

UC Irvine

UC Irvine Electronic Theses and Dissertations

Title

Alternative Pathways to Food Sovereignty through Community Based Partnerships: A Social-Ecological Case Study

Permalink

<https://escholarship.org/uc/item/1mt4f8k8>

Author

Harron, Connor Froyen

Publication Date

2020

Peer reviewed|Thesis/dissertation

UNIVERSITY OF CALIFORNIA,
IRVINE

Alternative Pathways to Food Sovereignty through Community Based Partnerships: A
Social-Ecological Case Study

DISSERTATION

submitted in partial satisfaction of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

in Social Ecology

By

Connor Froyen Harron

Dissertation Committee:
Professor Richard Matthew, Chair
Chancellor's Professor Emeritus Daniel Stokols
Associate Professor Jessica Dawn Pratt

2020

DEDICATION

*Para mi esposa Sharleen Marie y nuestro bebé.
Soy porque eres.*

TABLE OF CONTENTS

	Page
List of Figures	v
List of Tables	vi
List of Images	vii
Acknowledgements	viii
Vita	ix
Abstract of the Dissertation	x
1. Introduction	1
2. Research Questions	14
3. Research Objectives	15
4. Literature Review	18
4.1 History of Human Agriculture	18
4.2 Salt and the Rise of Fermentation	21
4.3 Amazonian Historical Example	25
4.4 Colonial Expansion and the Foundations of Capitalism	30
4.5 Rise of a Global Food Regime	36
4.6 Second Agricultural Revolution	27
4.7 Consequences of Modern Agriculture and Food Processing Practices	59
4.7.1 Environmental Impacts	60
4.7.2 Nitrogen & Phosphorous Cycles	62
4.7.3 GreenHouse Gas (GHG) Emissions	63
4.7.4 Groundwater Depletion	64
4.7.5 Deforestation	65
4.7.6 Loss of Biodiversity	68
4.7.7 Human Impacts	69
4.7.8 Human Microbiome and the Microbial Connections to Human Relations	70
4.7.9 Disparities in Human Impacts	75
4.7.10 Human Migration	79
4.8 Social Responses to Current Paradox: Exploring Alternative pathways	80
4.8.1 Cuba's National Association of Small Farmers (ANAP)	83
4.8.2 Malawi's Soils, Food and Healthy Communities Project (SFHC)	85
4.8.3 Brazil's Movement of Landless Rural Workers (MST)	87
4.9 People and Nature: An Emerging Worldview	91
5. Working Theory	96
6. Research Design	105
6.1 Case Selection	105

6.2 Methodology	109
6.3 Access through Active Participant Observation	111
6.4 Focus Groups and Semi-Structured Interviews	113
6.5 Written Materials & Secondary Data	115
6.6 Data Analysis	115
7. Results Chapter One: A Basis for Community	124
7.1 Prologue	124
7.2 A Beginning	133
7.3 Arrival	141
7.4 Lessons Learned	147
8. Results Chapter Two: The Early Years	151
8.1 Hindsight is 20/20	151
8.2 Limitless Possibilities	158
8.3 Play and Rituals, Creating Culture	159
8.4 Lessons Learned	172
9. Results Chapter Three: Social Movements in Action	181
9.1 Javier's Ecotours	184
9.2 Pura Verde with Juan	191
9.3 Finca Chocolate	211
9.4 Lessons Learned	226
10. Results Chapter Four: Power, Leadership and Sexual Misconduct	240
10.1 Core Team Beginnings	240
10.2 Sexual Violence and the End of Short Term Volunteer Programs	248
10.3 Power, Gender and Accountability	263
10.4 Mentorship and Cooperation in the Midst of Mistrust and Heartbreak	278
10.5 Lessons Learned	287
11. Results Chapter Five: Foundations for Community	294
11.1 Picking up the Pieces	295
11.2 Goals for the Future	301
11.3 Coronavirus Update	309
11.4 Key Lessons & Community Observations	312
11.5 Research Contribution and Limitations	326
11.6 Conclusion and Future Research	331
References	337

LIST OF FIGURES

	Page	
Figure 4.1	Theoretical Development of Maize Cultivation	27
Figure 4.2	Conceptual Illustration of pre-Columbian Amazon Vegetation and Disturbance Regimes	28
Figure 4.3	Changes in Cereal Trading Patterns Between 1961 and 2011	42
Figure 4.4	Sustainable Development Goals Wedding Cake	54
Figure 4.5	Copia, a Farm Designed with Nature. Columbus, Ohio	57
Figure 4.6	“Gold Diggers”	77
Figure 4.7	Planetary Boundaries and Tipping Points	93
Figure 6.1	Flowchart Linking Research Process, Topics Investigated and Data	110
Figure 7.1	Defining Agroecology, Agroforestry and Permaculture	127
Figure 7.2	Permaculture Ethics and Design Principles	128
Figure 8.1	Hirschman’s Hiding Hand	156

LIST OF TABLES

	Page	
Table 5.1	Convergence Between Ostrom's Principles and Prosocial Version	98
Table 11.1	Expanded Prosocial Design Principles and Ostrom's Equivalents	315

LIST OF IMAGES

	Page
Image 7.1	Bitter Fruit: The Story of the American Coup in Guatemala 135
Image 7.2	Rio Blanco, Costa Rica 139
Image 7.3	Sunset in Pueblo Arboles 143
Image 7.4	Farm to Table Breakfast at Centro Sustentable 144
Image 8.1	Dilapidated Housing, rural Costa Rica 154
Image 8.2	Doña Marta at Her Home 162
Image 8.3	<i>Peltogyne Purpurea</i> (Purpleheart) 167
Image 8.4	Lighting up the Earthen Oven at Centro Sustentable 169
Image 9.1	Deforested Mountainous Region Surrounding Pueblo Arboles 182
Image 9.2	Stones Balanced Precariously Under the Waterfall 186
Image 9.3	Cattle Ranging on Deforested Land, Costa Rica 193
Image 9.4	Armadillos Blindly Rummaging in the Darkness 198
Image 9.5	Jungle Mates, Pueblo Arboles Costa Rica 206
Image 9.6	Tico Repairing Motorcycle Beside Road 214
Image 9.7	Harvesting Cacao, Pueblo Arboles Costa Rica 218
Image 10.1	Whole but Broken, Pueblo Arboles Costa Rica 268
Image 10.2	Cloud Shrouded Mountains, Pueblo Arboles Costa Rica 275
Image 10.3	Swarm of Arthropods Devouring Young Vegetation 285
Image 11.1	Forest Fire Survivor 297
Image 11.2	Mycelium Decomposing Woody Debris, Pueblo Arboles Costa Rica 307

ACKNOWLEDGEMENTS

This research would not have been possible without the generous funding provided by the Newkirk Center for Science and Society and through the Social Ecology Dean's Dissertation Writing Fellowship. Additionally, the unwavering confidence, steady guidance, and thoughtful feedback provided by the dissertation committee members, Dr. Richard Matthew, Dr. Daniel Stokols, and Dr. Jessica Pratt, provided the support needed to persevere through the most challenging and uncertain periods of this investigation.

I have not walked this path alone. It is because of countless encouraging voices and the confidence of the men and women whose stories I share, that the lessons to be learned within the case study explored here can be made accessible to all.

Importantly, I would like to give special thanks to my Research Assistants Vicky Lopez and Jackie Molinero, whose diligent efforts and assistance in the data processing and analysis provided an invaluable source of support.

VITA

Connor Froyen Harron, PhD
Social Ecology Core Program, University of California-Irvine (UCI)

Current Positions (UCI)

International Liaison, [Blum Center for Poverty Alleviation](#) (since 2014)
Research Associate, [Center for Unconventional Security Affairs](#) (since 2013)

Current Positions (Non-UCI)

Director, Study Tour Programs, [Experience International](#) (since 2019)

Education

BA, Psychology, Western Washington University (2011), Magna Cum Laude
MA and PhD, Social Ecology, University of California, Irvine (2016, 2020)

Selected Publications

Quas, J., Dickerson, K., Matthew, R., and Harron, C. (2017). Adversity, Emotion Recognition, and Empathic Concern in High-Risk Youth. *Development and Psychopathology*. Open ICPSR.

Continuity and Change in Global Environmental Politics: The Social Ecology of the Anthropocene. (2016). Eds: Matthew, R., Goodrich, K., Harron, C., Maharramli, B., & Nizkorodov, E. Riverside: CA: Water, Science and Policy Center (WSPC).

Harron, C. (2016). "Challenges for Recovery in the face of a Sustained HIV/AIDS Crisis and Structural Mismanagement: Lessons from Swaziland." in "Continuity and Change in Global Environmental Politics: The Social Ecology of the Anthropocene. Eds: Matthew, R., Goodrich, K., Harron, C., Maharramli, B., & Nizkorodov, E. Riverside: CA: Water, Science and Policy Center (WSPC).

ABSTRACT OF THE DISSERTATION

Alternative Pathways to Food Sovereignty through Community Based Partnerships: A
Social-Ecological Case Study

by

Connor Froyen Harron

Doctor of Philosophy in Social Ecology

University of California, Irvine, 2020

Professor Richard Matthew, Chair

The greatest challenges to sustainable food cultivation are social, not technological, and it is at small scales where some of the most innovative experiments in human organization are taking place. Through this case study, I sought to assess how one particular agricultural community in Costa Rica successfully transformed their local economy through collaborative partnerships with external partners over a twenty-year period. The dissertation assesses how well existing theories regarding the management of common-pool resources explain the capacity this community has demonstrated in transforming local livelihoods towards improved social and ecological well-being. Questions regarding trust, vulnerability, and collaboration are explored to better understand how NGOs can serve to successfully support long term regenerative development and robust social partnerships.

Results reinforce and lend support to existing theories regarding the management of common-pool resources. Each of Ostrom's (1990) eight principles for successfully managing

public goods were observed to play crucial roles in both the successes and failures in the observed case. In addition, the current investigation identifies a ninth principle that should be considered during the formation and maintenance of groups, teams, or organizations to foster cooperative, well-functioning partnerships. Food is the often under-acknowledged, basic social building block that engages all five senses and creates unique opportunities for sharing and strengthening interpersonal bonds.

1. INTRODUCTION

Communities around the world are being strained to the point of collapse. From the communities of coral that extend along the great barrier reef to the rural agricultural communities of the Midwestern United States, it is becoming increasingly apparent that the very fabric of life itself is being stretched thin across a veil of hubris and egocentrism that are uniquely human characteristics. SARS-CoV-2, the disease caused by the novel Coronavirus that first emerged in Wuhan, China in late 2019, is yet the latest example in an accelerating trend of anthropogenically induced feedback loops that threaten to overwhelm the brittle nature of this industrial era of globalization (Ceballos et al. 2015; IPCC, 2014; Matthew et al. 2017; UNFPA, 2009; Singh, 2000; Zalidis et al. 2002). As will become clear during the first chapter, anthropogenic impacts have reached a point where several of Earth's crucial thresholds for sustaining life as we know it are becoming alarmingly taxed (Rockstrom et al. 2009; Steffen et al. 2015). Tragically, despite the fact that the science underlying our understanding of global climate change and other related human-caused impacts, such as COVID-19, have become increasingly clear and dire in its warnings, to date humankind has largely failed to curb greenhouse gas emissions, slow ocean acidification, halt deforestation, or contain the spread of the most serious infectious disease outbreak of the past century, and as a result, we are still on track to far exceed the international communities stated target of two degrees of global warming while also barreling towards a global recession that will likely further limit global investments in smart infrastructure and green technologies. These challenges have pressing implications for the

future of our global society and many communities can no longer afford to wait or rely on national or global leadership to guide the way forward. Without transformative changes to the ways we currently produce, consume, transport and dispose of goods, there are many communities around the world that are likely to be the last generations of their kind.

At the root of many of the grand challenges currently facing humanity lies a simple truth that we can no longer afford to ignore. Since the industrial revolution began nearly 500 years ago human civilization as we know it has been underpinned by a “Cradle to Grave” model that continues to operate in a linear, one-way process (Braungart & McDonough, 2002). Raw materials were transformed into goods with added value that could then be distributed and sold in large quantities to reduce the costs of production and generate profit. When the current industrial model was developed, waste was never included as part of the equation. At best, deciding what to do with the mountains of garbage and toxic waste produced through industrial processes and the consumption of commercialized goods has been an afterthought. Even most forms of recycling as we know it are in reality forms of down-cycling¹ that may extend the lifespan of raw materials, but ultimately fails to solve the conundrum this problem presents.

Earth is a finite world and the vast majority of resources are present in limited supply with defined, known limits. Given this reality, the viability of life on Earth is dependent upon organisms’ abilities to utilize the planet’s abundant resources in cyclical, closed-loop fashions. In nature, all “waste” becomes food for something else. There is no such thing as garbage. It is this

¹ Down-cycling is a method of recycling where unused or recovered materials are broken down and re-used, but the recycled material is of lower quality and functionality than the original material (Braungart & McDonough, 2002).

cyclical, cradle to cradle biological system which has allowed diverse lifeforms to flourish on Earth for hundreds of millions of years. In order for humankind to continue thriving on Earth indefinitely, we must apply the principle of infinite reusability to the development of circular economic systems that are designed to eradicate waste from all processes of human production and consumption. As Braungart and McDonough (2002) illustrate, it is possible to design everything so that all products can be disassembled and divided into materials that can either be safely broken down into biological nutrients or re-utilized as high quality materials for new products. Accomplishing this design transformation could allow humans to emulate the cyclical nature of biological systems and help restore the natural equilibrium of material flows on the planet.

In just the past few hundred years however, anthropogenic impacts have greatly disturbed this equilibrium, causing massive changes to the planet's biosphere and triggering the beginning of Earth's sixth mass extinction event (Ceballos, Ehrlich, & Raven, 2020; Ceballos et al. 2015). Particularly in the past Century, global trends towards the division of labor, mechanization and automation of industry, and demographic shifts towards urbanization have accelerated many of the processes responsible for developing forms of human production and consumption that are incompatible with ecological sustainability. The results of these changes have transformed the very social and agricultural landscape upon which modern human society was built (Ackerman-Leist, 2013; Steffen et al. 2015). These developments have allowed for major accomplishments, such as increasing daily caloric intake virtually worldwide while reducing the percentage of humankind directly involved in food production to the lowest point in

human history (Murphy, 2008; Pollan, 2008). In pre industrial European societies, for example, estimates suggest that between 50-75% of populations relied on agricultural employment, compared to less than 5% in most wealthy countries today (Roser, 2013).

Although these advancements have resulted in a more than doubling of life expectancy worldwide (from ~30 years to over 70) and helped eliminate chronic hunger in many regions over the past century, these achievements often overshadow the many burdensome consequences and disparities in benefits of these very same practices (Ackerman-Leist, 2013; Crino et al. 2015; Lewis et al. 2015). Consider that while less than 1% of the population continues to rely on agricultural employment in some the world's wealthiest countries (e.g. Germany, United States), in many African nations the proportion of individuals still reliant on agriculture for survival remains above 75% (e.g. Mozambique, Somalia, Democratic Republic of Congo (Roser, Ortiz-Ospina, & Ritchie, 2013). Other important measures of opportunity follow similar patterns, such as expected years of schooling, which ranges from just 4.9 years in South Sudan all the way to 22.9 years in Australia, nearly a five fold increase (Roser, 2013).

It is becoming increasingly evident that the technological expansion and reliance on cheap fossil fuels, petrochemical fertilizers and pesticides, which allowed for current agricultural practices to proliferate, are in fact degrading environmental and soil conditions at alarming rates, and will jeopardize humanity's ability to continue meeting human food demands into the future (IPCC, 2014; Matthew et al. 2017; UNFPA, 2009; Singh, 2000; Zalidis et al. 2002). As will be demonstrated in the Literature Review, environmental consequences of modern agricultural

practices include but are not limited to: widespread soil erosion and nutrient depletion, global deforestation, growing desertification, rapid freshwater depletion and contamination, increased carbon and methane emissions and the creation of oceanic dead zones (Goodrich & Nizkorodov, 2017; Lewis & Maslin, 2015; IPCC, 2014; UNFPA, 2009). Recent findings also improve our understanding of how our reliance on increasingly processed and packaged foods produced from this system are contributing to rising rates of chronic, non-communicable diseases such as diabetes, hypertension, heart disease, cancers, obesity, and even some neurological disorders such as anxiety, depression and autism (Canfield et al. 2010; Chivian et al. 2008; Singh, 2000; Zalidis et al. 2012). In addition to the direct health consequences of chronic diseases such as those listed above, research also indicates that many chronic diseases can increase the clinical vulnerability of patients to infectious diseases such as COVID-19 (Mirsoleymani & Nekooghadam, 2020; Sharma et al. 2020). The medication used by many diabetics, for example, have immunosuppressant effects that appear to greatly increase the likelihood of suffering severe, life-threatening conditions if exposed to the novel Coronavirus. These findings underscore and help elucidate the interconnected nature and dynamic interactions that simultaneously occur between industrial practices, consumer behaviors, and the well-being of both human and natural systems.

In briefly describing the multifaceted and far reaching unintended consequences of global industrialization, the intent is to underscore the interconnected and hypercomplex nature of the grand challenges facing human civilization in the 21st Century. What is important to recognize, is that the primary barriers to making significant progress on these challenges, such as the

Sustainable Development Goals (SDGs), are social and political in nature, not technological. For example, Jacobson et al. (2015) and Jacobson et al. (2017) outlined economically feasible roadmaps for 139 countries (including the United States) to achieve 100% clean and renewable energy by 2050. The main impediment limiting the progress of many nations, the authors note, are social and political barriers that impede cooperative or prosocial policies and behaviors.

Likewise, when considering the size and scope of the modern globalized food system, as well as the growing importance of international markets for economic development, it seems unlikely for recent agricultural and food production trends to shift significantly without broad-based support and coordination from global superpowers and at least some of the world's major corporations that are invested in current production practices. Again, the challenge is one of cooperation and coordination and is not the result of technical limitations. Paradoxically, it is actually at small scales, such as community and city levels, which have much less access to advanced equipment and new technologies, where some of the most innovative and potentially transformative experiments in human organization are taking place (Litfin, 2014). There are several examples of movements and partnerships working at such scales that have transformed local agricultural and economic practices and redefined people's relationships with food towards improved health and regenerative practices in ways that several authors argue can help guide larger-scale initiatives, improve design processes and help create a more just and sustainable world for us all (Ackerman-Leist, 2013; Holt-Gimenez, 2006; Litfin, 2014; McCune et al. 2017).

Many of these groups, which will be described in detail in the literature review, have certainly benefited from the use of innovative approaches to agriculture and the adoption of specific techniques, that when carefully practiced have the potential to actually regenerate landscapes while simultaneously providing abundant sources of food. None of these technologies however, are new, and many of the practices being (re)adopted have ancient roots. What really distinguishes these types of partnerships and communities is an interest in and willingness to redefine the way individuals and communities organize themselves, share costs and benefits, make decisions and resolve conflicts. And it is exactly here, in the invisible, social structures that either facilitate or hinder collaboration and teamwork, that the achievements being made at small scales can guide and inform the success of initiatives with global transformative potential (Ostrom, 2010). So, despite the fact that community and city scale activism have limited geographical scope, they have been demonstrated to be important in several ways, but most importantly as an invaluable source of creativity and experimentation in social organization and cooperation.

Importantly, globally it is the poor who are consistently the most vulnerable to hunger, malnutrition, infectious disease outbreaks and changing climates since their livelihoods often depend directly on seasonal crops or vulnerable working conditions while having minimal access to capital for technological investments that help wealthier landholders cope with changing weather patterns such as drought and/or shifting market forces such as needing to secure Personal Protective Equipment (PPE) (Matthew et al. 2016; Myers et al. 2017; UNFPA, 2009; Walk et al. 2011). The crucial role of economic factors, which often determines how these

impacts are distributed, is especially important because those who are better positioned to apply resilience thinking and recover from disaster are also those most responsible for driving anthropogenic environmental degradation. This sad irony highlights the need for developing approaches that promote equitable resilience and prevent the world's poor, who are the least responsible for driving environmental change, from bearing the highest cost of negative environmental externalities. Despite their fiscal limitations, the global poor present a wealth of untapped knowledge and regularly employ creative solutions in order to survive and innovate under harsh conditions and chronic uncertainty. A number of case studies highlight examples of impoverished individuals and communities who have demonstrated tremendous resourcefulness and the capacity for developing potentially transformative solutions to poverty and environmental insecurity, most commonly through the collaboration of small groups of individuals (Hildebrandt, 2001; Holt-Gimenez, 2006; Kamkwamba & Mealer, 2010). Therefore, learning how to improve collaborative efforts to support marginalized communities and empower youth to explore creative solutions to local environmental and public health challenges has the potential to both stimulate the development of regenerative socio-environmental systems at small scales and help inform the development of scalable models for redesigning agro-economic systems in countries around the world.

As a starting point, it is important to understand the way that campesino (farmer) driven movements envision their objectives, such as achieving food sovereignty, which is defined as the right of peoples to define their own agricultural and food policies in order to achieve healthy and culturally appropriate food produced through sustainable methods (Via Campesina, 2003).

Thinking about the differences between food sovereignty and more dominant paradigms, such as food security, is a good place to begin considering a few of the elements that are important to build effective partnerships with the potential to implement transformative changes. The term food sovereignty was developed by peasant farmers to capture elements of self-determination and cultural appropriateness that are missing from food security, which focuses exclusively on availability and access to calories. As is often the case when frameworks such as food security are developed from the top down, the focus is solution-oriented (reduce caloric deficiencies) rather than process-oriented (how to encourage behavior change or adoption of new practices) (McDonald, 2010). This common oversight can undermine stated objectives by failing to facilitate local ownership over project objectives, which reduces local participation and the likelihood that programs will be sustained (Haffeld, 2013; Masud et al. 2016).

Failure to plan for and pay attention to the invisible, social threads such as these can often spell disaster to group initiatives and community based projects, or lead to what Hardin (1968) first described as the “Tragedy of the Commons.” Fortunately, Elinor Ostrom (who became the first woman to win the Nobel Prize for Economics in 2009), later established that the failure of groups to manage common pool resources, which Hardin observed, is not an inevitable process. Through extensive field research, Ostrom first articulated the conditions under which groups could successfully manage common pool resources without depleting or overtaxing a system’s capacity for regeneration (Ostrom, 1990; Ostrom & Walker, 2003; Ostrom, 2008). More recently, a team of scientists from the Evolution Institute² expanded on Ostrom’s work to develop the

² The Evolution Institute is a non-profit global think tank whose mission is “to provide science-based solutions for today’s most pressing social issues in order to improve quality of life.” For more info, visit: <https://evolution-institute.org/>

Prosocial Framework, which seeks to provide practical guidance for how to apply the principles identified by Ostrom to help a wide range of groups improve their effectiveness and capacity to function as a team (Atkins et al. 2019). As part of this work, the researchers identified 8 core principles of well functioning groups. The eight principles first identified by Ostrom and adapted by Atkins et al. (2019) include:

1. **Shared identity and purpose:** Groups function best when its members clearly understand its purpose and perceive that purpose as worthwhile. A group also functions best when it offers a strong shared identity that helps group members understand who is in or out of the group, increases pride and pleasure in belonging, and guides and coordinates behavior through shared norms and values.
2. **Equitable distribution of contributions and benefits:** For groups to function well, the effort and other forms of contribution required of its members, and the benefits of those efforts, need to be distributed fairly. Most people have a strong sense of equity, argues Atkins et al. (2019), and it is violated when someone receives benefits disproportionate to their contributions. So perceived fairness - a fair balance between effort or workload and reward - is essential for group performance.
3. **Fair and inclusive decision making:** If you want good decisions and motivated people, group members need to be involved in making the decisions that affect them, particularly with agreements about how the group runs.
4. **Monitoring agreed behaviors:** For groups to function well, it's essential to have some way to monitor agreed-upon behaviors. Top down monitoring however can often be coercive and serve the interest of managers rather than those being monitored. Ostrom's work suggests that monitoring is often best performed by peers as part of the normal interaction of group members.
5. **Graduated responding to helpful and unhelpful behavior:** No one is perfect when it comes to fulfilling the obligations of a group. Even the most capable and well-meaning members can fail, especially given competing demands upon time and attention. Effective groups have in place responses to both helpful (e.g. expression of gratitude, rewards, celebrations, etc.) and unhelpful behavior (e.g. open conversation to find out what happened, sanctions, and in extreme cases exclusion from the group).
6. **Fast and fair conflict resolution:** Since people have different interests and information, any group that involves committed individuals acting authentically will inevitably encounter conflict. It is best to plan for conflicts and their resolution from the beginning, even if conflict seems unlikely in the future.

7. **Authority to self-govern (according to principles 1-6):** Every group is embedded in a larger society that can limit its ability to govern its own affairs. To create really high performing groups, it is essential to provide an environment that does not excessively interfere with the groups capacity to govern their own affairs or implement design principles 1-6.
8. **Collaborative relations with other groups:** If we are to build systems of cooperation, a group needs to not only practice principles 1-7 itself, but also relate to other groups and develop external partnerships using these principles.

It is of pressing interest to better understand the capacity for the eight design principles detailed by Ostrom (1990) and expanded by Atkins et al. (2019) to explain the successes and failures of groups that are committed to developing alternative pathways towards food sovereignty and regenerative development. Importantly, successfully managing existing common pool resources is a different challenge entirely from manifesting a shared vision for the future that does not yet exist. Although evidence suggests these principles are likely to be of value in the pursuit of alternative pathways towards food sovereignty, to the best of my knowledge, to date there is a paucity of research which has examined the capacity of these principles to explain the successes and failures of rural agricultural communities that are attempting to break away from the globalized economy and develop circular, closed loop systems.

Groups seeking to navigate the uncharted waters of developing alternative forms of social and economic organization are desperate for guidance which can make the invisible structures and patterns of symbolic, social relations more visible and understandable (Brock, 2017; Litfin, 2014). Additionally, to help grassroots farmer-driven movements realize their fullest potential, it is necessary to systematically investigate the motivations that are driving

certain communities to resist global trends in urbanization and instead pursue alternative pathways towards social and ecological restoration. These objectives are particularly important in the wake of COVID-19 in order to better understand whether or not these types of small, alternative communities and economic models can withstand or possibly even outperform more dominant systems in the face of the types of massive shocks and ongoing global stressors that are threatening the continued viability of the globalized economy.

Typically, the resilience of a particular system is determined by its adaptive capacity to respond to disruptions and challenges (Folke, 2006; Walk et al. (2011). The adaptive capacity of any system is inherently limited, and disruptions help provide feedback about where those boundaries lie and how the system reacts when circumstances push it near or over those limits. With regards to Social Ecological Systems, Stokols, Lejano & Hipp (2013) propose that resilient systems with high adaptive capacity are often able to respond to stressors in a way that actually increases the resilience of the system against future disturbances. Brittle systems on the other hand are exemplified by responses to acute stressors that attempt to maintain system functioning during the short term while sacrificing the system's capacity to respond effectively to future stressors. Developing a better understanding of the capacity for communities experimenting with alternative models of regenerative economic development to respond adaptively to global challenges and maintain system functioning is an imperative part of evaluating the potential for these communities to guide the emergence of broader scale transformation towards equitable resilience and regenerative social ecological systems. To serve as a viable alternative to dominant economic paradigms, these experiments must be able to demonstrate at least some capacity to

weather the storm of economic and social uncertainty in the face of increasing climatic and social disturbances.

This dissertation is structured to first provide an overview of the science underlying current understandings of environmental and human challenges as they relate to the development of agriculture, as well as outline emerging strategies to build equitable resilience and regenerative communities in the face of unprecedented global change. After providing an overview of the study design and methodology employed, the paper then dives deeply into one case to follow the 20-year history of a particular community where many of the innovations in ecologically regenerative agriculture can be described and documented. Through the investigation of this case, questions regarding trust, partnerships and collaboration are explored to better understand how NGO's can serve to support long term regenerative development and identify strategies that are crucial to successfully facilitate the transformation of local livelihoods towards improved social and ecological well-being.

2. RESEARCH QUESTIONS

This dissertation focuses on the following research question: In attempting to better understand the role of external partners in supporting community based efforts to achieve food sovereignty through regenerative development and reciprocal relationships cultivated through food, **how do underserved communities seeking to explore alternative pathways organize themselves and collaborate with external partners to successfully develop and maintain initiatives?**

As a part of this overarching research question, there are four main sub-topics and questions:

1) **Partnerships and Visions:** How do communities and their partners collaborate to animate social and economic change, as well as build and maintain trust over time? What do the visions that are catalyzing social change in these communities look like? What is cementing their desire to not only stay in their communities, but to transform them?

2) **Benefits and Assessments:** How is the community investigated implementing their vision? What strategies and techniques do they employ to live sustainably and provide for their families? What is driving the process and how do visions evolve through the implementation phase? Who is included and who is excluded within the social processes of community development?

3) **Implementation and Process:** What are the contextually bound and community identified conditions for success? How do they evaluate the social and ecological impacts of their projects and progress towards their goals? Are there measurable health and welfare impacts? Do people feel better off? Do they have new opportunities? More resilience?

4) **Scalability and Broader Impacts:** Do these types of community based initiatives represent fascinating, yet culturally bound projects that are small scale and non-replicable, or is it possible to identify scalable patterns within cases that can be used to guide agricultural and social development in larger populations? Are there identifiable social processes and procedures that can be replicated in diverse contexts to address interpersonal conflicts, improve group decision-making and promote effective forms of cooperation?

3. RESEARCH OBJECTIVES

To begin answering these questions, I completed an in-depth case study in one such rural agricultural community in Costa Rica, that has created collaborative partnerships to achieve locally driven regenerative development. Tucked away in the mountainous jungles above the Pacific Coast, I found a fascinating pueblo, that despite struggling with many of the challenges common to rural agricultural communities in Latin America (e.g. high poverty, sexual abuse, alcoholism/drug abuse, brain drain), has in many ways undergone a remarkable transformation over the last 20 years. As will become apparent during the results section of the dissertation, this transformation has been made possible due to the successful partnerships that have been built and maintained between the local community and a foreign owned NGO and Sustainability Education Center. Over the course of two decades of collaboration, these partnerships have survived significant obstacles and been sustained through the use of known, but underappreciated strategies to help implement community driven goals, maintain relationships and harmonize both the economic and ecological viability of project objectives.

Before diving into the case study, I will first provide a detailed overview of the literature. In particular, I include a thorough examination of the role that food and agriculture have played in the development of human society. This is necessary because results from the current investigation underscore the important and often under recognized ways that food can be intentionally used to bring people together, build trust and help forge the types of strong bonds that can persevere even through challenging times. To better elucidate this relationship and lay

the foundation for assessing the role of food in the development and maintenance of successful groups, it is important to clarify the role food has played throughout history and in the development of our current globalized economy. Examining this history will help clarify how relationships cultivated through food can be strategically realigned in order to foster more mutually beneficial relationships and serve as a foundation for community.

Next, I will detail the theoretical approach and research design employed before introducing the reader to the case study in earnest. The five results chapters of this dissertation are dedicated to detailing the outcomes of over nearly three years of fieldwork conducted in this community, from January 2017 through June 2019. For the purposes of this investigation, I draw on extensive interviews and organizational documents to present and evaluate the case study in a chronological fashion, thus utilizing a historical analytical framework. Each results chapter grapples with a particular portion of the history of the partnerships involved in this community, simultaneously working to provide a timeline of events while also honing in on important patterns, innovative practices and decision making strategies that are relevant to a wide range of communities and partnerships. The dissertation concludes with an evaluation of identified patterns and a proposed revision to the Prosocial framework theorized by Atkins et al. (2019) to support groups more successfully build and maintain regenerative community based partnerships.

The goals of this investigation are to provide an in-depth examination into some of the unique combinations of social processes and emerging cultural traditions that are taking shape in

one particular community, but that are representative of partnerships occurring across a wide range of projects throughout Latin America and the World. This case stands alone as a fascinating example of how a rural community that was once disenfranchised through poverty and industrial agricultural technologies, has now developed collective strategies based on available resources to successfully manage and preserve ecological systems while simultaneously improving the quality of life for the vast majority of residents. In addition, this dissertation seeks to evaluate patterns identified within this case against existing theories of prosocial behavior, and consider additional factors not yet articulated that are relevant and applicable to a wide range of projects. By seeking to identify and detail replicable social processes around challenges such as decision-making, organizational policies, procedures and practices, the findings have the potential to guide efforts for scaling up these initiatives and provide recommendations for future community based partnerships seeking to promote transformative social and agroecological change.

4. LITERATURE REVIEW

“History is a prophet who looks back: because of what was, and against what was, it announces
what will be.”

-Eduardo Galeano

4.1 History of Human Agriculture

When considering the many ways that human and environmental systems interact, it is difficult to consider a method in which humanity has historically related to nature that is more important than through food. Nearly 2.5 million years before the invention of agriculture, animals that looked very similar to modern man already roamed the Earth and were beginning to form primitive tools. Yet as Yuval Noah Harari (2015; pp. 4) summarizes, “the most important thing to know about prehistoric humans is that they were insignificant animals with no more impact on the environment than gorillas, fireflies or jellyfish.” That is to say, humans were indistinguishable from the plethora of other lifeforms on Earth. They struggled constantly for survival, subsisting primarily on gathered plants, insects, hunting small animals and scavenging the carrion left by more powerful predators. Of interest to this dissertation, is to better understand what changed about prehistoric human’s relationship with food and/or the natural world and how those changes have influenced the development of modern society and the evolution of humanity. By illustrating the foundational role food and agriculture have played in the development of human civilization, social stratifications and all too often human exploitation, I

seek to prepare the reader for the results section, where findings highlight several of the ways that relationships cultivated through food can be intentionally utilized to instead foster improved cooperation, build trust and cultivate healthy, mutually beneficial relationships between both people and nature.

The domestication of fire between 800,000 and 300,000 years ago was a transformative tool that changed the way humans ate and provided their first real defense against larger predators. The introduction of cooking improved nutrition and caloric absorption and triggered humanity's upward trajectory on the food chain. It was a sign of things to come. The cognitive revolution began with the first signs of culture, around 70,000 years ago, but this process greatly accelerated with the invention of agriculture, about 11,000 years before present (BP) (Harari, 2015). The first indications of what developed into modern day agriculture appear in the western half of the Fertile Crescent, where evidence indicates that foraging societies learned to cultivate the wild wheat and barley of the region and created permanent settlements (Mann, 2011). This singular development transformed the course of human history. As Mann (2011; pp. 20) puts it, "the invention of farming, [is] an event whose significance can hardly be overstated."

The domestication of nature liberated ancient humankind from the daily struggle for survival and for the first time allowed humans to dedicate increasing amounts of time and energy to thinking. According to some historians, these developments paved the way for early philosophical thinkers like Socrates, Buddha and Confucius, whose explorations in systematic philosophical thought laid the foundations for scientific inquiry and still influence society today

(Hughes, 2009). The expansion of agriculture fundamentally altered humanity's relationship with the natural environment towards one of subjugation, extraction and homogenization (Mozoyer & Roudart, 2006). This process accelerated with the industrial revolution, but its onset was predicated long before with the structuring of early agricultural relations that provided the foundations for the accumulation of wealth, centralization of production, and processes for the reproduction of labor forces that are essential features of our modern globalized economy (McMichael, 2009).

Philosophers from Voltaire and Rousseau, Jefferson and Hamilton to Malthus and Godwin have debated the distinctions between man and nature, or in other words, the nature of man. Very few, however, would argue that the development of agriculture has not played a crucial role in this break. The benefits that agriculture provided by supplying reliable sources of food allowed for the development of permanent human settlements, growing populations and the accumulation of capital in ancient human cultures around the globe. These developments directly led to the expansion of trade and bartering systems and arguably laid the foundations for the rise of Capitalism itself (Harari, 2015). In many cases, growing populations and the increasing demand for fertile soil led to the mismanagement of natural resources triggering losses in biodiversity, deforestation and oftentimes environmental and societal collapse (Diamond, 2004).

Although written history did not begin to emerge until around 4,000 BCE, it is easy to imagine how the rise of agriculture, permanent settlements and trade would have had a powerful effect on the way many ancient human civilizations thought about and related to nature. Nature

became something separate from mankind, something that humans could use, extract and/or transform into new forms with perceived added value. Although human society is currently undergoing yet another rapid change, in many ways it is still possible to observe the history of this worldview present today as evidenced by the large swaths of humanity who remain entrenched in shared delusions of limitless growth or beliefs in nature as a seemingly inexhaustible resource from which capital can be endlessly built and extracted.

4.2 Salt and the Rise of Fermentation

In transforming humankind from a species of relative insignificance to becoming the primary driving force of ecological changes on Earth, few of nature's raw resources or minerals have played nearly as significant a role as the seemingly benign inorganic compound, sodium chloride (NaCl) (Kurlansky, 2003; McGee, 2004; Harari, 2015). Civilizations first began understanding the potential utility of salt in ancient China and Egypt around 4000 BCE to assist with mummification (in Egypt) and in the production of fermented soy pastes (in China) that were the precursors of modern day soy sauce, but by the middle ages it had become a staple in Europe as well (Kurlansky, 2003). The growing demand for salt shaped the development of entire societies, dictating where cities were built and fueling lucrative opportunities for trade. To this day, salt is embedded throughout human societies, even the word *salary* comes from the Roman tradition of paying soldiers in salt (e.g. *worth his salt*) (McGee, 2004). Salt was clearly a valuable mineral, but why exactly did NaCl become so important in the development of humankind? To this, McGee (2004; pp. 640) has a clear answer:

“Thanks to its basic chemical nature, salt can alter other ingredients in useful ways. Sodium chloride dissolves in water into separate single atoms that carry electrical charge - positively charged sodium ions and negatively charged chloride ions. These atoms are smaller and more mobile than any molecule, and therefore readily penetrate our foods, where they react in useful ways with proteins and with plant cell walls. And because a concentrated solution of any kind draws water out of living cells by osmosis - water in the less concentrated cell fluid moves out of the cell to relieve the imbalance - the presence of sufficient salt in food discourages growth of spoilage bacteria while allowing harmless flavor-producing (and salt-tolerant) bacteria to grow. It thus preserves food and improves it at the same time.”

Although ancient humans most assuredly did not have a thorough understanding of salt’s chemical properties, cultures around the world nonetheless developed specialized techniques using salt to preserve and transform grains, vegetables and animal proteins into shelf stable foods with added nutritional value. Salt was essential for the creation of foods such as cheese, cured meats and fish, pickled vegetables, soy sauce and bread. Not only is salt important for preservation and flavor (it is the only natural source of one of our few basic tastes), but NaCl is also an essential nutrient, something our bodies cannot do without (McGee, 2004). Thus for ancient human civilizations, especially those that lived far from the sea, having access to this mineral through rock-salt deposits or other means became an indispensable feature of mankind, often serving to drive exploration, trade and economic expansion (Kurlansky, 2002).

While considering the ways that food and agriculture have influenced the development of human societies, the story of salt represents a particularly fascinating saga, which continues to influence social relationships today. Thanks to salt, in cultures around the world, the safe transformation of foods through shared processes of fermentation, have become a vital part of

vibrant and healthy societies globally. A Resurging interest in fermentation, as evidenced by the soaring popularity of fermentation advocates such as Sandor Katz³ and René Redzepi⁴ highlights our growing understanding of the role that fermentation plays not only in preserving foods, but also in forging stronger relationships both between people and the microbial world. As will be discussed in more detail later in the literature review, when people ferment foods together, they simultaneously lay the foundations for cooperation on more complex tasks in the future and quite literally contribute pieces of themselves (through the lactic acid producing bacteria on their hands) to the creation of new food products, which have improved nutritional value and are filled with colonies of microorganisms that scientists are beginning to understand play a crucial role in human health and well-being (Lv et al. 2017; Sun & Chang, 2014; Tang et al. 2017; Wang et al. 2017; Young, 2016).

Returning to the early stages of human agriculture, it is worth noting that human population growth, expanding environmental impacts and coinciding losses in global biological diversity continued at a relatively consistent pace for several thousand years, slowly plodding onwards until the Middle Ages. By 1300 AD however the rate at which most humans were altering natural environments was accelerating faster than at any previous point in human history (Harari, 2015). Built areas and cities were growing, and coincidentally deforestation, erosion and desertification most commonly followed. During this time period, enclosure first began in

³ Sandor Katz is an American food writer and activist and is the author of New York Times bestselling book, *The Art of Fermentation* (2012), Chelsea Green Publishing, VT.

⁴ René Redzepi is co-owner of the two-Michelin star restaurant Noma in Copenhagen, Denmark, which was voted best restaurant in the world in 2010, 2011, 2012 and 2014, after adopting an inventive approach to hyper local Nordic cuisine by using a range of fermentation techniques from around the world. He is also the co-author of New York Times bestselling book, *The Noma Guide to Fermentation* (2018), Artisan Books, NY.

Britain, which was the process by which small landholdings and commons were first consolidated by wealthy landowners into larger estates, restricting access and forcing landless peasants to sell their labor for wages. Several scholars theorize that it was this very process of enclosure around resources that had previously been treated as common goods, which may be seen as the original depeasantization and the instigator of modern capitalist value (Allen, 1999; Araghi, 1995; Patel, 2013; Wood, 2000). This example highlights how the treatment of common pool resources has changed through the development of specific forms of agriculture, the emergence of notions of land ownership and the resulting privatization and commoditization of both goods and labor, which can be argued is inextricably tied to the rise of Capitalism itself.

The process of scientific inquiry was also slowly making progress. Certain societies were faltering, yet steadfastly learning how to learn about the world. In the centuries to come they would forcefully set their imaginations and ambitions upon the rest of the world (Galeano, 1997; Mann, 2011). The Earth as a whole though was still full of life and many largely intact ecosystems remained. Importantly, although much of the world was being slowly transformed, there remained many ecosystems that would have looked wild at first glance but which had actually been inhabited and managed by indigenous peoples who, especially through the use of fire to maximize forage for game species, had learned to subsist within their local ecosystems for centuries or millennia (Harari, 2015).

4.3 Amazonian Historical Example

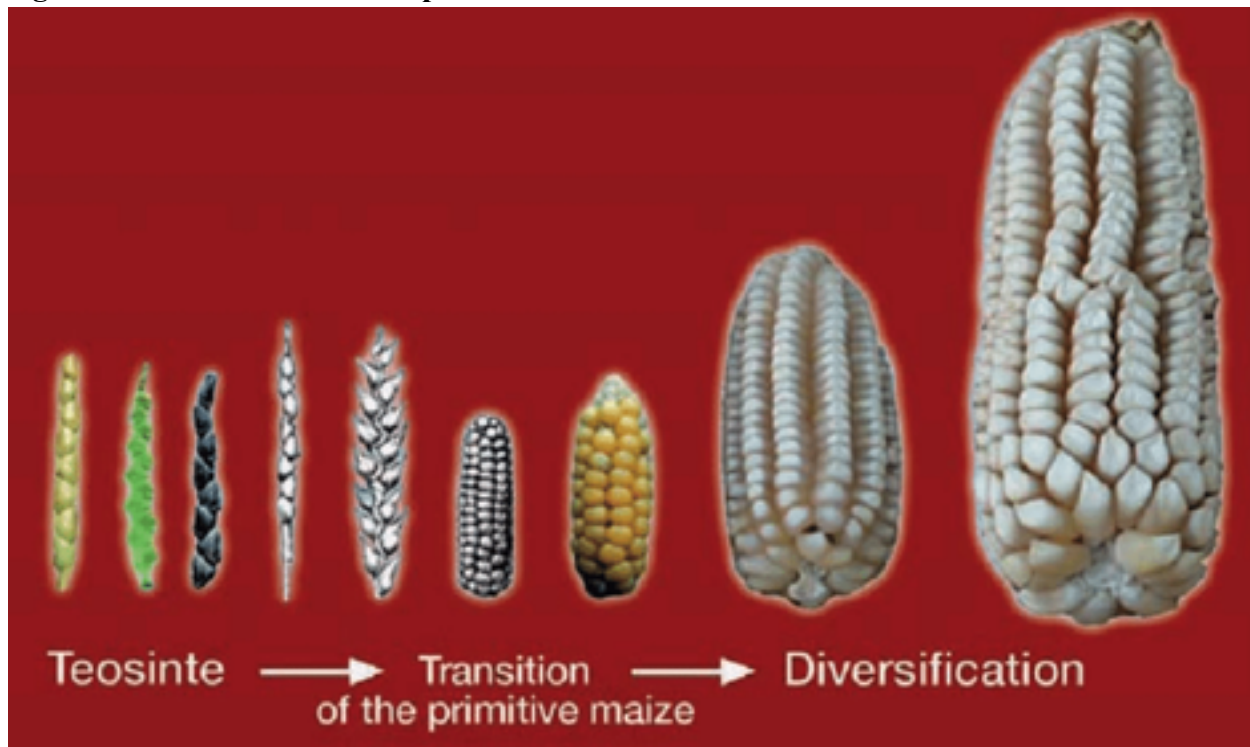
To illustrate the non-deterministic nature of agricultural development and highlight the existence of alternative trajectories for human society, this section examines a parallel timeline of societal evolution. One such location that has endured through history while sustaining large human populations and which, today, has important implications for the future of our species, is the Amazon rainforest. The legacy of pre-Columbian land use in Amazonian ecosystems has been a heavily debated and highly controversial topic in the social and natural sciences (Levis et al. 2017). Recent multidisciplinary findings however are helping to fill in the gaps and show that the development of complex societies in Amazonia began roughly 4,500 years before present (BP) and have had an enduring impact on Amazonian forest ecology and soil composition (Maezumi et al. 2018). Evidence suggests that the first inhabitants of the Amazon adopted a fascinating combination of perennial and annual polyculture-agroforestry practices that triggered an abrupt enrichment of edible plant species in the fossil lake and terrestrial records associated with pre-Columbian settlements (Levis et al. 2017; Maezumi et al. 2018).

It is worth noting that although there is considerable disagreement as to the first origins of homo sapiens to the American continents, by all accounts today's Native Americans left Euroasia well before the beginning of the first agricultural revolution (Harari, 2015). The implication clearly being that the systems of agriculture developed in the Americas evolved in complete independence from the simultaneous innovations that spread elsewhere in the globe. The nature of the parallel agricultural revolution which took place on the American continent is

all the more fascinating given what Mann (2011; pp. 21) describes as “the extraordinary nature of the most predominant Indian crop, maize.”

Cultivated maize (or corn as it is commonly referred to in the present day United States), unlike the original crops in Eurasia, does not have a comparative species that grows in the wild. Moreover, because its seeds are tightly wrapped in a thick husk it cannot reproduce on its own. The closest known relative is an alpine grass of minimal nutritional value called teosinte, which bears little resemblance to the maize grown by Native Americans (see figure 4.1), let alone the sweet corn most people are familiar with today. According to one ancient Indian legend, maize is “the food of the gods that created the Earth (Andelkovic & Ignjatovic-Micic, 2012; pp. 7).” In transforming such a humble plant into what would become the ancestors of all modern corn, the Native Americans accomplished a feat of such magnitude that it most certainly did create a new world for the first inhabitants of the Americas. The addition of maize to other staples such as squash, beans, avocados and cassava (in Amazonia) provided Mesoamerica with a well balanced diet that Mann (2011) argues may have been more nutritious than its counterparts in Asia and the Middle East.

Figure 4.1. Theoretical Development of Maize Cultivation

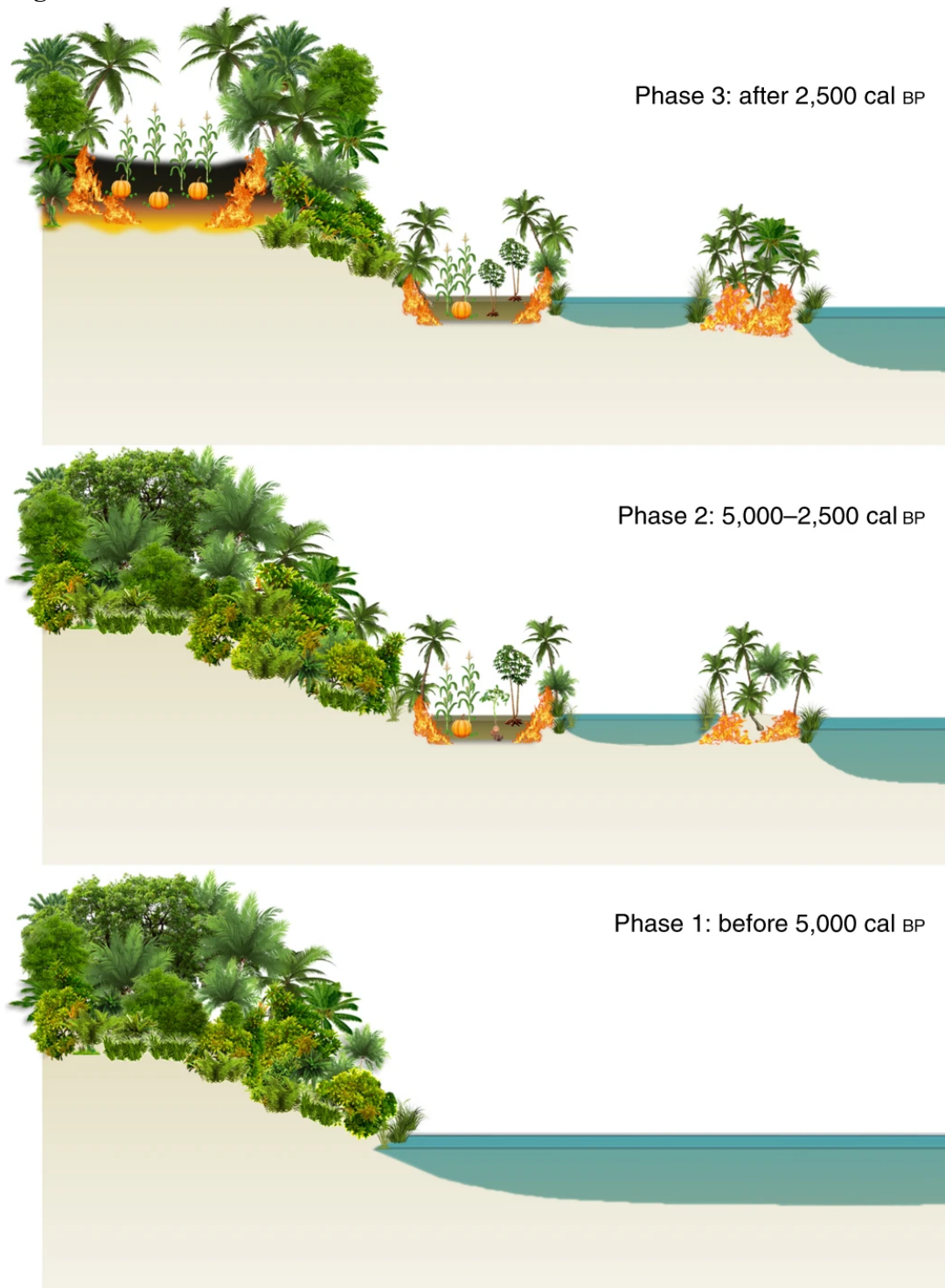


Source: Maize Genetic Resources - Science and Benefits. Violeta Andelkovic & Dragana Ignjatovic-Micic. Serbian Genetic Society, Belgrade (2012).

Particularly in Amazonia, the first inhabitants appear to have relied on a combination of aquatic resources, annual crops such as maize and manioc (cassava), as well as the incremental enrichment of edible forest species to achieve long term food security despite climate and social changes. The subsistence strategies employed by pre-Columbian peoples intensified over time through the use of closed-canopy forest enrichment, limited clearing for crop cultivation and low-severity fire management, and led to the development of the *Terras Pretas de Indio*, which allowed for the expansion of maize cultivation and growing populations in the eastern Amazon (see figure 1.2 to review a conceptual illustration of this process). The *Terras Pretas*, commonly referred to as Amazonian dark earths (ADEs), are one of the most distinct indicators of human

transformation of Amazonia because they provide strong evidence for the existence of sedentary human occupation.

Figure 4.2. Conceptual Illustration of pre-Columbian Amazon Vegetation and Disturbance Regimes.



Source: *The legacy of 4,500 years of polyculture agroforestry in eastern Amazon*. Nature Plants, Maezumi et al. (2018). The conceptual drawing above was inferred from an analysis of pollen, phytoliths and charcoal from multiple archaeological sites in the eastern Amazon basin. The illustration depicts the changing vegetation and disturbance regimes in the pre-Columbian Amazon over time.

Importantly, the mere existence of the *Terras Pretas* (or ADEs) flies in direct defiance of well accepted features of tropical soils. Tropical rainforests are notorious for having highly acidic soil conditions and low fertility due to the rapid rate of organic decomposition and nutrient cycling that occurs with the intense rain and heat in tropical ecosystems (Mann, 2011). Indeed, for decades scholars used this exact feature of tropical forests to argue that the Amazon basin could not possibly have supported more than a few thousand primitive people without environmental collapse. In contrast, the existence of ADEs defy this conventional wisdom, as they have long been associated with sustained and intensive agriculture and continue to be sought out and re-utilized by modern farmers due to their extremely high fertility. The widespread and persisting existence, as well as the rich organic content of ADEs is testament to the success and long term viability of landscape engineering conducted by pre-Columbian societies (Maezumi et al. 2018). The implications are astounding. Not only did the first inhabitants of the Amazon manage to develop a sustainable system of agriculture to support permanent civilizations spanning over 4,000 years, but they managed to accomplish this in a way that created long lasting improvements to soil fertility in a climate with one of the harshest soil conditions on Earth. Their innovations have left an enduring legacy on the abundance and hyper dominance of domesticated and edible plant species and enriched soil fertility that are still observable in the Amazon today. This example is valuable both because it serves to demonstrate an alternative trajectory for humankind and because the data from past anthropogenic land use is

being used to inform emerging land management practices that seek to develop more harmonious agricultural systems that can provide abundant sources of food without compromising the resilience and biodiversity of local ecosystems.

4.4 Colonial Expansion and the Foundations of Capitalism

On the European continent however, things were developing quite differently. The changes that began accelerating during the Middle Ages were continuing to build momentum. In early 1492, the same year in which Christopher Columbus would later set sail on his fateful voyage, Ferdinand of Aragon and Isabella of Castile defeated the last of the Arab strongholds and for the first time in nearly 800 years Spain achieved national unity (Galeano, 1999). Spain's conquests left their coffers drained and heavily indebted to other European states. Desperate to secure better access to Asian trade routes, the primary source of salt and spices such as pepper, ginger, cloves and cinnamon, Spain's Catholic rulers decided to finance Columbus's mission primarily in the hopes of gaining direct unfettered access to the source of these invaluable goods in addition to seeking silver and gold. Thus, at the dawn of the 16th century, Christopher Columbus set sail on his fateful voyage that would bring the American continent into the minds, imaginations, and desires of the European continent for the first time, kickstarting the rise of capitalism and the colonial conquest of the Americas. (Zinn, 2003).

Detailing the events that followed and the strategies by which European colonizers decimated indigenous populations is beyond the scope of this work. For more thorough accountings of the colonial conquests of the Americas, see Galeano (1999), Mann (2011) and Zinn (2003). For the purposes of this dissertation, it is important to highlight a few critical takeaways. Although the total number of deaths are unknown, the colonial exploits that flowed from Europe's first recognized contact with the Americas led to a near complete collapse of pre-columbian American societies and represents one of the greatest losses of human life to occur in modern history (Mann, 2011). Much of the European's military success can be explained by their "superior germs" to which native Americans were particularly susceptible and which wiped out up to half of the population or more (Galeano, 1999). Due to the rapid spread of diseases like smallpox, many populations were ravaged even prior to having contact with Europeans. As a thought experiment, the closest comparison would be to imagine if the Arab conquest of the Iberian peninsula in 710 C.E. had brought with it the Black Plague. The Islamic caliphate was the largest pre-modern empire of its time and had these invaders brought with them a highly contagious disease to which they had already acquired immunity (as did the conquistadors to Latin America), it is easy to imagine how they might have conquered all of continental Europe, stretching it's cultural fabric to a point from which European societies may have never recovered.

In Latin America, the toll these events took on the human capital of Mesoamerican populations is hard to imagine, let alone comprehend. No one knows for sure how many people perished but upper estimates range in the hundreds of millions. Equally difficult to fathom is the

sheer volume of raw mineral resources extracted from Latin America in a relatively brief period of time. According to Galeano (2011), in little more than a century from the discovery of the “New World” more than 185,000 Kgs of gold and 16,000,000 Kgs of silver arrived at the Spanish port of Sanlucar de Barrameda. These mind boggling figures exceeded three times the total European reserves during the same time period, making it no surprise why Karl Marx would later argue that these events triggered the first “primitive accumulation of capital” (Zinn, 2003; pp. 12). And because Spain was under mortgage it was not the crown, but rather her debtors throughout Europe that secured the most lucrative profits from the early conquests of America.

These findings have important implications for the development of capitalism. Those who view history as a competition may be inclined to view Latin America’s shortcomings as simply a result of their own failure. Yet, as Galeano (1999; pp. 2) explains, “our defeat was always implicit in the victory of others; our wealth has always generated our poverty by nourishing the prosperity of others - the empires and their native overseers.” The implications are that capitalism only emerged upon the bones, ashes and blood of millions of indigenous Americans, as well as the raw mineral wealth stolen from their lands. Scholars like Galeano (1999) argue that as a result of this inherent contradiction, development in a capitalist sense primarily serves to ‘develop inequality.’ Galeano (1999; pp. 2) powerfully summarizes this position in explaining Latin America’s role in capitalism’s own development:

“Latin America is the region of open veins. Everything, from the discovery until our times, has always been transmuted into European- or later United States - Capital, and as such has accumulated in distant centers of power. Everything: the soil, its fruits and its mineral-rich resources and human resources. Production methods and class structure have been successively determined from outside for each area by meshing it into the universal gearbox of capitalism. To each area has been assigned a function, always for the benefit

of the foreign metropolis of the moment, and the endless chain of dependency has been endlessly extended.”

If we look at commodities as a series of relationships rather than simply a state of existence between objects, it becomes readily apparent that the relational orientation of industrialism and modern day capitalism are rooted in and perpetuate violence, exploitation and ecological destruction (McMichael, 2009). Interestingly, these same patterns are also observable within patriarchal and other stereotypically disparate systems, which some scholars argue are inseparably connected. For example, Alesina et al. (2013) examined the origins of cross cultural variances regarding beliefs in the proper role of women in society. These scholars found that irrespective of region or ethnicity, the descendants of societies which practiced plough based agriculture (the main precursor to modern industrial farming) continue in modern times to suffer from less equal gender norms that devalue women’s participation in the workplace, politics and entrepreneurial activities. Patel (2017) explains it is not the plough that causes sexism. Rather, it is a system of agricultural relations that value enclosures and monocultures that disrupted what was once women’s and men’s work and have contributed to an embedded and enduring sexism that is still readily apparent today.

4.5 Rise of a Global Food Regime

As the colonial expansion continued, European capitalists began amassing enormous sums of wealth and not just in terms of gold and silver. The explosion of dispensable capital in

Europe caused international trade to rapidly expand. After the introduction of exotic foods like coffee (originally from Ethiopia) and chocolate (made from cacao seeds native to the American tropics), demand for seasonal fruits, spices and other delicacies exploded. The rise of global markets, and the regulations that followed led to the creation of the first food regime⁵ (Holt-Gimenez & Shattuck, 2011). Britain was the main driver of the first food regime and was the only major food importer during the 19th century. By the late 1800's Britain, considered the "workshop of the world" at the time, was already importing close to 80% of domestically consumed wheat (Ejrnaes et al. 2008).

