and Environmental Engineering*, *17*(1), 5–18. https://doi.org/10.7494/geom.2023.17.1.5

United States Census Bureau (2025) *Population Clock: Costa Rica*. Retrieved December 1, 2025, from https://www.census.gov/popclock/world/cs

Roland, E. C., AppleSeed Permaculture, Eaton, J., Fitts, C. A., & Hawken, E. Al. (n.d.). Eight forms of capital. Permaculture, No. 68–No. 68, 58–59. http://appleseedpermaculture.com/wp-content/uploads/2011/04/8_Forms_of_Capital_PM68.pdf

Roland, E. C., & Landau, G. (2013.). *Regenerative Enterprise: Optimizing for Multi-Capital Abundance*.

Ruttenberg, T., & Brosius, P. (2017). Decolonizing sustainable surf tourism. In D. Hough-Snee, & A. Sotelo Eastman (Eds.), The critical surf studies reader (pp. 109–134). Duke University Press.

Ruttenberg, T. (2022). Alternatives to Development in Surfing Tourism: A Diverse Economies Approach. *Tourism Planning & Development*, *20*(6), 1082–1103. https://doi.org/10.1080/21568316.2022.2077420

Stanford Woods Institute for the Environment. (2013). *Socio-economic panorama of the Osa and Golfito Cantons: Trends and challenges for sustainable development.* Iniciativa Osa y Golfito (INOGO).

Sylvester, O. & Little, M. (2025). *Cultivating Sustainability: Food systems cases, challenges, and solutions from Costa Rica.* University for Peace.

Tico Times. (March 13, 2026). Costa Rica Southern Airport Plan Revives Debate Over Growth and Conservation. *The Tico Times.*

https://ticotimes.net/2026/03/13/costa-rica-southern-airport-plan-revives-debate-over-growth-and-conservation

Vantress, S. (n.d.). The 8 Value Flows... a Journey to Abundance [Infographic]. ReGenerOsa-LLF-Vivero initiative.

What Is Ecotourism? (n.d.). *The International Ecotourism Society*. Retrieved April 18, 2026, from https://ecotourism.org/what-is-ecotourism/

World Bank. (October 6, 2025) Costa Rica Overview. World Bank. Retrieved November 13, 2025, from https://www.worldbank.org/en/country/costarica/overview



SCHOOL FOR
ENVIRONMENT
AND SUSTAINABILITY
UNIVERSITY OF MICHIGAN