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LAND USE & LIVELIHOODS

Create Space for Indigenous Leadership to Preserve Agricultural Biodiversity

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KEY FINDINGS

1. An Ecuadorian Kichwa community maintains their traditional agricultural system, the *chakra*, while incorporating cacao as a cash crop.
2. High quality cacao that depends on the *chakra* generates revenue and achieves sustainable development goals.
3. Institutions that partnered with indigenous leaders used a more holistic definition of the *chakra* than those that did not.

EXECUTIVE SUMMARY

Agricultural biodiversity bolsters food security. Because industrial food production wiped out many crop varieties, food systems must incorporate ancestral varieties to withstand threats posed by climate change. At the edge of the Ecuadorian Amazon, Kichwa *chakras* (traditional, biodiverse subsistence farms) persist. Kichwa farmers use *chakras* to grow food for their families and cacao for income. Contrary to popular belief, these subsistence crops and cash crops coexist. Based on surveys from 21 *chakras* in Santa Rita, intensified cacao production has no correlation with a decline in agrobiodiversity. Because cacao gets its value from the *chakra's* biodiversity, institutions support the *chakra.* Those institutions that see beyond the *chakra's* biodiversity, and towards the culture that sustains the *chakras*, build solid partnerships with indigenous leaders. In order to bolster global food security, sustainable development institutions must make space for indigenous leadership in the design and implementation of climate-resilient agriculture.

Introduction

The Crisis of Agricultural Biodiversity

When the planet ails, so do we. Human health is inextricably linked with planetary biodiversity (Romanelli *et al.* 2015). The increased emergence of animal-borne infectious diseases, like COVID-19, is related to habitat fragmentation, climate change, and biodiversity loss (Chivian & Bernstein 2010). When humans inhabit degraded habitats, they can come into contact with previously isolated zoonotic diseases (Vidal 2020). But emerging infectious diseases are just one of the many consequences of biodiversity decline.

Our global food system is devoid of natural abundance. Today, only nine plants make up sixty-six percent of all human crop production by weight (FAO 2017). This is a massive vulnerability because food security depends on agricultural biodiversity. Monocultures (agriculture with one crop variety) degrade soil and invite disease. On the other hand, polycultures (agriculture with many crop varieties) are resilient to such threats. If a threat kills off most of a species, the genetic variety of polycultures ensures that some individuals survive. Those survivors pass on their genes to future generations. Thus, polycultures generally have higher yields than monocultures, especially under stressful conditions (Reiss 2017). Climate change threatens food production: it increases pest ranges and intensifies floods, droughts, and extreme weather events (Kotschi 2007). Food systems need biodiversity to be resilient to these threats. In addition to enhancing food security, agricultural biodiversity contributes to human health by providing more nutritious foods, improving gut and mental health, and mitigating climate change (FAO 2017, Sandoiu 2019).

Figure 1: Santa Rita, a small Kichwa community in Ecuador's Napo province, is nestled between the Andes mountains and the Amazonian rainforest.

Indigenous knowledge strengthens global food security. Indigenous peoples have bred crop varieties over centuries that are adapted to various climatic conditions. But genocide, land grabs, and the Green Revolution have rendered many of these varieties lost forever. Despite all this, surviving indigenous communities have retained their traditional agricultural practices, knowledge, and biodiversity. In order to prepare our food systems for the climate crisis, we must learn from these indigenous knowledge bearers.

Santa Rita's *Chakras* and Chocolate

Santa Rita sits on the border between the rolling Andes mountains and the lush Amazonian rainforest. The Napo Kichwa, an Amazonian indigenous group, make up most of the community's population. They use traditional subsistence farms called *chakras* to grow their own food, medicine, timber, and cultural crops. *Chakras* can contain hundreds of different crops, each grown with knowledge passed down through generations. By maintaining diverse agroecosystems, indigenous growers conserve important seeds *in situ*. This socio-ecological heritage could hold the code to save crops we know and love, and introduce others previously unknown to the global food market.