Similarly to the first agricultural revolution, the industrial revolution was also spearheaded by innovations in agriculture that led to a transformation in how humanity produces, consumes and disposes of goods all over the world. During the course of the industrial revolution and resulting globalization, for the first time in human history standards of living, life expectancy and average levels of affluence made significant progress. Unfortunately, these gains have been disproportionately enjoyed by the global north and have also coincided with exponential growth in population, consumption of natural resources and losses to natural habitat and biodiversity.

The introduction of global agricultural markets helped to disentangle food consumption from local and even national food production, while the rise of industrial capitalism triggered an unprecedented demand for food commodities and catalyzed a restructuring of agricultural relations worldwide (McMichael, 2012). In this way the progressive development of agriculture

⁵ A Food Regime is a "rule-governed structure of production and consumption of food on a world scale." Holt-Gimenez & Shattuck, 2011. Food crises, food regimes and food movements: rumblings of reform or tides of transformation? *Journal of Peasant Studies*, 38: 1, 109-144.

into ‘food regimes’ through formal arrangements determining the procedures to be deployed in producing and circulating global food supplies is pivotal to understanding the history of capitalism itself (McMichael, 2009). “It is not about food per se, but about the relations within which food is produced, and through which capitalism is produced and reproduced” argues McMichael (2009; pp 281). He concludes that, “as such, the food regime is an optic on the multiple determinations embodied in the food commodity, refocusing from the food commodity as *object* to the commodity as *relation*, with definite geo-political, social, cultural, ecological, and nutritional relations at significant historical moments (McMichael, 2009; pp 281).”

Here McMichael (2009) uses food regime analysis to illustrate how dominant food regimes provide an important reflection on the multiple determinations embodied in food as a commodity. Food regime analysis is concerned with fundamental questions regarding the relational elements of capitalism such as where, how and by whom is what food produced and consumed. McMichael (2009; pp 282) explains that “methodologically, the food regime is generic to understanding capital’s structuring of agricultural relations across time and space as a foundation of accumulation and the processes of production and reproduction of labor forces.” Substantively, his point is that more recent manifestations of the food regime are merely the byproduct of a long-standing set of economic and social relations through which historical capitalism has reorganized global agriculture. By focusing on the food commodity as a set of relations, this literature review traces fundamental patterns of inequality and severe disparities that serve as the basic contradiction haunting industrial capitalism and as a byproduct, the current global food regime as well.

4.6 Second Agricultural Revolution

The first agricultural revolution, which most estimates converge began roughly 11,000 years BP, finally gave way in the latter half of the 18th alongside the development of several transformational technologies and novel methods of production (Harari, 2015). The second agricultural revolution picked up steam during the first half of the 19th century in the US, and earmarked the beginning of a broad based transition towards mechanization that has come to include industries from agriculture, manufacturing, and today even customer service and education (Ackerman-Leist, 2013; McDonald, 2017). This trend however, began with agriculture. The invention of mechanical refrigeration in the late 18th century paved the way for the expansion of the distribution of perishable foods such as meats, dairy, and for breweries to improve the longevity and consistency of beer (Ackerman-Leist, 2013). Then in the late 1930's, by the end of the Great Depression, pioneers in the Chicago meat packing industry perfected the mass production line model that would soon be rapidly adopted by the auto-industry and elsewhere.

The emergence of centralized and standardized food production practices coincided with the dramatic Dust Bowl, or Dirty Thirties, which helped drive over 400,000 small farmers to give up their land and join the industrial labor force (Ackerman-Leist, 2013; Library of Congress, 2018). This sudden migration towards urban areas created a massive surge in the availability of cheap labor, exactly what industrial capitalists needed to expand production and usher in the

industrial era. As a result, in little more than a hundred years humankind and the ways we relate to both one another and the natural world, have been irrevocably transformed once more (Harari, 2015). Many of the developments that have occurred during this brief time period, such as the explosion in digital technologies and growing reliance on virtual communication, would have been unimaginable at the turn of the 19th century.

What was unique in this transition is that for perhaps the first time in modern human civilization, the bulk of the United States labor force began to move permanently out of agriculture, and at the same time, the automation and standardization of food production, allowed caloric consumption per capita to increase (Dubofsky & McCarlin, 2017). Past famines and droughts had certainly triggered major land migrations and spurred the movement of large numbers of individuals, however the 20th Century was the first time in human history that the bulk of society's population permanently moved out of food related industries as trends towards urbanization and industrialization began picking up steam. Although it was unbeknownst at the time, the adoption of principles such as standardization, efficiency, division of labor, and mass production in the United States, with the assistance of globalization, would soon be introduced to industries around the globe (Robinson, 2008; Gereffi, 2005).

Globalization and the adoption of Green Revolution (GR) technologies (such as improvements in plant varieties and the widespread application of petrochemical fertilizers), led to major gains in crop productivity. Between 1960 and 2000, agricultural yields of staple annual crops for all developing countries increased by 208% for wheat, 109% for rice, 157% for maize,

78% for potatoes and 36% for cassava (Pingali, 2012). Throughout the first period of the GR, increasing yields more than kept pace with population growth, creating massive surpluses in food availability and causing average food prices to plummet. The automation of industry freed human energy from manual labor, created opportunities to greatly expand investments in science and technology and increased the demand for educated workers. The combination of these factors led to several enormous accomplishments, including unprecedented improvements in health, life expectancy and standards of living in many parts of the world, helping to lift millions of people out of poverty.

Despite these impressive gains, global aggregates mask severe geographic disparities. The resulting surplus of staple grains and cereals as well as declining food prices led to widespread food waste at a global level for the first time in human history. Moreover, despite surpluses in food production, historically this has not always meant that food is available where it is needed most. Still today roughly 821 million people globally continue to struggle with chronic undernourishment (FAO, 2020). Tragically, the global COVID-19 pandemic is worsening this situation, with hundreds of millions of people out of work and supply chains breaking down, as of writing the World Food Program currently estimates that an additional 130 million people could be pushed to the brink of starvation by the end of 2020 (Dahir, 2020). As during the GR, access to economic capital will play a formative role in determining who suffers the most severe consequences of the global coronavirus pandemic.

During the first GR, the adoption of new technologies gave farmers with the capacity to invest in High Yielding Variety (HYV) seeds, irrigation, industrial equipment and petrochemical fertilizers a massive advantage (Pingali, 2012). With the rise of the GR, subsistence farmers around the world began finding themselves in increasingly difficult positions, unable to compete with the well financed industrial monoculture farmers that have become symbolic of modern societies corporate food regime. To address this crisis, in 1971 the Consultative Group on International Agricultural Research (CGIAR) was founded with the specific mandate of generating technological advancements for countries that underinvest in agricultural research. The breeding research and seed technology that was developed at CGIAR was responsible for much of the improvements to crop yield throughout the first GR (Pingali, 2012). The success of the CGIAR programs is demonstrated by the fact that on average during the first period of the GR, CGIAR centers were able to disseminate high-yielding varieties (HYVs) of staple grains that independently were estimated to increase productivity per annum by an impressive 1.0% for wheat, .8% for rice and .7% for maize. By 1998, modern varieties had been adopted in 63% of all cropland (Pingali, 2012). However, even at the turn of the century, Latin America and Africa still lagged far behind, with only 27% of total farmland in Africa having access to HYV seed stock compared to 82% of all planted areas in Asian countries (including China). Research also indicates that gender played a determining factor in the distribution of benefits from the GR. Although cross-country empirical evidence demonstrates that women farmers are equally efficient as their counterparts when using the same tools, Pingali (2012; pp. 1304) argues that “with few measures to address women’s technology needs or social conditions... women consistently face barriers to accessing productive resources and technologies.”

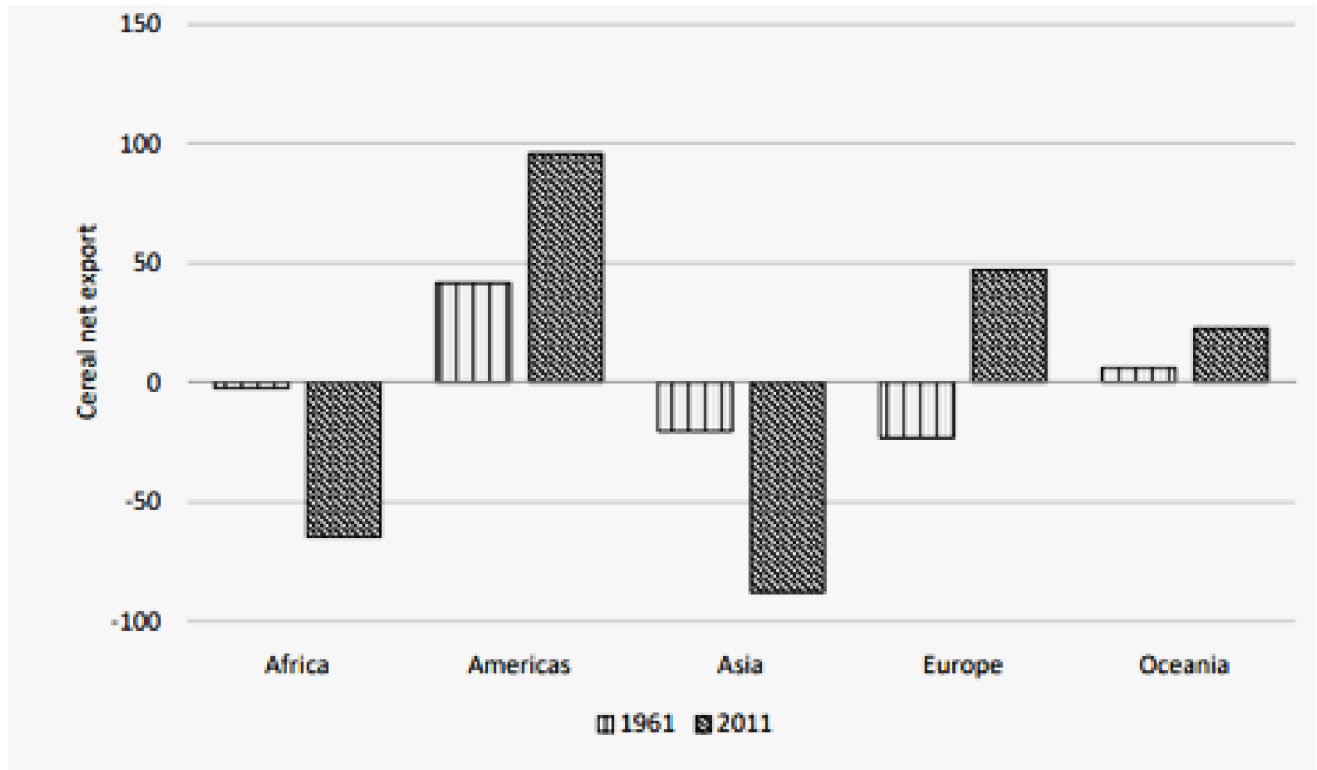
Also in 1971, the same year that CGIAR was established, Lewis Powell wrote a confidential memo regarding what he saw as a “broad attack” being levied against the “American economic system” (Powell, 1971). The Powell Memo, as it became known, was rapidly disseminated throughout the international business community. In it, Powell urged business leaders to take up political arms, saying that “business must learn the lesson... that political power is necessary; that such power must be assiduously cultivated; and that when necessary, it must be used aggressively and with determination - without embarrassment and without reluctance.” According to former Secretary of Labor, Robert Reich, the Powell Memo became a type of manifesto for new business-oriented think tanks, lobbying groups, trade associations and professional organizations who became committed to securing political power in order to protect their interests (i.e. profits) and thus kickstarting the growing influence of corporate interests on national and international politics (Reich, 2017).

Modern day capitalism is based on the ownership of private property and a ‘free exchange’ of goods and services. Although the notion of private enterprise and an exchange of goods and services still play central tenants within the modern global economy, the rules and regulations that govern these relational commodities have become exceedingly complex and opaque, serving to obfuscate the role of transnational corporations (TNCs) that have subtly worked to change the rules over time in order to benefit corporate interests at the expense of average workers (Reich, 2017). The narrative of the ‘American economic system’ has been built around concepts such as ‘free markets’ and ‘supply and demand’, but the myth of a ‘free market’

is belied by the fact that global markets, just like food regimes, rely on agreed upon rules that govern issues such as property, trade, monopolies, contracts, bankruptcy and various mechanisms of enforcement in order to function. Since economic rules are not a function of natural laws and are rather determined by people, Reich (2017) argues that the regulation of economic systems tends to reflect the interests of those with the most power and fluctuates over time depending on where power is concentrated (Reich, 2017).

At various points in history, global capitalism has utilized a variety of methods to address food challenges (Friedmann, 1993; McMichael, 2009). It is arguable that the adaptability of capitalism as an economic system has historically allowed it to strategically respond to societal pressures and is perhaps one reason for its continued dominance at the global level. During the first food regime, in the early stages of the industrial revolution (1870-1930s) tropical products were imported from colonized states in the Americas and Africa to meet growing demand within the European industrial class, led by the British 'workshop of the world' (McMichael, 2009). The second food regime emerged after the Dust-Bowl and US Great Depression when American industrialists reorganized agriculture as 'petro-farming' (Walker, 2005). Emerging surpluses in the US were then re-routed to support reconstruction in allied states after WWII and provide subsidized food aid in strategic states along Cold War perimeters (Friedmann, 1993; Xu, 2017), which according to some scholars was used to lower the cost of labor and pacify urban populations in an effort to stem the tide of communism (Patel, 2007). For a comparison of global cereal trading patterns between 1961 and 2011, see figure 4.3 below.

Figure 4.3. Changes in Cereal Trading Patterns Between 1961 and 2011



Notes: All exports are in 1000 tonnes. Net export is minus import.
Source: FAOstat, <http://faostat3.fao.org/>.

Cheap US food exports and economic support provided timely assistance for newly independent states, undermining their self-sufficiency in food production and instead incentivizing industrialization and investments in textiles and factories to fuel growing demand for non-agricultural products in North American and European markets. Contrary to ‘free market’ narratives, several scholars argue that federally subsidized US food imports, especially in former African and Latin American colonies served to undersell local producers and trigger large scale land dispossession of peasant agriculturalists (McMichael, 2005; UNFPA, 2009). As opposed to Britain’s ‘workshop of the world’ narrative which dominated during the first food regime, under the conditions of an increasingly ‘corporate food regime’ the dispossession of

peasant farmers has served to solidify labor reserves to perform the relation of 'export-processing' while deepening the 'world factory' phenomenon (McMichael, 2009).

Critics of industrial agriculture, such as Via Campesina, the transnational peasant coalition, claim that TNCs seek to prevent family and peasant farmers from feeding people because their true objective is to control the world food market and convert all peasant-based systems into industrialized production. Peasant coalitions fear that as industrial farmers expropriate increasingly larger portions of the global food supply that they will exploit vulnerable consumers by raising food prices, as was seen leading up to the world food crisis of 2007 & 2008 (Patel, 2013). McMichael (2009) suggests that critiques from peasant movements such as Via Campesina capture a critical value relation, "through waves of depeasantization, corporate agriculture has destabilized small farm cultures and their food provisioning capacities for a significant portion of the world's food, manufactured slums and generated a relative surplus labor force. It is this labor reserve that fuels accumulation - providing cheap labor for webs of outsourcing across both North and South, and exerting downward pressure on (social) wages (McMichael, 2009; 284)."

This assessment is consistent with observable patterns since the onset of the industrial revolution, including in the United States, which saw a collapse of small scale agriculture in the first part of the 20th century. Although the development literature emphasizes plans to support smallholder farmers, top down solution oriented strategies that focus on techniques such as the utilization of remote sensing and spatial mapping technologies to improve the management of

agricultural investments reveal a profound disconnect between proposed solutions and the realities that many peasant farmers face (Pingali, 2012). These types of solutions are more geared towards and likely to continue favoring well funded industrial farmers who can afford the training, equipment and staffing to implement high barrier technologies. McMichael (2009) suggests that within the neoliberal development narrative, the elimination of small scale and peasant agrarian lifestyles is seen as an inevitable form of progress. Under the guise of neoliberal advancements, he argues that agribusiness “*performs* this narrative” with support from development agencies and international regulations governing the corporate food regime, essentially viewing peasant agriculture as “a barrier to be overcome” through a self-fulfilling prophecy that *reproduces* the very inequalities and dispossessions upon which modern day capitalism’s colonist roots are founded.

The stated intentions of the neoliberal development narrative includes freeing humankind from manual labor, generating wealth, raising wages and ending world hunger. More insidiously however, it is undeniable that industrial capitalists rely on the exploitation of cheap labor and environmental resources (e.g. fossil fuels) in order to propel growing profits. These mechanisms are illustrated through Harvey’s (2004) concept of ‘accumulation by dispossession’, which highlights how peasantries are expropriated through a combination of direct global market forces (e.g. destabilizing effects of food imports, rise of contract farming, etc.) and indirect dispossessions due to privatization of public investments in small-scale farming, thus further allowing for the consolidation of corporate agriculture.

Transnational corporations (TNCs) trigger this process by lowering food prices in order to drive small scale farmers out of business and increase market shares, thus simultaneously eliminating competition and creating surplus labor to fuel the cheap production of commodity goods for global distribution. After monopolizing market structure, TNCs often move to inflate prices in order to ensure generous profits at the expense of waged consumers. The implications of this process of ‘accumulation by dispossession’ has led some scholars to argue that a dismantling of small scale agricultural sectors worldwide is failing its stated development goals while further undermining local stewardship of the land. This situation, critics argue, ultimately leaves the challenge of ‘food security’ to a global market relation and further engorges the corporate food regime with an endless supply of ‘surplus’ labor that serves to depress wages worldwide (McMichael, 2006).

The latest manifestation of the corporate food regime has, since the turn of the century been working to deploy a so called New Green Revolution (NGR), driven by recombinant gene technology and the use of genetically modified seeds to improve returns (Richards, 2011). In 1996 GE soybeans, corn and cotton first became commercially available in the U.S. The introduction of GE seed technology and increasing costs of associated R&D triggered a series of mergers and acquisitions that left the seed industry dominated by large TNCs whose interconnected investments range from petrochemical, food and pharmaceutical products, often in related industries (USDA, 2006). For example, the herbicide glyphosate (RoundUp) and the GE soybean seeds designed to tolerate glyphosate are produced by the same corporation. By the year 2000 the four largest firms (Pioneer Hi-Bred, Monsanto, Novartis, and Delta & Pine Land)

providing seed (both conventional and GE) for major field crops in the U.S. already accounted for the vast majority of total U.S. seed sales, including over 90 % of cotton, 70 % of corn and 47% of soybean sales. In less than a decade from their initial commercial release, GE crops were being grown by more than 8 million farmers across seventeen countries on a total of over 80 million hectares, representing the fastest diffusion of any agricultural biotechnology in human history (Qaim, 2005).

As a whole, agricultural biotechnology comprises a range of scientific techniques, which include genetic engineering (GE), that are used to create, improve, or modify plants, animals, and microorganisms (USDA, 2006). The use of GE technology has allowed researchers to alter selective portions of plant genetics in order to facilitate the development of traits and characteristics that would be either impossible or take decades to accomplish via selective breeding methods. GE crops are typically divided into three generations. The first generation focuses on modified input traits, including herbicide tolerance (e.g. RoundUp ready soybeans), insect resistance and tolerance to environmental stress (e.g. drought). Second generation GE crops attempt to provide added-value output traits (e.g. nutrient enhancement) while third generation research is seeking to produce pharmaceuticals, improve processing of bio-fuels and fiber based products.

GE technology is under various stages of R&D, although commercially available generations of GE crops are still primarily limited to those with modified input traits (e.g. pesticide resistance). The most widely adopted GE technologies continue to include herbicide

tolerance applied in soybeans and canola, and insect resistance, based on genes isolated from *Bacillus thuringiensis*, applied in maize and cotton (Qaim, 2005). When comparing GE technologies to previous crop innovations such as the development of HYVs, there are two major differences worthy of discussion here. Whereas the supply of improved seeds to smallholder farmers in developing countries was dominated by the public sector during the first GR, GE crop technology has been driven primarily by large TNCs, highlighting the increased importance of intellectual property rights concerns. Second, GE crops are associated with novel environmental and health risks that necessitate new regulatory processes and have limited public acceptance in many countries.

Although proponents of GE technology are quick to point out potential benefits, such as increased yields, reduced fertilizer or pesticide usage, the impacts of GE technology on issues such as crop production, world hunger and the environment, especially in developing and low-income countries, are hotly debated subjects (Pingali, 2012; McMichael, 2009; Patel, 2013; Richards, 2011). Patel (2013) explains that as a relational commodity, in pushing for a ‘New Green Revolution’, the first GR needs to be framed as a success. In order to be a success the first GR has to be considered complete and ‘unequivocally effective’, despite unintended consequences. However, as McMichael (2009) points out, any suggestion that the Green Revolution ‘succeeded’ begs the question ‘Successful for whom?’ To this, Perkins (1997; pp 258) has preemptively responded: “If success means an increase in the aggregate physical supply of grain, the green revolution was a success. If success means an end to hunger, then the green revolution was a failure. People without access to adequate land or income, regardless of their

country of residence, remain ill fed.” A central concern of critics of the GR is that at best, the rural poor were often overlooked, and at worst their struggles have been exacerbated (Patel, 2013).

Proponents of the GR utilize three central claims to argue that GR interventions supported small landholder farmers (Patel, 2013). These include *scale neutrality* (Mosley, 2002; Birner & Resnick, 2010; Hazell et al 2010) (Inputs are divisible therefore GR technology is adoptable by small and large farmers alike), *scientific improvement* (gains in biotechnology are becoming more suited to the needs of poor farmers living in marginal contexts), and *smallholder self-interest* (GR technology was adopted by poor farmers in order to increase yields and improve material well-being) (Borlaug, 2000; Griffin & Boyce, 2011; Hazell et al. 2010; Patel (2013). Although these claims have some merit, their arguments fail to hold up under scrutiny and are in some cases, baseless. The first proposal, *scale neutrality*, ignores the fact that while inputs may be divisible, they are not necessarily ‘resource neutral’. In adopting new seed technology, well financed farmers risked far less because they had more capacity to obtain credit, fertilizer, irrigation, labor when required and access to extension services (Berstein, 2010). Additionally, some scholars point out that technology was in fact, not always divisible, being that packages were often bundled by corporate agribusiness into fertilizer/seed combos that were too expensive and inappropriately sized for smallholder farmers (Palmer, 1972). Even the public institutions designed to address inequalities in access have often suffered from biases against poor farmers. Griffin (1979) captures this well:

“Extension agents concentrate on the large farmers; credit agencies concentrate on low risk borrowers; those who sell fertilizers, pesticides and other chemical inputs concentrate on cultivators who are likely to buy the largest quantities. State organizations tend to provide services to those from whom the government seeks approval, and in most instances these are the large landowners. Unless there is ‘scale-neutrality’ in the institutions which support the ‘green revolution’. . . unless small peasants have equal access to knowledge, finance and material inputs, innovation will inevitably favour the prosperous and the secure at the expense of the poor and the insecure (Griffin 1979, 236).”

The second claim, regarding *scientific improvement*, acts to deflect attention away from institutionally reinforced disparities by suggesting that even though GR policies tended to favor the minority of commercial agriculturalists, the scientific advancements gained through plant breeding research eventually became more attentive to the needs of peasant farmers (Patel, 2013). It is true that new varieties appear to be helping, with more plant breeding focusing on greater pest resistance and adaptability to marginal environments (e.g. less moisture and temperature sensitive) (Griffin & Boyce, 2011). As Patel (2013, 21) concedes: “This is important, though it is worth remembering the point of departure – the ministrations of plant breeding scientists could hardly have become less focused on the needs of smallholders than the original Green Revolution had been.”

The third argument, regarding *small holder self-interest* seeks to frame adopters of GR technology as rational actors that successfully escaped poverty, while farmers that chose not to adopt these innovations were described as ‘peasant conservatives’ or as possessing a ‘peasant psychology’ (Yapa & Mayfield, 1978). Although in some places the adopting of GR technology has helped increase the incomes of peasant farmers, impacts are far from clear and factors such as the cost of seed, access to water, and a lack of education also limited adoption of new varieties

(Patel, 2013). To the extent that adoption by peasant farmers did occur, Palmer (1972) suggests that farmers were responding primarily to the availability of cheap credit and discriminatory interventions by governments that were common in the early stages of the GR. As Patel (2013; 21) describes, “It was rational to adopt the Green Revolution in the way that it is rational to take an envelope of cash sitting on a table with your name on it.”

A valuable way to consider the true impact of the GR on peasant livelihoods is to consider how GR policies have impacted the value of land in comparison to wages. In this regard there is a clear trend. While economic pressures have generally caused the prices of land to skyrocket, real wages have made very little gains in the last half century (Piketty, 2014; Patel, 2013). For example, between 1960 and 1978, land values in the Punjab region of India increased four fold while wages remained almost constant (Kerr & Kolavalli, 1999). A similar pattern is observable across GR regions, in which “employment of labour goes up somewhat, the real wage does not go up a lot, and the rewards (price, rent) of land go up a good deal, probably reducing labour’s share in income’ (Lipton and Longhurst 1989, 110).” With respect to GDP, corporate profits have grown precipitously in the last three decades while the share of wages have shrunk to historically low levels (Piketty, 2014; Reich, 2017).

The historical specification of value relations provided in this section is crucial for understanding the complex role that the corporate food regime has come to play with regards to the manipulation of market forces, accumulation and increasing concentration of capital, and the limitations to GR technologies with regards to addressing social and environmental disparities

inherent to modern industrial systems, or ‘petro-farming’ (McMichael, 2009). As this literature review demonstrates, the once subtle enmeshment of business and state within the modern global economy has become a predominant and often assumed feature of state actors. The conglomeration of corporate and state interests undermines the likelihood of purely market driven responses, a point that Patel (2013; 26) illustrates well:

“In other words, the important variables aren’t supply or demand, but the extent to which movements were able to prevent the enforcement of capitalist free markets in labour by the state. Which is to say that the markets in which labourers sell their labour power are fought over, not naturally given. And in the epicenters of the Green Revolution, those markets were systematically tilted in favour of the buyers of labour power – the owners of land. The state made these markets as part of its making the Green Revolution.”

The imbalance of political power is an important factor limiting progress in efforts to reduce the nearly one billion people still living in poverty. In addition to political and economic forces, at this point it is irrefutable that increasing energy costs, ecological degradation and climate change are key factors eroding the capacity of humankind to continue feeding itself based on a model of industrial agriculture that is highly reliant on petrochemicals and fossil fuels (Altieri & Toledo, 2011). The shortcomings of industrial agriculture lie primarily in its reliance on fossil fuels (non renewable resource), monocultures (low ecological diversity) and limited genetic stock (vulnerable to pests and disease). As Altieri & Toledo (2011; 589) argue:

“Global food security could be considered the weak link between the ecological and economic crises affecting the planet. This became evident when the ‘perfect storm’ occurred in 2007–08 with the alarming rise in the cost of food that sent an additional 75 million people to the world’s line of hungry people, especially in Sub-Saharan Africa and Asia. Oddly, there had been no drought – the usual cause of hunger – in those regions during that period and there was plenty of food in the markets. ‘For no obvious reason the price of staple foods such as maize and rice nearly doubled in a few months . . . There were food riots in more than 20 countries and governments had to ban food exports and subsidize staples heavily’ (Vidal 2011; see also Holt-Gimenez and Patel 2009).”

In the aftermath of the 2007-08 food crisis the FAO linked rising prices to a confluence of interrelated factors, including growing competition for land to grow biofuels, increasing costs of oil and fertilizer, global dietary shifts towards higher meat consumption as well as climate change-linked droughts that affected major growing regions. However, in 2008, at the same time that hunger increased and food prices rose to their highest point in at least 30 years, cereal yields simultaneously reached unprecedented levels allowing TNCs (e.g. Cargill, ADM, Monsanto) to report record profits (Altieri & Toledo, 2011).

As testament to the growing recognition that ecological degradation and the impacts of climate-change are a global threat that will require extensive multilateral coordination to address, the United Nations adopted 17 Sustainable Development Goals (SDGs) at the UN Sustainable Development Summit in New York in September, 2015 and subsequent Paris Agreement on Climate Change shortly thereafter. The SDGs attempt to cover a comprehensive set of interrelated goals and lay out an ambitious framework for achieving “peace and prosperity for people and the planet, now and into the future (UNSDG, 2015).” Importantly, the SDGs recognize the stability of the ecosphere as foundational to sustainable development and that success is less likely if goals are addressed individually.

Inspired by research from Carl Folke and other systems scientists who argue that the divisions between human and environmental systems are arbitrary and that economies and societies are embedded within the biosphere, Rockstrom and Sukhdev (2016) propose a “wedding cake” model for the SDGs. This model shifts thinking away from a sectorial paradigm

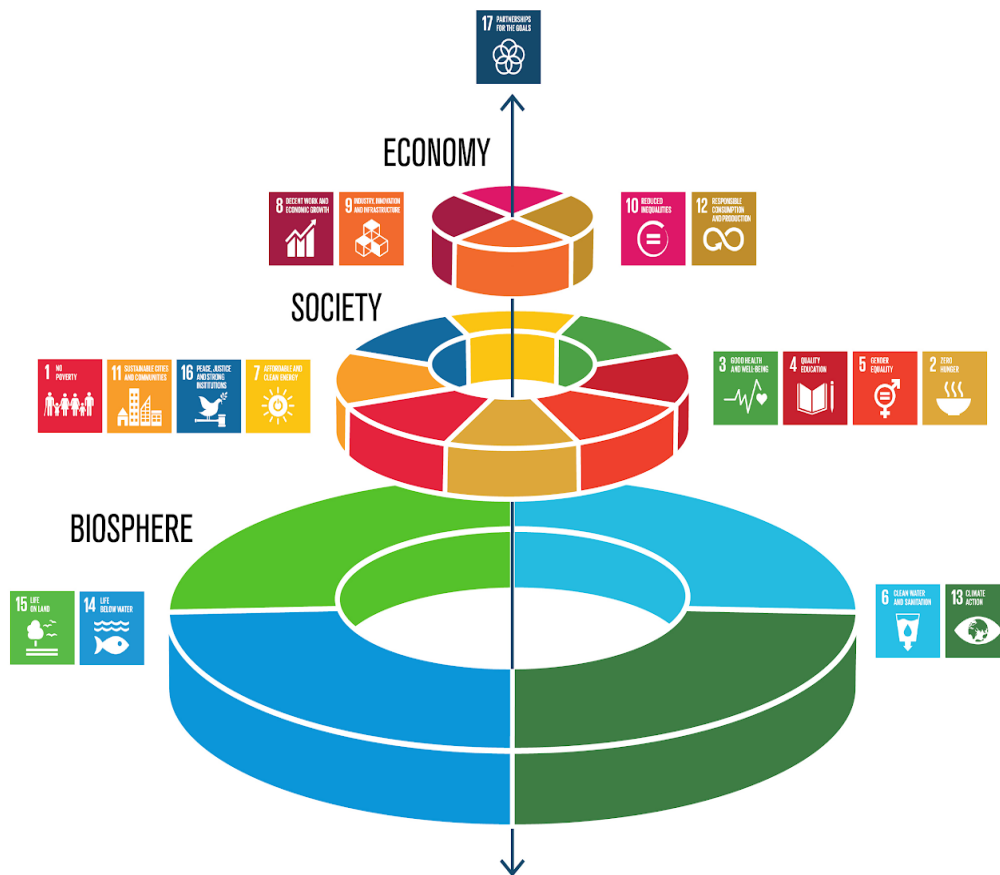
approach to development and instead seeks to integrate economic, ecological and social logics to encourage economic markets that evolve within the safe operating zones of planetary boundaries in order to serve society. Of interest, Rockstrom and Sukhdev (2016) argue that food best functions as the lynchpin which connects all 17 goals. In the following section I will provide evidence for this suggestion and detail the ways in which a reorganization of world agriculture systems, or a third agricultural revolution, is both timely and necessary to ensure the continued prosperity of humankind on Earth. Importantly, a reorganization of world agricultural systems, as evidenced by changes observed throughout the first and second agricultural revolutions, has massive implications for not only the mechanical methods of production and distribution, but also for transforming social relations and hierarchical value chains towards the types of closed loop, cyclical systems found in nature. Figure 4.4 below illustrates Rockstrom and Sukhdev's (2016) proposal to integrate the SDG's through their connections with food.

In June 2016, during the Keynote Speech at the Stockholm EAT Food Forum, Rockstrom and Sukhdev (2016) shared why the need for sustainable and healthy food connects all of the SDGs. During the talk, Sukhdev explained that the proposed wedding cake model (see figure 1.4), helps illustrate how, for example, that climate action (goal 13), ending poverty (goal 1), ensuring clean water and sanitation (goal 6), ending hunger (goal 2), and providing decent work and economic growth (goal 8), are all clearly reliant on our capacity as a species to produce abundant supplies of sustainably produced, healthy food in a way that is both equitable and socially just. Sukhdev (2016) then asks, "How will we provide decent work and economic growth (goal 8) if we don't focus on the 1.3 billion jobs that agriculture provides? And how will

we reduce inequalities (goal 10) if we do not attend to the livelihoods, the pricing of foods grown on these farms?” To address these issues, Rockstrom and Sukhdev (2016) suggest:

“Something we need to think about is [developing] a new lens for looking at food. For too long we have just focused on per hectare productivity as the way forward. The problem with doing that, is of course we forget that food is about a billion jobs. It’s about nutrition. It’s about health. It’s about culture. It’s about all of these things and yet when we come to measuring food, we just look at per hectare productivity. We need a much more comprehensive lens. A lens that shows that we are actually flying a spaceship rather than navigating a ship with a mariner’s compass.”

Figure 4.4. Sustainable Development Goals Wedding Cake.



Graphics by Jeter Lokantz/Azote

Source: Rockstrom, J. & Sukhdev, P. (2016). Azote images for Stockholm Resilience Centre, Stockholm University. In the wedding cake model Rockstrom and Sukhdev envision *Partnerships for Goals* as piercing economic, societal, and biospheric goals. The authors argue that each of the 17 SDGs are uniquely linked to the need for healthy and sustainably produced food. Wedding Cake Model at Keynote Speech accessible at:

<https://www.stockholmresilience.org/research/research-news/2016-06-14-how-food-connects-all-the-sdgs.html>

Despite adoption of the SDGs, a growing lack of confidence in national and international institutions has led hundreds of thousands of peasant farmers to band together in their demand for agricultural reforms rather than rely on the decisions of international leaders or the business community. In this way, social movements like Via Campesino and Campesino a Campesino (farmer to farmer) are working to re-establish land ownership through direct action, including long term protest and occupation as well as improved techniques through the adoption of innovative approaches to agriculture, such as agroecology, while sharing skills and improving plant genetics through farmer led trainings and locally based experiments.

As an approach to the cultivation of food, agroecology is distinctly different from modern industrial farming or even conventional organic agriculture. It is much more analogous to the forms of agroforestry that were sustainably practiced for over 4,000 years in the pre-Columbian Amazon. Instead of a dependence on high inputs, low biological diversity and limited genetic stock, the key objective of agroecology is to develop ‘agroecosystems’ that maintain minimal usage of high energy inputs (Altieri & Toledo, 2011). As a science, agroecology comprises the ‘application of ecological science to the study, design and management of sustainable agroecosystems’ (Altieri, 2002; Gliessman 1998). The implications for the application of ecological science to agriculture are to call for the diversification of farms to achieve beneficial and synergistic biological interactions between agroecosystem components that allow for the

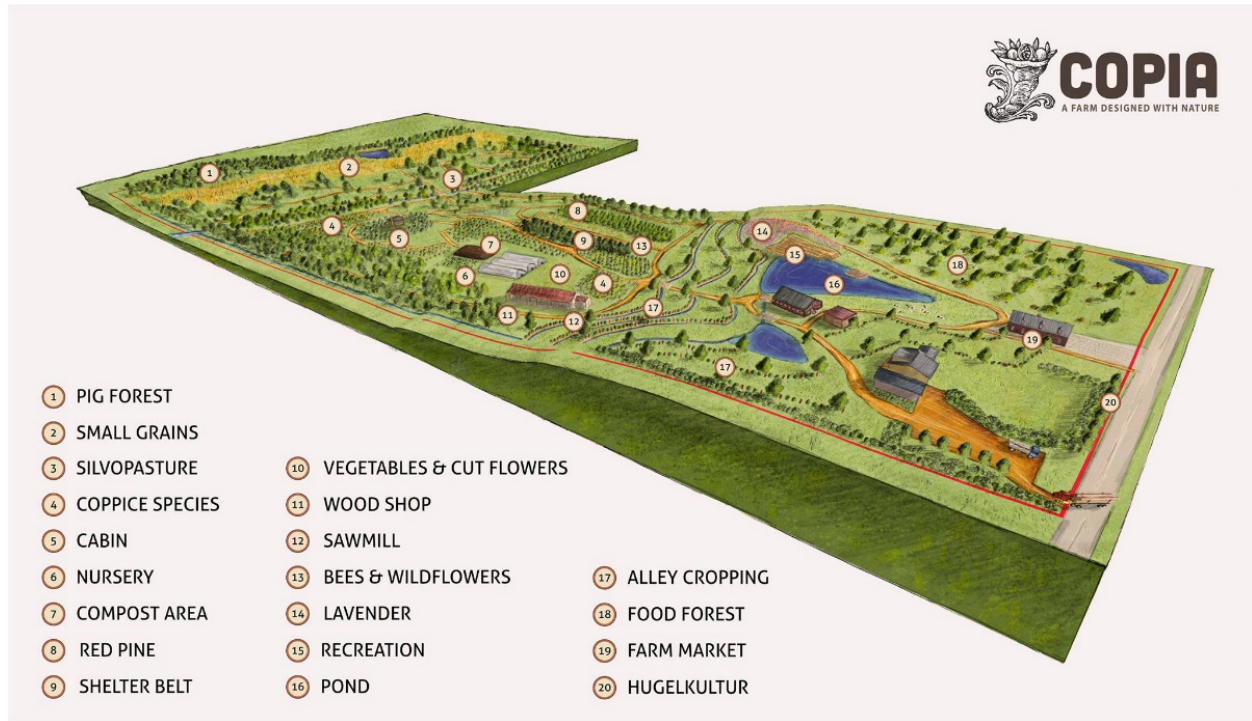
regeneration of soil fertility, protect crops and improve or maintain production over time. Altieri and Toledo (2011; 588) provide an excellent summary below:

“The core principles of agroecology include recycling nutrients and energy on the farm, rather than introducing external inputs; enhancing soil organic matter and soil biological activity; diversifying plant species and genetic resources in agroecosystems over time and space; integrating crops and livestock and optimizing interactions and productivity of the total farming system, rather than the yields of individual species. Sustainability and resilience are achieved by enhancing diversity and complexity of farming systems via polycultures, rotations, agroforestry, use of native seeds and local breeds of livestock, encouraging natural enemies of pests, and using composts and green manure to enhance soil organic matter thus improving soil biological activity and water retention capacity.”

As Altieri and Toledo (2011) demonstrate, agroecology is a highly knowledge-intensive practice, and is rooted in techniques that are developed through local knowledge and experimentation. Holt-Gimenez (2006) argues that in opposition to the corporate food regime, agroecology promotes community based solutions that address the subsistence needs of members, emphasize self reliance and favor the local by investing in human resource development and shortening the cycles of food production and consumption. With regards to the human relationships cultivated through this process, it is not difficult to imagine a very different set of partnerships emerging when compared to those formed through industrial agricultural practices. Rather than a focus on individual accumulation and efficiencies of scale that incentivize a reliance on monocultures, agroecological approaches are rooted in the ecological basis of traditional small-scale farming practices (Toledo, 1990; Altieri, 2004) and are best characterized by an abundant diversity of domesticated animal and guilded crop species that are sustained and improved through integrated soil, water and biodiversity management practices that build upon, rather than disregard traditional knowledge systems (Toledo & Barrera-Bassols,

2008). The design of a diversified regenerative farm located near Columbus, Ohio can be seen in Figure 4.5 below and illustrates this point well.

Figure 4.5. Copia, a Farm Designed with Nature. Columbus, Ohio.



Source: Copia Farms (2020). A ethical, nutrient dense, regenerative farm in Johnstown, OH. Accessible at: <https://www.copiaohio.com/>

Several authors argue that agroecology is providing the scientific, methodological and technological foundations for a new agricultural revolution that has the potential to help end humanity’s break from nature and guide humankind towards a reharmonization with the biological systems upon which we depend. (Altieri, 2009; Altieri & Toledo, 2011; Ferguson & Morales, 2010; Wezel & Soldat, 2009; Wezel et al. 2009). Not only have agroecosystems demonstrated the potential to meet human food demands in the 21st century and beyond but they are also biodiverse, resilient, energetically efficient and often socially just (Altieri, 1995; Gliessman, 1998; Holt-Gimenez & Altieri 2013). This is a powerful combination of potential

outcomes. It's potential, however, is contingent on our capacity to align personal and collective interests and collaborate successfully in teams and groups (Atkins et al. 2019). If humankind is able to develop replicable processes for guiding the development of effective partnerships, it is feasible that groups around the world may be able to utilize approaches such as agroecology in order to transform local agrarian relations and create hotspots of biological diversity and social-ecological resilience that could help humanity avoid the worst potential outcomes as a result of runaway anthropomorphically induced climate change.

Emerging approaches and technologies involving the hybridized application of agroecological science and indigenous knowledge systems are being led by a growing number of peasant coalitions, NGOs and some government and academic institutions, particularly in Latin America (Altieri & Toledo, 2011). Although to date these approaches have been limited in size and scope, they are proving effective in the effort to enhance food security while simultaneously conserving natural resources and supporting peasant organizations and movements and may provide important clues for the pathway forward. Given the prominence of agriculture at the crux of nature-human relations, learning how to better partner with and provide long term support to the farming communities that are developing healthier, more regenerative practices to cultivate abundant, accessible, nutritious, socially just and culturally appropriate food is of critical importance.

When considering the gains achieved during the 21st century, as a species we are forced to consider at what cost these accomplishments have been made. On one hand, global civilization

is more closely linked than ever through expansive global commerce and widespread digital communication and the World Wide Web (Robinson et al. 2015). On the other, rising global inequalities have been exacerbated by limited access to transformative technologies and unequal distribution of natural resources including clean water, food, and electricity (Piketty, 2014; Matthew et al. 2017). These events have caused some scholars, such as Robinson (2008) to suggest that new forms of divisions (e.g. access to technology, malnourishment due to overeating vs. undereating) now separating the haves and the have-nots both across and within national borders are producing forms of disparities that are unprecedented in human history. In the section below I summarize these impacts to provide a basis for discussing some emerging and innovative solutions in more depth.

4.7 Consequences of Modern Agriculture and Food Processing Practices

The consequences of modern industrial agriculture and food production practices can be broken into two principal categories: **Human Impacts** and **Environmental Impacts**. Although the use of these divisions can be helpful for orientation, as previously mentioned, it has become increasingly evident that the boundary between human and environmental systems is in fact both fluid and arbitrary (Cumming et al. 2013; Berkes and Folke, 1998; Berkes, Folke, and Colding, 2003). Human and natural systems clearly influence one another through numerous complex interactions that are nested within multiple time and spatial scales. For example, deforestation can lead to decreased local rainfall and drought, which can in turn reduce local harvests and trigger famine amongst the most vulnerable, which creates additional pressures for logging and further ecological degradation, followed by increased human suffering. Alternatively, the actions that people co-produce such as by creating a Marine Protected Area can generate expanded

ecosystem services such as return of fishing stock surrounding the MPA, increased tourism, and improved resilience to coastal flooding due to the improved health of marine ecosystems. Thus, although these systems are intertwined, dividing the following sections into two parts provides a useful heuristic for this discussion.

4.7.1 Environmental Impacts

Human activity has come to incur such a profound impact on natural systems that scientists have begun referring to the current era as the Anthropocene, emphasizing the driving role that humanity has come to play in directing environmental change (Steffens et al. 2015; Lewis & Maslin, 2015). Although the scientific debate regarding the onset of the Anthropocene continues, a growing consensus within the scientific community concurs that the magnitude of environmental impacts caused by human activity warrants recognition of a new global epoch, characterized by human activity as the primary driver of environmental change. A key feature of the Anthropocene is characterized by both the scale and speed with which these impacts are occurring. The combined impact of human activity has been so widespread and has occurred within such a short period of time that it is difficult to find a historical comparison (Goodrich & Nizkorodov, 2017).

Below I have summarized some important characterizations of this phenomenon:

- The nitrogen cycle has not been altered to such an extent in over 2 billion years (Canfield et al. 2010).
- Current atmospheric carbon levels have not been witnessed for at least 800,000 years or longer and are still rising (Lewis & Maslin, 2015).

·Ocean acidity is increasing more rapidly than at any point in over 300 million years (Lewis & Maslin, 2015).

·Human activity is currently triggering an ongoing sixth mass extinction, with current species loss occurring at 100 to 1,000 times historical rates (Raup et al. 1982; Barnosky et al. 2011).

·Compared to the past 5 mass extinction events, rates of biodiversity loss over the past 50 years exceed the rate of any other point in geological time (Chivian et al. 2008).

·Humans have transported and transplanted life from one corner of the globe to another, and as a result have reorganized life and evolutionary outcomes in a way that will affect life on this planet for hundreds of millions of years to come (Goodrich & Nizkorodov, 2017; Lewis & Maslin, 2015).

·The hottest temperature ever recorded in the Arctic (100.4 degrees Fahrenheit (38 Celsius) was observed on June 20th, 2020, a record most climate change models had not predicted to occur for at least 70 years (Khurshudyan, Freeman & Dennis, 2020).

To be clear, the pronounced global patterns described above are a result of the totality of human behavior, or a “Perfect Storm” of human influence (Goodrich & Nizkorodov, 2017, 17). Although it can be difficult to accurately quantify the proportion of global environmental change that can be attributed to food production specifically, it is important not to underestimate the role that agriculture has played in this process (Barnosky et al. 2011). For example, agriculture is the world’s largest producer of greenhouse gas emissions and is responsible for 70% of all freshwater withdrawals (Chen et al. 2018). Additionally, the global nitrogen cycle as well as the global supply of bioavailable phosphorus, have been primarily impacted by agricultural development and the expanding use of petrochemical fertilizers and pesticides. Importantly, these estimates do not even account for the role of industrial food processing, storage and global distribution networks that are an integral part of the globalized industrial food system.

In the following sections I describe in more detail how industrial agriculture has played a dominant role in driving changes amongst five crucial planetary systems: nitrogen & phosphorus cycles, greenhouse gas (GHG) emissions, groundwater depletion, deforestation, and loss of biodiversity. Importantly, this is not intended to provide a comprehensive examination of environmental impacts, but rather to illustrate some of the important ways that modern approaches to agricultural production and distribution have greatly disturbed Earth's natural processes in a way that will impede efforts to ensure humanity's continued well-being if wide scale changes are not rapidly adopted.

4.7.2 Nitrogen & Phosphorus Cycles

Excess nitrogen in ecosystems can cause a number of adverse health and ecological effects (USGS, 2014). The vast majority of nitrogen and phosphorus rich synthetic fertilizers applied is emitted into the atmosphere or eventually washed downstream into the Oceans, where it plays a crucial role in the rapid increase in observed algae blooms, loss of submerged aquatic vegetation and oceanic dead zones (USGS, 2014; Steffen et al. 2015; Goodrich & Nizkorodov, 2017). The massive acceleration of the nitrogen and phosphorus cycles associated with these changes in agricultural practices has led to widespread environmental degradation within crucial ecological habitats, including the eutrophication of terrestrial and aquatic systems, and triggered stratospheric ozone loss (Fulweiler et al. 2012). The effect of oceanic dead zones across the worlds coastal oceans has grown dramatically since the 1960's, and within the last decade is now estimated to cover a total area of more than 245,000 square kilometers (Diaz et al. 2008).

4.7.3 GreenHouse Gas (GHG) Emissions

Industrial livestock farming is a major source of greenhouse gases and accounts for ~11.2% of global emissions (EPA, 2015; IPCC, 2014; Tubiello et al. 2015). Between 1750 and 2011 the IPCC (2014) estimated that deforestation and agriculture resulted in the release of 180 gigatons of carbon dioxide (CO₂), by comparison all human fossil fuel consumption was responsible for the release of 375 gigatons of CO₂ during that same period. Importantly, although many sources of global greenhouse gas (GHG) emissions (e.g. land use, deforestation) have stabilized or begun to decline in recent years, GHG emissions from agriculture are still growing at a rate of ~1% per year, which coincide increasing demand for livestock products globally (Garnett, 2009; Tubiello et al. 2015).

Methane (CH₄) is a particularly pertinent greenhouse gas with regards to livestock production, which is the dominant anthropogenically induced source of atmospheric methane gas. Although CH₄ is found in low abundance (~1.86 parts per million) when compared to other greenhouse gases such as CO₂ (~408 parts per million) due in part to its relatively short atmospheric residence time, it nonetheless plays a significant role in global warming, accounting for about 20% of total anthropogenic ‘radiative forcing’ (Lassey, 2007; NOA, 2018). Methane gas is highly absorbent of infrared radiation, which is why even when comparing the ‘global warming potential’ (GWP) of CO₂ and CH₄ over a 100 year time period, each Kg of methane dispersed into the atmosphere has the same estimated warming effect as 23 Kg of carbon dioxide. This fact is troubling considering that while the annual growth of global CO₂ emissions has slowed in recent years, GHG emissions from methane have been accelerating rapidly

(Saunois et al. 2016). Although scientific debate regarding the source of increased CH₄ emissions is ongoing, there is ample evidence to suggest that agriculture, and livestock production in particular, may be playing an important role (O'Mara, 2011; Saunois et al. 2016; Worden et al. 2017; Voosen, 2016).

4.7.4 Groundwater Depletion

Groundwater extraction accounts for as much as 1/3rd of all water withdrawals worldwide (Famiglietti, 2014). This finding is illustrated by the fact that over two billion people rely on groundwater as their primary source of drinking water and that over half of the water used for irrigating crops globally is provided from fresh water sources stored beneath the Earth's surface. Despite groundwater's importance for global water and food security, as a natural resource it is poorly monitored and managed in many parts of the world, contributing to concerns regarding the rapid rates of observed groundwater depletion that are taking place in most of the world's major aquifers in arid and semi-arid zones (Famiglietti, 2014). These of course are also some of the world's major agricultural zones and are the places that rely most heavily on the use of groundwater to maintain current rates of crop production. Largely due to a lack of regulation and monitoring, groundwater has undergone a veritable 'free for all' that has allowed wealthy property owners that are able to afford drills to "generally have unlimited access to groundwater" (Famiglietti, 2014; p. 1). In the United States groundwater loss occurring from 1900-2008 is estimated to have a volume of nearly 1000 km³, the three largest sources coming from the High Plains aquifer, the Mississippi Embayment section of the Gulf Coastal Plain aquifer system, and the Central Valley of California (Konikow, 2014). Annual rates of groundwater loss nearly

doubled between 1945 and 2008, averaging over 24 km³/year since 2000 in the United States alone.

Land subsidence is one of the many effects already being observed as a result of the massive and ongoing over-extraction of water. Along the Los Angeles basin for example, widespread groundwater and oil pumping and the resulting land subsidence have been affecting tectonic contraction by obscuring and in some cases mimicking the tectonic observations that are typical of a 'blind thrust fault' since at least the early 2000's (Bawden et al. 2001). In Indonesia, researchers have identified concerning rates of subsidence in six major urban centers, with losses reaching 22 cm/year (Chaussard et al. 2013). Rates of subsidence have been highest along the most densely populated coastal areas that are particularly vulnerable to flooding. Groundwater extraction also appears to contribute to sea level rise, accounting for 13% of annual rates, compounding concerns for metropolitan coastal regions that suffer from simultaneous land subsidence and rising ocean tides (Konikow, 2011).

4.7.5 Deforestation

In the 21st century ongoing deforestation is primarily driven by urban population growth and growing international exports of agricultural products from the tropics (DeFries, 2010; Smith et al. 2016). This indicates that rather than being driven by rural settlements, as was once thought, it is primarily the movement of people to cities that is adding pressures to clear tropical forests. These pressures have resulted in such extensive damage to tropical forests that worldwide scientists have recently observed that some tropical forests are actually becoming net

sources of atmospheric carbon (Baccini et al. 2017; Don et al. 2010). Over a 12 year study period (2003-2014) Baccini et al. (2017) determined that deforestation and decreasing carbon density within remaining tropical forests have been twice the gains due to reforestation efforts and standing forest growth over the same time period, resulting in the world's tropical forests being an average net carbon source of ~425 teragrams of carbon per year.

Recent examples from Amazonia demonstrate that these challenges are only made more severe in the face of corrupt and/or despotic governance. More than 3,700 square miles of forest (an area the size of Lebanon) was razed in just one year after the election of Brazil's self described authoritarian leader, Jair Bolsonaro in 2018 (Sandy, 2019). Since taking office, Bolsonaro has encouraged ranchers to set forests ablaze, helping contribute to a more than 80% increase in fires compared to just one year earlier (Turrentine, 2019). In response to widespread international outrage, in July 2020 Bolsonaro imposed a four month ban on agricultural fires at the onset of the dry season, although it is as yet unclear what enforcement, if any, will be provided to support the new legislation (De Sousa, 2020).

Human population growth and rapid increases in per capita meat consumption are fueling pressures to expand land-use conversion and intensification of natural land and loosely managed lands into heavily managed projects characterized by dependence on groundwater supplies and broad application of fertilizers to maximize immediate returns (Smith et al. 2016). Globally, land-use change has been dominated by deforestation. However, in reality over 50% of tropical forest loss has occurred in Brazil and Indonesia alone (West et al. 2014). In these countries,

deforestation has primarily been driven by select commodities, including: timber, soy, beef, and palm oil. In addition to biomass reductions, deforestation also creates CO₂ emissions through losses to soil organic carbon (SOC) (Don et al. 2010). Highest losses to SOC have been observed due to the conversion of primary forest into cropland (-25-30%), however losses can be mitigated and are at least partially reversible if caretakers implement afforestation projects (+29%), or place land under crop/fallow rotations (+32%) or by converting cropland into grassland (+26%) (Don et al. 2010).

Further, a number of studies have shown that deforestation can also influence local weather patterns, exacerbating warming due to climate change and reducing seasonal rainfall (Bagley, 2013; Lawrence & Vandecar, 2015; Spracklen & Garcia-Carreras, 2015). For example, Spracklen & Garcia-Carreras (2015) estimate that ‘business as usual’ rates of deforestation will trigger a $8.1 \pm 1.4\%$ reduction in the average rainfall observed annually within the Amazon basin by 2050. Effects from deforestation can even extend to anthropogenic impacts by influencing disease vectors and increasing human exposure to viral hosts, playing a role in frequent disease outbreaks such as malaria in the Amazon, the 2014-16 ebola epidemic in Western Africa and quite possibly even the global pandemic triggered by COVID-19 (Laurence et al. 2013; Muyembe-Tamfum et al., 2012; Quammen, 2014). This section illustrates that while agricultural and commodity driven deforestation is a particular environmental challenge with measurable causes, the impacts of forest loss which include; biomass and topsoil loss, a reversal of tropical forests traditional role as a carbon sink, changes to local seasonal weather patterns, and even increasing anthropogenic disease transfer; move far beyond the original triggers and illustrate the

importance of taking a collaborative and interdisciplinary approach to assessing and addressing complex social ecological challenges. The growing recognition of this need is demonstrated by the increasing adoption of One Health approaches, which are being used to tackle both chronic health challenges such as malnutrition and infectious diseases such as COVID-19 (Bonilla-Aldana, 2020; Trilla, 2020). What unifies One Health partnerships is their focus on promoting collaborative, multisectoral, and transdisciplinary strategies to align local, regional, national, and global efforts to optimize health outcomes for people, animals, plants, and their shared environments (Centers for Disease Control and Prevention, 2020).

4.7.6 Loss of Biodiversity

As was briefly mentioned earlier in the literature review, a growing body of evidence suggests that as a result of the totality of human behavior, planet Earth is now at the beginning stages of the sixth mass extinction event in its 4.5 billion year history (Raup et al. 1982; Barnosky et al. 2011; Ceballos et al. 2020). Although there is uncertainty in estimates, ongoing species loss is occurring at a rate of between 100 to 1,000 times faster than historical comparisons and when compared to records of the past five mass extinction events, rates of biodiversity loss during the past 50 years appear to exceed those of any other point in geological time (Chivian et al. 2008). Ceballos et al. (2020) demonstrates that continuing population growth and increases in consumption per capita are further accelerating the extinction crisis. Importantly, since all species are parts of interdependent ecosystems, as they disappear, the other species with which they interact will increasingly begin to disappear as well. The authors argue that the ongoing sixth mass extinction may be the most grave environmental threat to the endurance of human civilization, quite simply because the consequences are irreversible.

4.7.7 Human Impacts

The marked gains made by humanity during the bulk of the 20th century have been touted as a hallmark feature of the benefits provided by industrial agriculture and globalization. These achievements are well known, and include remarkable increases in human life expectancy (in most parts of the world), unprecedented knowledge regarding and access to improved nutrition and macrobiotics, rapid gains in medical science, technology, etc. (Ackerman-Leist, 2013; Matthew et al. 2016). Since 1960 alone, average life expectancy globally has risen by nearly 20 years, with most of these impressive gains coming from poor and developing countries (World Bank, 2019). Hundreds of millions of people in Latin America, Africa and Asia have managed to lift themselves out of extreme poverty and forged something resembling the middle class. In the entire history of humankind, no comparable gains have ever before been achieved (Mann, 2018). To date, this is the signature accomplishment of our preceding and current generations.

Despite these impressive gains, also well documented, however, are the inequalities and growing disparities that have emerged alongside these accomplishments. For example, despite the fact that industrial food practices have improved access to fresh foods in some markets, the quintessential feature of modern diets is the very reliance on heavily processed, homogenized and packaged food products (Popkin, 2006; Guthrie et al. 2002; Grotto & Zied, 2010). For the first time in history, modern human diets rely more on processed and packaged foods than on fresh and/or whole foods (Pollan, 2008; Popkin, 2006; Ackerman-Leist, 2013). The Standard American Diet (SAD) is so dubbed for this very reason, and along with increasingly sedentary lifestyles, has played a key role in the explosion of chronic diseases that are threatening to undo

public health achievements and for the first time in recent history, reversing trends towards improving life expectancy (Popkin, 2006; Stuckler et al. 2012).

4.7.8 Human Microbiome and the Microbial Connections to Human Relations

Research indicates that the SAD ‘Standard American Diet’ alongside increasingly sedentary lifestyles has contributed to declining health in the microbial communities of the human gut that scientists increasingly understand to be crucial to overall health and well-being (Sun & Chang, 2014). Numerous recent findings implicate the human microbiota in a host of major disorders including infectious diseases, liver diseases, gastrointestinal cancers, respiratory diseases, mental or psychological diseases, and autoimmune diseases among others (Lv et al. 2017; Sun & Chang, 2014; Tang et al. 2017; Wang et al. 2017). Not only has poor gut health been linked to an increased risk of chronic diseases, but increasingly researchers are discovering that the regulation of intestinal flora through both invasive (e.g. fecal transplant) and non-invasive (e.g. dietary changes, probiotic supplements) means have the potential to help regulate and even treat several major conditions, ranging from anxiety disorders (Yang et al. 2019), diabetes (Ostadrahimi et al., 2015) to even Parkinson’s (Dutta et al. 2019). Additionally, it is worth noting that our understanding of the role that the human microbial system plays in our overall health and well-being is still in its infancy and that this field is developing rapidly, with new findings emerging weekly.

That being said, to appropriately illustrate the importance of microbial communities to human well-being as well as the complex evolutionary relationships we share, it is prudent to provide some additional context for this discussion. For more than three-quarters of life’s history

on Earth, microbes were the only characters running the show. During this time they permanently transformed Earth's biosphere, paving the way for the lifeforms that would follow and creating the very conditions conducive for more complex life to evolve (Young, 2016). For billions of years bacteria have helped to enrich soils while breaking down pollutants. They have been the historical drivers of planetary cycles such as carbon, nitrogen and phosphorus by converting these raw elements into compounds that are crucial for plant and animal life and in turn helping to decompose organic material and return minerals to the Earth (Young, 2016). They were the first creatures on Earth to make their own food through photosynthesis and it is thanks to them that we live on an oxygenated planet.

Up until the last 2 billion years, all life on Earth was composed of simple, single celled organisms. In the most improbable evolutionary leap to have ever occurred on Earth, the first eukaryotic cell emerged from two distinct single celled organisms. From this single ancestor has evolved all known complex life on Earth today (Young, 2016). The creation of the first eukaryotic (Greek for "true nut") organism was due to the very fortunate union between two ancient microbes in which one was consumed, but rather than being digested, it survived suspended within the larger bacterium and formed what is now known as mitochondria (a micro-power-station within all eukaryotic cells). These 'domesticated bacteria' transformed everything, allowing microorganisms to get bigger and more complex.

Over time certain eukaryotic cells began cooperating in larger numbers and for the first time living things became big enough that they could host entire communities of microbes inside

their bodies. Estimates currently suggest that the human body contains upward of 39 trillion microbial cells, compared to around 30 trillion human ones. The implications are astounding. Strictly speaking, we are more microbe than human. Not only did we evolve from microorganisms, but we continue to evolve with them too, every step of the way. As Ed Young (2016; pp. 11) eloquently summarizes:

“[Microbes] help to digest our food, releasing otherwise inaccessible nutrients. They produce vitamins and minerals that are missing from our diet. They break down toxins and hazardous chemicals. They protect us from disease by crowding out more dangerous microbes or killing them directly with antimicrobial chemicals. They produce substances that affect the way we smell. They are such an inevitable presence that we have outsourced surprising aspects of our lives to them. They guide the construction of our bodies, releasing molecules and signals that steer the growth of our organs. They educate our immune system, teaching it to tell friend from foe. They affect the development of our nervous system, and perhaps even influence our behavior. They contribute to our lives in profound and wide-ranging ways; no corner of our biology is untouched. If we ignore them, we are looking at our lives through a keyhole.”

At this point the reader may be wondering what microbes have to do with social processes and promoting collaboration. Well, the answer lies in food. Just like healthy soils (which are needed to grow nutritious foods) are composed of an incredibly diverse set of microorganisms, so too is a healthy human gut, which relies on the complex relationships we share with the microbial world in order to properly digest food and absorb nutrients (Young, 2016). As was discussed earlier in the literature review, the discovery of salt led to the first iterations of biotechnology in the form of fermentation. The practice of which harnessed the power of certain beneficial microbes for the production of new food products with improved shelf life, nutrition, and the presence of microbial colonies that have co-evolved with us ever since. Communities around the world have practiced fermentation for millennia as both an art

form and a science infused with multiple layers of purpose: creating unique flavors, sanitizing drinking water through the production of alcohol, preventing food spoilage, passing on tradition and sharing culture, to name a few (Katz, 2012).

In some ways, the emergence of the first eukaryotic organisms represented the world's first example of community, whereby two individual organisms were able to align their individual interests and develop a whole that was more than the sum of its parts. Other colonies of microorganisms express similar forms of symbolic cooperation that may be pertinent to approaches seeking to use biomimicry to inform the development of innovative technologies and methods of social cooperation. Symbiotic Colonies of Bacteria and Yeast, or SCOBY's as they are commonly referred to, have been popularized in recent years by the rise of 'probiotic' beverages such as Kombucha⁶, and refer to colonies of microorganisms, which over multiple generations of collective, human managed fermentation, have evolved into distinctive biological entities that under the right conditions can reliably reproduce themselves as cohesive communities (Katz, 2012).

In the case of Kombucha, the colony is typically comprised of a combination of yeasts, which consume sugar in the sweetened tea and produce alcohol as a byproduct, and acetic acid producing bacteria, which in turn transform alcohols produced by the colony's yeast into acetic acid instead, giving the beverage its iconic sour flavor and typically preventing it from

⁶ "Kombucha is a sugar-sweetened tea fermented by a community of organisms into a delicious sour tonic beverage, sometimes compared to sparkling apple cider... Kombucha has inspired much polarized debate, with claims of dramatic curative properties matched by dire warnings of potential dangers (Katz, 202; pp. 167)."

developing appreciable levels of alcohol. In order for the community to be maintained, the liquid must be regularly replaced with a fresh batch of sweetened tea to prevent the solution from becoming overly acidic, which could kill the yeast. Thus it is the multispecies interactions and reciprocal forms of cooperation between people, yeasts and bacteria that allow for all of the organisms involved to thrive. Although in the case of kombucha, it's health impacts are a widely debated topic, there is a growing body of evidence that suggests the consumption of commonly fermented foods (e.g. yoghurt or sauerkraut) may be associated with reduced symptoms and lower mortality rates in the face of infectious diseases, including COVID-19 (Antunes et al. 2020; Fonseca et al. 2020; Gou et al. 2020)

Unfortunately, since the discovery of microorganisms by Robert Hooke and Antoni Van Leeuwenhoek between 1665-83 (Gest, 2004), humanity's treatment towards these fascinating creatures has been largely misguided by an overly broad application of germ theory. The germ theory of disease is often attributed to the work of Louis Pasteur in the 1850s which was subsequently expanded by Robert Koch in the 1880s and correctly identifies certain microorganisms as pathogens or "germs" which are the source of infectious diseases. Although the vast majority of microorganisms are harmless, or in some cases even helpful, until very recently it has been the "bad guys" - these disease causing microbes that have stolen the show, captured our attention and inspired multi-billion dollar industries to defeat them. Although this effort has helped to eliminate or reduce the prevalence of a wide range of infectious diseases, an unintentional consequence of the "war on germs" has been that in the minds of many people, the

term microbe has become seen as synonymous with germs: some deplorable invader and harbor of pestilence that must be defeated at any cost.

Although understandable, the prejudice most people hold against microbes is not only unwarranted, but is actually self defeating. Young (2016) explains that of the thousands of species of bacteria living in the human gut, the vast majority are either helpful or under normal conditions completely harmless. At their worst, some are hitching a ride, but at their best “they behave like a hidden organ, as important as a stomach or an eye but made of trillions of swarming individual cells rather than a single unified mass (Young, 2016; pp. 11).” Analogously to how humans relate to other parts of the environment, through discovery and ingenuity we have tried to disentangle ourselves from the messy web of life, yet however hard we try we have only ever managed to obfuscate or delay the inevitable consequences of our actions. It turns out that the war on germs has in many ways, really been a war waged against ourselves.

4.7.9 Disparities in Human Impacts

A key feature in how current agricultural and food processing practices affect human health is that impacts have varied greatly along social and economic boundaries. Whereas the vast majority of the benefits of modern agriculture and food production have been received by wealthy in the global north, the poor, especially in the global south have borne the brunt of its consequences (Crino et al. 2015; Matthew et al. 2017; Piketty, 2013; Popkin, 2006; Shah, 2013; UNFPA, 2009; Walk et al. 2011). For example, more than half of the world’s extreme poor live in Sub-Saharan Africa and the disparities are only getting more extreme (World Bank, 2019).

While Central and East Asian countries have made significant gains, reducing the incidence of extreme poverty to below 3 percent, Latin American and African countries, the same regions that suffered the worst impacts from colonial exploitation, have continued to lag behind. If current trends continue, nearly 90% of the world's extreme poor will live in Sub-Saharan Africa by 2030 (World Bank, 2018).

The conceptual drawing below (Figure 4.6) illustrates the lingering impacts of colonialism on the Latin American and African continents. Several scholars argue that the accumulation of wealth in Europe and North America during the colonial period both created the conditions for the industrial revolution in the global north and continue to entrench disparities in access to resources and opportunities that are rooted in racial and class based divisions (Galeano, 1999; Harari, 2015; Mann, 2018). For example, in less than a century, the productivity gap between the least efficient agriculture in the world (e.g. exclusively hand tools, no irrigation) and the best equipped agriculture in the world widened from 1 to 10 in the interwar period to 1 to 2000 by the end of the 20th century (Mazoyer & Roudart, 2006). Importantly, these inequalities are not simply inherited from the past, but are the result of an ongoing process which is producing levels of disparities that may be unprecedented in human history (Robinson, 2008). The second agricultural revolution, which was spearheaded by a minority of industrial farmers in primarily developed countries, has exacerbated disparities in access to infrastructure and cheap capital, and allowed these producers to undercut market value in order to secure a greater share of total market sales, inevitably increasing the precariousness of rural, peasant lifestyles and subsistence agriculturalists (Patel, 2013). Perhaps this is one reason why nearly three-quarters of

the undernourished people in the world are rural peasants and agricultural laborers (Mazoyer & Roudart, 2006).

Figure 4.6. “Gold Diggers”

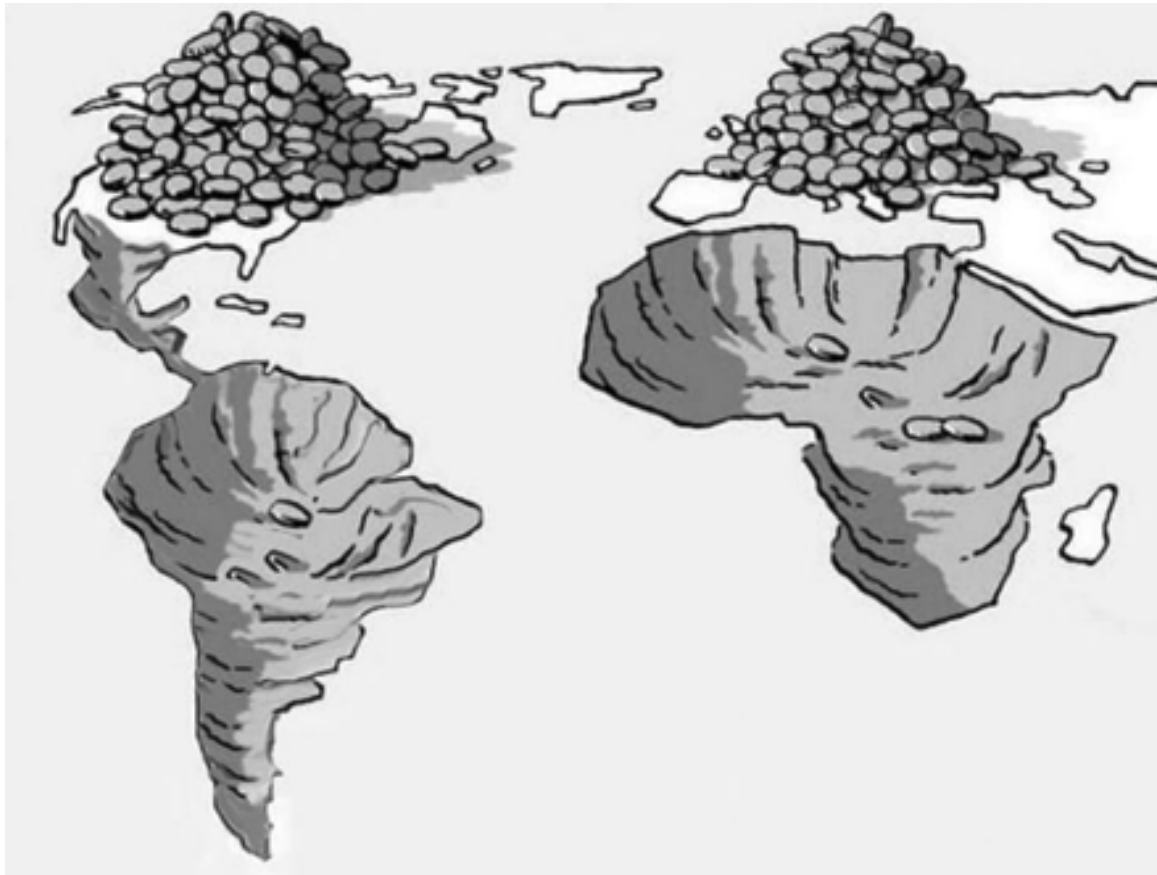


Illustration by Manchester, UK-based cartoonist P. Polyp

Just within the United States alone, disparities are stark. Nearly 40 million Americans struggle with food insecurity (including 13.9% of U.S. Households with children) or lack reliable and affordable access to sufficient, safe, and nutritious food that meets their dietary needs (USDA, 2019). Roughly 6 million children under the age of 18 suffered from food insecurity in 2018. Unintuitively, the challenges of food insecurity in the United States are not due to a shortage of food, but rather, a system of inequalities in wealth, access to nutritious foods, and

nutrition education and technologies. In reality, nearly 40% of all edible food grown and produced in the U.S. goes uneaten each year, representing a \$165 billion waste annually, or enough food to feed 160 million Americans. Although a number of factors contribute to food insecurity in America, limited access and lack of marketability for blemished (visually unappealing but perfectly healthy) fruits and vegetables are principle factors responsible for the vast quantities of food that go to waste in the U.S. each year (NRDC, 2017).

To further illustrate this point, consider the fact that over 23.5 million Americans (~7% of the population) live in ‘food deserts’, which are urban neighborhoods and rural towns that lack access to affordable healthy and/or fresh food options (Block & Subramanian, 2015; Ver Ploeg et al. 2009). Food insecure households in the United States such as these have limited and/or uncertain access to nutritious foods and are frequently forced to rely on charitable donations, local food banks, and/or inexpensive processed goods (which are typically high in fat, sugar & sodium & have depleted nutritional value) in order to stretch limited resources and make ends meet (NRDC, 2017; Pollan, 2006).

When accounting for the combined costs of resultant health outcomes, reduced economic productivity, decreases to school performance and ensuing rising costs of public education, avoidable health care expenditures, and the cost of charity to feed food insecure families, the total cost of food insecurity in the U.S. exceeds \$165 billion annually above and beyond the \$94 billion spent each year on federal strategies to improve nutrition, such as the Supplemental Nutrition Assistance Program (SNAP) (Shepard, Setren & Cooper, 2011). Federal assistance

programs such as SNAP have suffered from frequent funding cuts, yet remain a key component of the social safety net seeking to keep families fed. Despite these estimations, it is impossible to put a number on the true value of proper nutrition, however, since even brief stints of hunger and/or malnourishment during early and critical stages of development can have long lasting implications for emotional and cognitive trajectories across the duration of a person's lifespan (Prado & Dewey, 2014).

While practices such as efficiency of scale, mechanization of labor, and proliferation of green revolution technologies took hold in countries around the world, familiar patterns of environmental degradation followed by human migration towards urban centers have been witnessed worldwide (IPCC, 2014; UNFPA, 2009). As described in the 'Environmental Impacts' section above, it is actually growing urban populations that are driving most ongoing deforestation, challenging the notion that urbanization can help reduce pressures on natural resources.

4.7.10 Human Migration

Unplanned human migration, which is oftentimes deflected away from wealthy countries, can exacerbate environmental pressures and create additional strains on scarce natural resources in urban metropolises that are becoming increasingly vulnerable to environmental challenges such as resource insecurity and rising sea levels (Matthew et al. 2016). This is especially important given the increasing fragility of many global environments due to a combination of human induced climate change and degradation from human activities (e.g. deforestation, loss of topsoil, fresh water contamination), which indicates that unplanned human migration and

‘Climate Refugees’ are likely to become even more common as we progress further into the 21st century (Goodrich & Nizkorodov, 2017; IDMC, 2013; Steffen et al. 2015). The current global coronavirus pandemic is likely exacerbating this challenge as potentially more than a hundred of million additional people are being pushed to the brink of starvation, which can drive unplanned human migration and migrant smuggling (Dahir, 2020; Sanchez & Achilli, 2020).

4.8 Social Responses to Current Paradox: Exploring Alternative pathways

The global pressures discussed in the sections above have produced common patterns of resource extraction, environmental degradation, and resulting human displacement in many regions of the world (Steffen et al. 2015; IPCC, 2014). Despite these pressures, examples exist of communities that have resisted this transition and successfully combined old and new traditions in order to craft innovative methods of social and agricultural production in ways that are both healthy and sustainable (Ackerman-Leist, 2013; Holt-Gimenez, 2006; Litfin, 2014; McCune et al. 2017). These experiments represent important cases of social resistance, and include practices and social movements such as agroecology, permaculture, biodynamic farming, agroforestry, and agroecology (Mollison, 1988; Jacke & Toensmeier, 2005; Gliessman, 2014).

Permaculture and biodynamic farming are examples of forms of agroecology, which covers a wide range of agricultural practices that all share several primary principles: biomass recycling, mulching/cover cropping, closed loop design processes that promote biodiversity, stacking of biological functions based on interactions and synergies across multidimensional spatial and temporal scales, and consideration of whole ecosystem well-being, including soil fertility and integrated pest management as system outputs. Another key feature of

agroecological approaches to food cultivation is that they are context and site specific, meaning that design planning is based on an intimate working knowledge of local conditions and priorities. These efforts are primarily being enacted by small landholder farmers and are spread through community level initiatives. Emerging social justice movements have even coined new terms, such as food sovereignty, which seek to address limitations in paradigms such as food security, which as mentioned previously, fails to capture elements of self determination and cultural appropriateness (Via Campesina, 2003).

Despite a lack of attention and resources, it is peasant farmers working at small scales who are creating some of the most innovative and potentially transformative agroecological experiments around the world. By examining the social processes that have been utilized to develop effective partnerships in the face of these challenges, the lessons learned here have the potential to guide larger scale initiatives towards improved practices that can help create a more just and sustainable world for us all (Ackerman-Leist, 2013; Litfin, 2014). New partnerships are emerging between groups of farmers and non-governmental organizations to support communities in defying these global trends, to varying degrees of success (Litfin, 2014). Unfortunately, very little systematic research has been completed to date that has examined the strategies employed by communities seeking to resist these global norms and pave new pathways forward for human existence.

The relative contribution of these efforts, as well as the potential benefits from these forms of partnerships, are difficult to discern without systematic investigation of these processes

of social transformation. To be sure, there is ample evidence to suggest that these types of partnerships are certainly not always effective, and in the worst of cases, may actually be detrimental to stated objectives due to a lack of cultural sensitivity, incorporation of community vision into the planning process, and lack of local ownership over project directives, etc. (Asongu, 2014; Barrett, 2006; Lentz et al. 2015). It is much less clear however, what conditions predicate successful partnerships between communities seeking to resist trends towards urbanization and regenerate their local ecosystems and livelihoods.

Despite this knowledge gap, observations of agricultural resilience to extreme climatic events over the past two decades reveals that the capacity to recover after climate disasters parallels on-farm levels of biodiversity, with biologically diverse farms recovering crop performance much more rapidly than industrial and monocrop farming systems (Altieri & Nicholls, 2017). A number of studies also suggest that low input agroecological practices can help reverse topsoil loss and increase SOC levels and overall soil health, and represent the most robust pathways towards a climate resilient agriculture in the Anthropocene (Altieri et al. 2015; Wakeford et al. 2016; Weyers & Gramig, 2017).

These observations highlight the importance of reimagining new pathways for food production that integrate agroecological principles into strategies that promote climate resilience as well as food security. Although systematic evaluation of community based approaches are lacking, key examples exist of clearly successful partnerships between peasant communities and a number of different types of organizations that demonstrate, at least to some extent, the

potential for these types of collaborations to grow into social movements that can help catalyze social resistance to oppression, marginalization, and environmental destruction, and develop alternative practices towards improved social justice, regenerative change and development on the national and regional scale. These examples include cases from Cuba's National Association of Small Farmers (ANAP), Malawi's Soils, Food and Healthy Communities Project, and Brazil's Movement of Landless Rural Workers (MST).

4.8.1 Cuba's National Association of Small Farmers (ANAP)

Upon the fall of the Soviet Union in the early 1990s, Cuba faced a national emergency as (lacking its most powerful ally) it felt the full effects of U.S. Sanctions for the first time. After the ensuing collapse of Cuba's food and economic systems, the Cuban State implemented austerity plans originally developed for times of war, reducing average Cuban caloric intake by 30% over the next several years (Williams, 2017). This extended period of suffering caused Cubans to realize that their long history of dependence on international trade and industrial-scale farming had left them vulnerable, and created opportunities for advocates of sustainable agricultural practices to share lessons and catalyze the development of a transformed agricultural system (Altieri & Toledo, 2011; Holt-Gimenez, 2006).

This social context allowed agronomists and activist farmers to rapidly promote and disseminate knowledge regarding organic agriculture and agroecology as a low-input process for increasing and diversifying local production (Williams, 2017). Meanwhile, the Cuban State supported these initiatives by investing in further researching agroecology and in supporting farmer driven movements such as the Asociación Nacional de Agricultores Pequeños (ANAP-

National Association of Small Farmers) which advocates for and utilizes *campesino-a-campesino* (farmer-to-farmer) knowledge exchange in order to revitalize traditional practices and share new and emerging techniques based on an increasingly improved understanding of soil microbiology and multi-trophic level species interactions (Altieri & Toledo, 2011; Holt-Gimenez, 2006).

The majority of reviewed analyses that examine the Cuban agricultural revolution tend to cite external and political/economic factors, as well as state policies and programs as the primary drivers influencing the spread of biologically diverse agroecological farming practices in Cuba (Palma et al. 2015; Wakeford, 2016; Williams, 2016). It is true that Cuba's national program designed to support small farmers (ANAP) helped drive the social agroecological movement *Campesino a Campesino*, which is responsible for revolutionizing Cuba's network of monocrop sugar and tobacco plantations into a model self-sustaining agroecological system (Altieri & Toledo, 2011; Holt-Gimenez, 2006; Rosset et al. 2011). Despite this fact, these studies however tend to overshadow the grassroots work completed by non-state actors, (primarily peasant farmers and non-governmental organizations) who provided crucial on the ground peer led support to empower small landholder farmers; which ethnographic studies argue have played an equally important role to the top-down factors influencing the transformation of Cuban agriculture into a world leader in pursuing food sovereignty and agroecology (Williams, 2017). This point helps illustrate the value in aligning top-down and bottom-up strategies in providing opportunities for rapid widespread transformation.

4.8.2 Malawi's Soils, Food and Healthy Communities Project (SFHC)

Malawi is a fairly peaceful country in southern Africa that has maintained political stability since gaining independence in 1964. Despite this, it stubbornly remains one of the poorest countries in the world with a national poverty rate of nearly 52% (World Bank, 2019). Malawi is landlocked and has a growing population estimated at 17.5 million. The economy of Malawi is dominated by agriculture, which has struggled in the past decade as increasing droughts and environmental degradation have exacerbated stressors upon already tenuous livelihoods. With regards to infrastructure, energy sticks out, with access to electricity being limited to only 11% of the population (World Bank, 2019).

The Soils, Food and Healthy Communities (SFHC) project began in Malawi in 2000 with just 30 farmers in order to promote the use of agroecological practices in order to help communities improve soil fertility, develop culturally appropriate diets that are nutritious and diverse, facilitate democratic leadership and gender equity and improve resilience against climate change. The SFHC project uses a participatory approach to help farmers work with one another and exchange knowledge in a form of peer-to-peer mentorship that is helping to improve soil fertility, promote food sovereignty and address malnutrition. In the 20 years since they started SFHC has grown to partner with more than 6,000 farmers in over 200 villages across Malawi.

In a prospective, four year longitudinal study researchers attempted to answer whether the introduction of agroecological farming practices in vulnerable Malawian households could improve food security and dietary diversity (Kerr et al. 2019). In an investigation that included

over 200 matched households, researchers found that participation in agroecology experimentation increased participants use of intercropping, legume diversification, the use of compost, manure and crop residue amendments into the soil. Household use of intercropping was associated with improved food security and dietary diversity (a proxy for nutrition). The use of compost or addition of manure to soil was also significantly associated with dietary diversity. Additionally, findings indicate that spouses who discussed farming with one another were two and a half times more likely to be food secure and to have diverse diets, demonstrating that linking agroecology to participatory research approaches that encourage farmer led experimentation and gender equity can also support improved health and well-being without requiring additional inputs (Kerr et al. 2019).

Recent data indicates significant reductions in the prevalence of stunting and reports of domestic violence that coincide with rising household income and increasingly widespread adoption of agroecological farming practices. What remains unclear is whether or not these findings can be translated into dissimilar contexts, and if so, how. Currently, a team of researchers and non-governmental agencies are working to help answer this question. They have partnered with the Detroit Black Community Food Security Network (DBCFSN) to help translate the demonstrated success of SFHC in Malawi into the ongoing work of DBCFSN and it's partners in the cities 1,550 farm and market gardens to develop a culture of health throughout the network of urban agriculture organizations in Detroit.

4.8.3 Brazil's Movement of Landless Rural Workers (MST)

Brazil is one of the most inequitable nations in the world, ranking 4th worst on the OECD rankings (with a gini coefficient of .53), lower only than China, India, and South Africa (World Bank, 2017). The large disparities of wealth in Brazil are not new however, and stem from a long legacy of social injustices that have shaped the massive inequalities present in Brazil's agrarian structure today (Carter, 2015). Rural development policies since the 1950s have systematically provided unequal benefits to the 'landlord' class, thwarting reforms in land tenure and subsidizing land expansions and technological advancements for the agrarian elite (Costa Delgado, 2015).

The history of land reform in Brazil is fundamental to understanding the emergence and motivations of the Movement of Landless Rural Workers, or *Movimiento de los Trabajadores Rurales Sin Tierra* (MST) in Spanish, which today with ~1.5 million members is the largest social movement in the southern hemisphere (Martinelli et al. 2010). The MST grew out of a direct response to Brazil's inequitable agrarian policies. When confronted by a reactive government with constrained responses to peasant demands, MST members have largely relied on land occupations and seizures of large-scale agricultural lands in order to reclaim lands for impoverished farmers who have suffered under over three decades of economic policies and political disenfranchisement (Hoffmann & Fox, 2017).

Since the movement was founded in 1984, the MST has helped nearly 400,000 families acquire land titles (Martinelli et al. 2010; Kane, 2000; Wolford, 2003). For the MST, the

organization has been successful in placing sufficient pressure on the government to redistribute land to peasants primarily through the direct occupation and/or seizure of land from the agrarian elite. In reality, what this means is that families must live for years on MST occupations in refugee style ‘temporary’ encampments before government officials are likely to give in to their demands (Hoffmann & Foxx, 2017). Today, there are over 180,000 families still living on MST encampments spread throughout the country who are waiting and hoping for land. Their struggle has only become more desperate since 2018 given the current political climate in Brazil and surge in seasonal wildfires, primarily driven by land clearing from farmers seeking to grow cash crops like beef and soybeans.

Similar to the ANAP movement in Cuba, at the heart of Brazil’s MST social movement is a struggle for *food sovereignty*, or for the capacity to collectively grow nutritious, culturally appropriate and sustainable food (Hoffmann & Foxx, 2017; Williams, 2016). Importantly, Carter (2015) reports, MST members frequently distinguish between what they see as the two main parts of their challenge, the first being the struggle *for* land and latter being the struggle *on the* land. The first part of this challenge, the struggle for land, has played a major part of the MST’s efforts and is where they have had the most success. In the second part of the process, after land has been secured, the challenge becomes the creation of productive self-sustaining rural communities. Here the MST has responded by collectively implementing hundreds of small-scale agrarian cooperatives, MST Schools and processing plants around the country (Hoffman & Foxx, 2017; Martinelli et al. 2010).

The MST has faced increasing challenges since the 2016 constitutional coup, which ousted former president Dilma Rousseff on questionable ethical grounds (Hoffman & Foxx, 2017). Despite suppression tactics being employed by the new government headed by Jair Bolsonaro, the MST had managed to intensify their efforts, demonstrating that the movement has developed an increasing understanding of and strategic utilization of government processes and federal legislation over time (Pahnke, 2018). Clearly the challenges facing this movement are numerous and complex, which makes the achievements made by this peasant driven movement all the more impressive.

As one of the largest agroecological movements worldwide, the MST stands out as one of the most serious regional challenges to the industrial food regime on Earth today. Thus, the MST demonstrates the potential for grassroots farmer led activism to challenge social and agrarian monopolies. The MST case in Brazil presents an interesting contrast to the ANAP in Cuba, since their accomplishments have been made despite government tactics being deployed to suppress and stall their efforts.

This distinction is important considering that many scholars considered the government support provided to the ANAP as instrumental to their success. Despite the differences between these cases, the success of the MST movement and the continuing spread of Campesino a Campesino inspired approaches throughout Latin America, illustrates the potential for peasant driven land and social justice movements to not only make considerable progress without

governmental support, but to actually force institutional change through protest, occupation and land seizure.

The three examples drawn from above including cases such as the ANAP movement in Cuba, the SFHC in Malawi and the MST in Brazil, demonstrate that there is a great deal of innovation and creativity being implemented at smaller scales, and that at least in some cases, the results of these experiments call into question and actively challenge a number of assumptions that are incorporated into current modes of human production and consumption, such as the efficiency of scale, compartmentalization, and the viability of vast social inequalities or agricultural monocultures. All three examples highlight the importance of peer-to-peer mentorship and collaboration, while distinct forms of partnerships allowed each case to achieve results in a unique fashion. The ANAP in Cuba benefited from aligning top-down partnerships between grassroots and governmental organizations, while the MST in Brazil have demonstrated it is possible for grassroots movements to be successful even in the face of direct opposition from government forces. None of the above cases achieved their results due to the adoption of expensive technology or new equipment. Instead, it was the development of novel forms of collaboration that allowed each organization to achieve results, underscoring the need to recognize the complex relationships between people and nature while working to support more effective partnerships that have the capacity to address the serious challenges we collectively face.

4.9 People and Nature: An Emerging Worldview

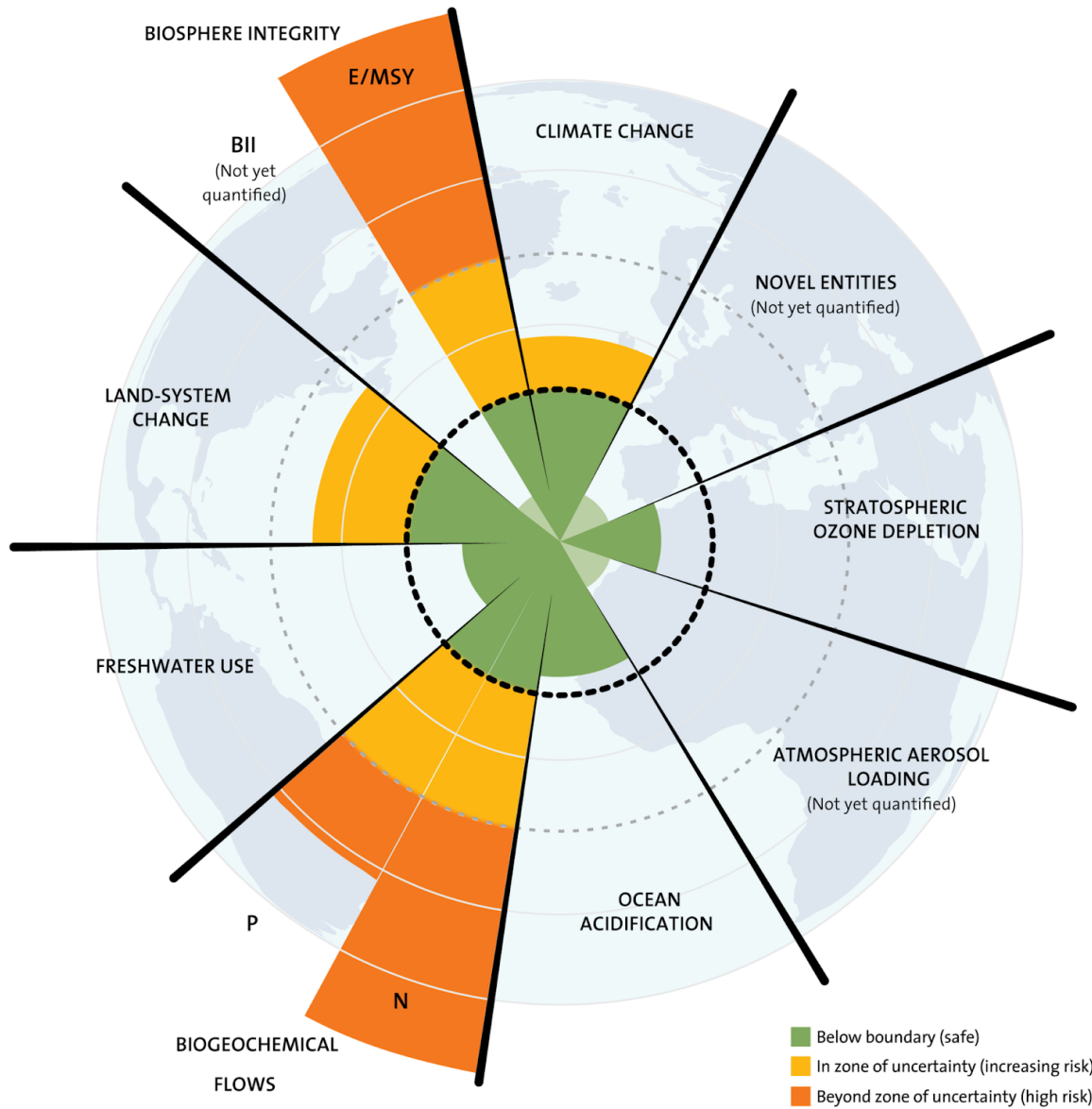
This literature review highlights the complex interlinkages between environmental and human systems and underscores the ways that food based relationships play crucial roles in the development of human societies, often determining the structure of value chains and distribution of capital. Similar to when Copernicus first theorized that the Earth did not in fact, lie at the center of the universe, modern views of humanity's complex relationship with nature and conservation also struggled to gain traction when first introduced. Since the mid 19th century however, both the framing of conservation ideas and the science underlying our understanding of the complex interactions between people and nature have grown dramatically (Mace, 2014). Today there is an increasing recognition of the relationship between people and nature. This framing, argues Mace (2014; pp. 1559) “rejects the linear relationship characteristic of [the idea of] “nature for people”, instead envisaging a much more multilayered and multidimensional relationship that is difficult to conceptualize, let alone measure.” This challenge underscores the need for developing improved processes for helping people to visualize and engage in mutually beneficial relationships with nature. As Rockstrom and Sukhdev (2016) proposed, food, if reframed in a new lens, may be the perfect tool to connect these threads.

Before the rise of modern environmental movements inspired by the likes of William Vogt⁷, historically nature had been thought of as distinct and separate from mankind. This worldview is perhaps best represented by the father of the GR, Norman Borlaug, whose supreme

⁷ Born in 1902, William Vogt was an ecologist and ornithologist who was intensely interested in concepts such as Earth's carrying capacity and trends in population growth. He first articulated many of the basic ideas for the modern environmental movement and arguably founded the belief that unless mankind drastically reduces consumption and limits population, it will ravage global ecosystems (Mann, 2019).

confidence in human ingenuity convinced him that humanity would be able to outwit natural, finite limits through technological innovation (Mann, 2019). To his credit, the efforts of Borlaug and his predecessors to, in effect, ‘wrangle the world’ in service to mankind, led to the development of modern high-yielding crop varieties that saved millions of people from starvation during the mid 19th century. On the other hand, the worldview emanating from this perspective continues to perpetuate a delusional, self-aggrandizing and anthropocentric philosophy that could ultimately lead to the collapse and potential extinction of our species. Many scientists fear that several anthropogenic environmental phenomena- such as climate change, land use conversion, biospheric integrity, and the alteration of biogeochemical cycles, are already nearing or exceeding critical ecological thresholds, or ‘tipping points’ of planetary boundaries that could lead to irreversible, catastrophic consequences (See figure 4.7 below) (Rockstrom et al. 2009; Steffen et al. 2015).

Figure 4.7. Planetary Boundaries and Tipping Points.



Source: J. Lokrantz/Azote based on Steffen et al. 2015. The proposed quantitative assessment of planetary boundaries illustrated above represent the limits within which humanity can continue to develop and thrive for generations to come. Crossing these boundaries increases the risk of generating large-scale abrupt or irreversible environmental changes. Accessible at: <https://stockholmresilience.org/research/planetary-boundaries.html>

The literature review underscores how ongoing human activity is at risk of triggering irreversible, catastrophic planetary consequences. Therefore, exploring alternative pathways and innovative approaches to designing human communities that integrate nature and ecosystem services are paramount. Importantly, appreciating the complexity and overdetermined nature of environmental challenges, such as the example shared earlier regarding the far reaching impacts of deforestation, highlight the need for developing replicable social processes to promote effective collaboration and align personal and collective interests in the pursuit of our species' continued success. Moreover, learning that land-use conversion is primarily driven by urbanization rather than rural expansion (Smith et al. 2016) highlights the importance of working with rural communities who bear the most immediate consequences of environmental degradation. In turn, these communities often have the most to gain through preserving and regenerating environmental resources. By tapping into this relationship, rural, agricultural communities have the potential to be some of the best positioned defenders of tropical forests and natural resources globally (Burt, 2019; Litfin, 2014).

To summarize the key takeaways from this literature review, it has become clear that the need for exploring alternative pathways that can lead communities and bioregions towards sustainable forms of food sovereignty is increasingly tantamount (Steffen et al. 2015; Ceballos, Ehrlich, & Raven, 2020; Ceballos et al. 2015; Crino et al. 2015; Lewis et al. 2015). At the same time, the large existing body of literature on the quantitative and technical aspects of agricultural productivity suggests that our understanding of these systems is well established (Ackerman-Leist, 2013; Altieri & Toledo, 2011; Holt-Gimenez, 2006; Murphy, 2008; McCune et

al. 2017). What is much less clear from the literature, are the ways by which food can contribute to fundamental social processes for building trust, forging mutually beneficial relationships and contribute to an emerging worldview of people existing in tandem with nature as part of an interconnected whole. During the second agricultural revolution, the intense focus on producing as much food as efficiently and as cheaply as possible has contributed to the emergence of a globalized food system that, in many ways has drained food of its rich potential, which exceeds far beyond providing basic forms of caloric sustenance for our bodies. Today, there is a pressing need to reflect on the many functions of food and consider how we can intentionally rejuvenate the capacity for food to help us learn about one another, about nature and economics, to name a few examples, while also strengthening the bonds that tie us. In the following section of the dissertation, I describe a working theory I have developed, which builds on the thirty year history of scholarship instigated by Ostrom (1990) seeking to more clearly articulate the means by which we can foster more collaborative and effective groups. I expand on this theory by explicitly recognizing the multiple values to be found in food and explain how by restoring the depth of our relationships with food, we can actually rejuvenate some crucial aspects to our sense of belonging and connectedness as well.

5. WORKING THEORY

A Social Ecological System (SES) is defined as a highly interdependent and intertwined system of people and nature (Cumming et al. 2012; Berkes and Folke 1998; Berkes et al. 2003). Analyses that incorporate an SES perspective recognize that systems are complex and dynamic across numerous spatial and temporal scales and place an emphasis on cross-disciplinary collaboration (Folke, 2006; Folke et al. 2011; Galaz et al. 2011; Stokols et al. 2013; Stokols, 2018). The literature review above illustrates the numerous and complex interactions occurring simultaneously between human and environmental systems, underpinning the importance of integrating social-ecological systems (SES) thinking into approaches such as this that seek to evaluate and craft responses to challenges that are inherently multidisciplinary and nested within unique ecological and sociopolitical systems.

There is demonstrated evidence that effective action requires contextualized responses that are grounded in local culture, time and place (Gavin et al. 2015; UNFPA, 2009). These findings support the assumption upon which this research relies- that social and ecological structures are tightly interwoven and that people and nature are co-situated within this complex system. Given this assumption, it follows that social-ecological interventions should be catered towards the smallest feasible unit, since the numerous interactions within social-ecological systems produce localized conditions that are almost assuredly unique, and therefore require customized approaches to draw upon local resources and address self identified challenges.

Despite the need for customization, I predict that underlying patterns exist between cases that can be identified to develop replicable processes for engaging with small groups of people (e.g. communities or households) in order to develop contextualized solutions that can be self-sustaining. Indeed, existing theories on the management of common pool resources from the likes of Ostrom (1990) and more recent expansions on these efforts from teams of evolutionary scientists such as Atkins et al. (2019), provide a basis from which to predict at least some of the conditions under which groups can successfully foster productive, equitable and collaborative groups. The development and growing interest in these theories demonstrate promise for improving our capacity to identify universal principles that can support and guide mutually beneficial social interactions. As described in the introduction, theories from Ostrom (1990) and Atkins et al. (2019) converge along eight core design principles (see Table 5.1 below). By clearly articulating concrete objectives for groups to improve collaboration and effectiveness, these theories provide an invaluable framework from which to build on for guiding the types of collaboration and teamwork needed to address the most pressing challenges facing humankind in the 21st century.

Table 5.1. Convergence Between Ostrom’s Principles and Prosocial Version

	Ostrom’s Principle	Prosocial Version	Function
1	Clearly defined boundaries	Shared identity and purpose	Defines group
2	Proportional equivalence of benefits and costs	Equitable distribution of contributions and benefits	Ensures effectiveness by balancing individual and collective interests
3	Collective choice arrangements	Fair and inclusive decision-making	
4	Monitoring	Monitoring agreed behaviors	
5	Graduated sanction	Graduated responding to helpful and unhelpful behaviors	
6	Conflict resolution mechanisms	Fast and fair conflict resolution	
7	Minimal recognition of rights to organize	Authority to self-govern (according to principles 1-6)	Supports performance and engagement
8	Polycentric governance	Collaborative relations with other groups (according to principles 1-7)	Scale to whole systems

Source: Adapted from Atkins et al. (2019) *Prosocial: Using evolutionary science to build productive, equitable, and collaborative groups*. Context Press, CA.

One shortcoming to existing theories of prosocial behavior, however, is an under-acknowledgement of the critical, interconnected role that food based relationships play in how humans interact, cooperate and build trust. As Rockstrom and Sukhdev (2016) suggest when presenting the wedding cake model of the SDGs, we are in need of a new lens for examining the role of food that guides us in taking actions and finding effective solutions. Because the role of food is often undervalued and under-recognized, it is important to highlight the importance of food in the process of promoting social cooperation and provide detailed

guidance for how we can use food to revitalize our relationships, whether we live in a small rural agricultural community or large urban metropolis. This is especially important in today's society at a time when in many countries, nearly 50% of meals are now eaten alone, often in the form of prepackaged and heavily processed foods (Food Marketing Institute, 2015).

I argue that the role of food in building and maintaining relationships is not limited to rural agricultural communities. Rather, at least part of the challenge is that especially in urban environments, many people have become so disconnected from where their food comes from and how it is produced that they no longer recognize or appreciate the many functions that food serves beyond simply providing fuel and nutrients for our bodies. Instead, I predict that in an agricultural community focused on cultivating healthier relationships with the land and each other, there is likely to be much more attention and intention placed into developing healthy food based relationships, and that by paying attention to these interactions, we can learn from communities like this to develop more intentional and mutually beneficial relationships within and between groups anywhere through the intentional use of food.

To expand on this concept, I am theorizing that in addition to the design principles described by Ostrom (1990) and Atkins et al. (2019), the need for cultivating reciprocal food based relationships is a missing piece of the puzzle that should be incorporated into the design principles in order to more successfully support long term cooperation and promote healthy, effective groups. Food is the ultimate connector. As Rockstrom and Sukhdev (2016) demonstrated, food connects all 17 of the SDGs, but it also serves to connect us in much more

personal and immediately consequential ways too. Not only is food a basic need with an evolutionary basis for being used to promote sharing and cooperation (Gurven, 2006; Harari, 2015; Ringen et al. 2019), but when shared engages all five of the primary sensory experiences (sight, touch, smell, taste & sound) as well (Korsmeyer & Sutton, 2015). An established body of literature demonstrates that the engagement of diverse senses supports improved learning outcomes and memory recall (Beery & Jorgensen, 2016; Sacco & Sacchetti, 2010). Further, results from Sports Science investigations into team building suggest that engaging multiple sensory experiences into training helps foster an increased sense of shared identity and loyalty within teams (Lee, Here & Chung, 2012). Here, I propose that it is a combination of food's evolutionary basis as a basic form of capital and it's unique ability to engage diverse sensory experiences while providing crucial forms of bodily nourishment, that help explain findings such as that sharing meals and eating the same foods together can contribute to increased trust and a sense of unity (Brock, 2017; Julier, 2013; Gross et al. 2011; Pollan, 2008).

In every aspect of food based relationships lies the potential for cultivating stronger, more mutually beneficial relationships. When we plant food together, grow food together, harvest food together, ferment food together, when we preserve, prepare, and cook food together, when we share a meal together or give food to our neighbor, when we talk, laugh, and cooperate through that process, we are laying the very foundations for community. By using food to build trust and expand skills for collaboration, we can create the conditions for successfully cooperating on the more challenging, serious topics that lay ahead. At the same time, these interactions provide invaluable opportunities to forge the types of deep bonds, friendships, and

sense of shared purpose that are needed to help us stick together, not give up on one another, and get through the inevitable challenges and interpersonal conflicts that arise in every lasting community, no matter how big or how small. This is why the role of food is so important in how we build and maintain successful partnerships.

To begin assessing this theory, I conducted an in-depth case study examining the partnerships from one fascinating community in rural Costa Rica. I utilized a form of process tracing to identify important patterns that have emerged over the twenty year history of these partnerships and draw from an extensive body of literature to relate observed patterns against existing theory. By exploring one understudied example in-depth and then comparing patterns that emerge against supplemental data and existing literature, I plan to evaluate the potential for expanding and either horizontally or vertically scaling these types of community based partnerships. In seeking to evaluate this hypothesis, there are several connected pieces of information that will be considered in order to develop a better understanding of this issue.

Today, it also remains unclear which factors are influencing communities' decisions to resist trends towards urbanization and to embrace alternative practices. Is there a growing disillusionment with the prospect of urbanization providing increased social benefits? Or is a growing environmental conscientiousness responsible for incentivizing families to adapt and maintain an agriculturalist lifestyle? Currently, few studies have examined these topics from an ethnographic lens, meaning that researchers have a poor understanding of the types of processes that communities go through to embrace social and environmental change and whether there are

common threads that can be built upon. Developing a clearer understanding of the factors motivating peasant families to embrace alternative social and environmental practices, and the strategies they employ for realizing those changes in their communities, will help determine the potential for replicating and/or building on their success.

As demonstrated in the literature above on the history of human agriculture, for decades, if not centuries, some of the primary drivers of the agricultural and industrial revolutions have been underpinned by a promise that technological liberation would free humankind from the toils of manual labor and uncertainties of previous generations. Although humanity managed to increase life expectancies in most countries around the globe during the past century, given the rapidly increasing disparities and quality of life between the wealthy and the poor, now severely exacerbated by the onset of the COVID-19 pandemic in late 2019, it is arguable that these gains have not been as significant as once believed. Currently, the vast majority of benefits technology provides are being enjoyed by the wealthiest individuals on the planet, whereas billions of people around the world are still struggling simply to survive. For those trapped at the bottom, if they live 10 years longer but spend the extra time working an unfulfilling job to keep their family fed while living in an overcrowded and polluted environment, have they been liberated by the technological revolution, or enslaved by it? In this investigation, I highlight stories from one example at least, that suggests an alternative option is possible, one where a richer life and healthier community can be founded on an abundance of social and ecological capital, rather than technological advancements.

This description is not meant to suggest a naively idyllic vision of what life in an alternative community is really like. The challenges these communities face are oftentimes serious and reflect many of the same problems facing rural agrarian communities worldwide. Alcohol abuse, in particular, is a common challenge that has plagued agricultural communities for millenia. The role of alcohol itself is complex, dating to it's first emergence at least 9,000 years BP as a product of fermentation that simultaneously improved the safety of untreated drinking water while providing some nutritional value (Liu et al. 2019). These features are of course in addition to alcohol's cerebral effects that have become a common feature of social bonding and entertainment as well as violent and destructive behavior in cultures worldwide, with over 18% of the global adult population participating in heavy episodic drinking (Peacock et al. 2018; Perez et al. 2020). Although rates of domestic violence are widely underreported, estimates in Latin America predict that roughly one in four women will experience sexual assault in their lifetimes (Heaton & Forste, 2008) and it is well established that alcohol abuse and the prevalence of domestic violence are closely intertwined (UNFPA, 2009). How communities work alongside external partners to navigate and respond to long standing challenges such as these is of interest to the current investigation as it relates to the strategies utilized by these groups to develop alternative social-economic models and promote healthier lifestyles. Based on initial observations, I theorized in alignment with Atkins et al. (2019), that for organizational partners working in a community based setting, maintaining legitimacy in the pursuit of collective goals is dependent on having integrity, transparency and accountability within decision making processes so that core values are consistently demonstrated and reflected in every action representatives take.

Finally, communities tend to think about concepts like poverty, sustainability, and progress in very different ways, thus the strategies communities employ to measure success is oftentimes informal and makes comparisons between cases challenging. Although I initially sought to conduct a comparative case study and incorporate a standardized assessment to assist in drawing comparisons between cases, due to funding and personnel limitations, this goal proved unfeasible to incorporate within the scope of the current investigation. This is a methodological limitation of the current study. Accordingly, this investigation focuses on analyzing one particular case, while drawing from the literature to highlight important patterns in how community partnerships operate to successfully address locally identified goals and some of the common barriers that appear to emerge in this process.

This dissertation provides insights into the factors that can support the scaling up or replication of these projects, and/or help identify limitations to larger scale operations. This information will help determine whether these experiments represent localized and contextually bound projects that are non scalable, or if it is possible to identify scalable patterns within projects that can be expanded and built out. Regardless, this information will help assist practitioners in targeting the appropriate scale at which to continue these forms of desperately needed experiments in alternative modes of human production and organization.

6. RESEARCH DESIGN

6.1 Case Selection

In order to investigate the social-ecological development of grassroots agrarian movements in Latin America, and identify patterns that can be used to inform future partnerships seeking to promote sustainability and explore alternative forms of social organization and production, I conducted an in-depth examination into the successful partnerships that have been developed and maintained between a rural agricultural community in Costa Rica and a foreign nongovernmental organization since 2001. To protect the privacy and confidentiality of research participants, the names of all places, organizations and people have been changed.

The primary focus of the investigation is to examine the relationships and partnerships that have evolved over nearly 20 years of collaboration between a foreign owned social enterprise and a rural, predominantly indigenous community in Costa Rica, which I will call Pueblo Arboles. I spent a total of 18 months conducting fieldwork in Pueblo Arboles over a three year period between 2017 and 2019, including an 11 month stint engaged in active participatory observation in order to build trust and gain an appreciation of the local context before formal data collection began. By the end of my initial period of participatory observation, I was certain this was an important case worthy of further examination for several reasons.

The partnerships that had emerged between Pueblo Arboles and the social enterprise, Centro Sustentable, over nearly 20 years of collaboration were clearly successful in many regards- the partnership was ongoing, the community was vibrant and safe, there were obvious

examples of economic transformation, numerous local entrepreneurs had been inspired by Centro Sustentable and with their support developed innovative business models rooted in regenerative practices that are proving to be both ecologically and economically sustainable, and the growing educational impact of Centro Sustentable's programs, which serve thousands of individuals from around the world each year, have exponentially increased the reach and potential impact of their educational services.

The long history and continued working relationships within this community represent the existence of rich stories and valuable lessons in community development that are ripe for further exploration. As documented by Altman (1995), who examined the challenges associated with research-based community partnerships, from initial observations it was clear that the relationships in this community also suffered from many of the same challenges that are common to partnerships and development initiatives worldwide. These challenges include, but are not limited to: economic and gender inequality, alcohol and drug abuse, lack of cultural sensitivity/fluency, miscommunication, failures to ensure accountability, and a loss of trust. Other commonly encountered challenges to effective collaboration that can be observed in the case of Pueblo Arboles and communities around the world, include the presence of conflicting personal goals, an inability to find common ground, a lack of effective leadership, ambiguous criteria for evaluating performance/success, lack of transparency, and difficulties in decision making (Atkins et al. 2019; Team Scholarship Acceleration Lab, 2020).

In this way, the case of Pueblo Arboles can provide guidance on solutions to many of the challenges facing humankind with regards to the creation of sustainable and even regenerative communities, while highlighting several of the social challenges that still remain. The persistence of some of these seemingly intractable social ailments serves to limit progress on goals surrounding social justice, which in term stunts human potential and can also undermine stated goals if organizational actions serve to replicate or reinforce existing inequalities.

The level of analysis is focused on communities (e.g. community leaders, elders, stakeholder groups, households), but also examines the process of partnership building that occurs within the case community and partner nongovernmental organization. In the case of Centro Sustentable, I also examine the development of community within the organization itself, which after a rich, 20 year history living within Pueblo Arboles, has developed its own subculture and semi-autonomous community that although reliant upon, is also clearly distinct from the broader community of Pueblo Arboles.

Importantly, as noted by Ernstson (2013) and others, ecosystem processes and social exchanges occur at multiple scales simultaneously. For example, community partnerships operate between individual community members, within families, and across community partnerships that include both people and organizations. This example can be illustrated by attempts to evaluate the potential benefits from community actions that can occur and/or be observed across multiple spatial and temporal scales. Observations could include aspects such as soil health (e.g. nutrient composition, microbial diversity), agricultural production (e.g. net food production,

diversity of crops, percentage of food sold & consumed locally), social benefits (e.g. poverty alleviation, access to public goods, educational changes, nutrition), and many other potential measures.

Attempts to comprehensively consider potential outcomes are further confounded by challenges with defining appropriate case boundaries within time and space to adequately restrict cases for the sake of comparison (Ernstson, 2013). For example, how can one capture and compare potential downstream impacts from changes in petrochemical use on ecosystem services and public health in communities beyond the study area in a way that can be compared across cases in different countries? For these reasons, the scope of this investigation will be limited to social processes and observations within each community since commencing their partnership with the specified NGO, and will not seek to be exhaustive in its attempts to evaluate community outcomes. Instead, assessments will focus on community and social outcomes, decision-making and implementation strategies, and partnership processes for building community relationships and maintaining trust.

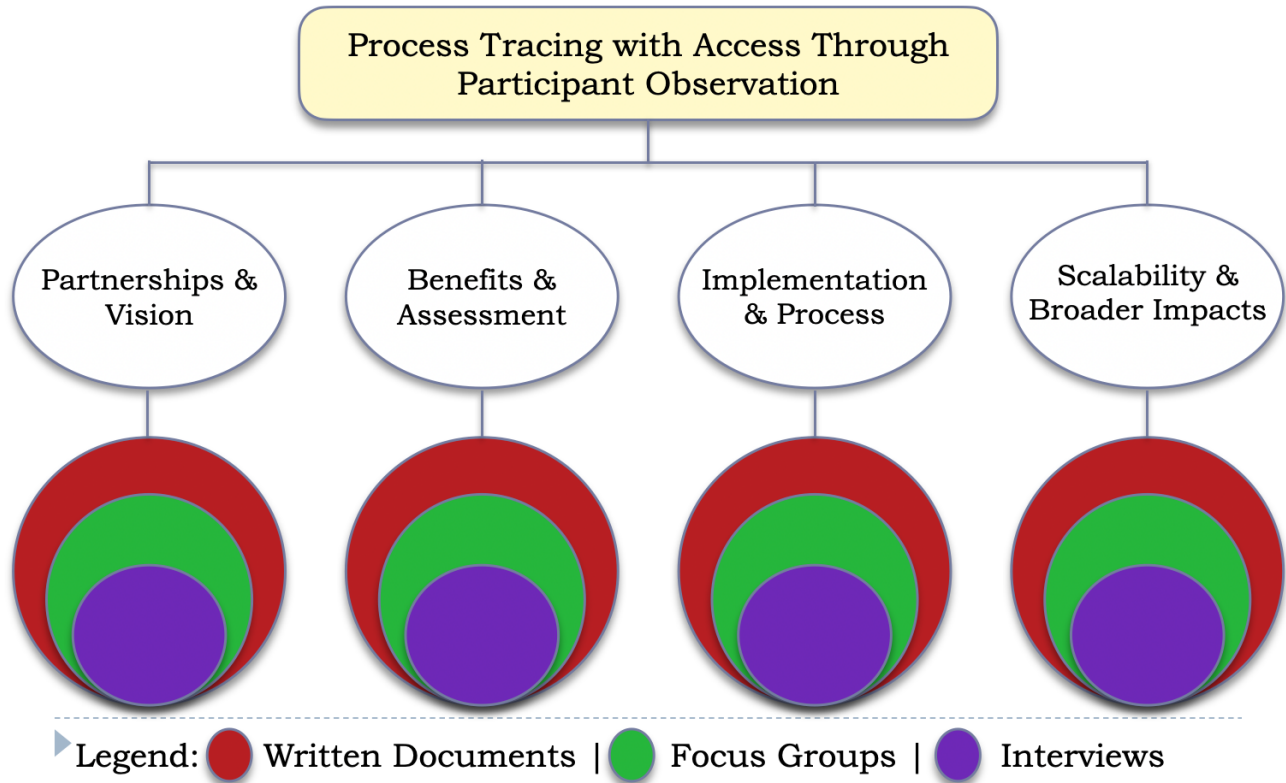
The case selected for this investigation was chosen to provide an in-depth perspective onto some of the types of partnerships that have emerged between underserved communities and NGOs working to achieve long term sustainable development and promote entrepreneurship. The primary focus of the dissertation is in Latin America, where some of the largest agroecological movements worldwide are taking place. Within Latin America, the case of Costa Rica is of particular interest, due its widespread recognition as one of the leading models globally for

sustainable development (Díaz & Mascetti, 2016). As Ostrom (1990 and Atkins et al. (2019) both argue, the authority to self-govern and presence of legitimate forms of good governance are important features of the contexts within which effective groups can reach their highest potential. By examining one fascinating community within this internationally well regarded political climate, I sought to simultaneously highlight the ubiquity of some challenges facing humankind as well as explore the potential for positive outcomes and transformative social ecological change.

6.2 Methodology

In this dissertation I utilize a case study and process tracing methodology which is appropriate for a study that seeks to examine poorly understood social processes as they relate to specific social phenomena and the exploration of alternative practices (Yin, 2003). In this investigation, each data source (e.g. focus groups, interviews, organizational documents) is treated as a piece of the “puzzle” that can be put together through analysis to reveal a clearer understanding of the broader phenomenon (Yazan, 2015; Yin, 2003). Similarly to Yin (2003), I am less concerned with distinctions between qualitative and quantitative orientations than I am with addressing considerations regarding design quality, such as construct validity, internal validity and external validity of the final assessment. Figure 6.1 below illustrates how multiple forms of data were used to check interpretations and utilize a form of triangulation to hone in on key patterns within each sub-theme of the investigation.