Since the early 21st century, Santa Rita farmers have integrated cacao into their *chakras* to generate income. As early adopters of cacao as a cash crop and a receiver of institutional support for the initiative, Santa Rita became known as *El Pueblo del Cacao y Chocolate*, or the Village of Cacao and Chocolate. Growing high quality, organic cacao in the *chakras* of Santa Rita has become the focal point of many sustainable development projects in the community. State ministries and non-governmental organizations, Kichwa chocolate organizations, and a private company host technical workshops to teach Kichwa farmers how to tend to cacao plants.

Figure 2: A *chakra* in Santa Rita with traditional subsistence crops and cacao trees

Lessons from Santa Rita

Often, when cash crops integrate into subsistence-based agricultural systems, polycultures become monocultures. As indigenous communities desire prosperity, capitalist social structures replace traditional ones and the cash crop becomes the only crop (Li 2014). But Santa Rita's case suggests it isn't always so. Cacao and traditional crops co-exist because Kichwa farmers still need *chakra* for subsistence and connection to each other and their culture. Only some Kichwa farmers are involved in the initiatives, leaving others wholly dependent on ancestral farming methods. Fine aroma cacao depends on the *chakra,* so institutions promoting cacao growth also work to maintain biodiversity. Finally, the institutions that understand the *chakra* holistically, by including in their definition aspects like family, culture, and subsistence, develop stronger partnerships with indigenous leaders than those that do not.

Thriving *Chakras*

The *chakra* still thrives because it feeds families, cultivates kinship connections, and is central to the Kichwa worldview. Traditional plants grown in the *chakra* continue to make up the fabric of daily life in Santa Rita. Among the hundreds of plants one can find in a *chakra,* yuca (*Manihot esculenta*) and plantains (*Musa paradisiaca*) are eaten at every meal; *guayusa* (*Ilex guayusa*) is served as a welcoming beverage, refreshment, and ceremonial drink; and *chukri yuyu* (*Bryophyllum pinnatum*) and *bálsamo* (*Myroxylon Peruiferum*) heal colds and seal wounds. Each crop requires healthy seeds and intricate knowledge about its uses, production methods, and meanings. A biodiverse *chakra* ties families together, as seeds, knowledge, and land are exchanged among families and across generations. And according to the Kichwa *Sumak Kawsay* (*Buen Vivir*/Good Living) worldview (Coq-Huelva 2018), a *chakra* with a rich polyculture cares for the *Amasanga* (forest) spirit.

> **Learn from indigenous farmers to preserve agro-biodiversity.** Indigenous agriculture rests on millennia of knowledge of how to farm in harmony with the Earth; and indigenous farmers breed seeds that work with their communities and environment. Their knowledge is crucial for preserving agricultural biodiversity. *Ex situ* seed conservation initiatives should partner with indigenous peoples to store their seeds, and *in situ* initiatives should work to protect indigenous peoples so they can continue traditional agricultural practices and maintain seed exchange networks.

Santa Rita residents have been selling cacao grown in their *chakras* since the turn of the century and growing other cash crops for decades prior. Institutions pushing for cacao growth in Santa Rita's *chakras* have donated thousands of cacao trees and technical knowledge about how to maximize their yield. This institutional knowledge does not erode traditional knowledge. Of seventeen beneficiaries of cacao development projects, fifteen still gifted or received seeds for other crops from/to their families. There is a very weak, positive correlation between cacao intensity (the number of cacao trees/hectare) and species richness (the number of crops found in the *chakra*) ($r = 0.158$), indicating that **intensified cacao production does not correlate with biodiversity loss**. Santa Rita residents need the *chakra* to feed, heal, and house their families; and cacao to pay for clothes, education, and supplemental food.