Figure 6.1 Flowchart Linking Research Process, Topics Investigated and Data



The illustration above highlights how the process of participant observation helped guide the development of research questions in the early stages of this investigation and how multiple forms of data were used to identify important patterns within each of the four sub-themes explored during data analysis

It is important to note, that given the study’s aims in part are to evaluate the meanings construed by people regarding these types of agroecological partnerships, one of the philosophical assumptions that underpin this type of research is the perspective that reality, or at least our understanding of it, is a shared construction of many individuals interacting with their social worlds (Berger & Luckmann, 1966; Merriam, 1998). If however, “reality is not an objective entity; rather there are multiple interpretations of reality”, this challenge is likely to affect qualitative and quantitative researchers alike who seek to answer social questions that

relate to individual perceptions and/or meaning making. This limitation highlights the value of Yin's (2003) laudable goals for seeking to construct rigorous processes for data collection and analysis, since as he notes, "the demands of a case study on your intellect, ego, and emotions are far greater than those of any other research strategy. This is because the data collection procedures are not routinized" (Yin, 2003, p. 58). For these reasons, although numerous data sources will be used to analyze the case, these sources will by no means be exhaustive.

In alignment with Stake (1995), from a SES perspective I seek to examine the case as a complex "integrated system" with defined boundaries and interacting parts, while recognizing that thoroughly examining every piece to the puzzle is not within the scope of this investigation. As stated above, the scope of the current investigation is limited to social processes and observations within Pueblo Arboles since commencing their partnership with Centro Sustentable. Assessments will focus on community and social outcomes, decision-making and implementation strategies, and partnership processes for building community relationships and maintaining trust. To accomplish this task, I utilize processes and methods of data collection that include:

6.3 Access through Active Participant Observation

Observation through active participation is the foundational activity that has made this investigation possible. I have actively and openly engaged with the community over the past four years, and based on strategies recommended by a number of researchers (Baum et al. 2004; Berg, 2004; Bernard, 2005), I have been documenting notes and reflections, taking photos and

reevaluating initial assumptions and interpretations of coordinated events, meetings and activities. These activities have provided a better understanding of how these types of communities are implementing their visions, guided the development of research questions and informed the interview process.

This role also defines and limits my points of access to the community under investigation. My positionality in this space is determined and allowed through the active participation and volunteer work I completed with the partnering organization. This serves as a limitation to the study, since it is difficult to predict how community member's perceptions or willingness to share may have been affected by pre-existing ties I have with the organization they collaborate with. Nevertheless, these ties have been instrumental for gaining access to the research site, without which this investigation would not be possible. This is one of the reasons why I spent considerable time in the community building rapport with local community members before formal data collection began.

In addition to participating in formal organization activities, I spent extensive periods of time walking through the community, observing different areas, getting to know community members through random encounters that often led to invitations for coffee or dinner, reflecting on personal assumptions and revising initial interpretations. These are strategies based on Yanow & Schwartz-Shea (2014) in order to generate data. For example, in Pueblo Arboles, Costa Rica this included time hiking in the forest and observing the boundaries between people and protected spaces. While making field observations, jottings were taken and then quickly

converted (ideally within the same day) into thickly described and detailed field notes that can be used to form a credible description of events as they took place (Geertz, 1973; Emerson et al. 2011).

6.4 Focus Groups and Semi-Structured Interviews

I completed semi-structured interviews and focus groups with organization and community members focusing on dimensions of relational characteristics both within and between groups. A focus group is an interview technique that in practice is similar to an ‘in-depth group interview’ that typically relies on a purposive sampling strategy to select participants based on particular characteristics (Thomas et al. 1995-citation in Rabiee, 2004). In Pueblo Arboles I conducted focus groups with organizational/NGO members from Centro Sustentable and the local community members from the town of Pueblo Arboles separately where I was able to introduce study objectives to each group and then listen to how each community talks about their experiences. Although Centro Sustentable is situated within the town of Pueblo Arboles, there are clear and obvious distinctions between these groups based on cultural backgrounds, languages spoken, privilege and mobility, motivations and forms of commitment.

As a starting point, it was valuable to hear how local community members discussed issues such as their weaknesses, failures, concerns, strengths, and accomplishments in a social setting, before completing individual and/or household interviews. After completing the focus groups I attempted to administer a qualitative survey and utilize findings to help inform a

purposive sampling strategy of both organizational and community members to approach for in-depth interviews, however I was unable to gather sufficient samples to support this goal and I was instead forced to rely on a combination of prospective and snowball sampling strategies to identify promising participants to approach for in-depth interviews (Palinkas et al. 2013).

Once the initial interviewees were selected, I completed interviews sequentially (in Spanish or English based on each participants preference), allowing each participant to help improve the investigator's understanding of the topic, allowing for a thoughtful process of refinement and reevaluation that continued until saturation was achieved (Yin, 2003; Small, 2009; Suddaby, 2009). In Pueblo Arboles, nearly 40 in-depth interviews were completed within this small village of only 200 families before saturation was achieved. Several of the interviews required multiple sessions in order to finish due to the rich narratives and fascinating stories people shared regarding the history of their village and the role that Centro Sustentable has played in its development.

Each focus group and interview was audio-recorded with permission from participants and then transcribed after completing data collection. Transcriptions utilized pseudonyms and copies of audio recordings were destroyed after each interview was transcribed. Through this process I aimed to develop a better understanding of what is catalyzing this community's desire for change, how individuals perceive synergies, trust, and power dynamics between organizational and community participants, and to what degree partnership objectives reflect individual priorities or community identified needs.

6.5 Written Materials

I examined relevant organizational documents (e.g. Mission statements, organization policy, written partnership agreements, grant proposals) as they relate to the community partnership under investigation. Most of these documents are not available publicly, but the participating organization has volunteered access to these documents to facilitate the investigation. Through this process I aimed to better understand the formal organizational structures that guide community partnerships as well as the stated goals and objectives of the NGO (Bernard, 2005). Access to this additional source of data greatly assisted in attempting to answer questions relating to the potential impacts that external partnerships with organizations have had on social outcomes within these communities. My initial assessments and interpretations of these documents reflect three sub research questions: (a) How is the organization collaborating with the community to implement their vision? (b) What is driving the process and how do visions evolve through the implementation phase? & (c) How does the organization define contextually bound conditions for success and evaluate the social and ecological impacts of their projects?

6.6 Data Analysis

Data analyses in this investigation utilized an adapted form of nested analysis. As Lieberman (2005) suggests, I attempted to incorporate the use of a preliminary quantitative assessment device administered to a sufficiently representative sample to identify patterns and select individuals for more in-depth, qualitative investigation. However, since there is

insufficient data available on the types of partnerships under investigation here to utilize statistical methods to identify exemplar case sites, the approach utilized in this investigation was novel in that rather than relying on a Large-N Analysis (LNA) to identify cases at the broadest level, I instead utilized a LNA to inform a prospective sampling strategy and identify potential participants for in-depth interviews. A limitation of this investigation is that even at the community level, during data collection it proved unfeasible to collect survey data from a statistically representative sample in order to evaluate representative individuals within the community.

Instead, I first identified and selected the case of Pueblo Arboles for the reasons previously outlined. Then I used extensive participant observation, written documents provided by partner organizations and extensive jottings from field observations to develop initial perceptions regarding organizational strategies and community relationships. Next, I completed focus groups with organizational and community members separately and attempted to administer a brief standardized quantitative survey. Although participation in focus groups was adequate, responses to the quantitative survey were insufficient to draw statistical comparisons.

Based on preliminary findings from the focus group assessments, as well as initial observations, I was able to identify major trends in participant responses and differences in opinion on important issues amongst organizational and community members alike, which served as a starting point for pursuing in-depth interviews with participants. From these initial interviews, I utilized a purposive snowball sampling strategy to identify new individuals to

approach while ensuring that a wide range of perspectives were included in the completed interviews. Despite limitations in the capacity to make statistical comparisons, the nested approach utilized in this investigation was useful to maximize diversity among respondent perspectives and to help identify patterns in the ways participants understand partnership dynamics, and assign meaning to group activities and program outcomes.

To analyze Written materials I engaged in a hermeneutic process of interpretation and meaning making. Yanow & Schwartz-Shea (2014) describe the hermeneutic process as circular, with no predetermined beginning or end point. Instead, it is an iterative and interactive process that requires reinterpretation of events as an individual re-evaluates prior knowledge and is exposed to additional information and perspectives (Schartz-Shea & Yanow, 2012; Yanow & Schwartz-Shea, 2014). In addition, as noted by Jackson (2014), individuals should take caution when applying a ‘double hermeneutic’ whereby the researcher makes interpretations based on the interpretations shared by study participants. Although often unavoidable (depending on the question under investigation), it is imperative for investigators to assess questions concerning the validity of their interpretations and not just developing the interpretations “we want” (Stake, 1995; p. 107).

To address these concerns, using triangulation within case study designs can be an effective strategy for checking and validating interpretations against additional data sources (Stake, 1995). In the classical sense, triangulation within a mixed-methods design seeks convergence by corroborating findings obtained from a variety of methods. Combining

quantitative survey results and in-depth interviews, when done appropriately, is an exemplar strategy that can be used to triangulate data in mixed methods case study research (Greene et al. 1989). Importantly, assessing discriminant validity in addition to convergence as advocated by Cambell and Fiske (1959) can help identify biases in data evaluation processes and initial interpretations that can be revised and corrected throughout the process of data analysis. This point highlights a common practice within case study research, which is that data collection and data analysis should occur simultaneously, hence obfuscating the exact point at which data collection ends and analysis begins (Stake, 1995; Yazan, 2015).

The simultaneous process of data collection and analysis underscores the need for reflexivity on the behalf of the investigator, which refers to the investigators responsibility to maintain an active role in “the continual analysis of the researcher’s assumptions, role and actions in the research process and incorporates at least part of this reflection into research findings and writings (Lynch, 2014: 17).” For this reason, written documents will be revisited from time to time throughout the research process in order to re-evaluate initial interpretations. Context (e.g. identity, positionality) can oftentimes play such a crucial and obvious role in the creation of social action that it can actually become invisible (Shehata, 2014). This underscores the importance of revisiting initial assumptions and critiquing preliminary evaluations over time.

After initial observations had been documented and I had the opportunity to introduce myself and the purpose of the study to the community, I worked with partner organizations and community leaders to organize focus groups to provide an opportunity for all interested parties to

participate. Focus groups are a unique form of data collection insofar as they rely on a ‘synergy of group interaction’ in order to generate data (Green et al. 2003). This means that based on the topic of discussion, focus group members should feel comfortable talking freely around one another and be willing and able to engage in discussion (Krueger & Casey, 2000).

As noted above, for this study I organized separate focus groups for members of the partner organizations and for community members in order to allow both groups to speak more freely. In some cases additional considerations may need to be addressed to promote group synergy when selecting focus group participants based on feedback from local partners and community leaders. Utilizing focus groups in this setting can help expose diverse viewpoints among community and organizational members alike regarding issues such as community strengths and weaknesses, health and social outcomes, sense of participation and ownership of project goals, and overall approval of the process as well as suggestions for possible improvements (Rabiee, 2004).

Each focus group served as a listening opportunity for the researcher to engage in a process that Atwood and Stolorow (1984:121) describe as “sustained empathic inquiry.” This requires a de-centering of expertise on behalf of the researcher and instead confers the status of expertise on the contextual knowledge possessed by local stakeholders (Yanow & Schwartz-Shea, 2014). Rather, when utilizing data gathering techniques such as focus groups, the researchers role is that of “process expertise, in knowing how to locate and access local knowledge and make it the subject of reflection that is publicly discussable (Yanow, 2014:23).”

In other words, in this case the investigator's job is to identify sources of local knowledge and create spaces for local experts to discuss and reflect upon the meanings ascribed to acts of group significance.

Focus groups were designed to encourage community members to share their thoughts with regards to concepts such as community strengths and accomplishments, past failures and/or current weaknesses, concerns regarding the future, and perceived sense of ownership and participation in collaborations with the partner organization. During and after each focus group, I jotted detailed notes regarding the focus group setting and interactions to capture observations made regarding non-verbal communication that was shared between group members during the focus group. These notes served to complement and support the validity of constructed data as well as to promote reflexivity throughout data analysis (Rabiee, 2004).

Krueger (1994) describes the data analysis continuum as proceeding from 'raw data' (e.g. transcripts) to 'descriptive statements' (e.g. initial reflections, connections) and finally 'interpretation' (e.g. generated theory), while noting that this process is non-linear and iterative. I proceeded through this continuum utilizing a 'framework analysis' approach, which is an analytical process that distinguishes between five interconnected stages of data analysis, including: familiarization, identifying a thematic framework, indexing, charting, mapping and interpretation (Ritchie & Spencer, 1994). Analysis of written materials continued concurrently with the other techniques outlined in this section. An additional point with regards to the framework analysis methodology is that it allows for themes to emerge from both research

questions and also the narratives shared by study participants. This was important for the current investigation, which relied on a few predetermined hypotheses regarding community perceptions, underscoring the value of allowing themes to emerge through the data analysis process.

After the initial focus groups were completed, I attempted to administer the quantitative survey to participants with the aim of inviting as much of the community as possible to participate. It is likely that funding limitations which prevented the researcher from being able to financially compensate participants contributed to the low response rate to survey questionnaires. In addition, it is also likely that because surveys are uncommon and foreign to community members in appearance and format that participants were more reluctant to share their perspectives in this manner. Buttressing this hypothesis, in contrast, not a single local participant approached for an in-depth interview rejected the invitation, indicating that interviews were seen as a form of data collection that was closer to the structure of a normal conversation and thus more familiar, which may have improved the likelihood that participants felt comfortable engaging in the interview process.

It is important for investigators to assess respondent bias since it is plausible that community members with negative associations towards organizational partners will be less inclined to participate in the study. To address this, special attention was paid to this issue during data collection and several attempts were made to reach potential participants that may otherwise be excluded from the data. As suggested by Lieberman (2005), initial analyses may focus on

simply reviewing descriptive statistics in order to assess variation and identify major trends in the data. In this case, I reviewed transcripts from focus groups and notes from previous experience with the community to identify important individuals who had negative experiences with the organization and/or other community members and took special care to approach them for interviews. This process can also serve as a check on initial interpretations, and help the investigator develop lines of inquiry to explore further during in-depth interviews. Surprisingly, all of the participants who were known to hold negative associations about Centro Sustentable and who were predicted to be resistant to participation, agreed to participate after discussing the study objectives and protections offered (e.g. lack of personal identification) and being provided adequate time to reflect.

Once prospective participants for in-depth interviews were identified, I completed interviews sequentially, meaning that each interview served to improve the researchers' understanding of the topic. By maintaining reflexivity throughout data collection, the investigator sought to continue collecting data while engaging in a process of thoughtful reevaluation and refinement that continued until saturation was achieved (Yin, 2003; Small, 2009; Strauss & Corbin, 1994; Suddaby, 2009). As discussed above, since there is no temporal distinction between the process of data collection and data analysis in case study research, evaluation of interview data began during each interview as the interviewer drew connections and made direct interpretations from the interviewees statements. As I progressed through the interview process and data analysis began to unfold, my objectives were to provide rich descriptions of participant's accounts and to achieve theoretical saturation. As noted by Yin

(2003), Small (2009) and others, the final interview should provide very little new or surprising information, which can serve as one important indicator that saturation has been achieved.

To promote reflexivity and awareness of my own positionality, I kept a daily journal throughout data collection to record observations, interpretations, and to evaluate my own worldview and biases and the ways in which these may have been influencing my analysis (Schwartz-Shea & Yanow, 2012). This data served to complement interview transcripts during analysis and created a benchmark from which to trace my thinking and interpretations over time. I then began formal analysis of interview data by coding, categorizing and memoing interview transcripts. This process is both interactive and creative. Beginning with open coding, I then proceeded towards categorical coding and finally by developing theoretical coding to guide data interpretation (Suddaby, 2006; Emerson et al. 2011).

7. RESULTS CHAPTER ONE A BASIS FOR COMMUNITY

7.1 Prologue

Humans are inherently social creatures. Because we are social, every person on Earth relates to the soil from which we come and the people that surround them through the food they consume. Food is the most foundational of all human relations. This basic relationship is easy to forget when living in the modern developed world where food is readily available and comes swaddled in gift wrap like sheets of plastic while often bearing little resemblance to the plants and/or animals it was made from. The interconnection we share with the world around us through food however becomes much more obvious in the context of the developing world, where over a billion people globally continue to rely on a combination of subsistence agriculture and astonishingly low wages in order to produce the bulk of the world's food supply.

In 2012, I came face to face with these processes for the first time in the small kingdom of Swaziland, deep in the heart of Subsaharan Africa. Swaziland lies at the epicenter of Africa's HIV/AIDS epidemic and during the 1990's nearly half of the nation's 250,000 children were orphaned. I was sent there as part of a team of scientists studying the impacts of severe deprivation and malnourishment on the development of orphaned youth. When we arrived it quickly became apparent that one of the first nonhuman victims of the epidemic had been Swaziland's agricultural sector, which collapsed due to labor shortages at the peak of the epidemic and had failed to meaningfully recover in the 20 years that followed.

In the face of increasing droughts and loss of cultural knowledge, the ‘lost generation’ as they are often referred to in Swaziland, became dependent upon international food aid for survival. Almost overnight schools transformed from a place of learning into a place of feeding as they became the central points of food distribution in this small, forgotten nation. In impoverished rural communities, it was common for the remaining parents to beg teachers to hold their children back and repeat grades so they could eat for another year. Those less fortunate, who were often raised by older siblings or cousins, if anyone at all, had lost the most vital connection to their past and culture. Worse, the way food aid was being distributed had undermined their sense of motivation to learn or be productive, since the food they received was provided by a faceless entity that was unresponsive to anything they did. Many students described feeling powerless over their future and the teachers explained how the meager portions were inadequate to quench the hunger of students, limiting most to focus more on their grumbling stomachs rather than engaging in their education.

The initial observations I made in Swaziland, in addition to further reflections over three years of subsequent fieldwork, have continuously brought me back to several interrelated questions that invariably have led to the research described below. Given that Swaziland had such a tightly woven social structure they did not even have a word for “orphan” until the 1990’s, how did their sense of community disintegrate so quickly? What is the role of families and agriculture in preserving or strengthening societal structure? How did the combination of ecological and agricultural collapse in Swaziland hobble recovery efforts and leave most members of society living on the brink? Is there any hope for societies like Swaziland to regain

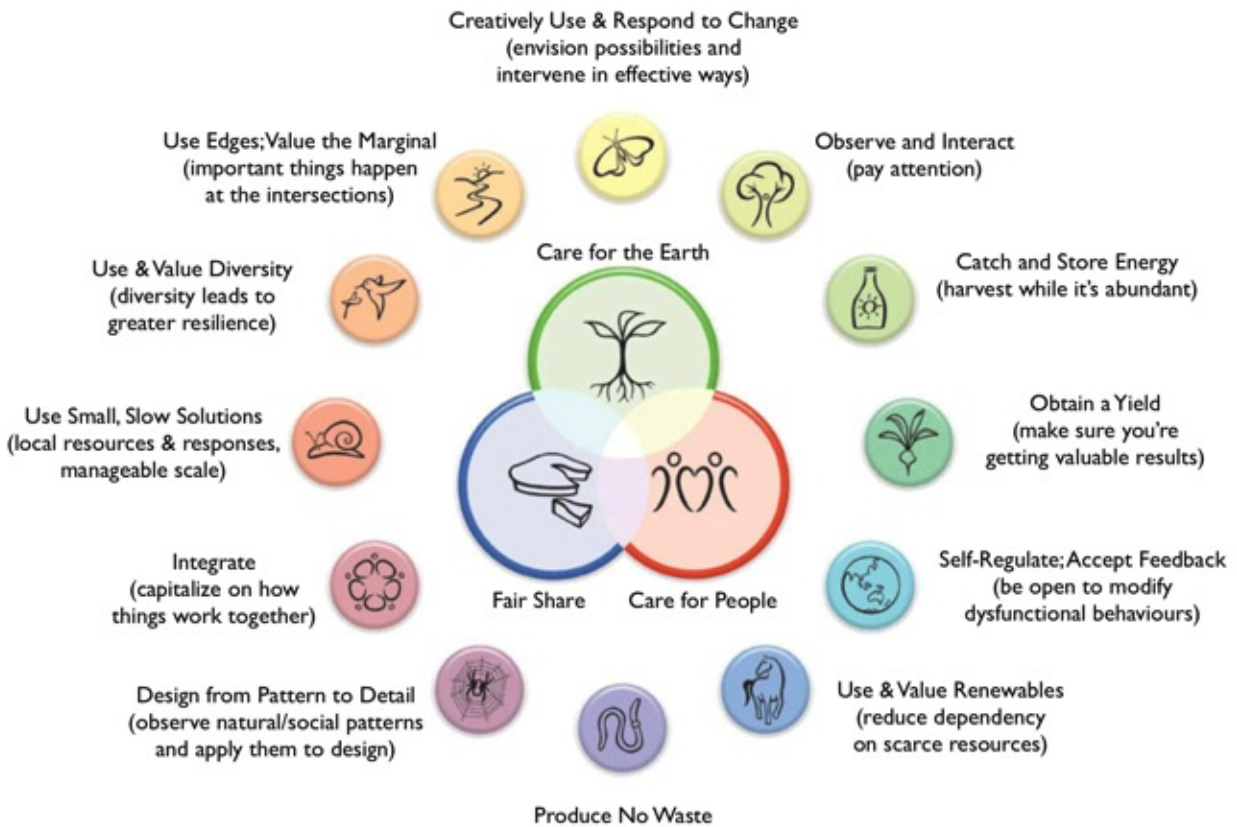
resilience in the face of rapid environmental and economic change? What does a sustainable or regenerative society even look like and how do they maintain self order and evolve over time?

Desperate for inspiration and hungry for answers, in the years that followed I began working with several organizations that were dedicated to using a combination of innovative approaches to agriculture and education to empower youth and young adults with the knowledge and skills needed to create human systems that are designed to function in an integrated fashion with natural systems, providing both social and ecological abundance. I was confident that although the current global food system has some striking advantages, the enormous stresses also manifesting as a consequence of the system's reliance on massive inputs and monocultural outputs make it an unviable process for long term sustainability. Meanwhile, the more I learned about emerging fields like Agroecology, Agroforestry and Permaculture (see figure 7.1), the more I realized just how far the scientific understanding of soil and plant biology, cross species interactions and closed loop agricultural systems has come.

Figure 7.1 Defining Agroecology, Agroforestry and Permaculture

<p>Agroecology</p> <p>As a science, agroecology can be defined as the application of ecological science to the study, design and management of sustainable agroecosystems (Altieri, 2002). As a form of agriculture, these ‘agroecosystems’ are designed to minimize the need for or usage of high energy inputs, and instead utilize genetic diversity as a key organizing principle in order to achieve beneficial and synergistic biological interactions between agroecosystem components that allow for the regeneration of soil fertility, protect crops and maintain production over time. Agroecology is thus a knowledge-intensive practice that is rooted in techniques which are developed through local knowledge and experimentation.</p>
<p>Agroforestry</p> <p>Agroforestry is often defined as a “collective name for land-use systems where woody perennials... are integrated into the farming system” but in practice, the use of the term varies from country to country and has evolved considerably since the term first emerged in the 1970s (FAO, 2019). Van Noordwijk, Coe and Sinclair (2016) proposed a new definition to encapsulate the expanding themes under the umbrella of agroforestry as “land use that combines aspects of agriculture and forestry, including the agricultural use of trees.” An example of agroforestry practices can be found in the Amazonian example in section 4.2. In practice, Agroforestry is often rooted in many of the same ecological principles as agroecology, including the utilization of diversity as a key tool to promote beneficial biological interactions between system components and reducing dependencies on high energy inputs.</p>
<p>Permaculture</p> <p>Permaculture is a design framework that was first developed by Bill Mollison and David Holmgren in the 1970s with the goal of describing the key principles needed to develop a permanent system of human agriculture. Originally, the word was coined to describe an “integrated, evolving system of perennial or self-perpetuating plant and animal species useful to man (Mollison & Holmgren, 1978).” The term has since evolved to include the development of a permanent human culture as well. In Permaculture One, Mollison and Holmgren defined three ethics and 12 design principles that provide the basis of this framework (see figure 7.2). Thus, rather than a specific set of practices, permaculture is a system of design rooted in ecological principles that’s applications extend far beyond the realm of food production and which draws heavily upon indigenous practices and value orientations.</p>

Figure 7.2 Permaculture Ethics and Design Principles



Source: <https://www.kinstonecircle.com/permaculture/>

With proper training, there are now a variety of techniques available to schools, farmers, communities and households that can help guide people in developing productive agricultural systems that are economically viable and which also promote biological diversity, provide crucial habitat for wildlife and intentionally rely on biological interactions to limit the need for inputs while sustaining or improving outputs over time. In this way small scale sustainable communities hold promise as an important approach for discovering ways to build resilience against some of the large scale external and ongoing forces that are rapidly changing the environmental conditions under which humanity has historically prospered. To what extent and

how well these types of communities have been able to accomplish these goals is one of the questions this dissertation hopes to address.

The biggest challenge, it turns out, is not producing food sustainably. Every sustainability practitioner I have ever asked concurred that by far the greatest challenge to developing sustainable human communities is in designing and maintaining social systems in a way that is healthy, functional and adaptive. That means redesigning and experimenting with innovative methods of social organization around values and principles that are often contentious and not mutually agreed upon, like democracy, cooperation, personal freedom, autonomy, fairness, justice, equality or the pursuit of happiness. For communities that have endured decades of economic hardship and have limited access to education, any transition towards a new societal norm is bound to be filled with numerous local and internal forms of stress that have the potential to be socially and/or economically devastating and may be difficult to build resilience against. Although many of the most dire outcomes are often explainable in terms of corrupt governance and destructive leaders, such as the Brazilian example of Jair Bolsonaro, even in countries such as Costa Rica, which is globally renowned for its strong social and democratic institutions and world leading commitments to eliminate single use plastics and reliance on fossil fuels by 2021, these challenges persist (Embury-Dennis, 2018). The seemingly intractable nature of some of these challenges suggests that although legitimate vs corrupt governance plays an important role, there are clearly other important factors at work.

While navigating internal barriers to collaboration, these small communities must also endure and remain resilient to national and global forms of stress as well. For while they are developing alternative economic models and in some cases approaching food sovereignty, these systems are largely in their infancy and are still deeply interconnected to and in many ways still reliant upon the dominant globalized industrial system. For example, many of these communities rely on international agrotourism to generate revenue, an industry that has been devastated by the global Coronavirus Pandemic. Finding ways to not only survive but continue thriving in the face of these types of multiple interrelated challenges will be no easy task.

Without concrete examples though, it was difficult even to imagine what a community and system of consumption absent of social or environmental exploitation might look like. For communities engaged in this pursuit, what do the visions inspiring their social changes look like? What is catalyzing their desire to not only stay in their communities, but to transform them? How are communities implementing their vision and what is driving this process? Who is included and who is excluded within social processes of community development? How are communities seeking to address historic injustices and promote individual as well and collective well-being?

Even though many of these communities look very different on the ground, as I expanded my scope of work common patterns began to emerge, such as nonviolent communication, shared meals and work, self reflection, personal accountability and deep commitments to place, or their absence. By serving a wide range of projects around the globe, I had the opportunity to witness an abundance of ingenuity and creative solutions in action, oftentimes from some of the most

impoverished regions on Earth. Although these observations were striking, they led to a realization that there was a shortage of rigorous research being conducted into the partnerships underlying these social experiments and I was left with only limited personal experience to draw from. Despite working with several organizations promoting sustainable development in different parts of the world, at that point my level of engagement was superficial in comparison to the depth these questions drove me to pursue.

After months of personal and intellectual struggle, I realized that in order to begin answering these questions I would need to fully immerse myself in a community engaged in this process of social and environmental transformation. The resulting search eventually led me to Centro Sustentable in Costa Rica, where I discovered a community that was both steeped in the social challenges that are common to communities worldwide (e.g. alcohol and drug abuse, poverty, loss of livelihoods, infidelity, sexual violence against women) and yet still making remarkable progress in the transformation of the local economy from being based on exported monocultures to diversified interregional production that is increasingly consumed locally, promoting sustainable entrepreneurship and experimentation with different models of leadership and self organization to better promote healthy livelihoods, equality and justice.

I was inspired to begin conducting this research in Costa Rica because in Pueblo Arboles I discovered a community engaged in what I can only describe as an innately human pursuit. They were making mistakes, learning and stumbling through the darkness in an effort to find more solid ground. As countless humans have before, they were explorers pushing the frontier of

human understanding, seeking ways to nurture humanity and develop a human culture that can more effectively nourish us and encourage us to be of service to one another. Like all explorers, they forged through darkness so that those who came after could find the light.

Although the lessons they have learned as of yet are incomplete, the opportunity to help identify some of the important patterns that have both contributed to and limited their success over the past 20 years were unmistakable. Thus, this investigation is not an end in and of itself, but is rather a beginning towards improving and mapping our understanding of societal transformation and the important patterns involved. To create this beginning, I first spent a year engaged in participatory observations through an 11 month apprenticeship in sustainable living at Centro Sustentable and then returned for an additional 8 months over the next two years to conduct in-depth interviews and begin identifying key patterns from the surrounding community with regards to regenerative social, environmental and economic development. After finishing data collection in mid 2019, I completed the data analysis and wrote the dissertation during the global coronavirus pandemic in 2020. While I haven't yet been able to return to Costa Rica, I have stayed in contact with several community members, who indicate that the transformations Pueblo Arboles has undergone since 2001 have helped the village achieve a remarkable degree of resilience in the face of this massive global shock, which has devastated numerous other communities and nations around the world. One future path for this dissertation will be to further explore these implications in the aftermath of COVID-19. Although my personal journey here began in January 2017, the story of Centro Sustentable begins nearly 30 years earlier, thousands

of miles from the lush rainforests of Costa Rica and before the organizational founders had ever considered they might one day manage a sustainability education center.

7.2 A Beginning

Centro Sustentable is an Education Center in Costa Rica that has grown to serve thousands of students every year from dozens of countries around the globe. Since its inception in 2002 it has grown into one of the leading sustainability education centers in Latin America and has won numerous awards for their sustainable systems, education programs, model agroforestry practices and low impact lifestyles. Less obvious, yet equally important, has been the role Centro Sustentable has played in facilitating the success of local entrepreneurs in their community and leading a transition away from ecologically destructive practices while working to promote a vibrant culture and community. Although this story is equal parts inspirational and cautionary tale, many of the outcomes observable in this community demonstrate the potential for small groups of individuals to facilitate transformative change in their communities despite personal shortcomings and organizational failures. What Centro Sustentable has become is the result of tens of thousands of hands that have dedicated their time, sweat and tears over nearly two decades of work, but none of it would have been possible without the vision, perseverance and continued commitment to growth and learning of its two principal founders, Matthew Ryan and Monica Torres.

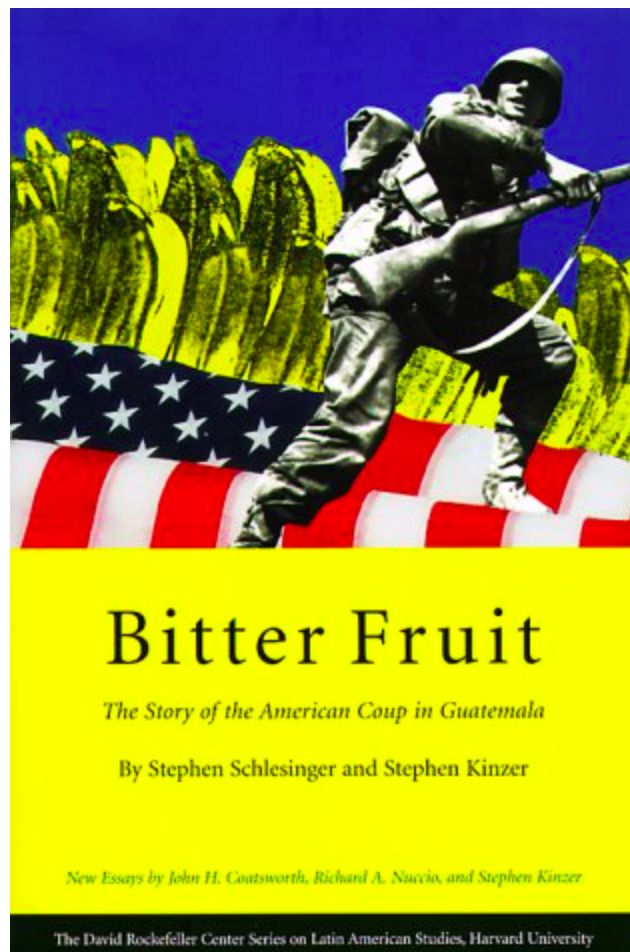
Matthew is the youngest of five kids and was raised in upstate New York. His father was a doctor and expected nothing less for his children. He studied at Cornell and his competitive

drive led him to become a star lacrosse player. Although he began studying pre-med, he ultimately switched and graduated with a degree in Agricultural Economics. After college he landed a job with Chiquita in Philadelphia and for the next few years served as a marketing analyst for one of the largest agribusinesses worldwide. At some point, a colleague and mentor at Chiquita, who had recently returned from serving in the Peace Corps in Guatemala, gave him a book that unbeknownst to Matthew, would utterly transform his life.

The book, "*Bitter Fruit*" by Schlesinger and Kinder (1982), detailed how the CIA, with President Eisenhower's approval, had conspired on the behalf of the United Fruit Company (now known as Chiquita Brands International) to overthrow the democratically elected Guatemalan government in 1954 while making it appear that the Soviet Union had been responsible for the chaos (see image 7.1). When he first began working at Chiquita, Matthew had really enjoyed it. "Everybody loves fruit," Matthew told me. "I certainly did as a kid and to get an inside look at how that world works and how we move large quantities of fresh fruit from the farm to the supermarket was interesting and compelling." After reading *Bitter Fruit* though, Matthew became disenchanted with his work at Chiquita and slowly began looking for alternatives. The regional headquarters for the Peace Corps happened to be right across the street from where he worked at Chiquita, so one day during lunch he wandered over and picked up an application. During this time his work at Chiquita continued to become less and less fulfilling and a few months later he decided to go ahead and apply. Shortly thereafter he was accepted, offered a position in Uruguay and then subsequently found himself moving to South America where he began working with small organic farming cooperatives.

Monica, who was also raised in upstate New York, is the youngest of two daughters. Her father immigrated from South America and when she was eight they traveled to Venezuela to visit her family for the first time. Monica would later explain that from this experience her “eyes were opened to a whole different world.” It planted a seed that after she graduated from the University of Colorado Boulder with a degree in Social Ecology, would sprout and call her back to South America, also to serve in the Peace Corps.

Image 7.1. Bitter Fruit: The Story of the American Coup in Guatemala. Schlesinger & Kinzer (1982).



When Monica first went to college though, she wanted to become an artist. To her discontent, her parents adamantly refused to pay for her to study art, which they deemed far too impractical. Thus she settled on Social Ecology, where Monica says she “got the environmental bug” which in “upstate New York was not even a topic of consideration.” Although she found some sense of fulfillment in studying Social Ecology, she felt deprived of any creative outlet for artistic expression. Her mom was an excellent cook, but was very particular and never invited Monica to join her in the kitchen. Determined to master the skill, Monica started a weekly dinner event and began cooking every Wednesday night for all of her friends. The only problem was she didn’t know how to cook. Undeterred, she bought her first cookbook, “101 Easy Pasta Recipes” and then one by one proceeded to make every recipe in the book.

Soon after graduating, she felt the call to apply for the Peace Corps and was ultimately offered a position in Uruguay. In January 1992 Monica set foot in Uruguay for the first time, almost exactly one year after Matthew had begun his service. They would not meet for a few more months, but it was here Monica explained that she really learned how to cook since she realized that “if I didn’t cook, I wouldn’t have eaten.” In the Peace Corps library she found cookbooks, which she began stockpiling and making photocopies of her favorite recipes.

It is thus unsurprising that after Monica and Matthew did meet at a Peace Corps gathering, she was at first appalled by the composition of Matthew’s diet, which he detailed had consisted of “white bread, cheese and beer, rice with ketchup... just really the worst... the bare necessities.” Monica’s response was to share with Matthew three simple recipes and to teach

them to him one at a time, thus unintentionally laying the foundation for their lifelong partnership and marriage. As will be illustrated in the rest of the chapter, it would not be the last of Monica's important relationships born from a connection through food. Despite Matthew's lack of aptitude for the kitchen, he diligently practiced making the three recipes in rotation: French onion soup, stir fried rice, and lentil stew. Equipped with these three recipes in hand, Matthew was finally able to begin feeding himself with the food he was growing in his garden rather than the hyper processed foods that were available in stores.

It was from this point that Monica and Matthew's partnership began. After finishing their time in the Peace Corps, they each returned to the United States and eventually moved to Portland, Oregon where they fell back into the same work they had been doing before their service. Trying to resettle into the lives they had left behind didn't sit well with either of them though. After a while they began craving a lifestyle that would allow them to dedicate their time more meaningfully and pursue goals in alignment with the mission they shared in the Peace Corps. But what were they to do? They both had decent jobs, but living and enjoying life in the city meant little of their earnings were saved.

Deciding that they were ready to get out of the city, in 2000 they made plans to move to rural Oregon. Out of the blue, their friend Ben from the Peace Corps contacted them. He had just returned from his honeymoon in Costa Rica with his wife and told them about an amazing piece of land he had found for sale that was tucked away in a small rural community far removed from city life. During the Peace Corps, Matthew and Ben had discussed the idea of starting an organic

farm in Brazil. Suddenly, the dream they had chatted longingly over felt possible. Ben was able to convince Matthew and Monica to get on a plane and fly down to see the land for themselves.

Several flights and an even longer bus ride later, Monica and Matthew found themselves in Pueblo Arboles, surrounded by tropical rainforest and hours from the nearest telephone. They spent two days staying in the community exploring the 300 acre property, of which over 90% was covered in lush tropical rainforest. By the time they returned home, Monica and Matthew were already brainstorming ideas and beginning to draft a business plan. Monica would later tell me that it was when she first visited the Rio Blanco (see image 7.2), which flows through what is now a private wildlife refuge and enters the property in the form of an impressive waterfall, that she knew it was the place. She elaborated, “when I arrived at the waterfall, I looked up and saw a river otter staring back at me!” Neotropical river otters, or nutria as they are known locally, are one of the most famous charismatic megafauna of the tropics and had just been put on the endangered species list in 1999 due to the decimation of wild populations from poaching. After realizing the property would not only meet their needs, but was also home to such a rich diversity of flora and fauna, Monica and Matthew decided to “step off the edge.”

After deciding to commit, the two couples looked to their families and managed to scrounge \$20,000 to make a downpayment on the property. Their plan was that Monica and Matthew would move down first in order to get the project set up while Ben and his wife Laura would stay behind to keep working and provide financial support from afar. After the first year they would swap places and Monica and Matthew would go to work in the US while Ben and

Laura managed Centro Sustentable. Within the first year though, Ben and Laura ended up having a child and before any swapping occurred, they decided to pull out of the project and allow Monica to slowly buy them out over the course of the next seven years. Upon reflection Matthew shared that he thought Laura had understandably “felt overwhelmed and they decided that, you know, embarking on a new life in rural Costa Rica with a newborn was more than they had planned for.”

Image 7.2 Rio Blanco, Costa Rica



Matthew continued, reflecting that “Looking back on it now, really it was quite ignorant, but it seemed like a good idea at the time.” Monica and Matthew believed that in moving to

Costa Rica they were merely leading the charge and that reinforcements would soon be coming to relieve them. Little did they know, the next time they would return home was going to be several years later, and when they did, it would definitely not be to work, but rather to visit family and recharge before diving back into the jungle. After living in Costa Rica for two decades, Matthew told me that the main reason flip flopping was such a bad idea was that the “transitions between Costa Rica and the United States are weeks if not months long and so thinking about doing that every year... it was an unsustainable idea.”

Fortunately for Matthew, he would not have to worry about trying to make that transition very often. Towards the end of 2001, Monica and Matthew loaded up their two trusty Toyotas with more gear than you would think possible and commenced a nearly month long journey to caravan across the American West and much of Central America in order to reach their new home with the gear needed to make it at least somewhat habitable. The property they were moving to, although beautiful and wild, had limited infrastructure on site, just one casita (small house). Across the street lay a second property, which housed agricultural lands and a bunkhouse that could provide lodging for groups. Matthew and Monica knew that these facilities were crucial to their business plan and so before finalizing their purchase they managed to get in contact with the owner. She was also a foreigner, but was elderly and no longer spent much time in Costa Rica. She agreed to lease them the land and to give them first right of refusal if she decided to sell, as long as they promised to continue supporting her farm manager, a local Tico named Diego. By merging the two properties they were afforded ample space to designate a large

natural reserve, build additional lodging for guests and partners, and plant an agroforestry system to produce abundant, sustainably produced food. In this way Centro Sustentable was born.

7.3 Arrival

Diego and his two sons, Javier and Antonio, ended up becoming some of the first employees at Centro Sustentable and all three continue to work there today. Javier shared with me that he still clearly remembers the day when Monica and Matthew first arrived at their new home, “It was the beginning of November 2001. Matthew and Monica pulled into the town of Pueblo Arboles just as the sun was setting, around 5:30 or 6:00 in the afternoon (see image 7.3). Matthew had been driving the red pick up and Monica was coming in the four runner.” It was lightly raining, helping to rinse thousands of miles worth of road dust from their vehicles and prepping them for the new journey ahead. Javier explained that his father, Diego, “had the keys to the front gate [of Centro Sustentable] waiting for them because he worked for the other American” who owned the farm across the street. When they arrived, the house had not been lived in for years, at least not by people. In the meantime a large population of bats, mice and insects had made themselves quite comfortable, so Matthew and Monica’s first order of business was to evict their uninvited guests, a less than pleasant process as one can imagine.

After serving in the Peace Corps in Uruguay for two years, both Matthew and Monica were fluent in Spanish and so while Diego helped unlock the house, Javier asked about the journey and they told him “that parts of the journey, especially along the border between Mexico and Guatemala and throughout El Salvador, had been extremely dangerous.” It was not an experience either Matthew or Monica liked to talk about, so it is unsurprising they never made

the trip a second time. When Matthew and Monica arrived in 2001, Javier was 16 years old and had just finished his third year in high school. He told his father he didn't think he wanted to study any more and Diego replied, "fine, you and I can talk with Matthew and Monica and see if they want you to work."

The very next day Javier and his older brother Antonio visited their father's new employer to discuss the possibility of joining the staff. At the time, Monica and Matthew needed all the help they could get. Less than two weeks after their arrival, their first group of nearly 20 students was coming for a two week immersion experience. Before they arrived, they not only had to remove the bats' nests and cobwebs from the bunkhouse, but they also had to build bunk beds, buy mattresses and bedding, set up their kitchen and arrange homestays for students for part of their visit. And that is how Matthew and Monica hired their first three employees. They were scrambling day and night, but with the help of local community members like Diego, Javier and Antonio, they somehow managed to get everything in place in time for their first guests to arrive.

From the very beginning, there were a few key principles that Monica and Matthew embraced as crucial to fostering the type of community they wanted to be a part of. In the Centro Sustentable guest book, the founders provide an excellent summary of some of these central pillars:

"Monica insisted from the moment that we passed through the centro's gates that we would provide our guests with scrumptious, wholesome food at almost any cost. Food is the centerpiece of life at Centro Sustentable. It brings us together and sustains us thrice daily. Everyone that spends time with us can be comforted after a well-earned night's rest

or a hard morning's or afternoon's work by knowing that soon they will be sitting down to a delectable, filling and life-giving communal meal. And as is so often the case during centro meals, the conversation can be as stimulating as the culinary spread. It is commonly a magical combination.”

Image 7.3 Sunset in Pueblo Arboles



When I asked Monica what the role of food was at Centro Sustentable, she shared “I like the fact that people see that our people are working and making the food they are consuming and you know, baking bread together. It’s a ritual that I think brings people together. You feel nourished and well taken care of when there is love put into your food.” She continued “Good

food motivates me, it makes me happy. And so I've tried to show my appreciation and love for that by always having really good food. I feel like it brings people together and we were very conscious of that design from the get go with the centro (see image 7.4).”

Image 7.4. Farm to Table Breakfast at Centro Sustentable



The centro, as those who have visited often refer to it with affection, to this day has only one fully equipped kitchen as well as a nearby food processing kitchen, despite housing 10 separate bungalows spread across nearly 400 acres and serving over 22,000 meals every year. Three meals a day, breakfast, lunch and dinner, every member of this community gathers around a long, central table (as well as the surrounding corridors and rooms if the group is large enough)

to eat and share company with one another. Monica explained, “I didn’t want to have a bunch of cabins with individual kitchens in them because I felt for one it would cause a lot of garbage. People would be bringing in stuff and I’m very conscious of what comes in and out of my kitchen and try to reduce as much as possible the waste. And I felt that, if there were a lot of different kitchens that would be so much more waste that would then ultimately fall on my shoulders. And as well as that, it would separate us and that unity over meals would, would dissipate.”

In Pueblo Arboles, there is still no garbage collection service. All waste produced there is either taken out by truck, burned or illegally dumped into the forest. In communities like these, garbage can present a serious challenge that lacks an easy or obvious solution. Until 2019 the local high school still burned their garbage on a weekly basis because they lacked any budget for waste disposal and only stopped because the not-for-profit division of Centro Sustentable began paying for the school’s waste to be included in their own landfill shipments.

Based on Monica’s account though, as well as the organizational document referenced above, clearly community meals were intended to serve a larger role at Centro Sustentable than reducing waste. I asked Monica how important the role of sharing meals together has been in maintaining a sense of unity in their organization and she explained “I think it’s pretty crucial... but I understand for some people it may be too much for them and that’s fine, you know if you need to have space and not be at every meal I fully get it, cause it can be intense, especially

during the busy season. But I think sharing meals together is a wonderful way to share community.”

The use of food as a tool to help build relationships at Centro Sustentable has not been limited to the confines of their enclave. When Monica and Matthew first moved to Pueblo Arboles in 2001, there was no internet and no telephone access anywhere in the community. Matthew had to drive nearly two hours in order to send and receive emails on a bi-weekly basis. Despite their separation from the rest of the world, because the front gates to Centro Sustentable’s main house and central gathering space sits right at the central intersection in Pueblo Arboles, they were never lacking for visitors. In Pueblo Arboles, all communication at that time passed via word of mouth, so one of Matthew and Monica’s first missions was to get to know their neighbors. “We’d go over to everybody’s houses, you know, have coffee and eat with them and kind of chit chat... And originally a lot of groups would do home stays, so we would go to everybody’s house to make sure... to say “do you want some people?” Okay, they’ll be here this time, etc. and then go to the next house. So visiting people at their homes... we did that much more often than we do now. WhatsApp has just completely eliminated all that. It’s gone from the visits to WhatsApp in no time flat.”

I could not help but notice a slight wince of disappointment from Monica when she explained how those regular visits have in many ways disappeared. Despite the added efficiency, for which she was surely grateful, it seemed that she felt like something had been lost as well. When reflecting on the interaction I was reminded of a Centro Sustentable motto that Monica

and Matthew often espoused. The motto lies enshrined, hanging on a sign, above the dinner table and reads:

“Disconnect to Reconnect.

Please turn off your phones.”

7.4 Lessons Learned

Research questions addressed in Chapter One:

How do communities and their partners collaborate to animate social and economic change, as well as build and maintain trust over time?

At the end of each results chapters 1-4 I have included a lessons learned section to review and summarize some of the important patterns identified in each chapter and relate them back to the research questions and theoretical propositions guiding the dissertation. Although some questions are explored across the themes of multiple chapters, I have attempted to organize each section primarily around the thematic exploration of one or more of the sub-questions guiding this investigation. For example, the findings discussed in chapter one primarily relate to part of the first subset of research questions: How do communities and their partners collaborate to animate social and economic change, as well as build and maintain trust over time? Although chapter one focuses on the beginning of the relationships established in this community, this represents a crucial time period when Monica and Matthew laid the foundations for how they wanted to relate to and collaborate with local community members from Pueblo Arboles. The strategies employed during this process relate directly to the principle I propose for the

importance of cultivating food based relationships and highlight how interpersonal bonds were forged and strengthened through this process. To help further organize the assessment, I find it is a useful heuristic to also link observed patterns to one or more of the six basic forms of capital commonly referred to throughout the development literature (Stokols et al. 2003; Stokols et al. 2013). These forms of capital include:

Material Resources:

1. Natural Capital- Resources produced through nature-based processes.
2. Physical Capital- Physical resources designed and produced by people.
3. Financial Capital- Financial assets for enhancing productivity and health.

Human Resources:

4. Social Capital- Relations between persons that facilitate action.
5. Human Capital- Attributes, including skills and knowledge that enable action.
6. Moral Capital- Investment of personal and collective resources towards cultivation of virtue and justice.

In this first chapter, for example, the introduction and core practices of Centro Sustentable highlighted above help illustrate how the cultivation and use of food (natural capital) can be used to not only generate income (financial capital) within the local community but also nourish human well-being and promote new skills (human capital) and strengthen interpersonal bonds (social capital). The many forms of capital that food intersects again highlights its critical importance for strengthening the webs that bind communities together.

To first examine how Centro Sustentable started building trust with the local community and began collaborating with partners in Pueblo Arboles, findings from chapter one make it clear that Monica and Matthew relied on intimate, personal connections cultivated over shared meals to create friendships and establish foundations for trust. Given the community's emphasis on

presence and sharing of community through personal interactions, it is thus unsurprising that they might have a complicated relationship with digital technologies that are both crucial to the success of their business, yet distract from one of their organizational missions. Without the household visits, shared coffees and meals in the early years as they got to know and build trust with their local community members, how different would Pueblo Arboles look today? Would the same (as yet unintroduced) entrepreneurs still have launched their businesses? Would countless home stays providing invaluable opportunities for cross cultural exchange ever have happened? Would Centro Sustentable even exist? It is impossible to say for certain.

It is possible that even without all the visits, chit chats and shared meals that the organization would still exist today, but it is unlikely the relationships would be the same. Several studies have demonstrated the powerful impact of sharing food in breaking down barriers, building trust and/or strengthening bonds (Gross et al. 2011; Julier, 2013; Pollan, 2008). Food is the original currency. Along with water and oxygen it provides the basis for human life, so it is not hard to imagine what an impact thousands of shared meals might have on the relationships between a small community of around 200 people. To further demonstrate this finding, subsequent chapters will present additional perspectives on food that highlight the many ways (both positive and negative) that the preparation of consumption of food continues to influence the ways we relate to and cooperate with one another.

I envision each encounter, shared coffee, or meal as a thread. Some are thicker than others due to the meaningfulness of certain interactions, yet together it is this complex web of

shared interactions that knits us all together. Sever enough connections though and we become isolated, causing the web to disintegrate. This is what happened to the ‘lost generation’ in Swaziland, but this phenomenon is also happening around the world. For example, as of 2015 nearly half of all meals consumed in the U.S. (~46%) were being eaten alone (Food Marketing Institute, 2015). These forms of social isolation are being dramatically exacerbated by household lockdowns and social distancing measures being imposed as a result of the COVID-19 global pandemic, serving to weaken interpersonal and societal bonds. The solutions thus lie in reconnection. Reconnecting to ourselves, to our families and to our communities. By taking the time to share genuine interactions with the people we care about, to work together, laugh together, cook and break bread together, we learn to see more clearly what we have in common and focus less on the things that divide us (Brock, 2017; Julier, 2013). For organizations seeking to promote transformative change this is an invaluable lesson, both to promote internal cohesion as well as to strengthen relationships with partner communities. The next chapter will follow Centro Sustentable during the first few years of its establishment to examine how they began weaving these threads together.

“If you really want to make a friend, go to someone’s house and eat with [them]... The people who give you their food give you their heart.”

-Cesar Chavez

End of Chapter One

8. RESULTS CHAPTER TWO

THE EARLY YEARS

Chapter two deals with the first few years of Centro Sustentable's presence in Pueblo Arboles. By drawing from a combination of historical organizational documents (e.g. old newsletters) and in-depth interviews with organizational founders and longstanding community members, this chapter moves back and forth between the actions and decisions made in the early years of the project and the reflections of those individuals nearly two decades later. In this manner, chapter two primarily focuses on addressing questions posed in the third subset of research questions: What are the contextually bound and community identified conditions for success? How do they evaluate the social and ecological impacts of their projects and progress towards their goals? Are there measurable health and welfare impacts?

8.1 Hindsight is 20/20

The first two years that Matthew and Monica lived in Pueblo Arboles flew by in a flurry of activity. In early 2002 they launched a volunteer program to provide opportunities for young adults interested in sustainable living to come stay and learn in exchange for their labor. Around the same time a visiting high school began what would become a long-lasting tradition by requesting a homestay program for their students. By May a growing team of local employees and international volunteers helped complete the first two natural building projects on the farm, a composting toilet and an earthen oven. They planted a large garden and began growing fresh greens, tomatoes, peppers, cucumbers, maize (corn) and beans. There was a powerful sensation of youthful idealism that was at least in part fostered by relative ignorance to the challenges that lay ahead.

In the beginning, Matthew thought they had some notion of what they needed to do and the skills they would need to be successful, but as he reflected back on it nearly twenty years later he expressed that he was “not 100% sure how you prepare for it... I would say, as much as possible go into it with a healthy dose of reality, or ignorance, or both...” Mathew chuckled to himself before continuing, “having a good support system is key. In our case I think we came into a weakening community, like a community kind of on their last leg. Maybe that’s a little bit dramatic to say it that way, but it seems like where this community was headed was basically to extinction. And that takes time to build back up and get people back in and rebuilding families... You want to see people having kids and a community with stable incomes and that all takes, I think, decades and maybe even generations to play out.”

Intellectually, Matthew knew that they would be dealing with a wide range of challenges that he thought his background in the peace corps would have prepared him for. But as he would explain, “when you actually put your feet on the ground it is always more intense and deeper and different than you’re able to think about... When you are emotionally and psychologically invested and you’re lacking sleep and you know, stressed out, it feels very different than when you think about it academically.” I asked Matthew what words of advice he would offer to entrepreneurs who are getting ready to start a similar project in Latin America and while laughing he shared “my gut answer is, don’t do it.” “Is that really your gut answer?” I asked, to which Matthew responded “Unless you are really prepared to go on an emotional roller coaster ride... I think, maybe it takes a bit of a special breed to want to tackle some of these issues or

maybe a healthy dose of ignorance because dealing with emergencies is heavy stuff. Sexual assault complaints, getting woken up at two in the morning for, you know some kid who is sick in bed with severe abdominal pain, it's fucking really stressful.”

It would be easy to interpret Matthew's reflections as a sign that community based development is not scalable or requires too great an investment to produce meaningful outcomes, but such a conclusion would be remiss. As will be demonstrated in the stories to follow, the primary issue has not been that the community has been unable to make significant progress towards their goals or mediate deficiencies through the introduction of new economic opportunities. Instead, the lesson that Matthew is referring to has more to do with the fact that while it is important to celebrate small victories along the way, it would be a grave error to mistake progress for a cure. Poverty manifests itself and is reinforced in insidious ways such as lack of medical services, unsafe housing (see Image 8.1), sexual violence, worker exploitation, alcohol/drug abuse and personal/collective belief structures that erode confidence and can paralyze local actors with insecurity and uncertainty (Brockett, 2019; Selwyn, 2018).

Even under the best of circumstances, it would be naive to think that the full range of these deep seated societal challenges can be replaced with healthier, more regenerative practices over the course of months or a couple of years. Given the complex cultural settings in which all humans are born (e.g. family, language, religion, socio-political systems, etc.), historically the vast majority of people on Earth born into poverty never had the chance to escape it (AAAS, 2020). Additionally, the inevitable shortcomings of organizational partners as they are learning

how best to support community goals and beginning to recognize how their own personal struggles have become inseparably intertwined with their professional relationships, means that reality will be far from ideal. Mistakes are inevitable when experimenting with something new. The key to developing long term strategies for building and maintaining successful cooperation between individuals and within groups is in learning how existing groups respond to challenges and grow from them to maintain function over time (Atkins et al. 2019).

Image 8.1. Dilapidated Housing, rural Costa Rica



It is for these reasons that multiple organizations I have spoken with about these challenges recommend practitioners who are serious about supporting transformative social

change to “have no exit strategy.” Instead, they imply that serious transformation requires long term, if not permanent commitments. Matthew’s reflections reveal an additional piece, which is that given the scale of the challenges facing human society more broadly as well as in specific communities around the world, it can be a challenge in itself to stay motivated and excited about engaging in this work without a deep awareness of the multiple scales and occasionally extended timelines at which we can make progress, a bit of ignorance, or ideally some combination of the two. This is an important reflection because it is true that awareness can sometimes become paralyzing if not balanced with some form of optimism or hope for the future.

For example, when focusing on global climate change, the challenges and solutions can often seem so big that it is often hard to know where to even begin. Indeed, we can probably all think of times we have personally felt this way or know others who have struggled to imagine how their actions could possibly make a difference when the problem is so large. Matthew’s suggestion, that a healthy dose of ignorance can help address this paralysis, is not without merit. The suggestion itself is squarely aligned with Hirschman’s theory regarding the predicament of the Hiding Hand (See figure 8.1). Lack of awareness can foster a certain type of optimism and creativity, which are fundamental ingredients in generating action and commitment towards societal change. Without a belief that things can get better, why would anyone even try? Unfortunately, as Matthew learned the hard way, optimism fueled by ignorance can make it more difficult to identify programmatic shortcomings and produce fertile grounds for falling prey to avoidable mistakes. Sometimes though, the only way to learn is through trial and error.

Figure 8.1 Hirschman's Hiding Hand

Albert Hirschman proposed that planners in underdeveloped nations typically benefit from the Hiding Hand, which hides and then makes planners unable to predict serious obstacles to their projects (Sunstein, 2014). Although seemingly problematic, Hirschman argues that the Hiding Hand is actually benevolent because the lack of anticipation pushes human creativity into overdrive once the obstacles arise. Hirschman contrasts the Hiding Hand against the planning fallacy, suggesting that if planners had been fully aware of the challenges they would face, they never would have authorized the projects in the first place.

Although Hirschman did not develop a testable hypothesis, planning scholars continue to debate the efficacy of his theory today (Ika, 2017). Most recently, Flyvbjerg (2016) took issue with Hirschman's principle, countering that a Malevolent Hiding Hand, which serves to obstruct projects rather than inspiring creative solutions, is more likely to prevail. Although Ika (2017) suggests what is most important is to identify why the Benevolent Hiding Hand sometimes works, of interest, Flyvbjerg's (2016) analysis of 2,062 projects found that the Malevolent Hiding hand applied to 78% of observed cases, while Hirschman's Benevolent Hiding Hand was only observed in 22% of cases.

In some regards at least, it may have been fortunate that in 2002, Matthew and Monica were woefully unaware of the heavy burdens that would be requested of them along the journey to come. Their desire in the early stages of the organization to challenge standard conventions led them to embrace a decision making structure that provided every member of the organization, whether part owner or a two week volunteer, an equal say in all community decisions. They wanted to eliminate hierarchy from their societal structure. "We are all equal" they would repeat frequently. The pursuit of equality is a value that was strongly emphasized by one of the founders of Social Ecology, Murray Bookchin in his groundbreaking volume, *The Ecology of Freedom*, first published in 1982. Although this pursuit, in and of itself reflects tremendous value, enacting this value, especially in the context of unequal levels of investment and ownership over

project goals and outcomes (e.g. project owners vs volunteers), can become extremely complicated in practice.