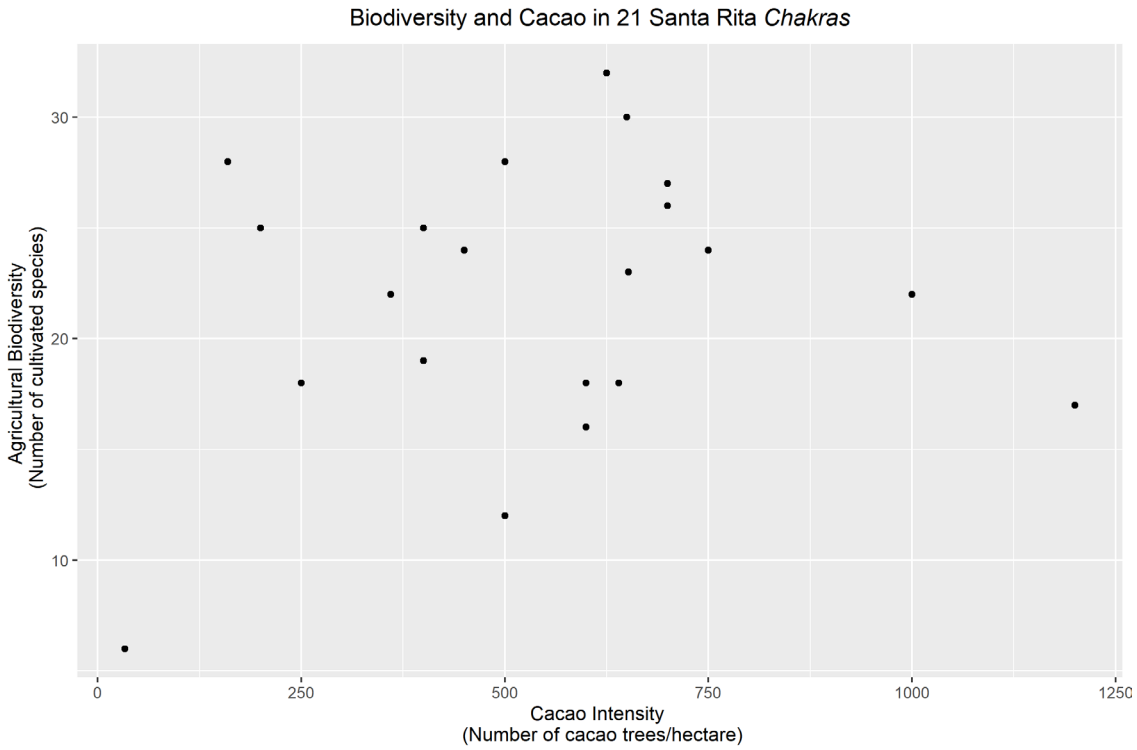


Figure 3: There is a weak, positive correlation between intensified cacao production and species richness in Santa Rita's *chakras* (r = 0.158), indicating co-existence between traditional crops and cash crops.

Indigenous peoples must have exclusive control of their seeds in order to maintain and share them. **Keep indigenous seeds in indigenous hands.** Penalize the unauthorized commercialization of native seed varieties. Protect indigenous seed varieties from cross-contamination with patented genetically modified varieties. Enact the Native American Seeds Protection Act of 2019 in the United States and enforce the International Treaty on Plant Genetic Resources for Food and Agriculture.

Cacao trees and methods are concentrated within an elite group in Santa Rita. Unlike ancestral knowledge about biodiverse *chakra* plants shared within the entire community, cacao trees and methodologies rest within an in-group with access to external resources. Santa Rita's President does not invite everyone to attend organizations' technical workshops or receive donated cacao trees. Those who receive institutional resources are the respected, and oftentimes elected, community leaders who already have immense traditional knowledge. Because institutional knowledge cannot reach every farmer in the community, most continue to farm without it. This separation bolsters the resilience of indigenous knowledge and seeds.

When working with indigenous communities, understand how institutional resources influence community politics and social structure. Do not try to spread resources to every corner of a community, but **work through the community's government to distribute resources**. Respect the power of elected community leaders.

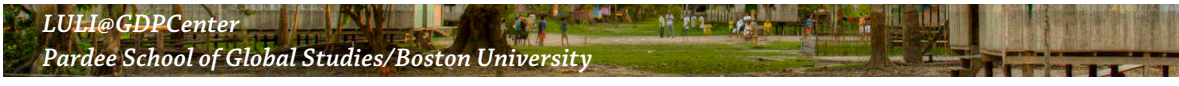
Indigenous leaders use cacao production to support the *chakra*. Kichwa chocolate companies sell *chakra* cacao to keep profits in Kichwa hands and ensure that the *chakra* thrives. Wiñak is a Kichwa-run cacao company that buys raw cacao beans from producers in Santa Rita, processes them into chocolate bars in the nearby town of Archidona, and sells fine aroma chocolate to high end markets abroad. As Kichwa cultivators, Wiñak employees understand the importance of the *chakra* to Kichwa identity, and advocate for continued *chakra* production when they share cacao trees and techniques with Santa Rita.

In order to maintain agricultural biodiversity, **support indigenous initiatives that sell crops grown in subsistence plots.** Because Kichwa people understand the centrality of the *chakra* to Kichwa identity, Kichwa companies are more likely to promote harmony between subsistence and cash crop production. Therefore, uplift indigenous initiatives like Wiñak by buying from them, connecting them to markets, and guiding them on best business practices.

Cacao's *Chakra* Dependence

High quality cacao that depends on the *chakra* generates revenue and achieves sustainable development goals. Cacao grown organically in Santa Rita's *chakras* absorbs the luscious smells of the Amazon rainforest, from whence chocolate originates. Chocolate chefs around the globe pine after the floral fragrance, fluidity, and acidity of cacao grown in *chakras* and sold by Pacari, an Ecuadorian chocolate company (Veintimilla 2018). Chocolate of the *chakra* is so flavorful that tourists come to Santa Rita's Community Tourism Center to see, smell, and taste the origins of fine aroma chocolate. Since Pacari and Wiñak, Ecuadorian companies, process and sell the chocolate grown in Santa Rita, this generates income for the Ecuadorian economy and boosts its standing in an international chocolate arena generally dominated by European companies. Santa Rita's chocolate and tourism initiatives also satisfy Ecuador's *Buen Vivir* (Good Living) sustainable development framework by generating income in an environmentally sustainable and culturally relevant way.

Because cacao derives its value from the surrounding subsistence production, **institutions support Santa Rita's traditional agriculture.** Institutions see the *chakra* as a space for both subsistence and commercialization. For example, the regional Napo government defines the *chakra* as both rooted in ancestral knowledge and adaptable to incoming market crops (GAD Napo 2017). Such dual understandings of the *chakra* play out in initiatives like the Table of Cacao (*Mesa de Cacao),* a consortium of NGO's, Kichwa chocolate companies, provincial ministries, and community leaders. The Table sought to enhance the production of cacao in the approximately 14,000 cacao-growing *chakras* of the Sumaco Biosphere Reserve while conserving the *chakra's* biodiversity and the accompanying array of ecosystem services (Torres *et al*. 2014).



Promote cash crops that depend on subsistence production systems. When encouraging the growth of a cash crop, understand how surrounding biodiversity creates value for the crop. Explicitly state the dependence of economic activity on ancestral knowledge, and value indigenous communities and their knowledge accordingly. Work with community leaders to ensure that cash crops do not overwhelm biodiverse, subsistence systems.

Beyond Biodiversity

Of the many institutions involved in Santa Rita, **those that partner with indigenous leaders have a more holistic definition of the *chakra* than those that do not**. The German development agency, Deutsche Gesellschaft für Internationale Zusammenarbeit (GiZ), worked with Kallari, a Kichwa cacao association similar to Wiñak, to unify their definitions of the *chakra.* In a document outlining criteria for sustainable production systems, Kallari and GiZ (2013) outline four basic principles of the *chakra*: It combines subsistence with income generation, is based on ancestral Kichwa practices, is a familial space for the reproduction of knowledge, and maintains a high level of biodiversity. By articulating Kichwa understandings of the *chakra,* GiZ necessitates Kichwa involvement.