Early on though, the faith Centro Sustentable members had in one another and the purpose of the project led every agreement and decision to be made verbally and with the shake of a hand. No one thought to write up employment contracts or sign written agreements. No records were made of their decisions other than in the quarterly Newsletters that Matthew would write and share with their community of followers. It was an exciting time of development for the community filled with uncertainty intermingled with an abundance of hope.

As will become clear later in the dissertation, the importance of developing written agreements early on within long term partnerships cannot be overstated. Although the idea of writing down agreements may seem obvious, it is a surprisingly pervasive challenge observed in the literature on cross-disciplinary collaboration and team scholarship (Bennet et al. 2018; Gulmera et al. 2005; Stokols et al. 2008; Stokols et al. 2010). Effective teams and partnerships typically work out a detailed collaboration plan (above and beyond the specifics of their research or community change plans) during the initial stages of their collaborative projects. Although not insurmountable, as will be seen with the case of Centro Sustentable, teams that don't articulate collaboration plans are likely to encounter greater challenges to their productivity, durability and continuity.

8.2 Limitless Possibilities:

Matthew shared that “There was also just a belief that what we were doing was, was good, was right, was fulfilling. It felt like we had genuinely come upon an idea that we were able to get behind, you know, this idea of bringing people together in a space like the centro has become. It was really something that we felt was needed and that people wanted. There was so much other stuff too, the natural beauty here, the people of Pueblo Arboles, but I’d be lying, you know, if I said there weren’t many days where I was close to telling Monica that we should throw in the towel. It was, it was a lot in the early days, it was hard to get people out here back then with limited bus service, no phones, no internet. We were really scraping by at that time and trying to manage 300 acres... I’d say mostly thinking back that it was just a really strong desire to succeed or contrarily a fear of failure as I first thought of it, but I wanted to be successful in whatever that meant, however that would be defined and I was driven by that.”

One former volunteer described there being a “sense of limitless possibilities” during this time. Unfortunately, this near magical sense of creativity and endless opportunity was being preserved by a fragile sense of shared purpose and intention that was only a misunderstanding or disagreement away from being shattered. With the benefit of hindsight, I am sure the reader can imagine any number of ways that these ingredients could lead to disappointing or even explosive outcomes within the organization. What is miraculous about this case, is not that social tensions eventually boiled over into serious personnel challenges that threatened the very existence of the organization. Rather, it is the fact that despite the lack of underlying organizational structure and/or a clearly agreed to set of norms, values and expectations, Centro Sustentable has so far

managed to avoid implosion and slowly has adapted to the obstacles they've faced along the way, reorganizing and growing with the community around them over the past 20 years.

I asked Matthew what were some of the biggest mistakes they had made since starting the project and he made it clear that not writing down agreements in the early stages was chief amongst them. In his own words, "Having clear agreements for sure... which sounds like a bit of a cop out but it's the truth. All those early agreements were just oral ones and those agreements just don't stand up to the test of time in our experience. Inevitably... hindsight is 2020 and looking back, it seems so obvious now. I feel like it should have been then, but people just remember events differently and that's just a fact... Just having clear arrangements and expectations with people, because we've been hurt by and we've hurt so many people. I dare not guess how many times, just by having different memories of the same conversation. For anyone listening, write it down. Don't ever go into business with anyone who doesn't have a contract."

Coming from someone who didn't start making his own contracts and writing down agreements until 2015, the seriousness with which he now takes the recommendation helps drive the message home. Write everything down. Never rely on memory, especially when it comes to agreements that are expected to last beyond a few days, let alone years. But these were lessons that at the time Matthew was more than a decade away from learning.

8.3 Play and Rituals, Creating Culture:

In spring 2002 of Centro Sustentable's first year, Matthew and Monica began playing futbol (soccer) on the local men's and women's respective teams. Afternoon practices and weekly Sunday games became the central gathering points for the community. With the help of Monica and any female volunteers that were visiting, the women's team always managed to have enough people to field a full team. Juan Gonzalez, one of the local men who was just a boy when Matthew and Monica first arrived, remembered how compared to other foreigners he had met, when "they arrived they mixed more with the local people. The owner played soccer, and here all the people play soccer and it was a good way of approaching everyone. The wife also played soccer, Monica, in a team of women from Pueblo Arboles, but I think the relationship was good because they were very open with the community, having a relationship and mixing with the locals, not being alone in their farm or only coming to Pueblo Arboles for short periods of time. In fact, they started living here and it was good to have that connection with the community. With the project they did, a sustainable farm, they started offering jobs to locals, so it was very good because it came to help part of the population that had no occupation. So it was good because they generated jobs and they were nice people. They were people who loved each other, so I think they were well blessed by a large part of the community."

The healthy forms of play that emerged on the soccer pitch demonstrated it was a vital space for the entire community to connect and build relationships. After playing for a couple months Matthew and Monica were already feeling more connected to the community and wanted to chip in. Over the next few months they organized a bingo event to raise money for the elementary school, built garden beds with volunteers for the students and took the lead on

cleaning up trash along the road to beautify town. The relationships they fostered from playing soccer and organizing home stays for students started budding into real friendships with some of their new neighbors. For example, every afternoon for lunch, Doña Marta, an elderly matriarch and herbalist who had lived in Pueblo Arboles her entire life would walk nearly 3 miles from her cabin to break bread with Matthew and Monica at their home, share stories and good company. Monica would later tell me that Doña Marta would continue this tradition for over 10 years. Sadly, as she got older her eyesight slowly began to fail her to the point where she became legally blind and unable to make the nearly two mile trek from her small cabin to town any longer (see Image 8.2). I had the chance to meet Doña Marta and she explained that “when Matthew and Monica arrived here and I was much younger, I cut a large cluster of bananas, plantains and cacao fruit and everything to sell and gift to Matthew and Monica.” Doña Marta went on to explain that when groups began arriving, “we began cutting and putting fruit out [by Centro Sustentable] at noon, and we had fun and worked well every day.”

Image 8.2 Doña Marta at Her Home (shared with permission)



In addition to building relationships with the local community, Matthew and Monica were also creating the types of meaningful rituals that could play an important role in maintaining group identity and cohesion over time. At Centro Sustentable, each evening just before dinner is served the lights are dimmed and the community gathers round a long wooden table made for 40 pairs of hands. Each hand grasps another and a circle is formed. This circle, as the ritual is referred to, signifies an open forum for expressing gratitude and sharing meaningful reflections from the day.

Many volunteers, visitors and community members alike described this practice as being crucial to the sense of community that they found in this place. For example, one volunteer had this to say about their experience at Centro Sustentable: “As the day comes to a close, we gather around the dinner table, light the beeswax candles, and join hands to share the vibes of the day. A time to give thanks, send out thoughts and prayers, and deflate after a full day. The meal, though, almost always without fail, delivers a knockout punch, sending us early to bed for a well-deserved sleep. Life at the Centro is never lacking in sustenance, nutritional and otherwise. We can thus do no more than take it one day at a time, making the most of every minute.”

In June of the same year, the Costa Rican government declared that the forest reserve bordering their property and the surrounding mountains was being dedicated as a National Park. This news brought both excitement and consternation, since having a national park would help attract new visitors, resources and attention, whilst much of their own property as well as many neighbors were at risk of having their farms expropriated by the Costa Rican government. These

changes provided additional motivation to place much of their land into permanent protected status so as to reduce the likelihood that their farm would be forcibly purchased. They argued successfully to the Minister of Environment that by not having to buy their property the government could save funds to buy more degraded lands and other important properties in the area.

For all the challenges they could not have been aware of, Matthew and Monica were very strategic in creating several important partnerships with various educational organizations before departing the United States. One in particular, would prove vital to the success of the project. “Their point man in the United States” as Matthew would describe him, Bob McDaniel, was a graduate student studying Restoration Ecology at the University of Oregon (UO) and owner of an international travel agency called “Education Adventures.” By August 2002, McDaniel had convinced one of his advisors, Karen Bolivar, a forestry professor who specialized in Stream Side studies, to begin preparations for bringing a group of students from the UO down to Costa Rica to participate in programs ranging from greywater recycling, alternative construction techniques, reforestation and restoration ecology. For Karen, the chance to work and be one of the first people to conduct research in the young national park was the opportunity of a lifetime.

Before the end of the year, McDaniel and Bolivar had brought the program to life, bringing nearly 20 students to the tropical rainforests of Costa Rica for a six week immersion that would kickstart a robust partnership that would continue for the next several years. By 2004 the UO was bringing 3-4 groups each year. Students began research projects to measure stream

gauge data, map local rivers, create vegetation plots and study the social makeup of the local community. They started conducting longitudinal studies in the new National Park that would eventually earn Karen an invitation from the Ministry of Environment to participate in the development and expansion of the National Park Management Plan.

When McDaniel first visited Pueblo Arboles he ran into Doña Marta during lunch at Centro Sustentable and they quickly became friends. When he realized she was an herbalist and expert in the local flora he got excited realizing the possibilities for collaboration. From then on, whenever McDaniel brought groups of students to Pueblo Arboles, he always visited Doña Marta. She enjoyed their visits and sharing her knowledge of the local flora and fauna with the students. With her help, they were able to identify several native hardwood species and collect enough seeds to start a tree nursery to contribute to the reforestation of degraded areas with endangered and ecologically important species. As I was talking with Doña Marta she pointed to a clearing at one corner of her property and said “we put 25 bags there and 100 seeds of a very special tree. We planted Nazareno, Cristobal, and Cedro as well. And when the saplings were this tall (points to knee height) the people would buy them from me and now there are many trees from my nursery in National Parks around the country... Just over there (points towards neighbors property) is a large and tall Nazareno that I planted when I once went by that little house. They are precious seeds.” *Peltogyne Purpurea*, commonly known as Nazareno or Purpleheart, is a coveted and highly exploited species for its beautiful color and natural durability (see image 8.3). Today, harvesting of Purpleheart is prohibited by law. Although illegal deforestation continues to be a challenge for this species today, Costa Rica is actually one of the

few countries in Latin America that is undergoing a process of reforestation that began in the 1990's and is projected to continue until at least 2069 (Stan & Sanchez-Azofeifa, 2019).

In addition to hosting their first college group from the UO, towards the end of 2002 and beginning of 2003, Centro Sustentable also hosted their first Wilderness First Responder (WFR) course with AERIE Backcountry Medicine, based out of Montana, as well as their first natural building and alternative construction course taught by Yestermorrow Design/Build school, based out of Vermont. During the years to follow, these three programs would become the lifeblood of the organization, providing consistent and reliable visitors each year that generated sufficient income to keep the business afloat while their network grew and additional programs and partnerships were developed. Interestingly, all three of these original partnerships were based on relationships formed in the year directly preceding Matthew and Monica's departure for Costa Rica. Matthew connected with the founder of AERIE while completing his own WFR in preparation for the move at the same time that Monica connected with the owners of Yestermorrow Design/Build School while taking a two week earthen building course in Vermont. Matthew and Monica met Bob McDaniel on the other hand by chance through their next door neighbors while living in Portland before making the move to Costa Rica. Bob was already organizing educational tours in the tropics and so the three of them naturally hit it off. It wasn't long before they started having coffee on the weekends to discuss potential ideas for how McDaniel could bring groups to come stay at Centro Sustentable.

Image 8.3 *Peltogyne Purpurea* (Purpleheart)



Just after the organization’s one-year anniversary they celebrated their first “gringo style” thanksgiving in Pueblo Arboles. The day began with one volunteer making a 10 mile round trip hike to the nearest town where a friend’s sister raised free range turkeys, or “chompipes” as they are referred to locally. He carried the turkey back in an old grain sack and a couple of the employees did the honors. First though, some of the locals got the bird drunk on Guaro (moonshine) because the “local white lightning helps make the meat tenderer, while making the bird a bit more cooperative during its last minutes.” Although the rest of the event went fairly smoothly and the meal was enjoyed by all in attendance, Matthew and Monica would soon begin to discover that the “local white lightning” as it is often described is consumed more for its intoxicating effects than for its capacity as a meat tenderizer.

On the next major community event, Christmas Eve, the crew and Centro Sustentable came up with another big plan to spread the holiday spirit with their fellow neighbors. Using their earthen fired Cobb oven (see image 8.4), the team spent the entire day baking cookies in order to walk from house to house and share them with the entire community. Unfortunately, as Matthew would later recount, “one of the volunteers, mistook the salt for the baking soda... And I mean, we had hundreds of cookies and they were essentially inedible. Right before we were about to go out on our little journey, I think Robin tasted them and she like, spit it out! Then we had this big debate about what to do, because we had spent all day baking and it was already four o clock. We didn’t end up going out. It was a total failure. We just bagged it.”

Although the Christmas Eve failure was surely a disappointment to everyone involved, the crew was nothing if not persistent. Not long after, they decided to try again. “We wanted to have a bit of a meet and greet with the community,” Matthew continued. “So we had a big party, we got a pig, we got a bunch of beer and yuca and green bananas and invited literally everyone in the whole town... And a couple of the males in the community just got absolutely shit faced drunk and caused a huge ruckus... women were trying to drag the males in their families home.”

That was the last time Matthew and Monica ever invited the entire community over at the same time. As he reflected back on the event, Matthew shared how “we just figured, beer and pork, just invite everyone over. But you know these cultural... just misunderstandings I guess on our part. In that case we thought we were doing something wonderful, fun but you know, not understanding the nuances of family relationships and who likes who and... You know, we

invited the Hayfields and the Garcia's and everyone in between and all of a sudden everyone was here and full of jealousy and envy, asking "why did you invite them when we're your allies?" And then the drinking.. so yeah, you learn from those experiences and how to treat community life a little bit more subtly, having a little better understanding of the idiosyncrasies that aren't quite so obvious from the perspective of a newcomer." After that event Centro Sustentable pulled back and became a little less presumptuous in their offerings to the community. They certainly became more selective about who they invited over for parties and festivities, especially if alcohol was going to be involved.

Image 8.4 Lighting up the Earthen Oven at Centro Sustentable



With celebrations out of the way, Matthew and Monica's second year in Pueblo Arboles went by even faster than the first. They slowly made progress with their buildings, adding a second composting toilet and a temporary shelter to house volunteers as well as laying the foundation for what was to become a bamboo classroom. Bob McDaniel came back with four groups of students in 2003 and in June, the president of Costa Rica visited to celebrate the official opening of the new National Park. Although there had been much debate over the new boundaries that would be drawn, in the end the National Park boundaries were nearly identical to the boundaries of the Protected Zone that had preceded it, primarily due to a lack of funding from the Ministry of the Environment to purchase additional lands.

During this time there were dozens of meetings with the local community, the ministry of environment and other organizations that were interested in the future of the new park and what opportunities it might present. When I asked Matthew if he had ever made any decisions that he felt had made a difference in how the the community of Pueblo Arboles was approaching their goals, he shared the following:

“You know what pops into my head as we look out at the national park? I remember in the early days, and all that was happening around the park. There was all this talk about how it was going to be developed and we were helping to co-develop the management plan and meeting with the National Park alongside the government officials and Ministry of Environment officials. And at that time I guess I was a little bit, more open and more loud and more opinionated about how I thought that should look. You know, I was that guy. The newcomer gringo. I shared some, I guess slightly controversial ideas of, you know, slow organic growth and my strong belief at the time that we needed to really develop this park and this community slowly and organically, based on what I thought would happen otherwise and what I had read about and seen in other parts of the world including here in Costa Rica. What unfettered, you know, uncontrolled development can do to a small community like this.

Everybody was so over the top excited about what it meant to have a national park in the backyard. And I was concerned at that time, first and foremost, cause we almost had our land taken via eminent domain by the government. But also, I just pictured, you know, this lightning quick development that resulted in developers coming in and buying all the land. I mean running prices up and kind of pushing the local community aside. And we had lots of meetings back then with the Ministry of Environment and with the associations and with other organizations. When a new development like this happens in a small community though, you get this rush of government officials and entrepreneurs and people with big ideas that are coming in to try to take advantage of a potentially lucrative economic situation, or political situation.

I was really adamant about slow development, about letting the local businesses have a run at this... allow them to get their ducks in a row and their clients together to be able to get something on the ground and in place before what I thought could be an influx of foreign investment. And you know, I was sometimes embarrassed by the response and shamed and talked to negatively because I was kinda that lone voice of what I thought was reasonable back then, and still do to some extent. But I stand by that, that action now looking back and kind of seeing it unfold the way that I was hoping it would. And I don't, I don't say that meaning that it was because I said that, that it happened the way that it did... The initial interests kind of faded with time, reality hit and you know, the ministry didn't have it in their budget and whatever is the case... What did end up happening and what I feel is still happening is that we have this slow organic development that has allowed [local organizations owned by Costa Ricans] to really get a firm footing in here to the point where I feel like they can care for themselves. They're established now. If a boutique hotel opened up in Pueblo Arboles, it could and might do very well, but I don't know if it would have a really strong negative impact on the organizations that have now had over a decade to build support.”

It is interesting that in reflecting on the development of Pueblo Arboles that Matthew both recognizes and dismisses the role his dissenting voice played in getting other community stakeholders to pause and consider the potential consequences of their decisions in the face of the excitement and euphoria regarding the potential personal benefits that most people were focused on. Regardless of how small or large of an influence Matthew may have had on the outcome, it is

probably fortunate for the sake of this community that it has continued to develop slowly and organically. In the past decade, a flurry of research has hit the scene of mainstream economic thought, flagging the dangers of economic policy that pursues growth at all costs and proposing consideration of low growth and post growth economic models to address these limitations in ways that are directly aligned with the slow organic growth model that Matthew suggests above (Buchs & Koch, 2017; Houtbeckers, E. 2018; Jackson, 2018; Pink, 2008). The following chapter highlights stories from some of the entrepreneurs who have had the opportunity to flourish in this context and develop financially and socially successful enterprises.

8.4 Lessons Learned

Research questions addressed in Chapter Two:

What are the contextually bound and community identified conditions for success? How do they evaluate the social and ecological impacts of their projects and progress towards their goals? Are there measurable health and welfare impacts?

To first examine the contextually bound conditions for success within this particular community, a crucial reminder that became evident in chapter two is that neither Pueblo Arboles nor Centro Sustentable exist in a vacuum. As Matthew explained, they had easy and reliable access to government officials who were supportive of community goals and objectives. For example, according to Transparency International (2020), Costa Rica ranks as one of the least corrupt and most democratic nations in Latin America and even in rural communities like Pueblo Arboles, individual households breathe clean air, have reliable access to public utilities like

affordable electricity and clean public water. Berbes-Blazquez et al. (2017) found that having equitable access to these types of ecosystem and public services played a crucial role in determining human well-being. These forms of Social and Natural Capital have proved to be invaluable resources in the development and maintenance of both the Centro's programs and as will be shown in Chapter 3, several local entrepreneurs as well. These observations directly relate to principle seven proposed by Atkins et al. (2019), having respected authority for self-governance, which is predicted to support the development of effective collaboration.

With regards to the health and welfare impacts triggered by Centro Sustentable, due to the lack of available economic or health related data in Pueblo Arboles from before Monica and Matthew's arrival, it is impossible to make direct comparisons of the changes this community has undergone. Because Centro Sustentable is not a research based institution, neither they nor community members placed an emphasis on developing formal metrics for evaluating project outcomes. Instead, results to this question must be inferred by the reports and reflections of individuals as it relates to changes in Pueblo Arboles over the past twenty years. Stories highlighted in each chapter contribute to answering this question, which will be reviewed once more in Chapter five, when I summarize findings from the dissertation.

To highlight an additional form of Social Capital that proved extremely valuable for Centro Sustentable, Matthew and Monica also brought an extensive network of relationships and connections with them when they first arrived, which proved crucial to the viability of their business, especially in the early years of the organization. The complex and overdetermined

nature of these factors makes it impossible to determine whether the same project could have been successful under different circumstances, but as several scholars have previously reported, what is important is that the specific strategies employed be aligned with local contexts, opportunities and barriers (Altieri & Toledo, 2011; Holt-Gimenez, 2011; Palma et al. 2015; Williams, 2016). The crucial role played by US based partners that Matthew and Monica brought with them in supporting the financial viability of Centro Sustentable in the early years demonstrates Atkins et al. (2019) principle eight, of the need for establishing collaborative and mutually beneficial partnerships with other groups.

This chapter also highlighted examples of how Centro Sustentable continued to foster a sense of unity through food based relationships by designating space within their regular community meals to create daily opportunities for members to share thanks and publicly express their gratitude for one another. This example reflects the principle of relationships cultivated through food that I propose and also connects to principle one described by Atkins et al. (2019), developing a shared identity and purpose. As an organization, although very little was written down in the early years, their values were clearly expressed, both in the name of the organization and in the daily actions they took (e.g. composting, eliminating garbage, buying local food, making decisions as a group, etc.). Additionally, because the accommodations are rustic and the village is so remote, it is likely that this may have served as an additional filtration device, which could have served to discourage visitors who were not pursuing a similar purpose, especially in the early years.

In addition, the radical approach to equality and participatory decision making adopted early on by the organization, especially in the early years, appears to have reinforced the sense of shared purpose expressed by volunteers and employees during this time period. This concept illustrates the connection between principle one (shared identity and purpose) and principle four (fair and inclusive decision making) proposed by Atkins et al. (2019). Although the organization continued to experiment with different forms of decision making, their goal from the beginning was to promote a participatory and democratic approach to decision making that appears to have been highly motivating in the early years and to have contributed to the sense of “limitless possibilities” discussed earlier in the chapter.

As will continue to be observed in the chapters to follow, the adoption of slow organic growth practices has been crucial not only to the success of Centro Sustentable, but to the many businesses started by local community members as well. By developing slowly the community had a chance to build human capital by creating new opportunities for local entrepreneurs and seeking to limit foreign investments seeking to take advantage of the types of land grab and quick profit scenarios that have stripped so many rural communities of their lands worldwide. This finding is not new, yet this investigation lends strength to previous investigations on this topic that have highlighted the importance of government support to protect grassroots objectives (Houtbeckers, E. 2018; Jackson, 2018; Pink, 2008) and contributes novel observations such as the potential value of diverse partnerships with international relations for linking communities to markets and sources of outside expertise.

Earlier in the chapter Matthew shared that if he had known the depth of the challenges that faced him in Pueblo Arboles, he might not have started Centro Sustentable in the first place. His suggestion ran parallel to Hirschman's Benevolent Hiding Hand theory, that naivety might be a requirement for being willing to engage in processes that seem overwhelming when considering the full scope of the challenge, such as the regeneration of a rural community headed towards extinction. In reflecting on these words of caution and considering Hirschman's critics, I realized that in the spectrum between pessimism and paralysis that can be fostered by an awareness of the immense scale of the challenges facing our species and the types of naive optimism that are fueled by ignorance, there lies an alternative choice that is cultivated through a discerning awareness of both the challenges we face and the potential we have for sowing seeds of change.

Especially because our societies are changing faster now than at any other point in human history it could be easy to deceive ourselves into believing that we can somehow erase centuries of violence, trauma and exploitation from our collective memories within the span of a single generation. In a universe where every motion is bound to generate an equal and opposite reaction, how could such a belief offer anything more tangible than an easing of one's conscience? On the other end of the spectrum, it would be equally easy to deceive ourselves into believing that the challenges of global environmental change are simply too large and complex to even try addressing. In response to disempowering personal beliefs such as this, Bill Gates (the founder of Microsoft) is famously quoted as saying, "We always overestimate the change that

will occur in the next two years and underestimate the change that will occur in the next ten. Don't let yourself be lulled into inaction.”

I propose that by instead recognizing the struggle neither began, nor ends with any single one of us and thus letting go of the egoistic need to witness all of the fruits of our labors, it is possible to develop a healthier relationship with time and the limited scope of human existence. In the history of life on Earth, each person has the opportunity to participate in the very briefest of glimpses, and I would argue that being able to participate for even this short time is a tremendous opportunity. With this sense of gratitude forefront in mind, I humbly propose that what gives this fleeting existence such power is the very capacity for humans to create footprints worth leaving behind. This can occur most obviously through our offspring, but perhaps even more importantly, through the people with whom we connect, the creations we build, and the lives we foster and support around us. This proposition is illustrated in reflections shared by Matthew in chapter two regarding how his belief that they were doing something meaningful kept him from giving up hope during the most challenging times. As humanity grapples with the scope of the challenges that we will face for generations to come, it is important to remember what vital resources hope and optimism truly are and build on our capacity to cultivate and preserve hope in the face of difficult and challenging experiences.

Twenty years into the twentieth century it is clear that a globalized civilization can be a terrifying community to be part of. War, terrorism, climate change fueled natural disasters, political turmoil and global pandemics are all relayed to us constantly through a relentless

network of multimedia devices that serve to bombard humanity with sensationalized and fear inducing information that is presumably highlighted because industry executives are convinced it will generate the most viewer/readership. After all, in the age of corporatized digital media consumption, clicks are money and the size of your audience is a powerful measure of one's capacity to wield influence.

The trap in fear-based thinking is that although it makes us hyper aware of a threat and provides a momentary burst of energy to either confront or escape a given situation, in modern day-to-day practice, it can also be a recipe that contributes to the spread of misinformation and prevalence of information fatigue and depression, especially if sources of information are not balanced with offerings of hope (Johns & Jacquet, 2018; Lee, 2019; Nabi & Myrick, 2018; Perusini et al. 2015;). The simplistic and reactionary decision making strategies that humans rely on when engaged in fear based thinking limit capacity for creativity and simply will not suffice for the type of innovative solutions required to survive and thrive in the face of twenty first century challenges. Today's challenges require observation, reflection, collaboration, compassion, communication, foresight and creativity, all of which are suppressed when responding to fear based stimuli.

In order to both sustain action and inspire creative problem solving, anxiety from awareness of the negative must be complemented by an aspiration for something better or more than what is currently possible (Johns & Jacquet, 2018; Perusini et al. 2015). This is not the kind

of passive hope that wishes for everything to be alright, but rather an active form of hope, cultivated from a clear vision of a better future. Brock (2017, pp. 58) suggests that:

“[Hope and fear] share a similar symbiosis that will be familiar to anybody who’s started a campfire. Starting the fire requires something highly flammable - leaves, newspaper, and twigs. But paper and kindling won’t sustain a fire. As any frustrated camper knows, the fire quickly runs out of stuff to burn and then peters out. To keep a fire going, you need dense fuel like logs. Only with the combination of kindling and denser fuel can a fire be created and sustained. In the midst of trying circumstances, nurturing hope can be like starting a fire in the rain. But once a vision for a different world catches on, it can be nearly impossible to extinguish.”

In an analogous way, the possibilities for change are suppressed without hope. Without the dense fuel that hope provides, burning steady and bright to sustain long term commitment and action, the odds of building sustainable or regenerative human communities are greatly diminished. In a discussion focused on the challenges of implementing a “Green New Deal” in the United States, Alexandria Ocasio Cortez⁸ shared that she “learned that hope is not something you have. Hope is something that you create, with your actions. Hope is something that you have to manifest into the world, and once one person has hope, it can be contagious. Other people start acting in a way that has more hope (Brookes, 2019).” Following this logic, by fostering gratitude for the opportunity to participate in the overwhelming complexity and awe inspiring beauty that life on Earth represents, we can cultivate the necessary discerning visions of hope, fueled by relentless optimism in the possibilities that life offers every single day, in order to support and encourage humankind to foster more positive relationships and persevere in the struggle to better

⁸ When Alexandria Ocasio-Cortez met Greta Thunberg: ‘Hope is contagious’
<https://www.theguardian.com/environment/2019/jun/29/alexandria-ocasio-cortez-met-greta-thunberg-hope-contagious-climate>

understand our place on this planet, create and share new stories that help us to live in harmony with the natural laws that govern our existence.

Another way to help build Social and Human Capital and foster optimism can be achieved through play. Finding and creating healthy opportunities to have fun with members of your team, your neighbors and broader community members, through games or sports is an important part of developing strong ties, especially in a foreign context where newcomers are ignorant of social customs or expectations. Playing games together helps break down these social barriers and remind us that we share more in common than what separates us. Sports like soccer teach teamwork, humility, and help prevent chronic health conditions like obesity and heart disease. In a rural community with few sources of entertainment, healthy forms of play provide a crucial outlet for youth and adults alike that can reduce the likelihood of drug and alcohol abuse. In the case of Pueblo Arboles, the challenges that drug and alcohol abuse pose to the future of this community are severe and complex and is a repeating theme that will be explored in more depth in the chapters to follow.

"It is difficult to say what is impossible, for the dream of yesterday is the hope of today and the reality of tomorrow."

-Robert Hutchings Goddard

End of Chapter Two

9. RESULTS CHAPTER THREE SOCIAL MOVEMENTS IN ACTION

Chapter three focuses on the stories of three young entrepreneurs who have sought to transform their home community and manifest personal visions for the future by establishing innovative businesses based on identified opportunities available in their homes. This chapter primarily draws on in-depth interviews conducted with each participant as well as their partners, friends and selected family members. In so doing, chapter three addresses the remaining parts of the dissertation's first series of sub-questions: What do the visions that are catalyzing social change in these communities look like? What is cementing their desire to not only stay in their communities, but to transform them? Results presented in chapter three also help answer the dissertation's second set of sub-questions: How is this community implementing their vision? What strategies and techniques do they employ to live sustainably and provide for their families? What is driving the process and how do visions evolve through the implementation phase? Who is included and who is excluded within the social processes of community development?

During the first decade of Centro Sustentable's existence in Pueblo Arboles, the organization and surrounding community both underwent a rapid series of transformations. The influx of foreigners and guests at Centro Sustentable alongside the creation of the National Park instilled several of the local youth with new ideas as to how they could build successful enterprises in their community. In this rural agricultural community, these were opportunities that would have been unimaginable just a few years prior. But for some of the teens and young adults that grew up witnessing the large groups of tourists and students that were willing to traverse

hours of poorly maintained dirt roads (see image 9.1) in order to visit their small village and experience the jungle firsthand, their eyes were opened to entirely new ideas for how to generate incomes.

Image 9.1 Deforested Mountainous Region Surrounding Pueblo Arboles



Several of these youth went on to study ecotourism as well as English in University and leveraged individual relationships that they each built with foreign visitors in their community to launch successful businesses ranging from ecotourism and education, to aquaponic salad production and farm to bar artisan chocolate companies. Centro Sustentable grew substantially during this period as well and by 2010 had developed a robust volunteer program and

relationships with a growing number of groups that were bringing thousands of pairs of hands a year onto the farm to learn from and support the ongoing development of their educational programs and natural building projects. The growth in activity put the organization in the community spotlight as the economic powerhouse paving a new pathway forward in the community and supporting dozens of livelihoods through direct employment, purchasing of agricultural products and even provisioning of interest free loans.

The growth of Centro Sustentable's programs fueled divisions within the community as well. Several of the community members who did not directly benefit from the increased flow of resources into the community expressed resentment and frustration towards Matthew and Monica. Meanwhile, each of the community members who had direct experience with the organization largely held Matthew and Monica in high esteem, regardless of any criticisms they also held. Some of the most successful entrepreneurs in Pueblo Arboles were inspired by Centro Sustentable to launch both competing and complementary ecotourism based enterprises to tap into the growing interest from foreigners while utilizing their own skills, resources and passions to stand out.

In this chapter, we examine the stories of a few of these interconnected examples to explore the beginnings of what can be described as a social movement in action, or a form of what I describe as micro-scaling, has spontaneously occurred through the reinvestment of economic activity generated from ecotourism back into community based enterprises. The term micro-scaling is used to distinguish from commonly discussed forms of horizontal scaling, which describe the emergence of additional, but functionally equivalent nodes within a cluster. In the

case of Pueblo Arboles, however, the observed forms of horizontal scaling have been achieved with only a small fraction of the resources and financial capital invested into Centro Sustentable, and many of the emerging businesses seek to fill small and diversified niches ranging from local egg production to the creation of farm to bar artisan chocolate. In this way, the emerging nodes in this cluster are not identical copies of the first, but rather reflect a growing cluster of smaller nodes that have grown and continue to develop in unique fashions through interdependent relationships with Centro Sustentable.

9.1 Javier's Ecotours

The first of these case study highlights begins with Diego's son, Javier, one of Centro Sustentable's first employees, who we met in chapter one. For Javier, as for many people in the community, the influx of outsiders that began arriving to Pueblo Arboles after the opening of Centro Sustentable was an eye opening and life altering experience. The impact from the injection of new people, technologies and ideas was felt rapidly, although unequally throughout the community. Given Javier's family's intimate ties to the centro and his own status as one of the first full time employees, he has had some of the most extensive and prolonged access to visitors and courses hosted at the education center of any local community member.

Perhaps the most influential visitor in Javier's life was Bob McDaniel, from the University of Oregon. When Bob first began bringing groups of students to Costa Rica in 2002, he and Javier immediately hit it off. Considering they both were big fans of Flor de Cana (Nicaraguan Rum) and traditional latin dancing such as Salsa, Rumba and Merengue, it is no

surprise they quickly became good friends. By 2004 Javier was helping Bob organize tours not just in Pueblo Arboles, but to visit sites around the country. The opportunities awarded Javier with the chance to see parts of his own country and meet people from parts of the world that he had not previously imagined.

As Javier put it, “Bob opened the door for me. Because when Bob came, Bob would tell me, okay Javier, we are going to work this week.” Javier began pumping his fists as he explained how he would create the itinerary for each trip. “Okay, the group comes on Monday so on Monday we are working at the school in the afternoon and having dinner at the centro and that’s it!” “Pow Pow Pow!” He exclaimed after each item, highlighting the value and excitement it brought up for him in reflecting on these cherished memories. He continued, “I did the group itinerary. Tuesday, we are going to the National Park to do a tour because there is a very beautiful waterfall (see image 9.2). Pow Pow Pow!” He exclaimed again while pumping his fists, fingers pointed towards the sky. “Wednesday we planted trees... because the nature reserve here now is a forest that Bob and I planted... We created a forest nursery. Using my knowledge of a million trees we looked for the most beautiful mother trees here such as the Purple Heart, Cristóbal, the Mastate because it is the Symbol of Pueblo Arboles and Piene do Mono (Monkey Comb). We made various nurseries and when groups came we put them to work on the land, filling bags, we went to the forest and brought plants back, they were saplings and we planted them and then a year later another group came to do another project and so on, but when you see the biggest trees here at the centro, many of them are the trees that Bob and I planted... some Cocobolos that I planted are over eight meters tall now! Pow Pow Pow!” He exclaimed one last time.

Image 9.2. Stones Balanced Precariously Under the Waterfall, Pueblo Arboles Costa Rica



Javier's work with Bob inspired him to go to University and complete a one and a half year program in English and then to start his own business. Javier explained that "I got the idea that, oaky, I have the knowledge, I can do this on my own. So I made this sign, "Javier's Ecotours" and I put it on the centro. The team supported me and I started to work with some other groups, doing night walks, hikes to waterfalls, hot springs, the National Park, etc. And I mean, it went well, and now I want to take it more seriously and see what happens."

In a personally devastating turn of events, after five years of working with Bob, Javier found himself sidelined from the Ecotourism business in 2009 after a series of student complaints regarding inappropriate behavior and unwelcome sexual advances left Bob feeling that he could no longer trust Javier with his students. He was nearly fired from Centro Sustentable as a result of the same and other related incidents, but was ultimately let off with warnings along with the development of new policies regarding staff and visitor relations. Details regarding these accusations and organizational implications are more fully considered in chapter four. For now what is important to understand is that disciplinary action was only taken after repeated complaints regarding serious accusations of misconduct.

In response to a question regarding some of his favorite memories with Bob, Javier shared how much he had learned from his time with professor McDaniel. “He taught me a lot. I am from the country” Javier explained. “I mean, I never ate with a fork and spoon or with cutlery, so once in Monte Verde (Green Mountains) we went to have dinner at this luxurious restaurant and when I saw the cutlery I said “oh my god man”... I froze because I didn’t know what to do. And Bob, he showed me how to put the napkin in my lap and how the little spoon was for soup, the long one for dessert. He taught me a lot...” Javier repeated before continuing, “he gave me tourist books, animal books, plant books... He taught me everything to study so that when the groups came I was focused on what was going on. He instructed me in the ethics of tourism because I was very young, like 15 years old, and he taught me to have respect and confidence.” It is worth noting that it was perhaps an overabundance of youthful confidence

along with insufficient levels of respect in the company of excessive alcohol consumption that were key factors in Javier's eventual failure as a tour guide.

One of Javier's other cherished memories from his time guiding with Bob was regarding the celebrations that they would host before the students departed. Javier elaborated that "on the last night of each trip in Alajuela, near the airport, we arrived at the hotel, went to dinner and then went dancing. We always had a bottle of Flor de Cana (Rum) and I knew where Bob kept it. On one trip I asked "Bob, what are we going to do today?" "Yerno (Son-in-law), we are doing the same. We are going to dinner, to dance and to the Airport in the morning!" Bob's use of the word Yerno was especially significant for Javier, because it was a special way of communicating just how much Javier meant to Bob and that he thought of him like a son. Afterwards, Javier jubilantly recounted how "before dinner I went to Bob's room and I saw that he had a bottle of 18 year Flor de Cana. I took a drink and then saw on the other side that there was a bottle of 24 year! I took a pull and Hua!"

Javier started laughing as he continued describing the memory, "I had four drinks and then went to take a shower. When I returned I had another four drinks and finished the 24 year bottle! I had it all... And when Bob arrived, "Yerno! Where is my 24 year old bottle!?" And I said "I took it." Bob asked if it was good, "Very Good!" I told him. "No drink for me?" Bob asked looking sad and I pointed to the 14 year and 18 year still around but he laughed and said "no, no, no." After dinner Javier explained that he felt bad so he went to a liquor store and bought a small bottle of the 24 year old Flor de Cana and put it in a paper bag. Before going

dancing Javier handed over the package, saying “Bob! Check the bag!” “What do I have in my bag?” Bob responded cautiously as he was still upset that Javier had taken his 24 year old bottle. Javier described how “when he opened the bag, Bob exclaimed “Awwww, my love” while making kissy noises to the bottle. He hugged me and said “Thank you! You have to take a little bit because it is very good.” So...” Javier paused dramatically before finishing, “I took it and quickly drank the whole bottle!” Then he tossed his head back and burst out laughing as he enjoyed the private joke and fortunately missed the look of horror that I could not stop from passing briefly across my face.

I was unable to discuss this memory with Bob McDaniel, but it is not difficult to imagine the shock and hurt he likely felt in response to Javier’s cruel attempt at humor by stealing his own gift towards reconciliation. The story shared is pertinent to the current investigation not because it demonstrates a great deal of critical self reflection, but rather precisely the opposite. In Javier’s recounting he demonstrates a lack of self awareness and displayed evidence of rampant alcoholism that reflect a broader pattern of alcohol and drug abuse within the community that many continue struggling with today. In Javier’s case, his repeated infractions and pattern of abusive behavior led to a diminished role in ecotourism and a loss of opportunities for working with groups of students where he loves to share his invaluable knowledge regarding the forests, flora and fauna of Costa Rica.

Ten years after losing his job with Bob McDaniel, Javier is still working for Centro Sustentable as a skilled carpenter, utilizing talents that he continues to hone and develop annually

through continued training and mentorship offered from renowned natural builders from around the globe. He is now married and helping to raise four children, three of which he adopted from his wife's previous marriage. As of 2019 he had been mostly sober for nearly four years and at time of writing is now planning to see how he can restart his ecotourism business and regain the trust of local partners that host visitors and educational groups. The fact that Javier has stopped drinking is an encouraging sign, yet as will become clear in chapter four, his continued unwillingness to admit wrong doings or reflect on the harm or pain caused by some of his actions does not bode well for his future prospects in the ecotourism industry.

Bridges often built so naturally they go unnoticed can be incinerated explosively or silently dissolve into nothingness if the underlying relationships that are the pillars of social collaboration are left untended. Once lost the trust that allows groups to collaborate efficiently can be much more challenging to reconstruct than could be assumed. Forgiveness, often a major barrier in its own right, is only one step in this process (Atkins et al. 2019). By all accounts Bob quickly forgave Javier for his transgressions and they stayed close friends even after severing their work partnership. Javier was never able to regain Bob's trust however and in 2012, three years later, Bob McDaniel died suddenly after a long lasting yet discrete battle with cancer. Javier explained that when Bob died, "It was a very hard blow for me, because Bob was more than a friend to me, he was like my family. I mean, I was very fond of him. He was an excellent person with me, with my family and he treated us as a family. He had a love for my dad, for my mom and for me. Before he arrived to Costa Rica each time he sent me an email which said, "Yerno, I'm coming to Costa Rica, get ready because we're going to travel!"

Javier and Bob may no longer be traveling, but that is not to say that the programs they spent over a decade building have disappeared. In 2009 when Bob realized he could no longer trust Javier as a local guide he knew that he needed to find an alternative local partner to help coordinate the trips. Fortunately for him, he didn't have to look very far to find exactly the people he needed. When groups started arriving in Pueblo Arboles in 2002 and youth like Javier and his brother Antonio began working for Centro Sustentable, their peers took notice. In particular, as a rural community on the verge of extinction due to outward migration, their fellow youth were keenly aware of the potential for earning ingresos (income) from the influx of foreigners and tourists that could allow them to stay in their familial homes rather than move to the city in search of work.

9.2 Pura Verde with Juan:

One such local youth who was inspired by Centro Sustentable was Juan Gonzalez. He saw the rise of ecotourism as an opportunity to help his family hold onto their land without relying on the same commodity based agricultural markets that had left his own parents impoverished and at risk of losing the farm due to financial strain. A combination of alcoholism fueled spending and widespread predatory-lending practices have trapped many low income families in this region into tragic cycles of debt. As will be illustrated in the case below, these types of situations often lead to foreclosures and forced sell-offs of familial homesteads that typically result in land grab like scenarios fueled by foreign investment and intense pressure to expand commodity production for goods such as palm oil, pineapples and papaya. A similar scenario has played out in both the United States (Caplan, 2014) and in many Central American

countries (Butcher & Galbraith, 2015), where lenders use flashy marketing and adjustable interest rate loans to trick low income families into believing that modern appliances are both necessary and affordable while ultimately forcing clients to often pay several times the standard rate for products such as cellphones that have become increasingly necessary in rural and urban communities alike for both business and entertainment (Cervello-Royo & Gibes-Giner, 2014).

Juan's uncle fell prey to this very combination of factors and was forced to put his nearly 40 acres of pristine farmland up for sale at a fraction of its value or risk losing everything to the bank upon foreclosure. Desperate for help, the Gonzalez family reached out to Matthew and Monica to see if they knew of a potential buyer that was at least interested in conservation and who would prevent either a large resort, more cattle or a palm oil plantation from moving in, further degrading the landscape and overrunning the community with extractive operations (see image 9.3). For Juan, it was a heart wrenching decision. In 2005 he began pursuing his own dream of becoming a naturalist guide and Spanish teacher for visitors in order to eventually start his own ecolodge and education center, but he was still early in his journey and at this point he was only just beginning his degree in tourism and starting to study English.

Image 9.3. Cattle Ranging on Deforested Land, Costa Rica



In 2019 Juan was reflecting on the fact that one of the issues he continues to struggle with is the knowledge that once land currently owned by locals is sold to foreigners, “they are lands that are not likely to ever return to the hands of locals. It is difficult to say, but being from the community I see that they will never be able to be bought by a Tico (Costa Rican) again... It’s a little ironic because I called Matthew and said “Matthew, my uncle is selling his farm, do you know someone who is interested in buying it?” In elaborating on his decision Juan explained that “the good thing about this is that the Centro Sustentable people or the owners have a conservation mentality and are using those lands for conservation. I mean, they are forests. Personally, if I see it from the point of view of my work, it is excellent, because there will be more birds, there will be more animals. I am a tourist guide, so there will be more biodiversity to show people. But they are also lands that will no longer be able to be owned by locals.”

I asked Juan if he thought that at the time there was anyone in town who could have purchased his uncle's farm and he explained that "Right now, I am kind of disappointed with myself because I could have made an appointment with the bank and they could have given me a 30 or 40 year loan and maybe in those 30 years I could make the money to pay back the loan, but like most people, sometimes I get scared to make investments like this, you know? So I am kind of disappointed with myself because it was a very good piece of land and I really, really like this place because the owner was part of the family, but at the time I just couldn't." Ultimately, Matthew and Monica were able to help identify conservationists who were able to raise sufficient funds to buy the property. As a further buffer against adverse social consequences as a result of the sale, the new owners have so far remained committed to preserving the land for not only conservation but also local use and have dedicated the property's three existing homes to providing affordable housing for local community members in need.

In a similar case that further helps illustrate the types of predatory lending practices that often entrap local residents and perpetuate cycles of debt and poverty, Javier's brother Antonio ended up over \$3,000 USD in debt after two cellphones he had purchased on multi-year installment plans broke before either was paid off. The resulting compounded payments and scaling interest rates sent him into a skyrocketing debt cycle that left him owing more each month than he had the one before. Once again, Matthew and Monica played a key role in helping create a solution by providing an interest free loan to pay off Antonio's debts. Unlike earlier loans however, in this case they learned an important lesson and decided to draw up their first

formal contract before distributing funds, requiring that Antontio agree to avoid taking any additional loans until his debts to Centro Sustentable had been paid off in full. These forms of supportive contracts represent what Orzi (2017) describes as ‘social currency’ that is crucial to the development of alternative, more circular economies, or in Orzi’s (2017) words, a ‘Social and Solidarity Economy,’ which seeks to address the intergenerational needs that have been legitimized by a community.

In 2019, Antontio was finally nearing completion of repaying his loan, nearly 3 years after Matthew and Monica paid off his other debts. It is hard to say what Antonio’s financial situation would be like currently if not for the financial support Matthew and Monica provided at a crucial moment. In a similar fashion, it is equally difficult to imagine Pueblo Arboles accomplishing the improvements that have been made without many of the steady and reliable forms of support that Centro Sustentable has provided over the past 20 years. This point illustrates an important observation regarding the potential for transformative change to occur within small groups and communities. Small communities such as Pueblo Arboles, appear to be quite sensitive to asymmetrical social conditions. In this case study, the reflections of community members and organizational partners alike reflect how the introduction of just one foreign organization has in many ways catalyzed the transformation of the local economy between 2001 and 2019. Within a large city such as San Jose, Costa Rica’s capital, which is home to more than three hundred thousand people, the impact of a single organization such as Centro Sustentable would likely be difficult to notice. The sensitivity of small groups and communities to outside influences underscores both the potential for experimentation and learning at small scales that

can guide the implementation of broader societal changes, as well as illustrating the need for caution and processes for promoting empathetic inquiry in order to avoid negative unintended consequences.

For Juan Gonzalez, even though he was unable to purchase his uncle's farm to keep it in the family, he was determined to not allow the same thing to happen to his own parent's land. Fortunately, Juan explained that the most valuable resource they had was not owned by any single person but was rather protected for everyone. To Juan, the most important event that helped inspire the changes happening in the community was the creation of the National Park. "Because before that, the mountain was just a mountain and everything there was stagnant. There was, like, there was no one from that mountain that talked about conservation, about protecting the forest, and when the park came they began hosting talks for the community, conversations in schools, and park rangers would have meetings with local groups, development associations and water aqueducts, etc. Then people began to have a different idea of what conservation is, and what is protection. I think that the park was initially what changed, it gave a full spin and came to help the minds of many people in this regard."

As a guide, Juan began by offering private guided hikes in the National Park. His trips included birdwatching in the early morning, adventures to hidden waterfalls in the jungle and nocturnal walks to explore some of the many ways the jungle bursts into action under the cover of darkness (see image 9.4). I had the opportunity to join Juan on several of his guided night walks over the course of my time in Pueblo Arboles and I still find it difficult to express what

profound effect the experiences have had on me. There is an incredible diversity and terrifying beauty to many of the creatures that feel less comfortable being exposed during daylight hours. A tropical rainforest at night is a crescendo of millions of insects, amphibians and other creatures singing in harmony, competing to be heard, yet not seen, all at the same time. This cacophony takes place in a frantic search for food, a mate, or both using the precious camouflage and cool temperatures in the few hours that true darkness provides. The sound can be almost deafening, yet somehow after a few weeks fades so much into the background that when it finally disappears, its absence can feel crushing, like leaving a part of yourself behind when you go.

In describing his role in the community, Juan explained that “I want to be, I don’t know, to be an instrument of education and for good, more than anything education to people, new generations who are trying to make a positive change and I get very involved with that, with trying to help people learn good practices for the environment.” With that inspiration in mind, in 2005 Juan set out to create a business, Pura Verde, that could do just that and help support his community through sustainable enterprise while sharing his passion for nature and knowledge of the local plants and wildlife with visitors from around the world. By 2009, when Bob McDaniel severed business ties with Javier, Juan Gonzalez was in an ideal position to fill the gap Javier left behind and help ensure the programs Bob developed could continue uninterrupted.

Image 9.4. Armadillos Blindly Rummaging in the Darkness



In fact, in 2011, a year before Bob passed away he asked one of his graduate students at the time, Josh Hooper, to work with Juan and help continue the programs while he underwent chemotherapy. When Bob passed away in 2012, Josh and Juan decided to continue collaborating in order to carry the programs forward and eight years later they continue to host university student groups from the University of Oregon. In recent years they have even expanded the programs to California State University campuses through a grant provided by the National Science Foundation to provide opportunities for minority students and first generation college graduates to receive hands-on and immersive training in STEM fields as an inspirational springboard program to prep students for graduate level research and training.

Around the same time that Bob McDaniel began working with Juan Gonzalez to help organize and lead his student groups in early 2009, the love of his life had recently moved back to Pueblo Arboles after finishing her University degree. Lilian Garcia, or Lily for short, grew up in the nearby village of San Martin. In San Martin there was no secondary school so as a student Lily began catching the single public bus each day that left San Martin at 5:30 am in order to travel to Pueblo Arboles and attend school, where she and Juan first met. Arriving at 6:00 am, she would need to wait until 7:00 am for school to begin and afterwards, when school was released at 2:00 pm, she would have to wait until 5:00 pm to catch the bus home. With the extra hours in town Lily slowly spent more and more time with her older cousin Brenda, who at the time was working as a cook at Centro Sustentable while raising her son, Leon, on her own.

Lily explained that at the time, “I didn’t have much confidence, so I started visiting her and I liked her very much. We got along very well and one day she told me, “Lily, there is space here if you want. It is only Leon and me.” She was just there alone and that was when Leon was still tiny.” After a while Lily began staying 3-4 days a week and it slowly felt more and more like home. When Lily finished high school in 2005 she decided to move to Pueblo Arboles and stay with Brenda and Leon full time. Lily was able to find work at Centro Sustentable as a cleaner and spent the next two years working, helping to raise her little cousin Leon and saving money to study at university. During this time Lily and Juan began dating. Neither Lily nor Juan provided many details regarding how their relationship began but what Lily made clear during our conversation is that before she was willing to consider marriage or starting a family, she knew

that she needed to finish her education first. “I finished high school and I went away to study at university. I gave myself time to think” she explained.

In the second half of 2008 Lily moved back to Pueblo Arboles in order to complete the Thesis for her degree in Tourism and completed a 4 month internship in business administration at Centro Sustentable as part of her degree requirements. After finishing her degree at the end of 2008 Lily didn't know what she was going to do. “I wanted to stay in Pueblo Arboles. Figuring out how was my concern and I didn't know what I was going to do after my internship ended.” Monica Torres however, had just had her first child, a healthy and rambunctious daughter who they named Isabela. While Monica was recovering after childbirth she was desperate for additional help in the office and so they offered Lily a full time position as an administrative assistant. When Lily received the job offer, she said “that was like “ooof” what a relief! Then I went back to live with Brenda and stayed there for a few years.”

In reflecting on the impact of Centro Sustentable on the community of Pueblo Arboles, Lily shared that before the centro opened its doors, it would not have been possible for women like her cousin Brenda to be independent and raise children on their own. “Before, most people had their jobs in the field” she explained before continuing, “before there were no options for a woman to earn an income, there was nothing before the centro. Women were in their homes maybe helping the husband, but after 2000 and the centro arrived and said okay, we need women in the kitchen and help with cleaning. Then with the first women working, how good that was!” Lily explained that although there was not enough work at Centro Sustentable for everyone,

quickly other organizations started emerging who were able to hire women for cooking and cleaning work and others started their own businesses, such as selling eggs and cheese locally to the new ecolodges. Lily explained that today “there are more women working in the tourist places than men... and it is great. That makes me really happy!” As a result of being able to earn their own wages, Lily explained that “women feel more independent. Obviously, I earn my own money so I feel independent. It is no longer just my husband or even single moms... Women are like “I am earning my money because I have my child and I don’t need to depend on the father or my family.”

Lily was clearly excited about the topic and paused to catch her breath before sharing an example, “like Brenda, she went to school with her own salary and now she feels proud and accomplished. Many times there are good women doing what they want so they can prove they can be independent.” Ecotourism, Lily explained, “has been very good because we have all been able to have an opportunity to feel part of the projects. For example some groups come and do home stays and I wish that all groups could do that. I would like that so much because there are people who need income but who do not have time to work and who have young children. If they could do home stays it is easy and they have everything to give that tourist a cultural exchange in something so simple as to stay for a couple of nights and that person leaves with such happiness, like “I know that I really supported that town.” Lily finished by emphasizing that “It is a really special opportunity.”

After starting her new role at Centro Sustentable in early 2009, Lily spent the next few years working full time as Monica's assistant and helped in nearly every aspect of the business. She explained that she learned English by practicing with guests, "when I left school my English was very bad, but when guests started to arrive and I saw people and wanted to meet people, and talk, after that I began little by little. Sometimes I made exchanges with people and there was a very nice lady who helped me a lot with grammar and pronunciation." As Lily increased her confidence with English and mastered her new role, in many ways she served as a form of liaison between Centro Sustentable and the broader community, helping pass on messages to Monica and Matthew and share insights with regards to how they could resolve individual disputes or areas of tension with particular community members or families. In Lily's words, "at that time I was the intermediate person, so workers would come to me with all of their complaints and then I would talk to Matthew and Monica."

In reflecting on the relationships between the community and Centro Sustentable, Lily highlighted how "the treatment they gave me was very kind and I will always say so. I will never in life have bosses like Monica and Matthew. I have had other work experiences and I have never encountered people that treated me as an equal and they always treated me like I was the same. So I think that was what helped. They were not a couple of foreigners who arrived with a lot of money and acted like owners of the town as in other cases around the country. Upon arriving, as foreigners they stayed on the same level as the gente (people) of Pueblo Arboles. That made people feel calm, feel supported and that relationship has been maintained.

At the beginning, maybe there was more connection because as soon as you help people get used to it, “ah, we are in need of something, we go to Matthew...” It is true that people fell into a habit. It came to a point where it was fine once, twice, but now coming all the time you have to stop. So many people walked away and stopped coming because it’s not the same anymore... But that’s fine. I can help and it helps myself if it helps the community but many times people take advantage of that and you have to put the line between helping the ones who really need it and stopping the ones who are taking advantage of me or the ones who would come and...” Lily hesitated before finishing “sell things. I bought the beans for the centro, bought the rice, bought this.” Lily followed this by asking rhetorically, “But what happened? What happened is I was being used and they were giving me very expensive prices. Why? Because I was working for a foreigner! So many times I had to say “no sir, we are not going to buy more from you. We are going to find another place.” Others I would tell “Mister, look, I am going to buy from you but, honestly the last one I bought was expensive” and I would just put the cards on the table so that people would not take advantage of me, because many times people are good but many times people take advantage and especially take advantage of gringos (foreigners).”

Lily continued that although there were occasional issues, “in general the relationship has been well maintained. That is, people support the centro. I mean, I’ve never seen anyone do anything with more examples of freedom than has the centro. [Centro Sustentable] has no locked doors, everything is open, everything is there and it is not just one house. There are a lot of people that come in and out. People with cash, with computers and cameras. Maybe about three or four cases have happened in 15 or 20 years and it has mainly been people not from here,

maybe from other towns. What better example is there than that? I say the same to Juan, “Juan, I know that this boy and this boy are drug addicts, but I prefer, how they say, to have the enemy as a friend rather than as an enemy.” Maybe that is what happened with [Centro Sustentable], that they have never had enemies. They have never had them. Maybe there are people who keep more distance and are not so close to them. There are people who have their space and think “I do not need anything from the centro and the centro does not need anything from me, but they have not done anything wrong to me nor do I have to do anything bad towards them.” Then we have that tranquility. And it is beautiful because for that reason Centro Sustentable has a good reputation even today despite small situations that have happened yet you can assume that it is still a town of peace and quiet.”

Lily’s intimate experience with the inner workings of the business and reflections on the organization’s relationship with the broader community provide important insights into some of the factors that have played key roles in their continued success as both a community member and partner that effectively supports regenerative local development. The safety of facilities and lack of theft over the years is a huge testament to the positive community will that has been built up over the years. Lily’s reflection that it is better to “have an enemy as a friend rather than as an enemy” is particularly interesting and relevant to the organization’s own approach, which was intentionally to try and minimize conflict with community members as much as possible, with few exceptions. The soft touch provided by the centro helped build trust early on but also led to being taken advantage of and enabled some members to be overly dependent on their help. It wasn’t until Centro Sustentable received the administrative support of a local like Lily to help

guide decision making in a way that was more culturally sensitive that they were able to address some of these issues. Further, Lily also appears to have functioned as a form of moderator or go-between that could represent workers and communicate feedback and concerns to the owners.

To better understand how Centro Sustentable has dealt with the issues that have arisen over the years, I asked Lily if she had ever had any issues with other employees there. She replied “Javier yes, a lot of times. Javier, I don't even know why he is still there...” She trailed off before continuing that “there was a time when Monica and Matthew said, “maybe we are to blame because we gave him the pass.” It was possibly confusing for the workers at the beginning. Because Javier had a lot of issues with girls. A few ones that I remember, for example, there was a group here and they came to the bar to go drinking. Then later, when they had already left to go to their rooms, Javier thought that the party wasn't complete. So he was trying with a girl in that place. And that happened once or twice.” “Without an invitation? He went to her house?” I asked to clarify. “Yes, but he was younger. He had no family, he was young and often people, there were so many locals dating with people from Centro Sustentable... There were many situations that, if the other person wanted that then it's okay, so we were not going to stop that (see image 9.5), but already to go over the line of respect and go to the house where that person is staying and want to harass that person... I don't know what he was trying to do but once Matthew had to go and tell Javier to get out of there... Because they got drunk so often. And Antonio was the same. Getting drunk so much then not going to work the next day because he's asleep. Surely they have been here for years, but the last time it was like “if you do it again

you're out." And I was working there at the time and Javier was told "if this happens again, let this happen again and you have to leave the centro."

Image 9.5. Jungle Mates, Pueblo Arboles Costa Rica



The last time one of these incidents occurred, Lily explained, "was with a group that Juan had and they never came back again. I don't know if it was for that, Javier went to a girl's room, to the classroom I think it was, but it was again with another drunkenness. But if that was the last time it was maybe 7 years ago. And then Javier met Deborah, which was a little more serious

so he doesn't drink that much anymore, but if these madmen get drunk..." Lily trailed off before clarifying, "But as I said their confusion maybe was at the beginning. They did all that and it seemed like it was part of the party. So they thought maybe they had the freedom to go like "this is my boss's property, I don't care." Do you understand me? Maybe that was the reason why Matthew and Monica considered keeping them. Like, we know they are good guys. And today they still remain..."