Figure 4: The ingredients and materials used to show visitors of the Community Tourism Center how cacao beans from Santa Rita's *chakras* become chocolate

In contrast, Pacari does not offer a definition of the *chakra,* understanding it as useful insofar as its biodiversity generates added value for their cacao product. To them, the *chakra* does not mean subsistence, Kichwa identity, or familial networks, so it becomes disconnected from Kichwa actors altogether. Pacari expressed that they had initially been willing to work with Wiñak by buying cacao indirectly from Santa Rita through Wiñak, but had never received the cacao beans they were promised. They thus decided to buy directly from Santa Rita producers, effectively pushing Wiñak to the margins. This weakened Wiñak's goal to produce cacao in order to support the *chakra*.

Use holistic definitions of agroecology to create space for indigenous leadership. When promoting products that gain value from biodiversity, acknowledge the entire system upon which the biodiversity depends. Incorporate aspects related to culture, family, and knowledge into the definition of an indigenous agricultural system. Create space for indigenous leaders by stating that institutional aims depend on indigenous knowledge. Collaborate with local leaders to align institutional definitions of agroecological systems with local ones. Require indigenous leadership to support ancestral production systems.

Conclusion

Indigenous knowledge makes food systems more resilient. As COVID-19 reveals weaknesses in the global food system, many will turn to production practices that are less dependent on complex supply chains and more adapted to climate change. During this shift to regional and regenerative food systems, agricultural biodiversity will be critical. If we want to incorporate crops that can withstand unexpected threats, we must listen to the wisdom of indigenous peoples. Their leadership will help create food systems that harmonize with, instead of fight against, natural ecosystems. Increasing agricultural biodiversity is just one step towards healing our planet, a prerequisite to healing ourselves.

REFERENCES

Chivian, E., and Bernstein, A. 2010. How Our Health Depends on Biodiversity. Center for Health and the Global Environment at Harvard Medical School.

Coq-Huelva, D. Torres-Navarrete, B., and Bueno-Suárez, C. 2018. Indigenous worldviews and Western conventions: Sumak Kawsay and cocoa production in Ecuadorian Amazonia. Agriculture and Human Values, 35, 163-179.

Deutsche Gesellschaft für Internationale Zusammenarbeit (GiZ) and Kallari. 2013. La Chakra Kichwa: Criterios para la conservación y fomento de un sistema de producción sostenible en la Asociación Kallari y sus organizaciones socias. Fascículo 7. Quito.

Food and Agriculture Organization. 2017. The State of the World's Biodiversity for Food and Agriculture. Rome.

Food and Agriculture Organization. 2020. Novel Coronavirus (COVID-19).

Gobierno Autónomo Descentralizado Provincial de Napo, Secretaría General. 2017. Ordenanza Para Declarar la Chakra Kichwa. Tena.

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Kotschi, J. 2007. Agricultural Biodiversity is Essential for Adapting to Climate Change. GAIA – Ecological Perspectives for Science and Society, 16, 2, 98-101.

Li, T.M. 2014. Land's End: Capitalist Relations on an Indigenous Frontier, Durham: Duke University Press.

Reiss, E. and Drinkwater, L. 2017. Cultivar mixtures: A meta-analysis of the effect of intraspecific diversity on crop yield. Ecological Applications, 28.

Romanelli, C., Cooper, D., Campbell-Lendrum, D., Maiero, M., Karesch, W.B., Hunter, D., and Golden, C.D. 2015. Connecting Global Priorities: Biodiversity and Human Health. United Nations Environment Programme, Convention on Biological Diversity, World Health Organization.

Sandoiu, A. 2019. Biodiversity may benefit mental health by affecting gut bacteria. Medical News Today.

Torres, B., Vargas, J.C, Starnfeld, F., and Rios, M. 2014. Mesa del cacao y chocolate en la Reserva de Biosfera Sumaco. In: Gobernanza participativa en la Amazonía del Ecuador: Recursos naturales y desarrollo sostenible. Puyo: Universidad Estatal Amazónica, 43-57.

Vidal, J. 2020. Destruction of Habitat and Loss of Biodiversity Are Creating the Perfect Conditions for Diseases like Covid-19 to Emerge. Ensia.