With that summary, Lily then contrasted Javier's case with a former employee who worked for the centro in the very early years. "He was very disrespectful with the girls and he didn't change. They spoke with him many times and he did not change and then he was taken out." In this regard the organization had established that they were willing to terminate an employee for misconduct under some circumstances, but clarity regarding expectations of behavior and which actions were forbidden/punishable was a long time forthcoming. This delay may have contributed to the number and frequency of issues relating to sexual misconduct that have occurred here over the years.

Given the issues with Javier and the party atmosphere that several respondents described in the earlier years of the centro's history I was curious how Lily remembered Bob McDaniel. "He was super nice!" She began. "Bob was at that time the life of the party and he loved to be there dancing with people, but obviously he also had his lines of respect. He kept the spirit cheerful but he had his line of respect with the community people. He kept his focus on the group, what they had to do for their studies, their data, but he was quite liberal! I met him many

years ago when he arrived at the centro and I was cleaning. And he told me, “I want you to work for me in the future.” Then he only had Juan. He had thought of Javier to become a guide because he had been traveling with him a lot, but the problem was that he did not see the seriousness in Javier, so he didn’t trust him to take their groups. Which is unfortunate because if not Javier would be a guide now, but because of those problems of drinking and no control that is probably while Bob decided to take Juan instead... But those are the things that one does by mistake. Because Javier really wants to be a guide but that’s why you have to be careful what you do because the things you do in the past can affect you in the future.” It was not until after Bob died that Lily returned to Pueblo Arboles with her degree in Tourism, but once she returned it was not long before she began working with Bob’s former student Josh Hooper and her partner Juan to support and continue building the programs Bob McDaniel had began more than a decade before, and which had been bringing two to three groups of students to Pueblo Arboles every year since.

Lily’s critical analysis and insightful reflections help demonstrate she is an intelligent and thoughtful individual with high levels of self awareness. Even so, Lily was herself not immune to the impulses of desire that can sometimes overwhelm our thoughts of future selves or possible consequences and lead even people who strive to live by strict moral codes to engage in behavior that would otherwise seem unthinkable. In 2012 it became public that Lily had been having an extended affair with a volunteer at Centro Sustentable. When Juan found out he flew into a rage. Lily did not want to discuss the aftermath, but Monica was willing to summarize the experience. “It was horrible. It caused years of damage with Juan and me... He screamed at me and said

things like “you think you are the king of town!” Like, all this stuff...” Under pressure from Juan and his family, Monica and Matthew felt like they had to ask the volunteer to leave or risk permanently jeopardizing their relationships with Juan and the Gonzalez family. In the aftermath Lily also quit her job at Centro Sustentable in order to preserve her relationship with Juan and eventually moved in with him. Despite the pain everyone experienced in the immediate aftermath of the affair it seems that the transparency in the way it was handled may have prevented outcomes from being more destructive. Today, Lily and Juan are married, work full time running an ecolodge and guiding company, Pura Verde, that they built and manage on their families’ property in Pueblo Arboles. As of 2020 they are busy raising their first child, a one year old daughter who is healthy and bursting with joyful energy.

When I asked Juan about the experience he was vague in his response and clearly did not want to discuss specifics, but he did explain that “it was a personal thing with a volunteer and eventually that person left. So it was temporary, of little time.” When I asked how he thought Monica and Matthew handled the situation he explained that “I feel that they took it as it was not their problem because it was not directly with them, it was something with an external person who was with them... it wasn’t something personal directly with them... so it was not something that affected my perception of their character.” Lily avoided the topic but at one point during our interview while she was reflecting on her experience working at Centro Sustentable, she shared one thought that sheds at least some insight into her thoughts on the issue. When reflecting on the actions of Javier and Antonio, she admitted that “I don’t know, but I feel I have not been a

person who always respected the centro's opinions or decisions. I never felt that I did something wrong, but I do not know."

In the context of her history with the organization, this reflection indicates that there was likely a level of miscommunication between Lily and Juan that could have facilitated the pain and disappointment which occurred. Perhaps before that point Lily had never felt that her relationship with Juan had been exclusive. It is possible that Juan made an assumption about the expectations for their relationship without really discussing the matter with Lily. Incidents of sexual misconduct and infidelity are tragically common and the community of Pueblo Arboles is no exception. For example, it is estimated that 35% of women globally have experienced some form of either physical and/or sexual violence (WHO, 2013). In all cases observed in Pueblo Arboles, however, the presence or lack of open and honest communication between the involved parties or easy access to a neutral third party for support is what separated incidents that the community and/or individual relationships recovered from and ended up stronger for, and the ones that festered and instead led towards feelings of resentment and injustice. In the case of Lily and Juan at least, there was an opportunity for transgressions to come to light and for the involved parties to resolve the dispute. With time and patience those wounds have largely healed, allowing the groups involved to continue collaborating as effective partners and teams.

9.3 Finca Chocolate:

The final example of micro-scaling covered in this chapter focuses on the work of one family that successfully transformed a failing cacao farm into one of the most successful businesses in Pueblo Arboles by transitioning their business out of commodity production and into agrotourism and value added creations by utilizing sustainable, low input practices and locally available resources. This transformation was spearheaded by Carlos Diaz, who grew up in Pueblo Arboles, and his wife, Kathy Diaz, who was born and raised in the United Kingdom and first visited Costa Rica in 2011. Despite growing up in near opposite ends of the world both literally and figuratively, their partnership has catalyzed the transformation of Carlos's family cacao farm into a gourmet tree to bar chocolate operation that stands out for both the exceptional quality of their product (as demonstrated by the several national awards they have won) and their use of low input and regenerative agricultural practices that have further reduced overhead costs, allowing them to provide a gourmet product at affordable and competitive prices. In addition, as of writing, the business has maintained complete local ownership and management of distribution so that 100% of proceeds go directly to the agricultural producers, an unimaginable accomplishment by the standards of most farmers. The section below will explore what factors led to the success of Finca Chocolate and then close by examining across the three cases highlighted in this chapter to consider implications for supporting and improving the success of additional local enterprises in Pueblo Arboles and beyond.

Carlos Diaz was born in 1989, the youngest of five children, and was part of the last generation of youth in Pueblo Arboles to experience a taste of what rural farm life was like here

before the rapid transformations began that have characterized development across rural Costa Rica since the 1990's. Between 1990 and 2000 alone, the national government invested in the construction of over 30 hydroelectric power plants that greatly expanded access to electricity and which has provided the backbone of Costa Rica's robust renewable energy supply (Anderson et al. 2006). The speed in which the introduction of technology and increased access to the outside world has taken place in this community is staggering. Along with the anticipated benefits of these changes a plethora of unexpected challenges have also emerged, not least of which has been the introduction of predatory lending practices discussed above in examples from both Juan Gonzalez's family and Javier's brother Antonio. The interviews I conducted with Carlos and Kathy Diaz provide an excellent glimpse into both the scale and speed at which this transformation has taken place. In Carlos's own words:

“As I said, until I was six years old there was no electricity here. All our light was from candles and at five in the afternoon I was looking for firewood to cook. By six I had already eaten and when you saw the moon rise it was time to go to sleep. It was very quiet. I lived more in nature, not that I don't live in nature now but when I see my nephew watching television or on the tablet the way we went to the field to climb a tree or to get mangoes and things like that, we were always going to bother birds, we made traps and things to fish in the river and when I was bigger I began helping the family. From a young age they took you to help in small moments.”

In considering the social implications for a community to go from having no electricity, cars or roads, to having widespread use of cellphones, televisions and personal automobiles in less than 25 years, it is difficult to comprehend. Kathy shared a famous family story from Carlos's childhood that helps illustrate the point. In the late 1990's after Pueblo Arboles had first gotten electricity, Carlos was in the center of town playing with one of the strange new power

outlets and struggling to figure out its purpose. While Carlos was fiddling around, Kathy explained that “a guy in the street shouted across and said, “put the metal thing in the hole!” He was telling him to plug in an electric domestic item, which of course they didn’t own because they hadn’t had electricity. So Jorge picked up a nail and put it in there and then ran running home to his mom screaming “I’ve just been stung by a scorpion!” As Kathy finished she burst out laughing, savoring the image of her partner mistaking the electric shock familiar to most children in western cultures with the far more common scorpion sting that Carlos knew and understood.

Carlos continued that in the past if farmers had a good harvest “then people came to us with big trucks. They bought the pigs, the cows, the bananas and yuccas, whatever the farmer had to sell and they took it to a large market like in San Jose. Now there is more local exchange, people are starting to buy more local. Let’s say for example, this guy Miguel who rides the motorcycle, I have always said he is one of the most important people here for distribution of local products because he cannot carry much quantity but he fills the motorcycle and after 10 kilometers he has already sold everything.” Miguel, the man Carlos mentioned, is another local entrepreneur who started a local food distribution business that he operates entirely on his motorcycle. Using an expansive relationship with families throughout the area, he zig zags his way through the community each day buying and selling local produce, helping to improve food security and fill the gaps so that families have to make fewer trips to the nearest large town and supermarket, a three hour one way journey by bus. The way the local economy currently works, Carlos elaborated, is that “we keep more money circulating within the town. Let’s say we go and

buy sugar from San Martin and to Centro Sustentable for ferments and for chocolate to Finca Chocolate and then we can go to buy eggs from one neighbor and cheese from the other neighbor ... I think there is more flow locally now and maybe a little more wealth because there are more motorcycles and more people with more expensive things but there is also a circular economy within the region so wealth is definitely growing (see image 9.6).”

Image 9.6. Tico Repairing Motorcycle Beside Road, near Pueblo Arboles Costa Rica



The increasing economic opportunity and rising incomes has certainly helped some families raise themselves out of poverty and secure improved livelihoods for themselves and their children. With the rise of these advances however, new disparities and divisions are also emerging. As Kathy put it, “I mean genuinely the difference between Carlos and his parents is

more like me and my grandparents or even me and my great grandparents in terms of outlook, education, access to the world, other ideas and opportunities. I mean it is that huge of a generational and cultural gap... So my grandmother, who's 85, she learned to drive when she was in her early twenties and everybody was like, "Oh my God, a woman driving! I can't believe there's a woman driving!" Well, that's what Carlos's sister is going through right now. It's sort of where his sister and other women driving in town, it's like "Oh my God, you're so brave! You are so incredible!" Kathy explained that the gaps have made it very challenging to develop strong friendships with many of the other women in the community, "even with [Carlos's sister] relating to each other, it's so difficult. We're basically the same age but there's such a void between our life experiences."

Despite those challenges, when I asked Kathy what it was that kept her coming back in the early years she made it clear that:

"Carlos really wasn't the first attraction, definitely not. That was a slow one. When I was here I loved... I mean obviously the nature. It is stunning and beautiful. And the outdoors and doing physical activity and learning new things, the whole time being a useless gringo. All of that was great, but I loved the community, the Pueblo Arboles community, the fact that they all knew each other and that they would drop everything to go and help each other. The family, I mean, his family are nuts, but lovely. And I think I just thought all of it was wonderful, but it was also a time when I didn't have any responsibilities. I'd relatively recently graduated and wasn't quite sure what I was doing next, so it was just this sort of transition period of trying to figure out what comes next. Yeah, so for multiple reasons, it was, I don't know how to describe it, but sort of these magical puzzle pieces coming together and I remember every time I would come back to that feeling of like, "Oh I feel so good to be sitting here in this warmth and hearing the cicadas and the crickets at night and having a campfire and, and taking time to do all those things that you don't do enough of back home." Which of course I don't do enough of anymore now that I live here all the time."

When Kathy first arrived at Pueblo Arboles in April 2011, before she was too busy to enjoy all the things that first made her fall in love with Costa Rica, she was supposed to complete a three month internship in natural building at Centro Sustentable. Fate, Kathy explained, had other plans. “I had finished another volunteering project building earth ships in the mountains of Costa Rica about a week and a half earlier than planned and two of the people that were volunteering on that project were coming to a chocolate farm that turned out to be in Pueblo Arboles as well. Having looked at the map I realized what a non-existent place Pueblo Arboles was, because at that point, it was not on the map. You could not even find it on Google. So the coincidence of this!” Kathy exclaimed while laughing before continuing, “I had not received confirmation from Centro Sustentable that I was definitely accepted and so basically I phoned up Carlos the day before saying, “can I come volunteer on your chocolate farm?” “Yeah, sure, take this bus” he said and then hung up. “That was pretty much it” Kathy summarized. “So I arrived on the bus after sitting on a sack of chicken feed thinking “Oh Jesus Christ, where am I going?” But laughing most of the way here. Yeah, so I went to volunteer on a chocolate farm for the week and a half or two weeks before my program at Centro Sustentable was meant to begin.”

While Kathy was volunteering at Finca Chocolate she received confirmation from Matthew that she could come for the internship, but by that point, Kathy told me she had already heard from Emily, who was Finca Chocolate’s volunteer coordinator at the time, that “Centro Sustentable was not currently doing any building projects. They were only doing stuff in their garden, and so in the end...” Kathy hesitated before elaborating:

“I decided to stay with a Tico family and try to learn more than really basic Spanish and ended up learning a load of stuff about tropical plants, which was nothing related to what I was trying to do, trying to learn, trying to work in... I studied architecture and I was halfway through my degree. So I'd done my first part of my degree and I decided I wanted to get some hands on skills. So that was my goal for being here... But instead I spent the full three months at Finca Chocolate in what was probably the penultimate year of party town Pueblo Arboles...”

This is a time period in the community's history that we will explore in chapter four. What is clear for Kathy personally, is that her decision to spend this period at Finca Chocolate completely changed the course of her life and ultimately led her to abandon her budding career in architecture in favor of moving to rural Costa Rica, becoming part of una familia de Ticos (a Costa Rican family) and co-managing a family owned tree to bar chocolate company. While working side by side under the thick canopy of Carlos's diversified cacao orchard and harvesting ripe cacao fruit together (see image 9.7), I asked Carlos what his original inspiration was for transforming the family business. In between calculated swings of his machete, he shared:

“It had really been a childhood dream to make it come true because we always worked with cacao but we never had chocolates to eat as they were selling all of the cacao. They brought some chocolate balls once but we ate them very quickly. More than anything I think that I was highly motivated to pursue an education because after [high school] I spent six years for a degree in Sustainable Tourism and then with distance learning I went to San Jose to study Tourism Management. Then I got the idea of this career where I could start my own entrepreneurial project... I was already here when volunteers began coming to town, the park was here and that gave me a link. And well, I believe my inspiration was not from one place but grew little by little. It was a natural evolution just like the town.”

Image 9.7. Harvesting Cacao, Pueblo Arboles Costa Rica



The first step, Carlos explained, was starting the volunteer program, which was a challenge at first since most of the volunteers spoke little Spanish. In the mid 2000's, a man named Billy, also from the United Kingdom, became the first volunteer at Finca Chocolate after he was kicked out of Centro Sustentable over an internal dispute. Billy was a friend of Carlos's father and Kathy explained that the Diaz family "adopts stray people. So Billy got adopted into Finca Chocolate and... I have not met this man and I'm not sure I would get on enormously well with him. However, he obviously was somebody with a lot of ideas, but he was known for saying "I'm the one with the ideas, you're the ones that do the work." So between him, Andrea (Carlos's

elder sister) and Carlos they were talking about how they should start a volunteer program because obviously at that stage Centro Sustentable, they were a couple of years in and volunteers were starting to come.”

Kathy elaborated that at first:

“The family was economically really struggling. And so between them, Billy helped build a lot of random stuff. First off, the tree house was built by him in order to house volunteers... but I mean at the beginning there were people camping, sleeping in hammocks like right in front of the house. I mean, just the hippiest of the hippies, some guy that was literally tattooed over every part of his body... It was probably somewhat chaotic and random and definitely incredibly eye opening, particularly for Carlos’s mom... she had never left this community. She was born here and she has never left so yeah, that was pretty eye opening. I don’t think anything surprises her now.”

Having heard these stories many times, Kathy was perhaps in a good position to summarize the events. Carlos on the other hand, described few of the challenges associated with starting the volunteer program:

“Then it was very difficult for me to communicate with people when they came to volunteer unless they spoke Spanish. So I was doing it for a while and then we left Emily as the person in charge and she managed it until Kathy came, who was also helping... We were learning the chocolates slowly as some people who knew how to make chocolate came to volunteer and they gave me ideas on this thing and if we do that thing and this is how that is done. And so little by little it has evolved.”

Following this pattern they demonstrated a surprising amount of ingenuity to use the materials and resources they had on hand to build and expand the project “poco a poco” (little by little). One volunteer with engineering experience helped convert spare auto parts and equipment from an old washing machine into a hydraulic press for making cacao butter and another helped transform an old bicycle into a pedal powered machine for grinding and processing roasted cacao nibs in preparation for making rustic chocolates. Kathy shared that “when I first came they made rustic truffles, a version of soap and powdered cacao butter but that was about it. They didn’t get a refining machine until a little bit further down the line but then suddenly in my first few years they started buying equipment two years ahead of when they were really ready for it. Or they’d buy it and not quite know what to do with it. So it would sort of just sit there until a couple years later they’d finally get around to changing the system enough or they started processing enough to get it incorporated.”

After Kathy’s first three months volunteering at Finca Chocolate in 2011 she returned to the UK unsure of what the trip had meant. Two weeks before she left, she and Carlos had started dating, “I’m leaving now. Wow, what timing!” Kathy shared laughing while remembering the experience. She continued:

“I went back for nine months. I worked, kept in touch with Carlos. We emailed each other in broken English and Spanish about once a month for nine months... so then I came back with Emily (the Volunteer Coordinator) around Christmas... I came back for a month or six weeks, something like that, but that is when Carlos and I decided that we were really a thing. Then I went all the way back to the UK again for another six months to work, then back here again, etc. etc. until we get to today... Now for the past three years it’s been about 10 or 11 months here.”

Early on, when Kathy was spending more of her time in the UK, however, she told me how she “started answering all of their volunteer emails and kind of helping with that. And then I think I was asked to help with the website and just like slowly doing more things. At that point the family was getting to the point where they didn’t want to have volunteers anymore. They were exhausted. They’d had 10 years of nonstop people, like never a day off. They never said “we’re going to shut our doors.” They just said yes to every day of the year, for 10 years.” “Wow” I responded, dumbfounded by the idea as Kathy continued “To anybody. Everybody, there was never a no. Just like if you want to come, come... So they were all exhausted and we had a big family meeting at that stage where I sort of said, “I think you have a few options. You can carry on with the volunteers, you can get rid of it completely or you could go for a longer term volunteer program...”

For a while the family decided to try and keep the volunteer program working by raising prices so that it was more expensive if people were only staying for short periods of time. “That didn’t seem to deter anybody.” Kathy clarified and then elaborated that in addition, “we could never get any men, because of *chocolate* farms.” Kathy paused and made a knowing look to emphasize the focus on chocolate before continuing, “So it was just young girls that wanted some chocolate... so we tried really hard to change the demographic of our volunteers but none of it was helping. So then we kind of talked about how they could either continue managing their cacao selling their beans... or they could look at focusing on the chocolate making and developing the chocolate making or doing more with the tours. They’d been doing a little bit

with tours but that was really just to volunteer groups, student groups and stuff... So they sort of as a family decided they wanted to pursue chocolate.”

Kathy described how after deciding to take the plunge and test their mettle in the chocolate industry:

“I took Carlos to a big chocolate fair in the UK and I think that was probably the beginning of the end because when I first knew him, when I asked him what he wanted to do with his life, he was like “well, I’m not going to be a fucking cacao farmer for the rest of my life. It is really hard work and you don’t get any money so I’m not going to do that for the rest of my life!” And I think introducing him to the world of chocolate, and there was so much to learn, because he’s like a sponge for new information. It sort of got his enthusiasm back.”

After that experience, Kathy summarized, “nothing was ever the same.” When Carlos got back to Costa Rica, Kathy described how:

“We started to really push and try and work out how to actually make chocolate, and transform that idea into a reality that was vaguely real. I mean, his mom even now, still says that she never imagined they would have packaging with their logo, something that a volunteer had designed for them 14 years ago or something like that, which had just been printed out in black and white and stuck on things. They never imagined it would become more than that. Even talking to them now, because... we’ve got to think about the future. We’ve got to re-register the business, work out how we want to organize things in a way that takes into account what our goals might be for the next five or ten years. Do we want to grow as a chocolate business? We want to, you know, put in a shop somewhere that is not in Pueblo Arboles. You know, what do we want to do? And Carlos’s parents are like, “oh we’re really, we’re old. We’re not gonna do any more. This has already exceeded our expectations of anything that we had.” They started with zero expectations so it’s still difficult trying to persuade people that it could be more...”

Kathy's reasoning for wanting to expand the business and open a shop outside of Pueblo Arboles makes sense given the relatively small market in Pueblo Arboles, where Carlos explained that at least 25% of their chocolate sales come from visitors at Centro Sustentable. The economic support provided from them has been a boon, but in some ways also makes them exposed. "That is the thing, if the centro leaves many of the micro-businesses here will also see a direct impact, because although we have the tours that come from the beach, there are always enough tours that come by Centro Sustentable to make sales for the week... We say here that many people in the community depend economically on the centro to work and sell products. It is like a center where there is movement of money and income stability... that puts them in a position of privilege because they have more income... and it's like the little things have had quite a strong impact for people from the town that are spending on something very small." This dependency on Centro Sustentable, Carlos reflected, makes them feel vulnerable, causing many people in the community to worry what might happen if Matthew and Monica were to close their doors or sell the business.

For Carlos and Kathy however, they are confident that even if Centro Sustentable disappeared, at this point they have diversified their income enough that they would be able to continue. From their perspective, the bigger challenge they continue facing is figuring out how to make business decisions as a family. When I asked Carlos if they have any strategies for building and maintaining trust within their family and business, he responded:

"Honestly, that is the point where we have failed a lot. Now that we are talking about how it is, we are waiting and saving thoughts until something bad has happened and then it falls into a conflict since we are not talking before and seeing who doesn't like

something or sharing “I feel this way.” Instead we wait until it’s almost like a lawsuit so internally it is a little bad because we know what is happening and I think that as we are all trying to find an alternative or a solution, figuring out how to create a more trustworthy environment and honest communication is paramount.”

For Kathy’s part, she shared that it might have taken a while, “I’m a bit of a commitment phobe, so I’ve gotten to ease in slowly, I think it could have been about eight years” but at this point they are committed to growing the business and seeing where it will go. “I’ve always said” Kathy continued while chuckling, “that chocolate sort of chose me. I wasn’t going out saying “Hey! My life’s dream is to work in some kind of artisan food production!” But I would say that probably within the last year or so we’ve started to talk about the future for the business and... I think we’ve realized that we chose this, we’d like to make this work and that yes, it could be more than it is right now, quite a bit more... I think we’ve got a couple of side projects that we’re looking at that would be related or fall under the umbrella or go alongside Finca Chocolate. We both want to have a bit more, not having all of our eggs in one basket, but definitely still sticking with chocolate and education. I think we are both quite enthusiastic about doing a bit more education as we’re both starting to realize that we’ve built up a substantial amount of knowledge. There’s still considerably more to learn, but yeah, I’m starting to realize that we know more than the average.” It is exciting to see just how far this family run business has come in a relatively short time period. Their pursuits are not without significant barriers, but the future appears ripe with opportunity.

On a related topic, in considering some of the important factors that still need to be addressed in Pueblo Arboles, Kathy shared:

“There are considerably more opportunities [in Pueblo Arboles now]. I think actually one of the things that’s holding people back is that there are not that many people with confidence and motivation to just get up and go meet the opportunities. Because, actually I think you’ve got a captive audience of people here. So many micro businesses could start up that would be beneficial to people and beneficial to people visiting the community and could potentially offer different activities or products. I think maybe that’s somewhere where support from outside, whether that’s from the experts or it’s from the government or whatever. I think that’s a kind of hole that needs to be filled a little bit to help support people through starting something or coming up with an idea that isn’t identical to everyone of their neighbors. Like the basic education of don’t compete with your neighbor. Do something that’s complimentary that’s important to you. I think the entrepreneurs that have been successful have a bit of a just do it attitude. You just gotta do it rather than talk about it or wait for somebody to give it to you because there is definitely a culture of waiting for somebody to give you money and then not having any idea of what you should do with that money and therefore not doing anything sensible with the money and sort of ending back up where you began... There’s also an element of just fearlessness of just, well we’ll try it and see. I mean what’s the worst that could happen? It won’t work. Most people here are afraid of failure or afraid of trying something new. Not many people that try very many new things here.”

So far it has become apparent that those willing to try new ideas and who are willing to accept the risks of failure have also been the ones to gain the most from the rapid changes that have flooded this community. In a place where change is the only constant, wishing for things to stay the same is a recipe for discontent and frustration. Only time will tell where the future takes them, but just from the experiences shared so far there are numerous important lessons for us to distill that can help guide decision making to improve outcomes for local entrepreneurs, both in Pueblo Arboles and beyond.

9.4 Lessons Learned:

Research questions addressed in Chapter Three:

What do the visions that are catalyzing social change in these communities look like? What is cementing their desire to not only stay in their communities, but to transform them?

How is this community implementing their vision? What strategies and techniques do they employ to live sustainably and provide for their families? What is driving the process and how do visions evolve through the implementation phase? Who is included and who is excluded within the social processes of community development?

In this chapter I presented three fascinating examples from the case study which highlight some of the important takeaways and implications for how organizations like Centro Sustentable can continue improving the forms of social support they provide in order to increase the likelihood of local entrepreneurs' success. To first consider questions regarding the visions catalyzing change in this community and cementing local entrepreneurs' desire to change their communities, there was a clear consensus that emerged among the local business leaders and entrepreneurs interviewed. Although several described a sense of disillusionment with the city, it was not the natural scenery that was their primary motivation, but rather the people that lived there. Universally, entrepreneurs in Pueblo Arboles explained that the main motivation for staying in their community was to be with and support family. This finding underscores the importance of familial bonds in preserving and supporting rural communities, who as discussed in the literature review, have the potential to be some of the best positioned protectors of natural

resources and remaining ecological reserves. Similarly, each of the entrepreneurs interviewed described the lack of economic opportunity in Pueblo Arboles as the main barrier that prevents more young people from staying in the village or returning after attending university.

With regards to how this community is implementing their vision and the strategies being employed to provide for their families, the process has been largely informal. The individuals within the community that self reported having the most success have partnered with family members and close friends to launch micro-enterprises and develop value added agricultural products (e.g. butter, cheese, coffee, chocolate, etc.) to generate revenue through primarily local sales. Because the largest purchaser of produce in the community (Centro Sustentable) values organic practices and is willing to pay a premium price for sustainably produced, local foods, farmers in the community are incentivized to adopt more regenerative practices and reduce their focus on monocultures, since if everyone was producing the same thing (e.g. corn) they would rapidly reach a surplus that local organizations would be unable to absorb. Instead, this informally emerging circular economic models appears to encourage farmers to diversify crops and coordinate with their neighbors in order to avoid unnecessary competition.

The prosperity of local entrepreneurs also helps support Centro Sustentable since each micro business helps reduce the need for sourcing goods and materials from outside the community and keeps more of the economic activity generated here cycling through the local population. In a comprehensive review of the history of the concept of circular economies, Winans and Deng (2017) suggest that as these types of circular economies take hold, the

disparities between community members are likely to become less severe over time while the social fabric between community members should become more densely intertwined and resilient. This illustrates how the principle of circular economic practices and the reinvestment of funds back into the local community are crucial processes in the development of economic models that are both socially just and ecologically regenerative.

As was discussed in chapter two, the economic interdependence between Centro Sustentable and the broader community is important since communities that are highly dependent on one another are more likely to stick together (Brock, 2017). However, in chapter three it became clear that community members have unequal access and opportunity to participate and contribute to the development of local financial capital. In some cases unintended consequences added additional strain on certain forms of social capital between community members. Several community members reported that this sense of power imbalance has reduced the likelihood of individuals expressing concern or sharing critical opinions about the organization since they don't want their family members to lose their job or for the centro to stop buying their produce, eggs or dairy products. To be clear, there is no evidence to suggest that the organization has made decisions to intentionally exclude certain individuals based on personal factors, but the fear that this might happen is still present. Along with this concern, a number of community members expressed fear regarding the possibility that Centro Sustentable might sell the land or close shop.

Given Centro Sustentable's privileged position as the community's largest employer and economic powerhouse, the organization's role has been complicated by disproportionate power imbalances that in some ways may have exacerbated existing jealousies and tensions between families based on who was included versus excluded from the economic benefits of ecotourism. Although these distinctions often aligned with historic family divisions within the community, new opportunities have clearly emerged for historically underrepresented groups, such as women, to participate in the growing economic prosperity from eco-tourism. Women such as Lily, who worked her way through college, or her cousin Brenda, who was able to support herself and her son as a single working mom, represent a growing cluster of financially independent women who are challenging traditional gender roles and spearheading efforts to further transform the local community in order to foster a brighter future for their children.

The concerns mentioned regarding power imbalances are not to imply that the organization bears all of the agency in the situation. As Carlos explained, "at the end of the day the community is large and if... let's say the whole community is against them they are not going to be happy because every tourist or every visitor that comes here will already have someone waiting to do them harm, well then a bad reputation is created and they are going to say they are not going to Pueblo Arboles because there they will steal your purse, etc." Carlos's example demonstrates that the community has some power over the centro, but if it requires nearly the whole town working together to intervene if something is not right, that could be very difficult to accomplish due to preexisting internal disputes and divisions.

Navigating this tight rope is one area where it appears that Centro Sustentable has been very successful. Despite the occurrence of several incidents over the years, they have largely managed to avoid creating any serious enemies within the community. By being sensitive to concern from community members and being responsive to the issues that have arisen, they have earned a widespread reputation as a reliable and respectful community member that has limited the development of sentiments such as anger, resentment and frustration that would lead individuals to take actions that would harm the organization. Perhaps Lily was right when she reflected that Centro Sustentable has always made friends of their enemies and that this is why there have been so few reports of theft over the years, despite having open doors and large numbers of visitors with valuable goods and cash on hand.

Prioritizing efforts to reduce conflicts between the organization and community members seems to have paid off here and could be a valuable lesson that is applicable in many contexts. Especially as a foreign organization, building social capital and community good will has been crucial to the organization's success, and their willingness to make tough choices in order to preserve the peace provides an important example that other organizations are likely to benefit from heeding.

In a similar fashion, looking to emerging ownership models such as cooperatives, land trusts or nonprofit organizations for guidance could help mitigate concerns regarding the future of the organization or property. Removing these types of support organizations like Centro Sustentable from private ownership and developing models for shared governance could improve

the sense of community ownership, promote opportunities for democratic processes and create opportunities for introducing bylaws and mission statements that would prevent the land from being sold to certain types of investors and/or limit the future uses of the land to education and regenerative agricultural practices as just one example. Moving away from private ownership and towards cooperative models might also help address community fears regarding the future and demonstrate the organization is committed to the long term development and success of the community rather than being focused on personal profits and organizational growth.

Interestingly, reflections from Lily demonstrate that Centro Sustentable has not always been willing to make sacrifices to stand up for their principles. On one hand, they showed they have been willing to make significant sacrifices to prevent negative sentiment in the community, such as when they removed an intern from the program after Juan Gonzalez of Pura Verde made it clear he found it unacceptable for the person to stay. On the other, they have demonstrated they are willing to allow certain issues to be swept under the rug, such as when Javier was accused of multiple incidents of sexual misconduct and inappropriate behavior by guests. One reason for this may be the difficulty associated with trying to replace effective help in such a small community. As Lily reflected:

“Who else do you have to replace them? You don’t have anybody else to replace them. And so then it’s what are your principles? Is that the most important thing or is getting your cabin built on time the most important thing? And so there have definitely been tough decisions where people that potentially in different circumstances wouldn’t have kept their jobs if there’d been other people available. But when you’ve invested a lot of time into people and training them and they know what they are doing and they do a good job, you can overlook some of their actions because really it’s too inconvenient to do anything about it.”

Lily's reflection illustrates both principle four and five from the prosocial framework proposed by Atkins et al. (2019). In monitoring agreed upon behaviors, Centro Sustentable did not establish any formal systems for evaluating staff performance. The lack of clarity regarding expectations may have contributed to an incorrect belief expressed by some employees that since they worked there, they had the freedom to treat the space as their own and go where they pleased. This misunderstanding appears to have played at least a partial role in the instance of sexual misconduct discussed in chapter three.

Principle five, graduated responding to unhelpful and helpful behaviors, brings up an important point with regards to how Centro Sustentable has reacted to harmful behavior, and which is especially pertinent to economic development in small and rural communities. When there are few options for labor and even fewer bridges to burn, in order to preserve and build human and social capital, how does an organization create effective methods of accountability and enforcement to prevent abusive and/or destructive behavior? This is especially important because in addition to the concerns raised by Lily, the owners also had to contend with the fact that many of Javier's family members still worked at the centro as well. If they had fired him, how would that have impacted the relationships with their other employees or even the broader community? Would people have felt it was justified or complained that Javier was being treated unfairly? In reflecting on the experience, Monica shared that "it's extremely difficult to play judge and figure out all these situations. And so having policies in place but then being able to enforce them too. I mean, it's like, you know, say Javier overstepped his bounds, he went to try to fool around with somebody. Okay, so we fire him. Now it's like his whole family is without

work and has no source of income. You know? I mean there's huge consequences. This family would totally hate us and I mean, that's something that is really, really difficult and you have to have like an investigation that goes into it and figures it all out.”

There are no clear answers here, but the clearest guidance comes from Matthew and Monica themselves, who realized through these experiences that what is most important to prevent these types of situations from occurring in the first place is to have simple, written expectations of employees as well as contracts that clearly state what repercussions are associated with specific types of infractions, as well as having mechanisms in place for enforcing those policies and holding all community members equally accountable to their commitments. That way, if something happens they can refer to the policy and it becomes less of a personal decision, less about the individual involved, and instead provides a consistent source of direction for which type of action to take under given circumstances. Although written policies can provide valuable guidance in decision making, the policies are only as strong as the integrity of those who enforce them. Additionally, policies such as these do not always lead to better decision making, but they do reduce ambiguity and create a sense of impartiality to the process so that it can be transparent and help those impacted feel that the process as least was fair and handled justly, which Atkins et al (2019) argue is a crucial step in preserving the integrity of functionality of social groups.

Coinciding with the increase in economic opportunity in Pueblo Arboles has also been an explosion of predatory lending practices driven by corporate vendors that have preyed on low

income families by tricking them into believing that expensive domestic appliances are both affordable and necessary. These companies buy up ads on radio and television and even send trucks to drive through the rural communities, blasting advertisements promising a “once in a lifetime opportunity” over loudspeakers while slowly meandering across the valley. Meanwhile, they rely on misleading contracts regarding rent-to-own purchases and deferred payment plans that led community members to sign up for contracts they could not really afford.

Although it is unclear what the community could do to prevent these types of businesses from targeting their households, addressing these issues will at a minimum require increased access to financial education and/or linking community members to sources of financial support and expertise that can help guide individuals to make strategic long term oriented financial decisions. Additionally, it is worth noting that communities which have been historically oppressed through policy and discourses of racial inferiority are generally in desperate need of increased access to legitimate forms of Financial Capital under reasonable and transparent terms. Recognition of this global need has triggered an explosion in micro lending, which Centro Sustentable has attempted to participate in by providing small and short-term interest free loans to community members in need. However, as they learned, just like with their employees, lending provided to help address cash flow issues can also backfire if not paired with strong agreements and social contracts. Providing financing is a crucial role performed by this organization, yet doing so carefully and with built in mechanisms in place for enforcement and promoting accountability are equally so.

A number of reflections shared during interviews, but perhaps most notably from Carlos of Pura Verde, helped demonstrate how the creation of the National Park bordering the town of Pueblo Arboles played a key role in facilitating the development of a tourism economy and triggered some of the initial shifts towards the creation of a more circular and regenerative local economy. This is an interesting point because it reflects how the conservation and protection of shared environmental resources can also improve and stimulate livelihoods in a way that is directly aligned with one of the challenges posed by Ostrom's (1990) groundbreaking work on managing common pool resources. Specifically, this example contributes to the debate Ostrom (1990) began regarding when and how it is appropriate or the best option for governments or private entities to intervene in common pool assets (Laerhoven & Berge, 2011).

The case of Pueblo Arboles illustrates that at least in some cases, when governments intervene in an effort to enable local communities to work out their own governance systems surrounding commons, that new designations and/or legal protections to certain areas, such as National Parks and Marine Protected Areas, can catalyze broader changes in surrounding communities in a synergistic fashion, simultaneously supporting conservation and environmental restoration while revitalizing economic development and improving livelihoods in the area. The creation of the National Park here also helped instill a sense of pride in local community members over their region, which has been demonstrated in other Costa Rican communities to create new opportunities for environmental education and inspire more care for the environment in addition to promoting tourism (Castillo, 2016). This form of development aligns the

cultivation of natural capital with both human capital and financial capital, a quintessential feature of the triple bottom line being pursued by regenerative economic models.

As the economy began to change, youth have been the ones most open to new ideas and a changing landscape of opportunities. It was the generation of youth who first saw the introduction of tourism into the local economy who have been the predominant group leading the charge of entrepreneurship in the town. This may in part be related to the importance of learning English for taking advantage of tourism opportunities, something that older adults have a much more difficult time doing. However, at the same time that some youth are leading the charge forward, the community is still recovering from severe brain drain that for decades caused most of the talented hard-working graduates from the local high school each year to leave and seek work or study at university. While this appears to be slowly changing, so far only a few of the most recent graduates have returned. Many of the young adults left in town are ones who lacked motivation or who got addicted to alcohol and drugs. Characters like these pose a threat to the progress that has been made, and if allowed to dictate social norms in the community risk undermining much of the progress the community has made.

In order to attract more talented and driven individuals like Juan, Lily and Carlos, the community will need to identify and create ways to support youth in continuing to learn and be engaged in activities that are both challenging and rewarding. In this regard, there may be some guidance to be found in recent findings from an investigation into the role of community-based ecotourism within remote coastal communities in Indonesia. In a similar pattern to those

observed in Pueblo arboles, Phelan et al. (2020) observed that a community's capacity to enhance primary incomes in ways that also supported ecosystem services played a crucial role in their success at generating wealth from ocean-related activities. Findings from their investigation highlighted three key areas where multilateral support is most needed for communities with ecotourism aspirations: waste management, hospitality skills, and market access (Phelan et al. 2020).

Within the case of Pueblo ARboles, these types of skills and opportunities could be introduced and supported in many ways, such as by utilizing existing forms of social capital between an existing group of successful entrepreneurs who can help identify gaps in the local economy, develop target areas for growth that are complementary rather than competing with existing businesses, and provide guidance and encouragement to young entrepreneurs who are just getting started. These sources of support could be implemented into the school system, sponsored by the local government or spontaneously managed by community and business leaders alike who are seeking to support systemic community transformation.

The relationship between Javier and Bob McDaniel showed how trust is often much easier to break than it is to rebuild. Although forgiveness is an important step in this trust building, these are separate and distinct processes (Spears & Lawrence, 2016). Although we can assume that Bob eventually forgave Javier since they maintained their friendship, there is no evidence that he ever really addressed the betrayal of trust between them and without that acknowledgement there was no opportunity for the trust between them to be regained. Lily and

Juan on the other hand, who experienced a far more explosive outcome when Lily's affair became public, were able to address the issue head on and eventually not only achieve forgiveness, but also rebuild the trust that was lost and move forward successfully as both romantic and business partners. Unlike forgiveness, which is a gift that can be given unilaterally, recent findings suggest that trust is only rebuilt over time with honest and clear communication that demonstrates authentic vulnerability and personal growth (Atkins et al 2019; Spears & Lawrence, 2016).

Clearly trust is a crucial characteristic of successful partnerships. Without trust it is exceptionally difficult if not impossible to coordinate effectively and rely on team members to make progress towards group goals. Interestingly, and perhaps unintuitively given common adages and warnings against doing business dealings with family members, as an operating unit families may actually have some advantages over other groups. For example, the strength of bonds between family members may help them persevere even when failing to take the precautionary measures of putting in place clear procedures for conflict resolution. Unlike other groups, family members cannot simply ask others to leave. In a much stronger sense they are in a way stuck together, or at least are more invested in working through issues and resolving problems. In addition, some observations support the idea that it may also be easier to rebuild trust with a loved one or family member even after feeling betrayed since, as attribution theory suggests, we are more likely to associate negative behaviors of loved ones as being externally influenced rather than as internal, immutable dispositions (Gretarsson & Gelfand, 1988; Park et al. 2018).

I close this chapter with a pertinent reminder that in this world, the only constant is change. In Pueblo Arboles, as in communities around the world, embracing change can be difficult. Experiencing change is never as easy as continuing a routine once established. Novel experiences necessitate that the individual involved will not know exactly how to respond, which can trigger feelings of uncertainty and/or insecurity. In a similar way, however, when situations are easy and follow a reliable and expected routine, there is very little opportunity for personal growth or self betterment. It is in the face of change and new challenges that as both individuals and as a species, we are forced to learn and grow. Similarly, fear of failure can stifle creativity and motivation, since by definition, creating something new introduces the risk of making mistakes along the way. Thus creativity struggles to be expressed in an environment where failure is unacceptable. By shedding fear of the unknown, embracing the constant of change and accepting failure as a necessary part of the learning process, we will become more empowered and motivated to pursue our passions and inspirations while promoting innovation and creative problem solving.

“Creative people do not see things for what they are; they see them for what they can be.”

-Julie Israel

End of Chapter 3

10. RESULTS CHAPTER FOUR POWER, LEADERSHIP and SEXUAL MISCONDUCT

Chapter four focuses on some of the most serious interpersonal challenges encountered during the investigation. This chapter draws on extensive interviews with core organizational partners and Pueblo Arboles community members, including two participants who self reported as being the victims of either sexual assault or misconduct. By carefully reviewing these incidents and surrounding interpersonal conflicts, chapter four builds on the previous three chapters in addressing the dissertation's fourth and final sub-questions: Do these types of community based initiatives represent fascinating, yet culturally bound projects that are small scale and non-replicable, or is it possible to identify scalable patterns within cases that can be used to guide agricultural and social development in larger populations? Are there identifiable social processes and procedures that can be replicated in diverse contexts to address interpersonal conflicts, improve group decision-making and promote effective forms of cooperation? Although the question above is ultimately addressed by the totality of the investigation, it is in chapter four that I examine in-depth the most serious issues encountered and consider the potential for detailing replicable processes that can help guide groups in overcoming these barriers.

10.1 Core Team Beginnings:

The birth of Isabela Ryan Torres in 2008, Monica and Matthew's daughter, marked the beginning of a major period of transition and turbulence for Centro Sustentable that would persist for the next several years. During this time period a new core group of volunteers

emerged at the centro who would prove instrumental to the development of the organization and its programs over the decade to come. In this chapter we will examine the role these individuals played in the growing pains experienced and lessons learned here in the last decade. Several incidents during this period help highlight that neither Centro Sustainable nor the broader community in which they are situated are utopian societies, but rather very real communities grappling with the challenges posed by multigenerational poverty, stress and anxiety, instances of failed communication and personal shortcomings. These incidents simultaneously highlight some of Centro Sustentable's shortcomings while underscoring some of the critical processes needed to successfully disrupt historical patterns of trauma, sexual violence and abuse.

The first of the new core group of volunteers to arrive at Centro Sustentable was Dan Avery. At the time Dan was part of a team of wildlife ecologists who was studying primates in Northern Costa Rica and in 2007 he took a break from his work to complete a 3 month work trade in Pueblo Arboles. In reflecting on the transition Dan shared that "I was interested in working outdoors and in, kind of like the self-sufficiency aspect of things... I envisioned that doing the research would be a little more in tune with the natural environment and I discovered that there was a real disconnect between the people who are studying wildlife and the people who were interested in conserving and supporting that... It became apparent to me that this kind of, super focused research into just one real very defined topic without a kind of more holistic view on things was just not, it wasn't for me." Dan explained that he had completed some really disheartening research in Borneo as well and after "seeing the huge logging operations that were just destroying the forest where the orangutans lived and just feeling very disempowered as to

how you could stop such a huge cycle of poverty which essentially created this. And so I came to the centro because I was interested in looking at how we can create a new kind of model of sustainable agriculture, of community development and of self-empowerment of people to disempower larger organizational structures. So taking more responsibility for your own actions and for the way that you do things.”

After Dan completed a three month internship, rather than returning to his research he asked Matthew and Monica if he could stay longer. It was a request they were happy to agree to. Having spent over a year working under Dan’s tutelage, I can personally attest to his driven attitude and strong work ethic, so it is no surprise Matthew and Monica were thrilled he wanted to stay. Dan reflected that during his first experience at Centro Sustentable:

“I mean it’s difficult to say cause it was so long ago... but I think the reasons that I stayed were that I enjoyed the work. I enjoyed the physical work. I enjoyed the community of people, the friends I’ve made here. I agreed with the mission and I felt like it was something that I could contribute to personally... In a way it felt like you were part of something positive rather than, I guess coming from the outside and battling against what is already a pretty strong existing structure. And I think through my life I’ve always been interested in trying to change things and had become so disillusioned and broken by that struggle.”

Dan’s sense of burnout is not uncommon in conservation oriented careers. For Dan, his way of dealing with this predicament was to engage in work where he felt he could “I guess be the change that you want to see in the world and show people that this is how to do it, but not get overly concerned about whether other people were doing it. Because I feel that is what breaks motivation is this constant wanting to change people and then not wanting to change because

others aren't changing. And so I realized that instead of being so preoccupied with that, what I could do is show a positive model moving forward that was impactful to people and show them that it's possible, and then it's up to them.”

While politicians continue to point fingers and use the sluggish response of others to excuse even further delays, a growing number of individuals and communities around the world, who like Dan are tired of waiting for others to respond, are taking it upon themselves to develop alternative models that can guide us into the future. It is no surprise these fledgling efforts are messy and riddled with mistakes along the way, yet it is worth noting as well the importance of Dan's second realization, which is that he can only control his own actions. This recognition has helped Dan reduce his focus on the behaviors of others and instead invest his time and energy into aligning his own actions and lifestyle with the values he strives to model.

It was not long after that the next core team member to be, would make her first arrival. In 2008 Sarah James made her first visit to Pueblo Arboles for a short stint as a volunteer. Born and raised in Vermont, Sarah returned to Central America multiple times over the next two years while pursuing a degree in landscape architecture back in the United States. “At that time I had been the volunteer coordinator at a permaculture farm in Nicaragua and I had spent seven months there, really learning more about Agroforestry and Permaculture. I took my Permaculture Design Certificate course during that time.” In 2010 she returned on a more permanent basis, committing at least six months a year of her time for the next several years to help Monica realize one of her original visions for the property, which Sarah explained “was always to go

deeper into agriculture... The earlier years were more focused on, building, um building the infrastructure, building educational structures and the sort of economic structures to help get the place running and to keep it going.”

Sarah James continued that:

“When I came back to Centro Sustentable, at that time they were really interested in getting our agricultural systems going and I was able to take what I had been learning in an established system, that didn’t really have a lot of room for me as a new designer to put much of a stamp on it. I was just learning... So it was a good, a good switchover. And so coming over here and starting the first, you know our first orchard planning and going to the first nursery and buying 15 trees and being like, where are we going to put these? Do we have room for 15 trees? And now it's like, you know, 500 trees later or at least 500 fruit and nut trees later, probably more, but thousands of trees, it’s like, oh yeah, there’s a lot of room.”

For Sarah James, as a young Landscape Architect with a passion for sustainable design, the chance to help design and implement a regenerative agroforestry project across dozens if not hundreds of acres was the opportunity of a lifetime. She leapt at the chance. Coinciding with Sarah’s first visit to Pueblo Arboles, two additional members of what would become the core team at Centro Sustentable also arrived for the first time in 2008. Sam Hollingsworth and Holly Anders arrived at the centro for a volunteer program after spending several months hitchhiking from the US-Mexican border across Central America. In reflecting on the decision, Sam shared:

“You know, we were both interested in learning Spanish. So that was part of it for me... I was just craving something different. I’m from a small town in Ohio, you know, you didn’t go backpacking and traveling, hitch hiking or bicycle tours. Like when I was growing up, I didn’t have any role models doing things like that. And so post college as I started meeting some of those people, it felt like I needed to take advantage of my young adulthood, I didn’t have college debt... Like in hindsight, I view it through this lens that I

had this immense privilege but at the moment it was more just I wanted to do something fun and interesting and different from what had been a pretty corporate world lifestyle.”

Sam and Holly first met in Colorado. Sam had recently graduated from a prestigious university with a degree in Economics and was being groomed for a high powered corporate job. Holly on the other hand had spent several years learning how to live alone on the road and in the wild. Realizing that the corporate world was not the lifestyle he wanted, Sam was looking for an escape from his previous trajectory. He shared that “all tides pushed towards this corporate job and it felt like if I didn’t make a really drastic move I was gonna end up doing that... And so Holly, who is very adventurous, she invited me to go trekking through Mexico and so basically I called off the job offer.”

“How well did you know each other before that?” I asked. Sam’s response was, “we’d met like twice. And yeah, well I turned down the corporate job and we drove to Tucson, dropped my car off with family, took a bus across the border and started trekking south. Yeah, the first night we slept on the edge of a garbage dump in Mexico next to a slaughterhouse and a softball field. I remember lying there and we didn’t put our tent up cause we didn’t want to be seen. And just being like, “oh I wanted adventure, boy did I find adventure” like “I’m in it now” you know, that’s what I was thinking.” Curious how he handled the experience, I prodded “did you ever have, like a panic moment?” “Not really...” Sam said then hesitated before continuing, “There was a moment, a couple months in when we were robbed. And I essentially had all my possessions robbed except for like my clothes I was wearing, my sleeping pad, my headlamp and maybe my Nalgene. That was all. I lost my passport and everything. Money, credit cards, all identification. I had \$40 sewn into my belt. I had that. Holly still had her basic stuff so we were

able to get by just fine, but I guess there was this moment of panic where I was just like, I guess I'm going home.”

At the time Sam felt it was the only reasonable thing to do but over the next few months his perspective slowly changed:

“I sewed my own backpack over about two months. I sat in town squares in Mexico, just piecing it together from random pieces of fabric and a wrestling belt. That and taking out a loan from Holly until I could get a debit card shipped down here and whatnot. And then the kindness of strangers hitchhiking back to Mexico City to get to the embassy. Every person had picked us up. I ended up with a briefcase and some tight jeans and a couple t-shirts and was stocked up by the kindness of everyone who looked out for us in that wonderful country.”

Sam admitted that before leaving on the trip with Holly he had a relatively limited experience of the world. In reflection, Sam shared that his first travels with Holly “reinforced the worldview that I was already looking at, which was that of abundance and kindness and openness and just like absolutely, that made me love people from Latin America, trust them, and I guess be interested in and value, you know, reflecting on and feeling like I have a debt to these communities broadly speaking, especially when I reflect upon how they're treated in the US as immigrants and migrants. It definitely cemented a worldview that I carry today.”

Sam's first experience traveling outside the United States might sound slightly crazy to some, but the takeaways and expanded perspective he gained as a result will sound familiar to many travelers who chose to explore outside of their comfort zones, even under slightly less intense circumstances. The story of how Sam and Holly first arrived in Costa Rica highlights

many of the reasons why international education and the types of programs offered by centers like Centro Sustentable have so much value. When designed intentionally they have the potential to offer transformative experiences for both students and local community members while offering crucial economic support and ideally modeling practices that can catalyze positive social change.

Holly explained that after completing a four month internship at the centro in 2008 they decided to come back to volunteer again in 2009. “During that internship, Matthew and Monica, the owners, approached Sam and myself about partnering with them as co-directors in the business. And so from there they wanted a five year commitment to work five full seasons in a management role as part of their work trade agreements for co-ownership and a profit share within the business. And so we did that for five years and then continued for several years after that. I resigned in September of 2018 so that makes this like the 10th year.” In reflecting on the partnership, Holly made it clear that when those discussions began the centro was still not recording decisions or making written contracts. “It was all verbal.” Holly stated simply before elaborating, “We made a verbal agreement. And then as the years passed we continued working at the centro and did a lot of program development and made management decisions and strategic planning and you know, we definitely had a director role. We were dealing with managing students and facilitating classes and making decisions for the business. So we did not have that profit share for the first five years or legal co-ownership. In the fifth year we received a few thousand dollars of a profit share and then continued to discuss what that would look like to have legal co-ownership and profit share.” In what should come as no surprise, the lack of

written agreements or contracts for these long term partnerships certainly contributed to and likely played a leading role in the social struggles and fallout to come.

10.2 Sexual Violence and the End of Short Term Volunteer Programs

After Isabela was born in 2008, Matthew began thinking more critically about certain aspects of the volunteer program they had created and the party culture that was emerging in Pueblo Arboles. Since they had begun relying on volunteer labor in the early 2000's, other organizations such as Pura Verde and Finca Chocolate had taken notice and followed suit. During interviews with Kathy she shared that when first arriving to Pueblo Arboles "there was a summer where there were more volunteers between our three farms than there were residents of Pueblo Arboles. And if you think that everybody would be like, "let's meet at the bar!" I mean... it was inside the bar, outside the bar, everybody, it was crazy."

During this period Matthew began to recognize that, "Yeah, it was pretty destructive both to me personally, not being able to sleep, and the realization that you know, I felt like a lot of people that were coming to the centro, guests, visitors, students, were acting in a way that I couldn't get behind. It was a type of behavior that we didn't want at all. We didn't want to encourage it and as an organization we started taking small steps just to try to discourage people from spending a significant amount of time at the bar. So we started, slowly implementing loose curfews, just talking to people more and... discouraged people from going over there, not all together but to do so in a responsible way such as before dinner and little by little, I think we've

eliminated that culture in the centro... it's become less of an issue of centro guests coming and contributing to that party culture.”

In early 2009, with an infant at home and a near constant party raging at the bar next door, the effects were clearly straining Matthew to the breaking point. Carlos of Finca Chocolate shared that it was during this time that he had his worst personal experience with Matthew. “I was at the bar, but calm and having a beer and the music was playing and everything. And Matthew came in wild like and aggressive, just screaming, but I was very calm and I said “Matthew, but what about you? Because you were here before enjoying with your friends and the others here are calm because we are all enjoying ourselves. We are not using drugs or anything. Why are you so aggressive?” Carlos continued that “then he came against me very, very aggressive and even the police came because of his screaming. I was like... I thought he was going to hit me but no...” Carlos hesitated, unsure of what to say next before concluding “No, after that we talked about how the heat of the situation took over, which I understand, he had a little girl and he couldn't sleep and I mean it was kind of stupid of both of us arguing about something like that.”

In reflecting on that period, Carlos admitted he could understand Matthew's frustration, “there was a time when the center of town did not sleep. I was there until four in the morning, there were people talking, dancing, and yes, since people were coming from other places because there were volunteer opportunities in Pueblo Arboles, there were gringos everywhere in what was already a night life atmosphere. Then for a time there came a reputation that was not good

for people... because then people who are not from here began coming, some to sell drugs, others came to see what they could steal, or I don't know, maybe to look for a girlfriend... That affects negatively the image for the local projects but also for the people here because they couldn't sleep because of a lot of noise.”

As Matthew and Monica were trying to figure out how to limit their contribution to the growing party atmosphere in town, they realized that a big part of the problem had to do with the types of guests they were inviting into their community. Matthew elaborated that “you know, short term volunteer opportunities are quite popular in Costa Rica and throughout the world where people come and live somewhere, work somewhere for a reduced rate for short periods of time. And so this transient culture really started to become the new norm now with all these organizations kind of buying into that model that honestly, we first introduced and that others then began to copy.” Matthew sighed, clearly frustrated by how the experience had played out. “I think it probably works very well for certain organizations, but the ones here I think everybody eventually found out that you're having a lot of people coming into your space and bringing disruptive behavior as part of that, and for us it doesn't make any sense.”

In remembering her own experience, Holly elaborated that at the time, “we had a lot of volunteers. They were coming in all the time. It was like a rotating door for volunteers. We didn't have any advanced planning, so people would just come in out of the woods, you know and put whatever they wanted to do on the board every morning. And you know, it was pretty hectic... It was chaotic actually, absolutely chaotic. Just everyday people coming in and out and

every day you'd be trying to figure out what the plan for that day was." Given the repeated challenges posed by the regular turnover of volunteers, the team realized that the program was unsustainable. Matthew made it clear that "we've since eliminated our volunteer program and other organizations have as well. I think everybody came to the same conclusion, somewhat independently at least, but as a result of that I helped found a loose organization, where these business owners and other people interested in the environment and positive social development got together weekly or biweekly to talk about issues in the community, challenges that developed and explaining that the type of party culture that had developed wasn't in the long term good of this community."

Slowly Matthew said that things began to change. Perhaps one of the catalysts for this transition occurred in 2011, which Kathy of Finca Chocolate described as "probably the penultimate year of party town Pueblo Arboles." Kathy explained that her friend Emily, who at the time was the volunteer coordinator at Finca Chocolate, had also earned a controversial reputation as "the social coordinator of Pueblo Arboles." Monica as well remembered from this time that "Emily was the instigator of lots of parties at the bar. It was when the party culture was going on. She was like the main organizer, like every weekend having dance parties... And it was when we were trying to eliminate that from our community but not everyone else had joined on."

As someone who had earned the nickname "social coordinator" of the town, it is easy to envision Emily as an outgoing socialite to whom friendships came easily and often. For the most

part, this description is accurate, with the exception being those who were concerned about the growing party culture in town and trying to limit disruptions being caused by the bar. Emily, a young American woman with a quick smile and long, flowing black hair, was not initially aware of the brewing tensions centered on her activities. While the large crew of “voluntourists” rotating through the community quickly fell into step with the party rhythm and vibe Emily was helping to model, a growing number of community leaders, including Monica and Matthew, were growing increasingly concerned by the scenario playing out before them. As Monica put it, “when you start playing with fire, you know, there’s going to be some consequences...”

Events finally came to a head one evening that year in December, just a couple weeks before Christmas. After a seemingly normal night of partying and dancing, Emily recalled, “I was walking home to Finca Chocolate. I had a ride set up, but then my ride, um, got too drunk, so I had to walk home.” While she was on her way, Javier approached silently from behind. Emily trembled while remembering the incident, and then continued, “He came up from behind me and attacked me, saying that “he deserved a woman” and he pushed me to the ground, put his hands down my pants. I mean, I was telling him No!” As she continued recounting the experience, she mimicked pinning her arms to her sides while saying “I was like this, with him on top of me so I couldn’t fight back. I was telling him no, you know? But he just wouldn’t listen... It was very lucky Carlos drove by on his bike with his dad on the back and at that moment he released me, or enough that I could push him off of me. And I came into the road with my pants or my skirt, like halfway down. Carlos was like “What is going on!?!” I got on the back and was like, “just go!”

After such a disturbing experience, the next day Emily was clearly struggling to process what had happened. “So I, I went and sought out [my friend] Anna, because she was the closest girlfriend that I had here. And I was like, “I don’t know what to do. I mean, I was a mess. I was a huge mess.” And so, she encouraged me to go and talk to Javier and so I talked to him and I said this is what happened and this, this is not okay... I was trembling during the entire conversation. Like I remember looking down at my hands, my hands were just like trembling...” When Emily confronted Javier about what happened, she claimed his response was “What? What? I what? I didn’t do anything bad... I don’t remember, I don’t remember this happening. I was really drunk. I don’t remember anything.” I asked Emily if she believed him that he didn’t remember, “Um, I didn’t. I felt like he was lying. I feel that he has never been called out for his actions in the way that I called him out. And yeah, he felt quite uncomfortable. It was easier for him to deny it than to deal with the consequences... We have not talked since then.”

I was interested to see what Javier had to say about the incident and so I began by asking him if he knew Emily very well. “Yeah, I know her. She is someone Rara (weird).” “Rara?” I asked. “What makes her weird?” Javier replied that “I call the person who is unfriendly weird... Emily is someone who when she went to the bar and drank, she was very cross and wanted nothing more than what she wanted. I am a person that likes to relate to, that likes to have friendship everywhere and to share... We ran into each other many times and ugh, I do not speak to her.” When I asked if something had happened to cause her to be cross with him he elaborated that “back then, I was single, I was 25 years old... and I came to the bar, I had my beer, if there

were pretty girls, I would come and speak English.” “Pow! Pow! Pow!” Javier exclaimed like he was scoring points in some imaginary game. “We would start talking, we would dance, and if something had to happen, it would be understood. And [Emily] did not like that groups came every three months and I could conquer a girl today, and in three months I conquered another. They understood me so it was not a problem, [Emily] was my problem. She got into it with me and said “it’s that you only like to play with women!” I was like, it’s my life, I am single... and it is not that I am playing with them, because I explained to them, okay, you come here, I am ethical and I am not going anywhere. If you want to spend your time in my dwelling, then with pleasure. I put the card in front of them, I told them what I was like, that’s who I am.” “Boom!” Javier dropped the metaphorical microphone, apparently convinced he had just sealed his case.

Javier wasn’t finished though explaining why Emily was apparently unfriendly. “So I had a girlfriend at Finca Chocolate for like three years, and everyone already knew that I had a girlfriend. Then [Emily] would get jealous or she would be angry because I went to the bar, and maybe there were some pretty girls and I would go and start dancing Merengue or Salsa and everything. And I would talk to the girls and everything and that’s why I ran into her, because she was, like, protecting the women from Finca Chocolate. And I explained to her, “I mean, you do not need to take care of anyone. They are of legal age, they know what they are doing. If they came to Costa Rica they came to enjoy themselves, they came to do everything, they are not you.” Javier continued, “we all have a different point of view, and she is unfriendly, yes, but then I was single, I was crazy.” “Is that why you think Emily is unfriendly?” I asked. “Yes, yes, yes”

he replied before summarizing, “she is a little closed with me. As my dad says, “I’m not a gold coin to be liked by everyone.””

In this regard, Javier’s response is interesting for two main reasons. First, he never acknowledged the principle accusation made by Emily, even to refute it. Instead he came up with an alternative justification, namely that she was jealous, for why she didn’t treat him in a way he felt was kind or respectful. Second, in defending his assessment of Emily, Javier repeated and idealized a masochistic and patriarchal view of women, referring to his sexual exploits as “conquering” and repeatedly bragging about the number of foreign women he slept with. Given the pattern of sexual misconduct allegations and inappropriate behavior complaints leveled against Javier from multiple individuals over the years, his explanation that he was “ethical” and always open with his lovers also rings hollow. Under circumstances such as these, where one or more involved parties refuse to acknowledge the pain and trauma caused by their actions, reconciliation can prove impossible. Even if Emily chooses to forgive Javier for what happened, until there is mutual recognition of what transpired, the foothold for beginning the long journey of rebuilding trust is simply nonexistent.

In the aftermath of the attempted sexual assault, Emily explained that after Javier stonewalled her attempt to discuss what happened, “I also went and talked to Matthew and Monica about it and said “I think it’s really important for you to know that Javier sexually assaulted me” and they asked me what I wanted them to do about it. I had never, like I didn’t know the answer. Now I feel much more empowered. I have much more experience. I would be

able to answer that in a very different way. Back then I didn't know what to say, like what even were my choices? And I was so traumatized at that moment, I was just like "I don't know." While Emily was still trying to process the question, trying to figure out what she wanted to happen, she said that Matthew responded by saying "Well, are you sure you said no to him?" And I said "Yes" "Did you say it loud enough?" Emily remembers Matthew asking in response.

When Matthew asked the second time, Emily explained that "I was like, Holy Shit! I must not have said it loud enough. I must not have used my voice... I mean, I was totally questioning everything because Matthew was like "whoa, what did you do?" When the conversation was nearly over, Emily recalled that "Matthew said he would talk to Javier and tell him that when a woman says no, he should stop. And then it was brought up, "well, do you want us to fire Javier?" And I was like, "I mean, I don't know." And Monica said, "because that would really hurt him economically." In the end Emily said she told Monica "Oh yeah, no, I don't want to hurt him economically, like that would be horrible. So I was like, "no, you don't need to fire him."

In order to assess how Centro Sustentable had responded to the incident, I asked both Matthew and Monica separately about what they remembered had transpired. When I asked Monica about an incident of Javier sexually assaulting someone she became defensive and responded that, "Yeah, it was not on our property. And yeah, that was not investigated. Like, we're his employer. If it happened at the centro then obviously that's something that we need to take care of. But that incident with Emily, I mean we would have had to like investigated and

talked and like spent a lot of time figuring that out. And I mean, is that our role as an employer? I mean, I don't know. Yeah, that's my question I guess."

In some ways it is a fair question, given that in the United States, for example, similar issues would likely be handled by the local police department or some other independent party. On the other hand, given the fact that in rural Costa Rica, Monica and Matthew knew that no one else was in a position to perform that investigation, the lack of action taken to resolve the issue or try to evaluate what transpired, could be interpreted as a dereliction of duty. Ultimately, I think the real question boils down to, how important is it for your organization to prevent employees from engaging in repeated patterns of misconduct and/or violent behavior against guests and other community members?

If avoiding and addressing that type of behavior is truly a priority, then in a context where no local authorities exist with the capacity to investigate such claims, excuses for allowing such serious accusations to go unevaluated come across as just that, excuses. In Matthew's words:

"These are difficult issues to deal with on so many different levels. Oftentimes it's one person's word against another. Of course, playing judge and jury, not having a police presence in this community. Having a defunct local government for most of the time that we've lived here, really kind of puts these issues onto our lap. We don't have, and this is the case for much of what we do here, we just don't have the institutional support that people are accustomed to having. We can't call the child abuse hotline to get help if we hear about domestic abuse cases in somebody's house, which is and has been the case. I don't know, this is so hard. Life here in a town of 120 people is and has been so different than what I had grown up with. And I think the rules are different here and I think these really difficult issues, I look at that from a very specific small community lens... What I do know is that if we had terminated the employment every time one of the employees had done something wrong we wouldn't be employing anyone. I do personally believe in

people's ability to change and become better. I have made many mistakes in my life and been given second and third chances. And that's generally the attitude I have with people as to address the situation and talk about it. To find out how people were impacted, what happened."

Many of the concerns Matthew expresses in this passage are legitimate. The issue with his reasoning here is that Matthew simultaneously recognizes that these issues are "put in our lap" and that they are used to operating without the forms of institutional support available elsewhere, while at the same time throwing his hands up because the solutions are not black and white. What Matthew fails to admit, at least here, is that his options and responses are not restricted to "fire or not to fire." Matthew's self-assessed attitude of wanting to talk to those involved and find out what happened is admirable, yet at least in this case does not appear to have been practiced.

Monica specifically mentioned that the incident was never investigated and when I asked Matthew what happened he also became defensive and claimed "I found out much later in the game... I don't know all the specifics. And you know, if one of the questions is should Javier have been terminated or not? You know, I don't know. These questions are bigger than I am. What I am trying to do is be as fair as possible as I'm the director of this organization and make thousands of decisions probably on a weekly basis and certainly not all of them easy. I unwittingly assume many roles in this community and in the organization that I didn't sign up for... that really put me in situations that I'm oftentimes unprepared to deal with."

I can sympathize with Matthew's struggle to handle such challenging circumstances, yet am unconvinced that healthier and more effective ways of responding aren't achievable. If Matthew feels incapable or unable to handle these situations on his own, it is imperative that as an organization they develop policies and protocols for how to respond appropriately and identify an individual or team that is prepared to undergo training for how to deal with and appropriately investigate these issues when they inevitably arise. Importantly, in Matthew's explanation he gave the impression that he found out about the sexual assault from a third party long after the incident had transpired. That is in direct contradiction to Emily's testament that she had gone directly to speak with Matthew and Monica in the immediate aftermath of the assault.

To better understand what happened, I asked Monica if Emily had told her about what happened. She hesitated before explaining:

"I mean, that's what Sarah James said, but I actually don't remember, which is horrible to say. So she may have, Sarah says she did. And honestly, I feel horrible saying this, but I don't remember it. I do remember having instances of problems involved with Javier drinking. It was when the party culture was going on. Emily was a huge instigator of lots of parties at the, at the bar. She was the main, like every weekend dance parties and having parties... And it was when we were trying to eliminate that and we had eliminated that from our community but not everybody else. And she was like the main instigator. And maybe because of that we were like, "well... how is that our problem?"" Monica then answered her own question, explaining "you're the one creating this party. Not that it's her fault, not, not... but you're creating a party atmosphere. Alcohol is involved, you know... Shit is going to happen."

Although Monica was quick to clarify she was not trying to blame Emily for what happened, her language and assessment of how the situation played out seemed to place the responsibility squarely at Emily's feet and parallels common patterns of victim blaming that

focus on the decisions that made the victim vulnerable to attack rather than criticizing the actions or role of the perpetrator. Matthew reflected a similar thought pattern when he shared his reflections on the situation. “I’m doing my best to lean on supporters, lean on friends, read, research, write, talk and think about these issues in a way that meets modern standards...” Matthew hesitated before finishing while laughing “you know, that I don’t always agree with either.” After he finished chuckling, Matthew continued, “It’s an unfolding story and... at least three male employees that, you know that we do have, there have been known instances of them treating females inappropriately. And they’re still working at the centro. They’re still friends of mine. I feel like in all three cases they’ve become such better people. I think maybe in part, because the centro is here, I’m here. I don’t want to take credit for that, we all hopefully wise up as we get older. But where would we have gotten if none of them were here now, in this community, if they were working in the city, contributing to a broken system that we are trying to create an alternative to? If we fire Javier and Antonio for doing something inappropriate after hours, that impact is far reaching, both for them and for us. And where does that get us in the long run? Where did it get that person? But I do acknowledge there being real psychological strain and damage done in these situations. And in many situations, most of the ones that I’m thinking of now, all of them are when a male inappropriately treats a female.”

While supporting victims of assault or abusive behavior it is important to not forget how certain forms of punishment may have far reaching and unpredictable consequences. Matthew however, even in hindsight, appears to have done exactly the opposite in focusing almost exclusively on how to avoid negative consequences to his own business and male friends, rather

than considering the ways they might have helped to minimize or alleviate the psychological strain and damage that victims suffer from. Matthew even acknowledged these incidents are primarily caused by men treating women inappropriately, demonstrating that on some level he recognized the damage being done while simultaneously excusing his inaction in an effort to preserve the well-being of the individual who was ultimately responsible for what happened.

To consider what impact the assault and the way it was handled ultimately did have on Emily, I asked her how the experience had affected the way that she related to Centro Sustentable. The topic clearly resonated with her because she quickly responded “Um, that’s a great question” and then paused before continuing, “I lost a lot of respect, and it happened slowly over the years when I, because during those years I was friends with a lot, I was friends with the majority of the interns. They were usually there for three months, and some of the best friends I’ve made, like two or three of my really, really, really good girlfriends I met and I’m still friends with now, were at the centro during that time. And so I heard stories.” Emily paused again as she reflected, “I heard more and more stories about sexual misconduct, or sexual assault by members of Centro Sustentable, either by their, um, leadership team and/or by their employees. And over the years, it didn’t really hit me. At first, I didn’t really understand the gravity of the situation. I think I was still in such shock from what happened I didn’t, I didn’t fully process the attack. Um, I just, I was embarrassed. I thought it was all my fault. So I just went on going on because that was my only option I felt.”

As time passed and Emily gained more distance from the assault, she explained that “slowly over the years, as I have gone to counseling about this and I have reached out for help in different ways, um, I have come to understand how messed up the sexual misconducts that happen at the centro are and how disempowering they are and how much they lack respect for women.” Despite the harsh criticism, Emily did not withhold praise either, “It’s hard because I think that what the centro is doing for the world in teaching all these amazing things to the students that come there, I think it’s really important and great. Although I mean, they need to have rules in place. They need to change their sexual misconduct policy. They need to have one, right... yeah and always enforce it. I’ve never talked to them since then about that though.”

In regards to how Emily has personally dealt with the emotional scars left by the incident, she shared that “I’ve worked a lot, a lot over the years on, on forgiving. And learning that me holding onto grudges against people’s wrong actions is hurting me more than it’s hurting them. And it’s not fair for me to hold onto the negative energy, it’s not good for me to hold onto that negative energy. And so I am learning how to release it and also learning to identify it when it arises, and figuring out a way to deal with it in a healthy way and having forgiveness is, has been a really important part of my healing process.” The lessons Emily learned through this process show remarkable growth and illustrate how forgiveness is often the best tool available, when reconciliation is not feasible. By working to forgive Javier as well as Matthew and Monica for the role they played in her trauma, Emily is helping to relieve her own stress and anxiety associated with the incident and allowing herself to move past the experience in order to realize her own personal aspirations.

In 2018 Emily partnered with her close friend Anna and her now husband, Angel, who is an expert in local botany and pre-columbian medicine, to begin their own business focused on selling sustainably crafted botanical skincare products and sharing indigenous knowledge through educational programs. Emily shared that “our direct goal is to preserve and share their heritage, Pueblo Arboles heritage. Um, and I’m trying to help out as much as I can.” Time will tell what becomes of their organization, but the potential is exciting. Emily’s reflections demonstrate she has a great deal of clarity regarding what she is seeking and the resolve needed to face the challenges ahead. Both Anna and her husband Angel on the other hand, who are cousins, share deep rooted knowledge of the native forests and the products they have developed so far are of excellent quality. Like many of the successful examples observed here in Pueblo Arboles, this group also shares the bonds of family that may help get them through the most challenging times.

10.3 Power, Gender, and Accountability

In the year after Emily’s tragic experience with Javier and Centro Sustentable, several of the organizations that had been hosting volunteer programs decided to follow the centro’s lead and eliminate their short term volunteer programs in an effort to reduce some of the destructive tendencies in the community that were becoming far too common. In early 2012, Carlos of Finca Chocolate explained that in order to begin addressing the issue, they organized a “meeting of the leaders of the projects in town and we all agreed that... increasing the minimum length of

volunteer programs... was the best thing for the future of the town, because if they kept bringing that type of person... coming with that party mentality... it is going to have a negative impact for the future and the children and all that.”

To clarify, I asked Carlos if they had all agreed as a group to change how they ran their volunteer programs. He elaborated that “I remember that a meeting was held specifically for those problems that were happening, at the bar, because it was like there was no more atmosphere in the town and then we discussed the idea that well, what if some person comes to you and asks to be a volunteer next week after spending less than one week somewhere else? The idea is that we communicate so that if this person asks, we say no if they were a bad influence, so the idea is for us to have internal communication between projects as well so as to avoid conflicts.”

After the four organizations who offered volunteer programs in Pueblo Arboles all agreed to develop more stringent guest policies, discourage partying at the bar and excessive drinking, things slowly began to change. Lilian Garcia, who was Monica’s principal assistant at the time, described the change well. “One of the bases that I think helped was asking guests to think of the people who have to work and to be quiet after ten o’clock at night. If partying, try to do it on the weekends. Many students and groups now have the rule when they come so Matthew and Monica don’t even have to say it... After that the situation calmed down. And today, the center does not have a single foreigner. From time to time there is a foreigner, but before the locals would stay there until midnight waiting maybe for a girl or a boy but now they think, staying at

home is better.” These two simple changes of transitioning from short-term to long-term volunteer programs and actively discouraging visitors from staying late at the bar helped simultaneously accomplish two of Matthew’s goals, limiting noise from partying at the bar and reducing the amount of money men in the community were wasting on alcohol instead of using it to support their families.

Unfortunately, limiting the party culture in town was not enough to put an end to Centro Sustentable’s struggles with sexual misconduct. Less than a year after Emily’s incident with Javier, Holly Anders, one of the core volunteers at Centro Sustentable, had a frightening encounter with an individual who came into her house in the middle of the night hoping for a lay, and then for a time, refused to leave when she told them to go. This time, however, the source of the altercation was from someone completely unexpected.

Set amidst this backdrop, the sense of community, shared purpose and trust that had been built between the team of individuals pushing Centro Sustentable forward was about to endure its most challenging test yet. At the time, Holly was finishing her third year working under a verbal agreement with Matthew and Monica as “co-directors” and “partners” in the business with the hope of securing legal co-ownership and profit sharing once the organization was able to generate more revenue than expenses each year, a goal that as a team they had been vigorously pursuing. Holly wrote about her experience to record and begin processing what happened. With her permission, I have included an excerpt below:

“By this time I loved the centro dearly as my home, and had invested years of labor into it. I had an excellent personal and working relationship with the owners, and

several new colleagues. The owners often described my boyfriend and me as their “little angels” because of how we had stabilized the community and made the business more professional and financially viable. But even though the business was starting to make money, it wasn’t financially viable for me or my boyfriend. This situation became extremely stressful, and that stress filtered into all aspects of my life. I felt really confused, and trapped.

One day I approached one of the owners, the husband (I’ll refer to him from here on out as “my employer” since that’s the simplest accurate description of his working relationship with me) in a fit of tears, confessing my insecurities and confusion about what I was doing at the centro. My boyfriend was away at the time, leading an educational group off-site. That evening I went back to my cabin and lay in bed, alone, in the dark. A while later I heard a sound outside the window, and saw my employer standing in the doorway. Even though it was nighttime and I was alone, I felt relieved, because I thought he was there to continue our conversation and offer guidance for my situation. Even though he had never visited me at night in that way before, I trusted him and believed he was there to help me. But he wasn’t. He was drunk, stumbled over to my bed, and lounged over me, asking for a kiss. I lay there, frozen and unable to think of what to do. It didn’t make any sense. This wasn’t the person I believed him to be. He was a mentor, a friend, an employer. He was someone I liked and admired, who I needed to like and admire me. He had control over everything in my life. I trusted him, in most ways more than I trusted myself, and for this reason had put so many of my personal and professional eggs in his basket. I told him, in a small voice, to go back to his wife and family, who lived in another cabin a 10-minute walk away. But he didn’t. He stayed there, sitting next to me on the bed, one arm crossed over my body, leaning in, asking for a kiss, over and over again, while I just laid there and quietly said no. Finally he rubbed my side, kissed my cheek, and stumbled out.

When he left, I was still in the same position I had been when he entered the room, flat on my back, with my arms plastered to my sides. I heard another sound, a fast paced tapping, and turned my head to see what it was. Then I realized it was my teeth. I was so upset, my whole body was shaking, and my teeth were chattering in my head, uncontrollably.

I am a tough person, and not easily rattled. And this story is not about sexual violence, nor did I ever once feel threatened physically. And yet, this experience, within this context, was so disturbing, and so emotionally wrenching, that it upset me to the core of my being, to the point where I froze so tightly my teeth chattered. It wasn’t cold in Central America. This was an embodiment of extreme anxiety. It was the pain and

pressure of discovering myself, suddenly, to be completely bound in another person's sphere of power, and then realizing they were willing, able, and ready to abuse that power in a way that was not in my best interest. If I had an affair with him, it would destroy our community and I would lose everything that was important to me. I trusted this person's character so deeply, I knew he wouldn't put me, or us, in that position. But here he was, putting me, and us, in that position. It was impossible to understand, and it just felt terrible."

Returning to the interview, Holly recounted how this terrifying experience impacted her. Her voice steady, she could be heard clearly above the cacophony of the jungle which spread out below our perch nestled against the mountainside. "That situation created a lot of professional and personal problems for me because after that point I was very upset and I felt really isolated, because I didn't know if I should say something because I felt like if I said something that it would end our community and our business... So I didn't say anything and it kind of isolated me, I think emotionally because I've had this big trust issue, which wasn't just about that situation, it was a realization that this person might not be working in my best interest overall. And I had just made this huge commitment to someone who had all this power over me and who very well might be abusing that power."

"Matthew..." Holly continued, then hesitated before finding her words, "Matthew has a history of having affairs with interns, which has caused a lot of problems in this community. My understanding is from what he and Monica, his wife, have said is that the majority of that happened in the first few years, or like right before Sam and I arrived. I got there while she was pregnant, and I know that's been really stressful and that there were groups that came through here where people were extremely disturbed by that behavior... because Monica had dealt with her husband's affairs in the past, she was at the point of leaving him if he had another affair. And

so she actually knew that something had happened, but she didn't know what it was and she didn't talk to me about it either. And so it created, like within our community, I was really isolated from her and Matthew. And then she was also not knowing what was going on with the most important relationship in her life. And so I think it just created this sort of dark river of distrust, personally that I never recovered from in those relationships.” In that instant, the strong bonds of mutual trust the team shared were severed by hairline fractures that left the group appearing whole from the outside, but internally created invisible chasms separating individual members (see image 10.1).

Image 10.1 Whole but Broken, Pueblo Arboles Costa Rica



In trying to understand how the incident was handled in the aftermath and what could have potentially been done differently to reduce the mistrust that festered over the years to come, I asked Matthew to reflect on his own actions, not just during the night in question, but in the days, weeks and years that followed. Of interest, Matthew admitted that it was not until several years later that the altercation became public knowledge. Matthew explained that in the days immediately after he had arrived uninvited in Holly's home, "I thought that at that point I was gonna lose everything.... I was scared to lose my child and my partner and everything, which if Monica had found out at that time, that's exactly what would've happened.... So I asked Emily if she might even need to tell Monica and she said, "no, I don't.""

In Matthew's fear, he pleaded with Holly not to tell his wife, explaining that if she did, his wife would leave him and he would lose his daughter. Essentially, Matthew asked Holly if she wanted to destroy his family, framing it in a way that suggests it would have been her fault if that was to happen. Interestingly, Matthew's scramble in the aftermath of this incident, in a similar way to the case involving Emily, demonstrated that his responses were centered on self preservation to the point of excluding his capacity to seriously consider the potential ramifications for the victims involved. When asked about both incidents, Matthew's reflections centered primarily on the potential negative consequences that may have occurred if either Javier had been fired or his infidelity became public in the immediate aftermath of his attempted affair with Holly. In contrast, Matthew shared relatively little with regards to how those incidents might have impacted the women involved or what could have been done in the aftermath to reduce or mitigate the harm they experienced until specifically asked to do so.

Holly's reflections about the experience, on the other hand, in the immediate aftermath demonstrated precisely the opposite. After Matthew told her what would happen if word got out about what happened, she became hyper aware that if she told anyone, even her partner, that everyone in their little community would likely find out and that if they did, it was likely that the entire organization would implode. In an effort to preserve the life she and Sam had carved out for themselves in Costa Rica as well as the organization as a whole, she suffered in silence and delayed seeking help, guidance or counseling for years. Instead, Holly focused all of her energies on developing formal decision making structures, pushing for legally binding agreements and contracts and promoting better forms of communication at the centro.

In continuing her story, Holly next shared:

“Then professionally, that was the thing that I really never saw coming. Just because the way everything works at the centro community is, it's like, very informal. It's very subjective. Like, there were no written agreements and so it was kind of all based on how Matthew felt about everything, for all these decisions. And so suddenly he didn't want to be seen with me for fear that people would think we were having an affair. And so I became isolated from him in terms of my work and talking to him and like, so it kind of distanced him from understanding what I was doing as an employee. And it just, it created a lot of tension. And at that point I started pushing too. I realized I had to legalize our agreements because I was in this terribly vulnerable position and so I began pushing for a legalization of our agreements, pushing for us to talk about communication and talk about gender. This is when I started doing the strategic planning for decision making and for developing our vision/mission goals. I really believed that we could all get on the same page and work through things without having to talk about this, which was absolutely wrong. We had to talk about it.”

In the two years that followed Holly was successful at making her case and pushing to create more formal structures at Centro Sustentable for making group decisions including the development of the core team to share power and responsibility over respective areas of expertise, introducing the practice of nonviolent communication⁹ and instituting a weekly community check in meeting to have a space for resolving interpersonal disputes and share any issues people might be going through. Holly referred to this as a “circle meeting”. On several occasions she shared with me that Centro Sustentable does a great job with “square meetings” where there is a defined goal and objective and the focus is on efficiency and accomplishment. Dealing with social conflicts, emotional stress and discussing things like misconduct, on the other hand, were areas where the community really struggled.

Sarah James, one of the other core team members, described the centro culture in a slightly different, yet complimentary fashion. “We had this like strong rooted, we do hard work, we get stuff done attitude. We don’t just lay in hammocks and dance around in the forest. We are less, “woo woo” than a lot of other places. Um, I mean the majority of people here, we have a very strong New England, like North East background... The um, the Protestant or Catholic thing. Sort of this, uh, we don’t talk about our emotions. We just work harder. Yeah, just work hard. And maybe if we have feelings that we don’t know what to do with, we work harder or you take it out in athletic events.” This strong work ethic has helped the organization advance their

⁹ “Nonviolent Communication (NVC) is based on the principles of nonviolence -- the natural state of compassion when no violence is present in the heart. NVC begins by assuming that we are all compassionate by nature and that violent strategies - whether verbal or physical - are learned behaviors taught and supported by the prevailing culture. NVC also assumes that we all share the same, basic human needs, and that all actions are a strategy to meet one or more of these needs. (Rosenberg, 2015).”

project in a number of ways, most notably with regards to the gorgeous naturally built structures that are now sprinkled across the nearly 400 acres the property encompasses. At the same time, their inability to discuss emotional and interpersonal issues with one another has clearly contributed to a pattern of sexual misconduct and abuse of power in numerous relationships, even if unintentional. Burying emotions through physical work and exertion only works for so long. It seems inevitable that at some point cracks emerge in the armor and those internal disputes begin spilling over into other aspects of relationships. This is not to imply that sports are a bad way to cope with stress and anger, rather it is to emphasize and clarify some of the reasons for why Holly might have struggled to discuss her experiences when immersed in an emotionally repressive culture, especially given they were tied to such a challenging and sensitive issue.

From the back porch of Sarah's home, a timber framed cabin built by a few of the thousands of hands that have contributed to this space over the years, a testimony to the love that has been poured into this land and why so many leave deeply inspired, blissfully unaware of the difficult challenges maintaining such a community entails. In this place, Sarah opened up about her experiences while we sat in handcrafted rocking chairs and gazed upon the forest's edge, searching for answers hidden amongst the trees dappled in sunlight.

As Holly began communicating more with her compatriots on the core team and discussing the types of changes she saw in how they made decisions and shared power within the organization, Sarah James reflected that her reasoning was infectious. "These are things that Holly made more apparent to me, which was like, that feeling of insecurity here. It also made me

realize another insecurity, which was like, what if Costa Rica decides to stop giving me a tourist visa? Like, I don't have a legal right to work here. But you know, it's a lot of things that have been said over the years, like, this is your home. You will always have a home here. This is your place. But wanting to have some sort of actual legal right to that, to realize that all of that is still based on when things are good, you know, it's like obviously there has been trust, we all went into this because we believed in it and we believed at least to some extent in each other. But when things come up, when things come up everywhere that challenge your belief that everybody is always going to be looking out for each other, it makes you realize like, oh wait, I don't have any actual, like this might be my home" Sarah paused for a moment and pointed all around her to emphasis the point "but I don't own any of it."

In reflecting on some of the options they considered as a group in order to address the team member's concerns, Sarah shared that "a lot of the conversations at different points was whether or not, could we parse off a piece of land for core team members? Which would also give us something if we needed to get out. And I think I've realized the importance of an exit plan in any organization and that these are best determined in the beginning when everyone's feeling good about each other. You know, I wish we spent two or three years talking about this. What is the structure? Like all these things, they just took so long to get there. And in the meantime we've invested so much of our lives and time into it and to this day it's still like, a piece of land is on the table, but nobody wants to do it. That has been a frustration for me. The inability to just say like, "No. It's not an option." Cause if we know what the options are, we can

figure out if it works for us and say “I’m in or I’m not.” But a lot of this slow decision making leaves you stuck in the middle.”

Sarah’s frustrations are understandable and while it is probably for the best that they did not divide up the land into plots that could be individually sold off, having a painfully slow decision making process can clearly leave members feeling in a state of limbo when left without clear guidance to inform their decisions. Sarah also makes an excellent point regarding the importance of designing these types of frameworks early on before an organizational culture is established. By the time this group began implementing organizational changes however, the business was over 10 years old and had developed informal systems and habits that had to be retooled and unlearned in the midst of running programs and hosting guests for nine months out of the year. In a situation like this, with the inertia of patterned responses reinforcing routines, it is much more difficult to institute rapid change, which may explain some of the reasons for why cultural shifts, even within relatively small organizations, can often take years.

I asked Matthew what lessons he learned from the experience and listened to his carefully worded response as we sat on the second story of a large timber framed house that at the time, I called home. It was raining steadily while we looked over the community soccer pitch and onto the cloud shrouded mountains in the National Park (see image 10.2). I leaned in close to hear Matthew’s words over the sound of the rain pattering on the corrugated iron roofing above our heads as he shared, “Something we thought about as an organization and had not done until the last couple of years, which was really to, to Holly’s credit for her pushing that piece. And really

making that a focal point and making us aware of it. A lot of it comes down to good communication. We've been working on that conflict resolution policy around sexual misconduct. And so we have been trying to address it more with our apprentices, build it into the culture here. It's a slow process of course. But yeah, it's something that we've been thinking more and more about."

Image 10.2. Cloud Shrouded Mountains, Pueblo Arboles Costa Rica



Matthew paused for a minute, deep in thought, and then continued, "We've done some short trainings this year to help the apprentices, with the basics of nonviolent communication, kind of tiptoeing around the first step of that and trying to figure out how to make this a part of

our everyday culture and create a space where people can feel like they can resolve conflict in an agreeable fashion and to learn how to communicate with people in a way that's not hurtful. I mean, there's so much to it. We still have a long way to go but it has become an increasingly important part of what we are paying attention to." When Matthew paused I asked if he was committed to continuing to try to promote and incorporate those changes into the culture of the organization and he responded that "Yeah. I mean, so yeah. How to do that is kind of the bigger question in my head, not whether to do it. How best to do that, and as we become a more refined organization that still has somewhat limited income revenue. Those become the bigger questions for us." As Matthew continued he paused between each word to emphasize his point, "how do we take on this really... enormous... project... and seamlessly incorporate it into this existing infrastructure without stressing human and financial resources? How do we do that? Like... Am I committed to making this a more harmonious, balanced, friendly, healthy place for all the people who interact with it?" Matthew proceeded to answer his own question, chuckling as he spoke "I mean, yeah, I don't know how to say it any other way. I feel like that's what I've dedicated the last 18 years trying to do, you know? Sometimes with great success and other times with abject failure. But those are, kind of the realities that we're faced with as an organization with limited resources as we keep trying to take on more and get better, but we're taking from the same pool of human and financial resources." Matthew paused before asking himself a peculiar question, "So how do we distribute that in a way that doesn't cannibalize the great work that we've already done? It's really important for me to recognize the limitations that we have, and to allocate limited resources in a way that allows us to stay relevant and continue to

do the work that we're doing while simultaneously, you know, innovating and growing and becoming better. So yeah, it's a tightrope to walk sometimes.”

Matthew's reflections demonstrate that he is aware of the challenges facing his business and that his goal is to develop healthier ways to resolve conflict and for everyone who interacts with the centro to have a positive experience. Matthew also clearly emphasizes the difficulties entailed with trying to change organizational policies and culture on the fly while continuing to perform as a well functioning team. As a result, Matthew explains that they are “tiptoeing” around the first steps of incorporating these changes into practice while hesitating to implement robust mechanisms to promote enforcement and accountability. As he mentioned, there is certainly a tight rope to be walked, balancing several competing demands at any given time and as Matthew's series of unanswered questions illustrates, he doesn't necessarily know the answers.

One promising strategy to help address these types of stalemates, which is practiced by many organizations on an annual or bi-annual basis, is performing a SWOT analysis, or a Strengths-Weaknesses-Opportunities-Threats assessment. Along with reviewing organizational Mission and Vision Statements and treating these as living records, reviewing these guiding documents on a regular basis can help teams highlight priorities, identify complementary goals and objectives so that limited resources can be allocated more efficiently in a way that is directly aligned with the group's objectives.

10.4 Mentorship and Cooperation in the midst of Mistrust and Heartbreak

In early 2014, while the emerging core team were deep in discussion with Monica and Matthew about how to improve conflict resolution and create formal structures for decision making, an important new character arrived on the scene. Sally Durand came to Pueblo Arboles to complete a six month apprenticeship at Centro Sustentable after finishing her degree in Sociology. Sally is a compact, athletically explosive young woman from California who is timid in large groups and still struggles with Spanish, but has an incredible talent for building with and sculpting earth. She explained to me that after finishing university, she “was fed up with the world and wanting to go do something different and gratifying.” Sally found out about the program online, applied and “randomly got in.” While completing her apprenticeship at Centro Sustentable, she and Dan Avery, the core team member from the UK, began a romantic relationship. By the time her internship was over and it was time to return home, Sally remembered “I was sobbing because I thought I would never see Dan again.”

As it turns out, Dan was planning to spend his time away from Costa Rica that year working for a friend running a permaculture project called Under Hill Farms in Massachusetts. While he was there Sally shared that “I decided to go out to Under Hill to see their project. Dan was working there at the time and so I went to see him. Um, and he was, like yeah, maybe you should come back. So Dan was slightly an influence on why I came back, but I also believed that I had more to learn and really wanted to come and experience it for a bit longer.” When Sally returned to Costa Rica in 2015 as Dan’s partner she found herself in an undefined role and at times, an uncomfortable position. She remembered that “the structure of the core team was kind

of just getting figured out at that time, and so it wasn't probably until the third year that things were a bit more defined for things like my time and my role and compensation.”

Interestingly, Sally reflected that during this time period, “I was in my second or third year here and trying to figure out what my position was, like I wasn't a core team member. I wasn't an apprentice, and I was trying to figure out what, what that meant. The people who made me feel most uncomfortable and had, like, power over me were Sarah, Holly and Sam to the extent that it was clear that they did not want anyone else really to be on the team... I think it was just at the time they were trying to figure out their roles and their compensation and the idea of someone else coming in and like, being on the same...” Sally paused and then clarified, “like, I didn't want to be on the same as them, the same level playing field cause I knew they'd all put in much, much more time than I had, but it was really difficult to navigate, like how to bring on a new person.”

By 2016, the core team was finalizing their agreements regarding organizational decision making. They decided to embrace an approach inspired by sociocracy¹⁰, using a combination of individual management over areas of expertise and practicing consent rather than majority voting after discussion as a group. While Sally was trying to establish herself on the team and avoid being known simply as Dan's “partner”, she could not have imagined the emotional toll this process was taking on some of her fellow teammates. Holly Anders shared that “around that time my professional relationship with Matthew had started to become really stressful and I realized

¹⁰ Sociocracy is “a method of governance that gives people the power to consent and object to the conditions under which they live and work (Buck & Villines, 2017).”

that I needed to say something to the rest of the team to explain why it was so important for me to finalize our legal agreements... So I sent Matthew an email telling him I needed him to let Monica know, because it was affecting how I felt our power dynamic was developing. And at the time he was very upset about that.”

While Holly was preparing to tell her partner and the rest of the core team what had happened between her and Matthew in an effort to explain why it was so important to her to finalize their legal agreements, the unthinkable happened. Holly discovered that her partner, Sam, had cheated on her with an intern at Centro Sustentable, which she discovered after finding lurid text messages between them on his phone. She could not believe what was happening. In the aftermath, she simultaneously attempted to salvage what was left of her relationship with Sam while finally opening up about what had happened between her and Matthew years earlier.

Sally Durand, who was still unsure of her position on the team, recalled when Holly first brought everything to their attention. “I think that Holly could have, she didn’t tell anybody, till like six years later and when she came out and told people it was, I dunno, it just seemed like it could have been handled better. Like we would have all, we all would have supported her through this. And if we had known that was how she was feeling, I think things would have been, could have been resolved, but she didn’t tell anybody about it. And then it just kind of blew up because she didn’t tell anyone. And then she told everyone like six years later and it came right after Sam had cheated on her with someone else and it was just like chaos. And I...” Sally paused while considering her next words, “I can see how she would feel like, because of

that somehow Matthew wasn't letting her have decision making power. But I also truly don't think Matthew would've done that."

Navigating transitions like these in team membership can be challenging under the best of circumstances. For Centro Sustentable, the added burden of coping with the growing mistrust between certain members and lack of clarity that team members had regarding individual roles and responsibilities compounded these normal growing pains into something much more serious. The levels of miscommunication, between Holly and Sally for example, highlight how the incidents of sexual misconduct that Holly went through, created an invisible barrier between the two women that prevented their ability to understand or truly empathize with each other's distinct, yet interconnected predicaments.

Holly Anders admitted that personally, her own ability to be a mentor for the women under her, such as Sally, had been severely impacted by her dual experiences with Matthew and Sam. In Holly's own words:

"So basically over this time period, I developed a huge amount of social anxiety, and a lot of that was coming from the fact that I was living, you know, I had this personal trust issue with Sam and a personal trust issue with Matthew, But then I was also hosting young women as interns and students that at any point could be a threat to my home and my relationships on multiple levels. You know, if Matthew was sleeping with someone, or if Sam was sleeping with someone, it felt incredibly risky. And all this time I still hadn't talked about it. And so I developed a lot of very serious physical reactions and anxiety that I had never had before. But it happened slowly over time so I didn't really realize it was happening... And so I think from my end, a really important part within these communities is that, when you're living with your partners and your colleagues and your partners are having affairs with your students it creates a huge amount of emotional fear. And I think it truly prevents women in an instructorship role from connecting with

and mentoring younger women that are coming as students. It prevents those female students from even seeing those women as reputed mentors or teachers because they're so clearly not respected by even their own partners. So I think on a professional level, it's incredibly damaging, especially within these communities. And that has to do with personal relationships and trust. And I think we tend to completely divide professionalism from the personal, but in a community where you're living and working together like this, you simply can't. They have to be intertwined. And if one is a part of the other, how you live your life personally is part of your work and how you're working is a part of your life."

Holly's reflections demonstrate that during the same period that Sally was struggling with finding her own place at the centro and feeling pushback from other members, including Holly, about her position, Holly herself was dealing from immense trust issues that caused her to perceive other women as threats to her own home and livelihood. This tragic example underscores Holly's point, that in intimate community settings where coworkers are also housemates and your closest friends are also your boss, there is no boundary between the professional and the personal. Keeping this principle in mind and developing guidelines and policies early on that are designed to emphasize this point seem crucial for maintaining healthy partnerships and effective teams over periods of years and decades of collaboration.

After Holly found out about the affair between Sam and one of their former apprentices she left Costa Rica for a time to figure out her next steps. In reflecting on the time, Holly shared that at this point, "I'd been with Sam for eight or nine years at that point, so I decided that I wanted to try to do everything I could to make the relationship work, and if it didn't then it didn't. And in hindsight I think that worked well for me in a weird way. So I asked Sam, to do self reflection on why he had his previous affair. And so he did some of that and so we started to

try and build trust.” When Holly came back to Centro Sustentable to try and make things work, “I was so nervous about being at the centro and talking to Matthew that I literally changed my name to Molly. It was pretty extreme as far as things go. But it was 100% for psychological self protection because I felt like I could no longer engage with people at the centro. But I was so afraid that if I wasn’t at the centro, Sam was going to keep having affairs. And so I decided to come back as Molly.”

I asked Holly if someone had suggested the idea of taking on an alternate persona as a form of psychological self defense and whether or not the practice had been helpful. She shared that when it came to changing her name, “I just came up with that one. I’m a problem solver. Yeah, and it works to a certain degree... That said it didn’t take my anxiety fully away. It was bad. I mean I had, it was very painful, even physically. When I was back in the states that year I was convinced I had lyme’s disease because, you know, lyme disease can make you have these weird pains in your body and I was even going to a doctor for it. It was really, it was a serious time. After that year Sam and I went away on a long bike trip together... I started the bike trip by myself and then he came in and joined me and it was really a great time for us. And at the end of that trip, Sam came back to work the rest of the year and I decided to formally resign from the centro. And once I formally resigned I felt comfortable being myself again. That was the moment, it was just like instantly I began to feel better. It was just such a relief. So that’s when I changed my name back to Holly.”

Holly's decision to adopt an alternative persona as a coping mechanism to deal with the social anxiety she felt when returning to the community where she had once felt so much joy, marked an important turning point in her relationship with Centro Sustentable. Clearly such dramatic action was not sustainable or healthy. The compounding issues gnawed away at her sense of confidence and inner peace in the same way swarms of locusts and grasshoppers devour new plant growth (see image 10.3). By mid 2018 the team had finalized the new contracts and they were just waiting on the organization's lawyers to finalize changes in legal ownership and provide each of the core team members with equal shares based on the total amount of time they had spent working at Centro Sustentable. Monica and Matthew had largely moved past the explosive news that emerged a year earlier, while Holly and Sam seemed to be recovering in their relationship as well. Holly finally felt some relief when she decided to resign from her post, and after Sam finished up the season they were planning to begin looking for land of their own where they could homestead and start their own farm or community. For the first time in what had felt like years, Holly said she began to feel hope again for what the future might bring.

Image 10.3. Swarm of Arthropods Devouring Young Vegetation, Pueblo Arboles Costa Rica



After Sam returned to Pueblo Arboles, Holly confessed:

“We were planning our life. We had new jobs lined up at another place in Costa Rica. We talked about homesteading. He asked me to marry him. And so we did a lot of talks about marriage and life together, and I had him do some more self reflection on his path to care and he was writing about why he would never do that again. And...” Holly paused to collect herself before bursting out, “It turns out the whole time he’d been sleeping with this 25 year old intern. And the thing about that, like there’s the personal element of dishonesty within a personal relationship, but there’s also the professional element of you overtly lying to everyone. He lied to all of the other apprentices about it. He lied to me about it. He encouraged her to lie about it so she was lying on his behalf so that he would not get found out. He was not planning on telling me and so, she was just his mistress... And so it’s just like these multiple experiences of really unhealthy intimacy. Like it’s intimacy that’s not in the best interest of the people involved... I mean, I think this is a damaging type of relationship, and you know, I think it’s just really confusing for women too, because I think that she really wanted his admiration and I think she wanted a long term relationship with him, from what I understand. And that is just damaging. It’s emotionally damaging. It’s not the way to have community and it’s not the way to have a business like ours. And I think that’s at the core of the biggest problems at Centro Sustentable is how men have this idea of masculinity and of treating women in a way that’s not in their best interest.”

Once Sam’s second affair became public, there were no more opportunities for reconciliation. It was the final blow to this group who had spent the past decade building a community and business together. Over the next six months, three of them would leave. For Holly Anders, Sam Hollingsworth and Sarah James, the cumulative struggles were simply too much to bear. What had once felt like their forever home had become a foreign and uncomfortable place. It was time for a fresh start. With nearly half of the core team departing, the founders, Matthew Ryan and Monica Torres, along with their sole remaining partners, Dan Avery and Sally Durand, were left to pick up the pieces as they struggled to figure out what they would do next.

10. 5 Lessons Learned:

Research questions addressed in Chapter Four:

Do these small scale community initiatives represent fascinating, yet culturally bound projects that are small scale and non-replicable, or is it possible to identify scalable patterns within cases that can be used to guide agricultural and social development in larger populations? Are there identifiable social processes and procedures that can be replicated in diverse contexts to address interpersonal conflicts, improve group decision-making and promote effective forms of cooperation?

In this chapter I covered a number of serious issues related to alcohol and drug abuse as well as sexual violence and misconduct. Pueblo Arboles is not exceptional in this regard, but rather the experiences here illustrate how the pervasive challenge of abusive sexual relationships can be allowed to perpetuate even in communities that espouse a commitment to gender equality and social justice. To consider how the observed findings address issues related to identifiable social processes and procedures that can help groups overcome these forms of destructive behavior, in the section below I have attempted to summarize some of the key lessons and takeaways from the experiences observed in this chapter.

The stories heard in chapter four demonstrate many of the ways in which alcoholism and sexual misconduct often contribute to one another, creating destructive feedback loops. Independently, either threat has the potential to place strains on social relations. These scenarios do not occur in isolation, however, and as was observed in cases involving both Javier and

Matthew, it was the combination of intoxication along with a personal inclination towards sexual promiscuity that led to some of the most explosive episodes in the history of Centro Sustentable. In the context of tourism, these types of behaviors can increase the number of opportunities for negative interactions between locals and foreigners, promote excessive consumption from a wide range of local actors and produce far reaching consequences to human and social capital for community members and visitors alike. It is difficult to evaluate how tourism may have impacted rates of domestic violence in this community, but it is clear that the numerous instances of transgressions that have occurred from centro staff, including one of the owners, has undermined their capacity to serve as a model for alternative behavior in this regard or champion these changes in the community.

When Matthew and Monica set out to found Centro Sustentable, they did so with an enormous amount of ambition and idealism. Although they set out with the intent to avoid repeating past mistakes and to break away from what they saw as the broken and unsustainable patterns found in mainstream society, while making the break and laying the groundwork for something new, it is crucial to remember that everyone brings their own emotional baggage along with them. The traumas and emotional toils with which every human struggles, are not left at the door when entering a new home or job. If we choose to ignore these histories and fail to create spaces for expressing and resolving fears, doubts and concerns, then those issues are likely to fester and worsen over time. By recognizing that all people bare emotional scars and suffer from personal shortcomings, groups can prioritize developing mechanisms for responding to and

addressing these issues as they arise rather than waiting for them to explode into something chaotic.

In the case of Pueblo Arboles, short term volunteer programs that encouraged visitors to rotate through the area on a regular basis, proved to be a recipe for disaster, as demonstrated by the fact that all local businesses have since eliminated those programs. It is no surprise that the loose structure and limited commitments offered by short term volunteer programs would attract a transient crowd with little concern for the well-being of the broader community. After all, with no personal connection or long term relationship to the area, those individuals were likely to see themselves as just passing through. They had little to no investment in what was left behind after they were gone. By switching the focus of these programs to long term apprenticeships that were six months or longer, multiple organizations reported seeing substantial, positive changes emerge in the types and quality of applicants as well as in the ways those visitors interacted with the community. It is easy to imagine that as a volunteer, if you were planning to live in a small rural community for an entire year, the way you would think about your actions and the potential consequences are likely to be considerably different than if you were leaving in a week or less.

When Centro Sustentable decided to change the drinking culture within their organization and began emphasizing that shift within their communication and the expectations that they articulated to guests, they were able to facilitate a dramatic change in the drinking culture not just internally, but also in the broader community by getting the other local businesses on board with modeling similar practices. It stands to reason, that in a similar way it may be possible to

guide the development of new norms in the community regarding sexual abuse and domestic violence if Centro Sustentable were to make similar changes in this regard internally while actively encouraging other community leaders to do the same.

The example of sexual assault from this chapter highlights the importance of principle six of the prosocial framework, establishing fast and fair methods of conflict resolution (Atkins et al. 2019). Whenever there is an accusation of sexual assault or other serious forms of misconduct, in order to prevent feelings of injustice or resentment from festering, these instances need to be taken seriously, thoroughly investigated and dealt with in a transparent and responsive manner that focuses on supporting victims recovering from the damage caused by these types of behaviors (Atkins et al. 2019). In the aftermath of the incident between Emily and Javier, for example, it was apparent that Monica and Matthew placed at least some of the blame for what happened at Emily's feet. Regardless of whether or not a decision to punish those involved is made, in order to promote healthy forms of conflict resolution it is imperative that accusers have the opportunity to be heard, have their claims investigated and that they be protected from repercussions for speaking out. For organizations like Centro Sustentable, who operate in communities that lack social institutions designed to help resolve these disputes, organizational partners should have policies in place and develop institutional capacity for responding to and mediating these types of conflicts if they hope to preserve and strengthen those relationships over time.

As several participants mentioned, decisions regarding how to respond to interpersonal conflict can have far reaching and unanticipated consequences. This is exactly why building robust protocols for resolving disputes is so important. Although Atkins et al. (2019) suggests that responses to hurtful behavior should become gradually more severe, what seems most important in this process is that victims are not ignored or left in the dark about what is being done and how the situation is being handled. There needs to be swift efforts that address individuals concerns, support healing and when possible, promote reconciliation.

Developing policies and institutionalizing responses that promote accountability in the face of these types of incidents are crucial to prevent potential abuses of power. As Holly reflected, in a setting where there is no separation between personal and professional relationships, promoting integrity and personal accountability are crucial in order to prevent toxic forms of intimacy. In order to prevent corruption and ensure accountability, protocols should be put in place to trigger external reviews or hold administrators accountable so that responses are not entirely subjective and based on the individuals involved rather than the evidence and severity of the accusations at hand. Without clear outlets for reporting issues and resolving conflict in a clear and transparent manner, results demonstrate that mistrust appears likely to fester over time.

Romantic relationships between co-workers and even more so between instructors and students, have significant potential for developing into unhealthy and damaging forms of intimacy. Trying to outlaw or prevent these types of relationships from cropping up may very

well be impossible considering that the very forbidden or taboo nature of certain actions can make them all the more appealing to some individuals. Instead, possibly the best thing organizations can do is to make sure that individuals are transparent and open about the relationships they are in, and for those in positions of authority to remove themselves from decisions involving someone they are romantically involved with. In addition, it can be a productive and useful exercise for teams to work as a group to collectively create a community agreement that establishes mutually agreed upon expectations for individual behavior and have everyone sign it. These types of exercises can help clarify to members what acceptable behaviors look like as well as what are the expectations that members have of one another. This practice can reinforce positive social dynamics, promote empathy and compassionate understanding and reduce the likelihood that toxic behavior will be allowed to go unaddressed (Christian, 2003).

Finally, as Centro Sustentable attempted to respond to the emerging concerns being raised by core team members they exhibited a form of organizational paralysis. As Sarah James reflected from her experience, when core team members were beginning to negotiate for a more equal distribution of benefits, a lack of clear communication from the owners often left at least some team members feeling uncertain of what their choices really were. This example highlights the importance of principle two of the prosocial framework, establishing a fair distribution of contributions and benefits. Eventually, a lack of clarity and progress made on these goals appears to have led to a breakdown in trust and lack of confidence that changes were happening to the legal structure of the organization in the way the owners had promised it would. This type of stagnation was fostered by a painfully slow and ambiguous decision making process. The lack of

apparent changes taking place prevented some members, such as Holly, from feeling there was a sense of resolution to the issues she attempted to address, even as she felt forced to re-confront the same situations repeatedly, oftentimes for years before realizing the changes she sought. As a result, many of the types of problematic behavior continued unabated while challenges for at least three core team members grew into insurmountable barriers. In chapter five, I conclude the dissertation after examining the most recent steps taken by Centro Sustentable to rebuild and grow from the experiences highlighted in the stories above.

“You may encounter many defeats, but you must not be defeated. In fact, it may be necessary to encounter the defeats, so you can know who you are, what you can rise from, how you can still come out of it.”

-Maya Angelou

End of Chapter 4

11. RESULTS CHAPTER FIVE FOUNDATIONS FOR COMMUNITY

In chapter five, we return to the overarching research question, some of the original motivations, and central themes of this dissertation. First, to refresh the reader, how do underserved communities seeking to explore alternative pathways organize themselves and collaborate with external partners to successfully develop and maintain initiatives? Although this dissertation dedicates considerably energy to exploring topics that may at first glance seem unrelated to how humankind will grow and produce food, in reality, as was highlighted earlier in the dissertation, the most challenging aspects of creating sustainable food systems have always been in developing and maintaining healthy and resilient social relations and value chains that are free of exploitation. If we are to have any chance at meeting international objectives for mitigating the social and environmental consequences of anthropogenically induced climate change, it is imperative to identify and grow viable alternatives to the global food system upon which we currently depend. Arguably the biggest distinction between experiments in alternative systems like those being developed in Pueblo Arboles and the global food regime, relates to their pursuit of cradle-to-grave and circular economic concepts introduced at the beginning of the investigation. A key feature of alternative systems is a focus on breaking away from this linear model and instead embracing the type of cradle-to-cradle thinking and closed loop system design that is the quintessential feature of natural systems. Because the development of these systems is a knowledge intensive and contextually specific process, they inherently require the presence of long term partnerships to establish and maintain. To be truly sustainable, communities will need to figure out not just how to cycle nutrients in the soil like Nitrogen, but also how to preserve and

reinvest the human and social capital being generated through coordinated action, education and friendship.

I begin addressing this question by examining some of the most recent steps taken by Centro Sustentable to rebuild and strengthen their organizational structure in the aftermath of experiences highlighted in the stories above. After considering Centro Sustentable's most recent steps and hearing an update on how they are currently fairing with external stressors such as the Coronavirus Pandemic, I then consider the capacity for the organization to maintain continued resilience in the face of both external and internal stressors. In considering some of the important lessons learned, I identify six key patterns observed in this community that appear to have played important roles in promoting both their successes and failures. Before concluding the dissertation I summarize important contributions and limitations of the investigation, discuss the generalizability of findings outside of rural Costa Rica and underscore the critical need for further research into these topics.

11.1 Picking up the Pieces:

For Centro Sustentable, a big part of moving forward entailed healing the relationships between its founders, Matthew and Monica. After Matthew was forced to tell Monica about his attempted affair with Holly, they spent the next three years rebuilding their partnership. As she and Matthew worked to reconcile the past and take their next steps together, I asked Monica about what she needed to forgive Matthew after what happened and if they've been able to restore trust. Monica reflected that when it comes to forgiveness, "I need to give it and hope that

the gift is received and taken to heart and creates a change. But you can't give it with contingencies. You have to just give it and then see what happens because no true gifts come with contingencies." Monica went on to explain that if she held onto the hurtful things others have done to her in the past, "it would cause problems internally. And it would create negative feelings and negativity. Whereas the forgiveness, for me, releases my attachment to it." Trust on the other hand, Monica said, was different. To rebuild trust, "the person has to do it. I mean, like they have to demonstrate it, you know? For example, if for the next 10 years, no more fires are started, then you know, I'll trust that Vinny won't start anymore fires."

In 2019, the year interviews were conducted, Pueblo Arboles had suffered from four separate arson attempts (see image 11.1). Fortunately people from all over the community had volunteered and jumped immediately into action, connecting dozens of hoses, creating bucket chains and teams with hand tools to create breaks between the flames and additional sources of fuel. In these instances, the community demonstrated another form of resilience. They were used to relying on one another and proved more than capable of banding together with only a moment's notice in order to successfully put out the flames each time before any structures were threatened or significant amounts of forest were lost. Monica might have already forgiven Vinny, the person responsible for starting those fires, but it will be a long time yet before she even begins to consider trusting him once more. In contrast, the fires he started may have had the surprising effect of strengthening trust between other community members. The last fire hadn't been since 2012, but after successfully defending the town from four wildfires in 2019,

community members across town expressed confidence and pride in their ability to defend the town, highlighting the potential value in accomplishing difficult tasks together.

Image 11.1. Forest Fire Survivor



After sharing the example about Vinny, Monica summarized some of the major lessons she learned while dealing with her husband's infidelity and working to preserve her family. Monica reflected that "a huge thing that I've learned is that you can't control other people's reactions to things. It's like, that's their personal baggage or their personal way of looking at

things. And like, in *The Four Agreements*¹¹ that is something that I really learned. You can't take it personally. You do your best, and the person's reaction to it is based on, you know, their history and everything and it's their way of interpreting it, and you can't take it personally. And obviously, you know, Holly's reaction to it was because of something that Matthew did, but it might be different, it would be different for every person that was involved with it, because of personal circumstances and what have you. But what you can control is how you go forward and how you deal with it and how you learn from it. That's what you can control. And you know, we've gone through that, we're past that, it's water under the bridge. You know, it's something that happened years and years ago, and obviously it wasn't dealt with then and should have been, but it wasn't. So it's done, it's over and you know, we're moving past it."

Based on Monica's reflections, she seems to reflect a remarkable capacity for forgiveness because she recognized that by withholding forgiveness from those who wronged her, she was ultimately just hurting herself. Matthew, she explained, was not able to let go so easily:

"Matthew has, you know, spearheaded trying to make sure that this doesn't happen again. But yeah, I think it's just his guilt, and like, he has to get through it but I think, he hasn't been able to get past it yet for whatever reason. He is almost there, but you know, it takes him a long time. He thinks about it. You know, he said he's thankful for Holly pushing him to be a better person and he's learned and he's totally changed. Who knows what's going to happen in the future but it's obvious that he tried to change the way he thinks and acts, and I've seen it. And I think something that Matthew hasn't fully grasped yet is that it's in his control to put it behind him and move beyond it. I think he'll get there, but it'll take him a lot of time."

¹¹ The Four Agreements is a self-help book based on ancient Toltec wisdom that advocates a simple code of conduct for overcoming self-limiting beliefs: 1. Be impeccable with your word. 2. Don't take anything personally. 3. Don't make assumptions. & 4. Always do your best (Miguel Ruiz, 1998)

In Matthew's own reflections, he admitted that at the time he did not think there was a culture at Centro Sustentable that was perpetuating problematic behavior, "but I also learned that, you know, oftentimes you go about your life and you think a certain way and you can't see the trees through the forest." Matthew then proceeded to ask himself, "Is that the right way to say it? You know, I could be choosing a male for an opening in the core team and feel like in my head, I've gone through my due diligence and in, considering all possible candidates yet, until recently I didn't really understand that I may have been, taught, educated and raised in a certain way that didn't allow me to easily see my own implicit biases. So if nothing else, I realized that I'm not sure of anything I believe in, which has been quite disconcerting to me as a human being, I am kind of already wishy washy as it is and now not to be able to feel confident about anything that I believe in, that's been a really tough process for me to engage in and embrace. Cause I feel like now I'm uncertain, much more than I have been about the choices I made in life and, so I'm working through that stuff. But it has also allowed me to see that absolutes aren't my..."

Matthew paused to think before finishing, "aren't my cup of tea. I guess I just, anytime I hear someone say something with that absoluteness attached, I immediately draw away and pull back... I just feel like life is a process of learning, that, what you see might not be the way that other people see it or might not be the best way to see it." Matthew's insights indicate that because Holly forced light onto the issues between them and encouraged Matthew to look inward as to why the incident had occurred in the first place, he has undergone a real growth in perspective. His newfound sense of uncertainty might be unnerving, but by interrogating his biases and embracing the subjectivity of his own experience, he also exercised a crucial form of

psychological flexibility that is a fundamental process in expanding one's capacity to empathize with others (Atkins et al. 2019; Donald et al. 2008; Heppner, 2008; Lakey et al. 2008). Findings from positive psychology suggest that emotional and cognitive openness can help people use their attentional flexibility to focus attention towards opportunities that allow us to put values into action. Recognizing that everyone possesses both unique and incomplete perspectives, with time should help Matthew develop a more compassionate reaction towards the perceived shortcomings in both himself and others.

In an illustrative example, when I asked Matthew if he had any words of advice to other men based on his experience, he shared:

“For me the turning point was Cal, one of my close friends. Cal helped me just look at it from the standpoint of like, you get into a relationship, then you have emotions, hormones, alcohol, and whatever else, all of that. He explained that they all encourage you to act in a certain way, and most of the feelings, at least at the time feel pretty positive...” Matthew paused to ask himself again “Is that the right word? But it's like, it feels good, you know? But as soon as you think about the impact that you're having on other people, that was, I mean it sounds obvious. It is so obvious, right?” Matthew asked rhetorically, then continued, “but you're feeling, whatever it is you're feeling, blessed or passion or whatever it is that is releasing some endorphins into your body and making you feel good. As soon as you put it into the context of, making somebody sad or devastating somebody's emotional state, then it's like, wow, wait a second. That no longer sounds so good. Like, I feel I've based my entire life on trying to help people and, to be good to people, and those situations never end up producing long term positive results in happiness on the other side and usually not on either side. It just leads to pain and destruction.”

Matthew's words of wisdom here may indeed seem obvious, yet many of the world's greatest discoveries seem equally so in hindsight. His simple yet powerful realization holds one

of the keys to breaking multi generational patterns of violence and repeating cycles of trauma. By shifting his association of positive feelings away from the present moment and instead focusing on what the future repercussions of those actions might be, he ruptured the relationship between ideas that were likely to lead to negative consequences and the endorphins those actions would have brought in the moment. As discussed earlier, this type of behavior reflects a form of psychological flexibility that emerging research in the field of contextual behavioral science has recently reaffirmed is one of the most important psychological processes for aligning individual behavior with personal values and beliefs (Atkins et al. 2019). As the example from Matthew demonstrates, one of the important ways that psychological flexibility helps foster prosocial behavior is by shifting attention towards the long term implications of actions.

11.2 Goals for the Future:

In an effort to personally move forward, Matthew shared that now, “I am just trying to honor my agreements. I am trying to be a good person, obviously not allowing anything like that to happen again, which hasn’t, and which hadn’t happened for a long time before that. It was eye opening for me, going through this process of being raised as a white privileged male and all that meant in high school and in college as an athlete, and just kind of a way that I was taught to see the world, and then having that all turned upside down and having to go through this, you know, pretty long learning process of, seeing the world through a different lens, and that continues to happen today. And yeah...” Matthew paused for a moment to gather himself, “Jeez” he sighed then began again. “For me it’s a combination of things. I don’t want to belittle male tendencies

and alcohol and all that. That all has real destructive consequences when left unattended. And I don't want that to happen again. So I've tried, you know, I've tried to change my behavior, the ways that I interact with everybody. My partying days I think are behind me for the most part. I enjoy alcohol, but I don't drink nearly as much as I used to, maybe in part because I'm getting older but I think a part also is that I recognize the weaknesses in myself that occur when I have too much, and..." Matthew paused for a moment to sigh, expressing his self disappointment. "Yeah, it all ended unfortunately with Holly getting hurt in the same way that she had been trying to help me avoid repeating, and yeah, you know I wish her the best. I'm sure she's gonna be stronger as a result... I just, I can't beat myself up over it anymore. I can just try to create a culture that doesn't allow that in the future."

Over time the team at Centro Sustentable has learned that they can't force their own ideas or suggestions onto the community and that when it comes to sustaining relationships over the long run, sometimes less is more. When I asked Dan Avery what lessons he had learned from his time living in community, he replied that "I think one of the things that I've learned over time is the impact that individuals can have on the community. I think of how long it takes to build trust and how quickly it can be eroded, and I think, I guess one of the things I've been thinking about a lot is how important it is that we are reliable and steady rather than, I think in the past we've been drawn to kind of glitzy, glamorous things, like building the new bus stop at the school or buying the lawn mower. But I think ultimately the things that really develop the community and improve it are the fact that we are continually here year in and year out and people know that they can rely on us for whatever it is. Whether it's like pumping up their tire if they've got a flat

or borrowing money, or selling us something that they have or coming over and talking to us about their wife who took everything that they have, or I mean, whatever. I think those things just take time, and I think Matthew and Monica have put in the time and, now we get to reap the rewards from it in a way, in a way that is quite unique and that I am grateful to be a part of.”

Dan may have a good point with regards to the slow and steady approach. Real change comes from within and as foreigners, perhaps the best role they can perform is that of a helpful and reliable neighbor. By modeling the types of relationships and systems of support they hope to see elsewhere without the expectation that others will follow, they can help inspire those who are interested without creating animosity with those who don't share their vision. For this reason, Dan is placing more of his energy into inspiring guests and visitors than trying to change the town of Pueblo Arboles. “We can't worry about the other seven billion people on Earth because we can't do anything about it. But what we can do is change this community here, and this community influences the communities around us. We can be a positive model for people who want to change. Cause at the end of the day, people have to want to do something if they are going to do it. By coming here, they are demonstrating that they want to, you know, make those changes.” Interestingly, when I asked Dan if he could describe his strategy, he summarized it as follows, “Just trying to be here. Say here we are. If you're interested come find us. We will show you, show you the light.”

Dan's presumption of being in a position to show others the “light” is another example that illustrates how as an organization, they still have a lot of growing pains to overcome before

they will entirely rid themselves of their destructive tendencies. While there has been significant growth over the years, Dan's personal reflections demonstrate a continued lack of awareness regarding just how serious some of their struggles as a group have been. Rather than considering the lessons they still have to learn, when I asked Dan how he tries to move forward with people after instances of betrayal, he responded that "you just move forward. It's in the past and what's the next step is whatever's next kind of thing. I think one of the biggest things that holds back communities and at least from what I can see holds back this community a lot is holding grudges. I don't think that ever ends up being a positive thing. So I think that what we can do is try to not be part of that and to try and just move forward and understand that people make mistakes, and sometimes they do things which they shouldn't do and that's just life." Dan concluded by leaving a series of questions unanswered, "What are you gonna do? Are you either gonna never talk to that person again or are you going to decide to move forward and continue to work and develop, as a community together? I mean there's been things that have been bad and regrettable for sure on both sides, but that's just life, you know?"

While Dan is partially right and echoes Monica's own reflection that holding grudges can be personally harmful, he does not appear to consider why others might have a difficulty letting certain things go or what is needed so that individuals can reconcile their differences. At the same time, by framing the issue as having "two sides" rather than considering everyone as being part of the same team, he perpetuates a divisive narrative. Although an attitude of moving forward and not taking altercations or disappointments personally can be a healthy way of responding to stressful life events, assuming that everyone else should be able to respond in a

similar way can create additional stressors, especially in a tight knit community where professional and personal boundaries are non-existent. Such an expectation is unrealistic unless it is something that all community members agree to and clear options are in place for resolving disputes in a timely and transparent manner.

In thinking of what that future might look like, I asked Monica what she hoped to see in the next 10 years at Centro Sustentable. “Geez, I don’t know” she responded at first. After pondering for a few moments though, a vision clarified before her, “You know, I’d love to see the building stop, cause that’s hugely time and energy and financially consuming. We don’t want to grow numbers wise. We just wanna be able to have quality accommodations for everyone, you know? And so probably in 10 years we’ll be just finishing the buildings, maybe...” she trailed off, looking slightly doubtful. “Although I love building, I’d like to see it run more by locals as well. Like, at one point we were thinking of creating it into a collective and having the employees run everything, but they weren’t motivated. They didn’t wanna do it. We had thought about how they could get shares, you know, and it was just like, they didn’t want to put any time or energy into it. So it was like, we’re not going to create this framework if they’re not really invested in it.” This would have been an interesting topic to explore from the perspective of local community members, but unfortunately the subject was not broached until the end of data collection and I was thus unable to discuss the topic with the employees involved.

Although there are a number of reasons for why employees might have been hesitant to take on a partnership role at Centro Sustentable, it was likely a good decision not to transfer the

organization to local ownership without demonstrated interest and commitment. If they had tried to force management of the organization into unwilling hands, no matter how good the intention, it would have likely ended in disaster. Sally explained that since then, their plans for the long term future of the organization have changed. “Monica mentioned a while back when they were getting their citizenship, that part of the reason she was going through the process was because, the reason they have residency is because they have a business, and what happens if one day they don’t want to have a business, and they just want to like, retire in Costa Rica, i.e. Sell the centro? And I was like, Oh, well yeah, obviously that’s gonna happen. And Matthew and Monica are like 25 years older than me, so that’s gonna happen like 25 years earlier than I’m ready to retire. And who knows if I’ll be here in 25 years, but if I am and Matthew and Monica decide to sell the centro, that means there goes my home and my livelihood. And so we’ve talked about having some sort of, like a redundancy thing. So for every year, basically if the centro gets sold, the employees of the centro get paid like some bonus salary for every year they’ve worked. So that you leave with like an extra, something to help you when you go as well as like having first dibs on the job coming up, like if you want to stay and work for the next people who buy the place. But then it’s like, who the fuck is going to buy this place?” Sally erupted into laughter after the last question, clearly amused by the idea.

Sally’s point clarifies that the future of Centro Sustentable is anything but certain. Matthew and I were discussing this issue once and he responded by sharing an analogy about the fact that all organisms eventually die and are composted in order to create new life. “Why would it be any different with businesses or organizations?” he pondered out loud, seemingly

unconcerned by the idea of the organization dissolving back into the Earth from which each structure had been sculpted (see image 11.2). It was an approach reminiscent of a Buddhist tradition, whereby several monks will spend hundreds of hours crafting an intricate piece of art called a mandala, which is comprised exclusively of different colors of sand. Once they are finished however, they pay homage and then use brooms to carefully sweep their creation away.

Image 11.2. Mycelium Decomposing Woody Debris, Pueblo Arboles Costa Rica



While there is a certain romanticism to this approach, it is important to question whether it would help achieve the broader mission of the entity that was created. In the case of the art piece, its purpose was metaphorical and symbolic, thus its destruction is equally so. Centro Sustentable on the other hand, serves a practical and concrete role in the community of Pueblo Arboles each and every day, the absence of which would create a void in the community likely to trigger unpredictable and far ranging adverse consequences. If one of the organization's missions is to support long term community health and development, it seems to be a wasted effort to invest 30-40 years building a sustainable source of economic and social support only to let it crumble, and as it goes yank the rug out from beneath those whom you supposedly served. Only time will tell how Centro Sustentable approaches this forthcoming challenge. Already though, the implications are apparent and clearly relevant to a wide range of groups who have goals that can only be accomplished over multiple decades and generations of teams working together effectively. The long term resilience and viability of the project is clearly reliant upon their capacity to develop and execute a plan for organizational founders to transition into a post management role. Unfortunately, examining lessons regarding how to successfully navigate organizational transitions towards a post founder status are beyond the scope of this investigation. For those seeking guidance in this regard, the Findhorn Foundation and Community in Scotland, founded in 1962, has some excellent guides and historical examples into the challenges and necessary steps associated with these types of transitions.

11.3 Coronavirus Update:

Of interest to the current investigation is how the combination of ongoing global stressors and internal conflicts may impact the continued resilience and viability of organizations like Centro Sustentable. How well equipped are they to weather the storm of a global pandemic given the state of international travel and sudden collapse of tourism related industries? I had a chance to speak with Matthew in July 2020 and receive an update on how the Coronavirus Pandemic was impacting life in the rural village of Pueblo Arboles. As with many places, the global shutdown has eliminated several forms of employment in Pueblo Arboles. Centro Sustentable for example, was forced to lay off all but one of their full time employees since their primary source of revenue evaporated overnight. Fortunately, Mathew reported that not all of the impacts from the Coronavirus Pandemic have been nearly so burdensome and at least in part, appear to highlight some of the very advantages and appeal these alternative forms of social organization entail. In Matthew's, words, when the Pandemic hit:

“Well, obviously our business came to a screeching halt, but you know, I think as is the case with a lot of people, there are lots of silver linings for us. It is really the first time in years we have had time to spend on personal projects and step out of the role we had been in for close to 20 years. In a lot of ways it has been a pretty heavy weight off of my shoulders, not having to manage as much, not being an employer and running after high school kids and making sure they are safe. It is the first chance since we started to kind of reenvision and reimagine what we do here and how we do it and how we can remain viable economically. It has also been the first big test of the systems we have been able to put in place and how resilient they are. You know, in part it's why we've been doing this. I've been expecting this at some point in my lifetime to come down the pipeline, and here we are. It's the first big test and you know, it's exciting on that level, with the obvious acknowledgement that this is simultaneously causing suffering for many millions of people. On the other hand it's somewhat validating knowing we are eating increasing calories off the farm, we've entirely eliminated our use of propane.

It's just given us this really unique opportunity to see that with 14 people we can actually live quite simply and live almost entirely off of the farm and that we can continue to maintain our relationships in the community with regards to supporting the agricultural producers that we can, but it's also been really nice to be put to the test. And we have a great group of apprentices, so that's been really a benefit of course. They have kind of bought into this whole process and as a result we are able to have community. You know, we don't have to social distance so we are really fortunate. We get to play volleyball whenever we want and we don't have to wear masks. We have a social network that's built into the infrastructure here that allows us to lean on one another."

As I listened to Matthew describe the state of affairs at Centro Sustentable, the joy in his voice was unmistakable. Although he was clearly cognizant of the many new challenges they faced and the uncertainty that lies ahead, he sounded happier and less burdened than he had in years. As he said, this is exactly the type of scenario they had been preparing for and he was clearly excited that in many ways, the systems they have put in place are so far at least, performing in many of the ways they had hoped. The biggest challenge they are currently trying to overcome is how to get one of their teammates back home. It turns out that Sally Durand had been visiting family in the United States in March 2020 when international borders were shut down and as of writing she has still been unable to find a way back to Costa Rica.

I asked Matthew if he was concerned about their capacity to weather this global turmoil, especially given the collapse of their primary source of revenue, but his response demonstrates that they seem well positioned to continue thriving despite the external stressors. As Matthew explained, "It has motivated us to start having conversations about how we could make a living in ways that look different than how we have in the past, but fortunately this happened at a good time for us. Over the past few years we have financially gotten ourselves in order... We

overhauled our financial system and that has paid dividends in major ways... If this had happened 5 or 10 years ago we would not have been in nearly as good of a situation. Now we have some cash reserves that without employing 8 people we are good to weather this for awhile... We could last at least a year or two without any revenue, if we decide not to take salaries we can push that for even longer.” Matthew explained that employees had been their biggest organizational expense for a long time and that now they had the chance to reevaluate their business model, it was becoming increasingly clear that without so many employees, they no longer need to bring in nearly as much revenue to stay afloat. Now that they have been presented with this opportunity to reflect, they are going to make the most of it and carefully weigh their choices before deciding on their next steps as an organization.

I asked Matthew how the rest of the community was fairing as well as the employees who had been laid off and he clarified that all of the staff who lost their jobs received sizable severance packages through their unemployment insurance equivalent to 6-12 months of salary (depending on how long they had been working for the centro). Additional programs being provided by the Costa Rican government should mean that most families will be able to maintain financial stability for at least the next year. Matthew shared that one of the most gratifying experiences has been seeing the ways the community has come together to support one another, “At least until now the community has demonstrated a lot of resiliency... I have observed people really reaching out and caring for one another... More food is being planted here now than in the past 10 years, everyone is saying that it is more important now than ever to plant beans and

yucca. It seems to me there is a good deal of food security and a social network that at least for now seems to be functioning.”

In addition to these promising reports from the community, Matthew also mentioned that he has been receiving more online requests from around the world than ever before, underscoring how the pandemic is driving increasing numbers of people to recognize the need for pursuing alternative and more resilient methods of agricultural and economic production. Although community members reportedly fear it is just a matter of time before the Coronavirus arrives in Pueblo Arboles, as of July 2020 they have not had any cases and Centro Sustentable is committed to doing their part to keep it that way. As Matthew summarized, “I think for the centro we will be able to figure it out. I don’t know what it will look like in 2 or 5 years but we are in such a good spot now and have so many creative minds that we will be able to maintain some trickle of money coming in. I don’t feel any urgency right now.” This calm and confident projection in the face of so much global uncertainty is a testament to the successful planning and resilient, self sustaining systems that Centro Sustentable has built over the past 20 years. Despite all the turmoil and challenges encountered along the way, the future for both Centro Sustentable and Pueblo Arboles seems bright.

11.4 Key Lessons & Community Observations:

One of the sub-questions this investigation sought to answer that has not yet been fully described, is what benefits, if any, have really been observed in the broader community of Pueblo Arboles over the last 20 years. Are there measurable health and welfare impacts? Do people feel better off? Do they have new opportunities? More resilience? As was noted in chapter two,

neither Centro Sustentable nor the local community prioritized developing formal systems for evaluating progress towards collective goals. Although informal partnerships were established between businesses and the local community association, the vast majority of collaborations and impacts were not formally documented or evaluated by local partners. For this reason, the capacity to answer questions regarding the changes in material well-being and health are limited by a lack of quantitative data. Instead, to consider these questions, I was reliant on the self descriptions of changes provided by local residents. Although there were clear divisions in the community regarding the overall satisfaction with the role Centro Sustentable has played in the community, every women interviewed and all but two men reported that there had been substantial increases in economic opportunity within the community since the arrival of Centro Sustentable, who they attributed to the rise of eco-tourism and economic turning point for the village.

With regards to health and wellness impacts, the results were less encouraging. Almost every mother interviewed described an increase in childhood obesity within the community as a result of growing access and reliance to cheap, processed foods and less active lifestyles with the introduction of television and internet in the town. As was described in chapter three, the changes in access to technology and contact with the outside world have changed dramatically within this community over the past two decades. In this regard, the impacts clearly represent a double edged sword, whereby on one hand community members now have increased mobility, access to information and economic opportunities, while on the other they have become increasingly exposed to new threats posed by challenges such as predatory lending firms, drug

traffickers and thieves, and the potential for exacerbated challenges with alcohol, to name a few examples.

In the process of conducting this investigation, I theorized that a modified version of the framework developed by Ostrom (1990) and Atkins et al. (2019) could better explain the development and sustained capacity of effective groups (See figure 11.1 below). Specifically, based on the findings in this dissertation, I propose that the additional principle of cultivating *reciprocal food based relationships* should be incorporated into the prosocial framework to better explain some of the fundamental ways that people can build and maintain trust, which is a precursor to all forms of effective teamwork. Based on the functions of the original eight principles, as articulated by Atkins et al. (2019), it is appropriate for the proposed addition of *reciprocal food based relationships* to be considered as principle one, since processes of emotional bonding and trust building should begin even before groups start defining their identity and purpose. Importantly, I am not suggesting that emotional bonds and trust can only be fostered through food based relationships. Rather, I propose that due to the unique characteristics of food (as described below), when utilized to facilitate reciprocal interactions, it is perhaps the ideal vehicle for creating the optimum conditions for emotional bonding and trust building to occur.

In addition to the identified role that food plays in the development of community bonds, in the current dissertation, observed patterns provide reinforcing evidence that are in alignment with all eight of the core design principles articulated by Atkins et al. (2019). In this section I

identify each of the proposed nine design principles and summarize some of the findings from the current investigation that illustrate how each principle plays an invaluable role in this process. The observations selected below to illustrate each principle were identified based on the frequency and diversity of sources which mentioned their importance or shared reflections illustrating the role a given pattern had played in either facilitating and decreasing cooperation and trust.

Table 11.1 Expanded Prosocial Design Principles and Ostrom’s Equivalents

	Ostrom’s Principle	Expanded Prosocial Version	Function
1		Reciprocal Food Based Relationships	Bonding & Trust
2	Clearly defined boundaries	Shared identity and purpose	Defines group
3	Proportional equivalence of benefits and costs	Equitable distribution of contributions and benefits	Ensures effectiveness by balancing individual and collective interests
4	Collective choice arrangements	Fair and inclusive decision-making	
5	Monitoring	Monitoring agreed behaviors	
6	Graduated sanction	Graduated responding to helpful and unhelpful behaviors	
7	Conflict resolution mechanisms	Fast and fair conflict resolution	
8	Minimal recognition of rights to organize	Authority to self-govern (according to principles 1-6)	Supports performance and engagement

9	Polycentric governance	Collaborative relations with other groups (according to principles 1-7)	Scale to whole systems
---	------------------------	---	------------------------

1. **Cultivate reciprocal food based relationships:** Food is the ultimate connector. It links us to community and culture, economics and family. Food is the basic social building block that opens doors and creates new opportunities for sharing and strengthening interpersonal bonds. Food is unique in that, not only is it a basic need, but it also gives us pleasure, and has the potential to actively engage all five of our senses simultaneously. I theorize that it is the diversity of senses engaged through food, which increases our emotional response to and memory of food based experiences. The more emotionally engaged we are, the greater the opportunity for strong bonds to develop. These characteristics make food based relationships the ideal space in which to forge emotional bonds, foster trust and lay the foundations for long term collaboration. Importantly, this theory should not be construed as implying food based relationships are the only way to foster emotional bonds and/or trust, but rather, it is the capacity for food to engage all five of our senses while enhancing pleasurable social interactions that gives it the potential to serve as an ideal vehicle for fostering the conditions under which emotional bonding and trust building can occur.

Although food is such a regular part of life that it's purpose can meld into the background of experience, upon further consideration, the importance of these

roles is quite obvious. For example, some of the ways that food has been used to bolster relationships in this community include: using food as a gift to create conversation and instigate new friendships, cultivating food more sustainably to develop harmonious relationships with natural systems, processing and preparing food as a group to create opportunities for collaboration and building trust, sharing meals daily as a group to reinforce a sense of community and create spaces for expressing gratitude, as well as fermenting food with colonies of beneficial microbes to improve personal well-being and support symbiotic relationships with the invisible world of bacteria and fungi, which comprise the majority of all the cells in our bodies. Additionally, because these processes relate directly to personal well-being and our capacity for self care, the skills gained through experiences such as growing and preparing food can also provide a sense of individual self-efficacy and personal sense of empowerment.

Early on in the results we heard from numerous participants who described how sharing food and meals was a crucial part of making and maintaining friendships in the community. Indeed, between buying local produce, harvesting and preparing meals together, developing symbiotic relationships with the microbial world through fermentation and inviting friends and community members for gatherings centered around sharing a meal together, there are few aspects regarding the relationships in the community that do not bear some connection to food. Even the partnership between Matthew and Monica itself was founded with

a connection through food and lessons regarding self sustenance. As Monica summarized in chapter one, “I like the fact that our people are working and making the food they are consuming and you know, baking bread together. I think it’s a ritual that brings people together. You feel nourished and well taken care of when there is love put into your food.” Given the oftentimes underappreciated and seemingly unnoticed role that food plays in modern society, underscoring its importance in developing and maintaining social relationships serves as a pertinent reminder.

Even in groups that already have well established emotional bonds and trusting relationships, utilizing and cultivating reciprocal food based relationships is an important tool for helping to reinforce and strengthen those bonds over time. Several reflections from both community and organizational team members converged around the idea that all relationships take maintenance to preserve trust and prevent personal insecurities from festering. Reflections from Dan Avery of Centro Sustentable illustrated this point well, “relationships are always ongoing. If you ever stop putting energy into a relationship, it begins to deteriorate. So relationships are all about maintenance, whether they’re a relationship with someone in town or a personal, intimate relationship, they all take constant work at developing and nurturing.”

As humanity increasingly recognizes the interconnected nature between human and ecological well-being, food has the potential to be of great assistance in facilitating this process. For example, when we collaborate with friends and family to preserve food through fermentation, we are not only preserving and improving the nutritional value of the food, but we are doing so through the cultivation of the very colonies of microorganisms that we need and depend on for our survival and personal well-being. When we consume those foods together, whether it be a loaf of sourdough or batch of pickles, we are reminded of the people, places, ingredients and microbes involved in bringing that food to our table. As we savor the delicious flavors of our creation, the sense of satisfaction and joy felt will also be shared amongst and associated with the people who participated in the process, from the farmer who grew the crop to those enjoying the fruits of our labors, making them all seem closer and more connected. It is in this way that the decisions we make regarding what we eat and with whom we eat it, how our food is produced and by whom it is grown, influences almost every aspect of our lives. Thus the more we can align our food based behaviors with practices that are reciprocal, or mutually beneficial, the more successfully we can lay the foundations for building collaborative, fair, and effective groups.

2. **Shared identity and purpose:** One of the universal reflections that Centro Sustentable team members expressed was having a strong belief in the mission and pursuit of the organization. Even though they failed to write down mission

statements and values in the early years, the intention behind the project was clear to all those who visited. A common observation across several team members emerged in how they each described struggling to identify a clear sense of purpose that felt positive and achievable before coming to Centro Sustentable. In joining a project where they felt they were part of something larger than themselves and working towards concrete actionable items, it provided a sense of satisfaction many had never found before.

With regards to the need for a sense of shared identity and purpose, reflections from Dan provide an excellent summary that is illustrative of similar comments made by several team members at Centro Sustentable. While Dan was describing his primate research before coming to Costa Rica, he explained that he felt “disempowered as to how I could stop such a huge cycle of poverty which essentially created these huge logging operations.” In contrast, when reflecting on his role at Centro Sustentable he explained that he stayed because “I agreed with the mission and I felt like it was something that I could contribute to personally... It felt like you were part of something positive... rather than battling against what is already a pretty strong existing structure.” This reflection helps illustrate the power of shared purpose in keeping a team united and persevering in the face of unavoidable challenges. In the case of Centro Sustentable, if it were not for the level of buy-in from core team members it seems unlikely they would have made it through some of the most challenging barriers encountered along the way.

3. **Establish equitable distribution of contributions and benefits:** This is not to suggest that all forms of compensation need to be financially equivalent, but rather that it is important for each team member to receive compensation that is commensurate with their efforts and skills and that the policy for distributing compensation and benefits is developed in a transparent manner. This was clearly an area of serious contention at certain points in the centro's past. When the core team first emerged, a lack of written agreements or clear understandings of what forms of compensation could be expected contributed to a sense of anxiety and resentment that for a time undermined the ability and motivation of the group to continue.

Sally explained that by 2019 however, they had finally resolved this issue. As they prepared to hire a new core team member, Caleb, in order to fill in some of the gaps left in the absence of Sarah James, Sam and Holly, Sally explained that "it was difficult to navigate how to bring on a new person. And I think now that those three have left, and we've brought on Caleb, it's been very important to everybody that he comes in and he's equal to the rest of us. Like, we have a trial year, but then after this year, if he wants to stay on board, then it's, you get equal salary, you get equal time off, you're on the same page as everyone else. And I think that's the smoothest way, just like to not devalue people's time and effort. Just because someone's been here longer doesn't mean that Caleb's not putting in

just as much effort, and so that's important to us, that's how we want to move forward." Despite the growing pains and challenges encountered along the way, in all likelihood the partnerships and clarity in agreements that have emerged are likely to make the remaining team stronger as a result.

4. **Fair and Inclusive Governance:** For groups to succeed in the long run, there need to be opportunities for individual members to contribute to decisions regarding group agreements and expectations. Early in the centro's history the organization embraced a form of radical equality in their decision making approach which proved unrealistic because it failed to acknowledge existing power structures that persevered despite the stated position that everyone was equal. Over time this situation became untenable as a number of members began feeling that their opinions were not really valued or that they could not affect changes in the organizational structure they hoped to see. As the core team evolved however and they developed concrete agreements inspired by principles of sociocracy, team members developed a stronger sense of contribution both towards overall group decision making processes as well as personal autonomy over the areas they directly managed. This shift reflects an important recognition by owners and team members alike regarding existing power dynamics as related to ownership, while committing the organization to a path that has embraced and continues to encourage democratic processes.

5. **Monitoring agreed behaviors:** As was highlighted on numerous occasions in this investigation, the importance of developing written agreements that outline expectations and developing mechanisms for monitoring and enforcing agreements cannot be overstated. As Matthew shared in chapter one, the biggest mistake he felt they made as an organization was to rely on oral agreements in the early years. As Matthew summarized, “Hindsight is 2020 and looking back, it seems so obvious now. I feel like it should have been then, but people just remember events differently and that’s just a fact... Just having clear arrangements and expectations with people, because we’ve been hurt by and we’ve hurt so many people. I dare not guess how many times, just by having different memories of the same conversation. For anyone listening, write it down.” In order for groups to function well, it is imperative to have some way to clarify expectations and monitor agreements. Atkins et al. (2019) suggests that top down monitoring can often be coercive and serve the interests of managers rather than those being monitored. In order to promote accountability in an equitable fashion, Ostrom’s (1990) work suggests that monitoring is often best performed by peers through normal group interactions.

6. **Graduated responding to helpful and unhelpful behavior:** Nobody's perfect when it comes to fulfilling the obligations of a group. Even the most capable and well-meaning members can fail, especially given competing demands for time and attention. Effective groups have in place responses to both helpful (e.g.

expression of gratitude, celebrations, etc.) and unhelpful behaviors (e.g. open conversation to find out what happened, sanctions, and in extreme cases exclusion from the group). Although Centro Sustentable has come a long way with regards to the development of contracts and clarifying expectations of staff and instructors, they have made less progress with regards to incorporating robust mechanisms for enforcement and ensuring equal accountability from all team members. Until this shortcoming is addressed, from time to time they are likely to continue encountering the combined challenge of addressing infractions without a clear framework delineating appropriate and graduated responses. As a result, decisions regarding punishment in the face of misconduct are likely to continue being perceived as subjective and personally biased, thus further contributing to negative sentiments and problematic behavior.

7. **Fast and fair conflict resolution:** In order to preserve and continue building trust over time, groups need to establish fair and clear procedures for how to address conflicts when they arise in a way that is objective and transparent. The observed incidents between both Javier and Emily as well as Matthew and Holly, each highlighted the importance of developing not only written expectations, but also ensuring that when conflict does inevitably arise, there are mechanisms in place for addressing and resolving interpersonal disputes in a timely fashion.

Although policies don't necessarily lead to improved decision making, they do reduce the ambiguity associated with these processes and provide a sense of impartiality so the process can be more transparent and support those impacted to feel that and least the process was handled in a fair and just manner. This is a crucial step in preserving the integrity of social groups and preventing personal blowback when making challenging organizational decisions.

8. **Authority to self-govern (according to principles 1-7):** Every group is embedded in a larger society that can limit its ability to govern their own affairs. Evidence from Ostrom (1990) and Atkins et al.(2019) indicate that really high performing groups require an environment that does not excessively interfere with the groups ability to govern their own affairs or implement design principles 1-7. As was discussed in chapter two, Costa Rica is globally recognized for its strong institutions and investment in social services. This context has clearly aided Centro Sustentable and the community of Pueblo Arboles in a number of ways, such as how involved the local community was able to be in the process of establishing the National Park discussed in chapter two.

9. **Collaborative relations with other groups:** Finally, if we are to build systems of cooperation, we need to develop external partnerships among other groups, ideally by using principles 1-8. Centro Sustentable clearly illustrated the value of these partnerships through the relationships they established with US based

institutions before moving to Costa Rica, which could attract large groups of students to visit Pueblo Arboles on an annual basis. In the early years of the organization, it was the presence of these international partnerships that served as the lifeblood of the organization and bought them time to establish more diversified and streams of revenue.

11.5 Research Contribution and Limitations:

The current investigation has sought to provide an in-depth examination into one particular community that is grappling with the challenges needed to shift trajectories and embrace sustainable change. Within this case I have sought to identify important patterns that are potentially relevant to other communities and partnerships between groups of individuals who are struggling to adopt similar changes. Findings from the current investigation suggest that in addition to the patterns identified by Atkins et al. (2019), food also appears to play a fundamental role in the ways we build and maintain trust and support collaborative partnerships over time. As mentioned early on in the dissertation, when asked specifically about food, participants in this study almost universally reported that food played a crucial role in the development of relations in the community. However, very few respondents considered the ways food had impacted community relations until the topic was mentioned, indicating that the role of food may oftentimes be taken for granted, leading to an underrecognition of the powerful and numerous ways that reciprocal relationships cultivated through food influence the ways we relate to and think about one another.

Given that findings from the current investigation are largely aligned with emerging research in the contextual behavioral¹² and evolutionary sciences, the patterns identified here lend additional support to the theory of prosocial behavior proposed by Atkins et al. (2019). Of value, the stories highlighted in the current investigation provide concrete examples that illustrate how these patterns can play out over time within a group of highly dedicated individuals with shared values and objectives. Additionally, findings suggest that the attempts of organizations like Centro Sustentable, which seek to support the adoption of sustainable practices and develop circular local economies, have been demonstrated to be important for numerous reasons. Importantly, the lessons learned from this case study demonstrate that education centers such as Centro Sustentable have the potential to promote two distinct forms of horizontal scaling, while also informing the expansion of identified principles with applicability that is independent of scale and applicable to any group. While the direct impacts of Centro Sustentable have most obviously and directly supported forms of micro-scaling, whereby local entrepreneurs have been inspired to launch innovative enterprises despite limited access to financial resources, the educational programs provided by Centro Sustentable have also inspired past visitors, students and former volunteers to launch similar projects in their own communities and in other parts of the world. An initial examination of these examples illustrated that several appear to be functionally analogous to the role Centro Sustentable has played in the community of Pueblo Arboles, demonstrating the potential for organizations like Centro Sustentable to have global impacts that reach far beyond the boundaries of the communities they were originally

¹² Contextual Behavioral Science emerged from behavioral psychology but has expanded from those roots and is “based on contextual assumptions regarding the centrality of situated action, the nature of epistemology versus ontology, and a pragmatic truth criterion linked to the specific goal of predicting-and-influencing psychological events with precision, scope, and depth (Hayes, Barnes-Holmes, & Wilson, 2012; pp. 1).”

intended to serve. Although an exhaustive consideration of the global network of education centers and community based projects that have emerged in relation to Centro Sustentable was beyond the scope of this investigation, future research into this fascinating form of horizontal scaling could help further elucidate the applicability of certain lessons and technologies utilized here in Costa Rica to diverse contexts around the world.

If enough of these projects can be supported to emerge in regions worldwide that help blend local ecological awareness into the development of a society that is also more fair and inclusive and that inspires hope for the future, then the combined impact of these types of institutions could be substantial. In this regard, the findings here are aligned with an existing proposal being championed by Brewer (2020), who directs the Design Institute for Regenerating Earth. Brewer (2020) argues that given the relative inaction by transnational institutions in the fight against global climate change, our best chance to preserve sufficient ecosystem functioning and biological diversity on Earth and avoid worst-case-scenario projections is through the development of a globalized network of bioregional education centers, similar to Centro Sustentable in Costa Rica. This fascinating proposal suggests that by focusing efforts within functional bioregions, organizations can scale efforts to a level that is manageable while having the potential of supporting whole ecosystem well-being. By then collaborating and linking efforts horizontally and aligning objectives with other groups around the world, Brewer (2020) argues that the transformative potential is immense.

An additional point worth reiterating here is in regards to the sensitivity of small groups and systems to asymmetrical change or the introduction of foreign entities. As was illustrated in this case study investigated here, the introduction of a single organization appears to have catalyzed a broad economic restructuring within the small rural community of Pueblo Arboles over a twenty year period. It is difficult to imagine a similar project triggering such noticeable impacts at a larger scale, such as in the capital city of Costa Rica, San José. This note underscores the importance for foreign partners to utilize cautious approaches grounded in sustained processes of empathetic inquiry in order to avoid manifesting unintended consequences in the communities they serve. At the same time, it also highlights the potential for these types of projects to have meaningful and far reaching impacts as well as serve as invaluable sources of experimentation and learning that can guide future efforts to develop regenerative systems for human development at larger scales.

Although results highlight the potential for various forms of horizontal scaling to take place, the nine design principles I propose here in an expanded version of the Prosocial framework should scale vertically and are applicable to groups of all sizes and in any location on Earth. In this way, findings from the current dissertation provide clear guidance to any group seeking to develop more effective methods of collaboration, or any individuals seeking to establish a group focused on addressing some aspect of the many interrelated challenges facing humanity in the 21st century. Whether it is a group of four friends starting a gardening club at their school or 150 Nations seeking to finalize agreements on climate change mitigation strategies, this dissertation lends further evidence that the principles first articulated by Ostrom

(1990) and expanded here, are widely applicable social processes that help groups stick out difficult challenges and align personal and collective interests.

Some limitations of the current investigation are that the capacity to generalize findings across other cases is limited by the nature of this case study. It is impossible to extrapolate universal truths from the study of specific, individual human experiences. What can be observed is context-dependent knowledge, which although descriptive and useful in its own right, is not well suited to formal generalizations. In this case, due to the understudied nature of the processes in question, important patterns and hypotheses needed to first be elaborated upon before rigorous hypothesis testing can proceed. Future research should consider how patterns observed in the current investigation can be studied within a methodological framework that allows for the statistical evaluation of a researcher's propositions within the development of community-based relations over time.

In addition, my own positionality and implicit biases likely influenced access to certain portions of the population, lines of inquiry pursued as well as what types of questions participants would feel comfortable discussing in my presence. To moderate these effects, I spent several months building relationships in the community before formal data collection began and built trust with each respondent over time before asking for their participation in the interview process. These steps helped establish rapport with community and organizational members alike, and are likely an important factor that increased the likelihood of participation in the study, as

demonstrated by the fact that not a single member of the local community I approached for an interview objected to the request.

11.6 Conclusion and Future Research:

I conclude the dissertation by considering a few of the characteristics that may have distinguished Centro Sustentable from similar groups and communities that have either imploded or failed to continue making progress towards these challenges. An important observation from this study suggests that real, widespread community change is most likely to happen from within. In Pueblo Arboles, Centro Sustentable helped plant the seeds and inspired many youth who were in a good position to respond and flourish. It is those local entrepreneurs who are now leading the charge forward that are likely to be the main sources of inspiration to others in the community. Centro Sustentable's role in the community has evolved over time as the organization has grown and become more established in relation to the broader community of Pueblo Arboles. Now they hope to be there as a source of continuous support, providing dependable assistance over the long run, responding to community identified needs and requests and leading by example through modeling of appropriate behaviors and values in both professional and personal roles.

Although this investigation focused on one particular type of emerging alternative community, this example is illustrative of a wide spectrum of groups looking to develop viable alternatives to the dominant global system. While much of the world is increasingly moving a wide range of human experiences into virtual formats, a process which is being drastically

accelerated by the global coronavirus pandemic, there appears to be a common theme of resistance to this transition within a wide range of emerging alternative communities, which emphasize a need to maintain personal connection, cultivate meaningful relationships, a sense of belonging and community. One possible thread for future research would be to explore this range of alternative communities and the motivations/visions inspiring them to develop a taxonomy for better understanding and relating the shared vs. unique attributions of these interesting and potentially transformative approaches to societal organization.

Interestingly, one of the most distinguishing features of Centro Sustentable that separates them from similar projects that have failed along the way, is possibly their strong commitment to the community of Pueblo Arboles and demonstrated perseverance in continuing the project through obstacles and challenges where many others would have likely called it quits. As Matthew admitted, they had their doubts at times, but they never gave up. This simple fact is ultimately the reason why the centro still exists today. Although it is impossible to say what the future will bring, this observation highlights both a point of praise and note of caution. Many organizations like Centro Sustentable have failed in the long run due to an overreliance on a single charismatic leader, typically the organization's founder. Although Matthew and Monica have demonstrated a deep commitment to their project, eventually, if the organization is to survive beyond them, they will need to build strategies for organizational transition to ensure that community relationships are institutionalized and not solely maintained by team members with existing friendships. Relationships require continuous maintenance and in order for long standing partnerships to be passed on successfully, the team should develop a transition plan to provide at

least a one to two year period for integrating new management and ensuring continuity of services.

In addition to perseverance, promoting interdependence among the community members of Pueblo Arboles has been a key part of sustaining the slow growth model that was informally adopted at the inception of Centro Sustentable. From hiring locals, creating homestay opportunities, buying local produce, collaborating with neighbors or volunteering for community events, these types of activities serve to strengthen the bonds between organizations and local community members. Although these inputs have also served to create new forms of competition and jealousies, the shift towards a closed loop economy that is helping to reinvest funds back into the community has made clear contributions in strengthening the bonds that keep this community alive. Some scholars argue that the most important factor in determining whether a community will stick together is not sharing values or friendship, but rather how much they need and depend on one another (Brock, 2017). The more you need your neighbor to fulfill your basic needs, the more likely you are to stick it out together through good times as well as the challenging ones.

Analogies for these forms of mutual interdependence are present in the natural world as well, and typically develop over extremely long periods of time. Although in any given ecosystem, individual species are likely to form tight clusters or groups, it is actually the web of relationships that are formed across species that provide natural systems their strength and resilience (Ackerman-Leist, 2013; Montgomery & Bikle, 2016; Young, 2016). In natural systems

there is typically a direct relationship between the diversity of organisms present and the capacity of that ecosystem to recover from acute shocks and stressors. As current patterns in global food production and the ongoing Coronavirus demonstrate, humankind is not as insulated from these processes as might once have been believed (Nystrom et al. 2019). As species slowly weave relationships with others in natural systems, the majority of their interactions are based on mutual collaboration, yet competition, predation and parasitism also play important roles in resilient systems. As Brock (2017; pg. 117) describes, “whether any two species are friends or enemies, all the species in an ecosystem ultimately depend on a healthy network of relationships. And in the proper relationship, a community of diverse species can weather the ups and downs of drought, fire, or climate change to last for millions of years.”

In social communities like the ones humankind has constructed, the rapid capacity to share and distribute information and absorb new knowledge through modern digital technologies affords many members of modern societies the capacity to develop intentionally diverse and resilient networks in much shorter time periods than would have been possible for humans historically (Robinson et al. 2015). Despite this potential, emerging challenges illustrate the disparities in global access to these tools and how such limitations directly undermine our capacity as a species to respond effectively to the rapid changes triggered by ongoing human activity (Robinson, 2008).

The most obvious example of this weakness can currently be observed with the impacts from COVID-19. Of importance lies the fact that the disease has laid bare for the world to see

just how interconnected humankind is and how much our coordinated actions can either prevent or foster widespread destruction. This is a transformative narrative that Rogers (2020) explains, “accomplishes what no isolated and episodic story of environmental damage, from melting glaciers to fire storms, could ever do. Instead, we’re all attentively following a fast-moving virus, piecing together information on how we can best defend ourselves and protect our neighbors, fellow citizens and the world itself from the worst-case scenarios.”

In this excerpt, Rogers (2020) helps illustrate how a once obscure and difficult fact to comprehend, has now become painfully obvious. Humankind is inextricably interconnected both with each other and Earth’s natural systems. This is a narrative that Centro Sustentable has helped the people of Pueblo Arboles embrace and the findings here illustrate how the community appears to be benefitting in many ways as a result. I myself was inspired by my experiences in Pueblo Arboles to develop a more personal relationship to the food I consume and play a more active role in developing the types of regenerative agricultural systems we need in order to sustain thriving human life on Earth. After finishing data collection for this research, I purchased a tiny house and moved onto 20 acres of undeveloped farmland in Northwest Washington State, where I plan to homestead with my family and establish a diversified fruit tree orchard for both research and educational purposes. One of the most valuable lessons I learned while conducting this research, is that true change begins from within. It starts with me, with you, with each of us. As a species with no option but to continue moving forward, recognizing our interdependence does not expose a weakness. Instead, it helps us identify our greatest allies, in one another.

Together, we can foster the kinds of creativity and ingenuity needed to persevere and cultivate a more harmonious world for us all.

Changing the World

“When I was a young man, I wanted to change the world. I found it was difficult to change the world, so I tried to change my nation. When I found I couldn’t change the nation, I began to focus on my town. I couldn’t change the town and as an older man, I tried to change my family. Now, as an old man, I realize the only thing I can change is myself, and suddenly I realized that if long ago I had changed myself, I could have made an impact on my family. My family and I could have made an impact on our town. Their impact could have changed the nation and I could indeed have changed the world.”

-Unknown Monk, 1100 A.D.

References

- AAAS (2020). Social Class, Social Change, and Poverty. ScienceNetLinks. Accessed at: <http://sciencenetlinks.com/lessons/social-class-social-change-and-poverty/>
- Ackerman-Leist, P. (2013). Rebuilding the Foodshed: How to Create Local, Sustainable, and Secure Food Systems (Community Resilience Guides). Chelsea Green Publishing, VT.
- Alesina, A., Giuliano, P., and Nunn, N. (2013). On the origins of gender roles: women and the plough. *The Quarterly Journal of Economics*, 128(2), 469-530.
- Altieri, M. A., and Nicholls, C. I. (2017). The adaptation and mitigation potential of traditional agriculture in a changing climate. *Climatic Change*, 140(1), 33-45.
- Altieri, M. A., and Toledo, V. M. (2011). The agroecological revolution in Latin America: rescuing nature, ensuring food sovereignty and empowering peasants. *Journal of Peasant Studies*, 38(3), 587-612.
- Altman, D. G. (1995). Sustaining interventions in community systems: On the relationship between researchers and communities. *Health Psychology*, 14(6), 526–536.
- Anderson, E., Pringle, C., and Rojas, M. (2006). Transforming tropical rivers: an environmental perspective on hydropower development in Costa Rica. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 16, 679-693.
- Andjelkovic, V., and Ignjatovic-Micic, D. (2016). Maize genetic resource -science and benefits. Serbian Genetic Society.
- Antunes, A., Vinderola, G., Xavier-Santos, D., and Sivieri, K. (2020). Potential contribution of beneficial microbes to face the COVID-19 pandemic. Elsevier Public Health Emergency Collection.

- Asongu, S. A. (2014). The Questionable Economics of Development Assistance in Africa: Hot-Fresh Evidence, 1996-2010. *The Rev Black Political Economy*, 41, 4, 455-480.
- Atkins, P., Wilson, D. S., and Hayes, S. C. (2019). *Prosocial: using evolutionary science to build productive, equitable and collaborative groups*. New Harbinger Publications.
- Atwood, G., and Stolorow, R. (1984). *Structures of subjectivity: Explorations in psychoanalytic phenomenology*. Analytic Press, Hillsdale, NJ, USA.
- Baccini, A., Walker, W., Carvalho, L., Farina, M., Sulla-Menashe, D., Houghton, R. A. (2017). Tropical forests are a net carbon source based on above ground measurements of gain and loss. *Science*, 358, 6360, 230-234.
- Ballestero, A. (2019). The Anthropology of Water. *Annual Review of Anthropology*. 48, 405-421.
- Ballestero, A. (2012). Transparency Short-Circuited: Laughter and Numbers in Costa Rican Water Politics. *Political and Legal Anthropology Review*, 35(2), 223-241.
- Baum, F. MacDougall, C., and Smith, D. (2004). Participatory Action Research. *Continuing Professional Education*, 60, 10, pp. 854-857.
- Barnosky, A. D., Matzke, N., Tomiya, S., Wogan, G. O. U., Swartz, B., Quental, T. B. and Ferrer, E. A. (2012). Has earth's Sixth Mass Extinction already arrived?, *Nature*, 471, 51-57.
- Barrett, C. B. (2006). *Food Aid's Intended and Unintended consequences*. Background Paper for FAO State of Food and Agriculture.
- Beery, T., and Jorgensen, K. (2016). Children in nature: sensory engagement and the experience of biodiversity. *Environmental Education Research*, 24(1), 13-25.

- Bennett, L.M., Gadlin, H., & Marchand, C. (2018). *Team Science and Collaboration, A Field Guide*. 2nd. Ed. Bethesda, MD: Department of Health & Human Services.
- Berbes-Blazquez, M., Bunch, M., Mulvihill, P., Peterson, G. D., and Wendel de Joode, B. (2017). Understanding how access shapes transformation of ecosystem services with an example from Costa Rica. *Ecosystem Services*, 28(C), 320-327.
- Bernstein, H. 2010. Introduction: Some questions concerning the productive forces. *Journal of Agrarian Change*, 10(3), 300–14.
- Berg, B. (2004). *Qualitative research methods for the social sciences*. 5th ed. Pearson education Inc.
- Berger, P., and Luckmann, T. (1966). *The social construction of reality: A treatise in the sociology of knowledge*. Penguin Books, USA.
- Berkes, F. and Folke, C. (eds.). (1998). *Linking social and ecological systems, management practices and social mechanisms for building resilience*. Cambridge University Press, Cambridge.
- Berkes, F., Colding, J. and Folke, C. (eds.). (2003). *Navigating social-ecological systems: Building resilience for complexity and change*. Cambridge University Press, Cambridge.
- Bernard, R. (2005). *Research methods in anthropology: qualitative and quantitative approaches*. Altamira Press.
- Block, J., and Subramanian, S. (2015). Moving beyond “Food Deserts”: Reorienting United States policies to reduce disparities in diet quality. *PLOS Medicine*, 2015 12(12).

- Bonilla-Aldana, D., Dhama, K., and Rodriguez-Morales, A. (2020). Revisiting the One Health approach in the context of COVID-19: a look into the ecology of this emerging disease. *Advances in Animal and Veterinary Sciences*, 8(3), 234-237.
- Borlaug, N. 2000. The Green Revolution revisited and the road ahead. Anniversary Nobel Lecture. Oslo, Norway.
- Braungart, M., and McDonough, W. (2002). *Cradle to cradle: remaking the way we make things*. Farrar, Straus and Giroux, NY, NY.
- Brewer, J. (2020). Design institute for regenerating earth: Online Educational Platform. Accessible at: <https://culturalevolutioncenter.org/design-institute-for-regenerating-earth/>
- Brockett, C. (2019). *Land, power and poverty: Agrarian transformation and political conflict in Central America*. Revised Edition. Routledge Press, New York, NY.
- Buchs, M. And Koch, M. 2017. *Postgrowth and wellbeing: Challenges to sustainable welfare*. Springer, NY.
- Buck, J., and Villines, S. (2017). *We the people: consenting to a deeper democracy. A guide to sociocratic principles and methods*. Sociocracy.info.
- Burt, M. (2019). *Who owns poverty?* Red Press, England UK.
- Butcher, W. And Galbraith, J. (2015). Microfinance control fraud in Latin America. *Forum for Social Economics*, 48(1), 98-120.
- Canfield, D. E., Glazer, A. N. and Falkowsky, P. G. (2010). The evolution and future of earth's nitrogen cycle, *Science*, 330(6001), pp. 192–196.
- Caplan, M. (2014). Communities respond to predatory lending. *Social Work*, 59(2), 149-156.

- Carter, M. (2015). Challenging social inequality: the landless rural workers movement and agrarian reform in Brazil. Ed. Duke University Press.
- Castillo, R. M. (2016). Educación Ambiental para el Desarrollo Sustentable. *Revistas Estudios*, Universidad de Costa Rica. DOI 10.15517/RE.V0I0.27584
- Ceballos, G., Ehrlich, P., and Raven, P. (2020). Vertebrates on the brink as indicators of biological annihilation and the sixth mass extinction. *PNAS*, 117(24), 13596-13602.
- Ceballos, G., Ehrlich, P., Barnosky, A., Garcia, A., Pringle, R., and Palmer, T. (2015). Accelerated modern human-induced species losses: Entering the sixth mass extinction. *Science Advances*, 19 June 2015.
- Centers for Disease Control and Prevention. One Health. Accessed at: <https://www.cdc.gov/onehealth/index.html>
- Cervello-Royo, R. Moya-Clemente, I., and Ribes-Giner, G. (2014). Microfinance institutions (MFIs) in Latin America: who should finance the entrepreneurial ventures of the less privileged? *New Challenges in Entrepreneurship and Finance*, Springer.
- Chen, B., Hang, M. Y., Peng, K., Zhou, S. L., Shao, L., Wu, X. F., Wei, W. D., Liu, S.Y., and Li, Z. (2018). Global land-water nexus: Agricultural land and freshwater use embodied in worldwide supply chains. *Science of the Total Environment*, 613, 931-943.
- Chivian, E. and Bernstein, A. (2008). *Sustaining life: How human health depends on biodiversity*. Center for Health and the Global Environment, Oxford University Press, New York, NY.

- Costa Delgado, G. (2015). The agrarian question and agribusiness in Brazil. In ed. Challenging social inequality: the landless rural workers movement and agrarian reform in Brazil. Duke University Press.
- Crino, M., Sacks, G., Vandevivere, S. Swinburn, B., and Neal, B. (2015). The Influence on Population Weight Gain and Obesity of the Macronutrient Composition and Energy Density of the Food Supply. *Current Obesity Report*, 4,1 pp. 1-10.
- Cumming, G. S., Olsson, P., Chapin, F. S. et al. (2012). Resilience, experimentation, and scale mismatches in social-ecological landscapes, *Landscape Ecol.*, 28(6), pp. 1139–1150.
- Dahir (2020). Instead of Coronavirus, the hunger will kill us. A global food crisis looms. Accessed at: <https://www.nytimes.com/2020/04/22/world/africa/coronavirus-hunger-crisis.html>
- Danielsen, S. (2009). Regime building and consolidation in Paraguay: In perspective of agrarian legislation 1954-2008. Master's Thesis, University of Bergen.
- David, L., Maurice, C. F., Carmody, R. N., Gootenberg, D. B., Button, J. E., Wolfe, B. E., et al. (2014). Diet rapidly and reproducibly alters the human gut microbiome. *Nature*, 505, 559-563.
- Dearning, J. A. (2006). Human-environment interactions: learning from the past. *Regional Environmental Change*, 6:1, 1-16. <https://doi.org/10.1007/s10113-005-0011-8>
- DeFries, R. S., Rudel, T., Uriarte, M., & Hansen, M. (2010). Deforestation driven by urban population growth and agricultural trade in the twenty-first century. *Nature Geoscience*, 3, 178-181.

- De Sousa, M. (2020). Bolsonaro imposes 4-month ban on fires to preserve Amazon. The Washington Post, Jul. 16th, 2020. Accessed at: https://www.washingtonpost.com/world/the_americas/bolsonaro-imposes-4-month-ban-on-fires-to-preserve-amazon/2020/07/16/818987ce-c781-11ea-a825-8722004e4150_story.html
- Díaz, C. and Mascetti, F. (2016). El camino alternativo: Costa Rica hacia la construcción de un modelo de desarrollo sustentable. luz y sombra. *Revista Encrucijada Americana*, 8(2), 71-91.
- Diaz, R. J. and Rosenberg, R. (2008). Spreading dead zones and consequences for marine ecosystems. *Science*, 321(5891), 926–929.
- Don, A., Schumacher, J., and Freibauer, A. (2010). Impact of tropical land-use change on soil organic carbon stocks – a meta-analysis. *Global Change Biology*, 17, 4, 1658-1670.
- Donald, J., Sahdra, B., Zanden, B., Duineveld, J., Atkins, P., Marshall, S., and Ciarrochi, J. (2018). Does your mindfulness benefit others? A systematic review and meta-analysis of the link between mindfulness and prosocial behavior. *British Journal of Psychology*, 110(1), 101-125.
- Doran, J. (2002). Soil Health and Global Sustainability: Translating Science into Practice. *Agriculture Ecosystems & Environment*, 88, pp. 119-127.
- Dubofsky, M., and McCartin, J. A. (2017). *Labor in America: A History* (9th Ed.). John Wiley and Sons Inc. UK.
- Dutta, S. K., Verma, S., Jain, V., Surapaneni, B., Vinayek, R., Phillips, L., and Nair, P. P. (2019). Parkinson’s disease: the emerging role of gut dysbiosis, antibiotics, probiotics, and fecal

- microbiota transplantation. *Journal of Neurogastroenterology and Motility*, 25(3), 363-376.
- Ejrnaes, M., Gunnar, P. K., and Rich, S. (2008). Feeding the British: Convergence and Market Efficiency in Nineteenth Century Grain Trade. *Economic History Review*.
- Embury-Dennis, T. (2018). Costa Rica to ban fossil fuels and become world's first decarbonised society. *Independent*, UK. Accessed at: <https://www.independent.co.uk/environment/costa-rica-fossil-fuels-ban-president-carlos-alvarado-climate-change-global-warming-a8344541.html>
- Emerson, R., Fretz, R., and Shaw, L. (2011). *Writing ethnographic fieldnotes*. Second ed. University of Chicago Press.
- Eric Holt Giménez & Annie Shattuck (2011) Food crises, food regimes and food movements: rumblings of reform or tides of transformation?, *The Journal of Peasant Studies*, 38(1), 109-144.
- Ernstson, H. (2013). The social production of ecosystem services: A framework for studying environmental justice and ecological complexity in urbanized landscapes. *Landscape and Urban Planning*, 109(1), 7–17.
- Ezquerro-Canete, A., and Fogel, R. (2017). A coup foretold: Fernando Lugo and the lost promise of agrarian reform in Paraguay. *Journal of Agrarian change*, 17, 2, pp. 279-295.
- Famiglietti, J. (2014). The global groundwater crisis. *Nature Climate Change*, 4, 945-948.
- Fallahzadeh, M. K., Haghghi, B. A. And Namazi, M. R. (2010). Proton pump inhibitors: predisposes to Alzheimer disease? *Journal of Clinical Pharmacy and Therapeutics*, 35, 125-126.

- FAO. (2009). Land grab or development opportunity? Summary of the FSN forum discussion No. 44. Accessed at: http://www.fao.org/fsnforum/sites/default/files/files/44_Land_Grab/SUMMARY_land%20grab%20or%20development%20opportunity.pdf
- FAO. (2019). World food situation. Food and Agriculture Organization of the United Nations. Accessed at: [fao.org/worldfoodsituation/foodpricesindex/en/](http://www.fao.org/worldfoodsituation/foodpricesindex/en/)
- FAO. (2020). Hunger and Food Insecurity. Food and Agriculture Organization of the United Nations. Accessed at: <http://www.fao.org/hunger/en/>
- Fawcett S. (1999). Some lessons on community organization and change. In *Reflections on Community Organization: Enduring Themes and Critical Issues*, pp. 314–34. Itasca, IL: Peacock.
- Feldman, Martha S. (1995). *Strategies for Interpreting Qualitative Data*. Sage Publishing.
- Fernandez-Cornejo, J., and Caswell, M. (2006). The first decade of genetically engineered crops in the United States. *Economic Information Bulletin*, 11. United States Department of Agriculture.
- Flyvbjerg, B. (2016). The fallacy of beneficial ignorance: a test of Hirschman’s hiding hand. *World Development*, 84, 176-189.
- Food Marketing Institute (2015). *U.S. Grocery Shopper Trends 2011: Executive Summary*. Food Marketing Institute, Arlington VA.
- Folke, C. (2006). Resilience: The emergence of a perspective for social and ecological systems analyses, *Global Environ. Chang.*, 16(3), pp. 253–267.
- Folke, C., Jansson, A. Rockstrom, J. et al. (2011). *Reconnecting to the Biosphere*. AMBIO.

- Fonseca, S., Rivas, I., Romaguera, D., Quijal, M., Czarlewski, W., Vidal, A., Fonseca, J., Ballester, J., Anto, J., Basagana, X., Cunha, L., and Bousquet, J. (2020). Association between consumption of fermented vegetables and COVID-19 mortality at a country level in Europe. MedRxiv, preprint.
- Friedmann, H. (1993). The political economy of food: a global crisis. *New Left Review*(197), 29.
- Freedom House (2013). Uruguay. Available at: <https://freedomhouse.org/report/freedom-world/2013/uruguay>
- Fulweiler, R. W., Rabalais, N.N., and Heiskanen, A. S. (2012). The eutrophication commandments. *Mar. Pollut. Bull.*, 64(10), pp. 1997–1999.
- Galeano, E. (1999). *Open Veins of Latin America: Five Centuries of the Pillage of a Continent*. 25th Anniversary Edition. Monthly Review Press, NY.
- Garcia-Lopez, G., and Arizpe, N. (2010). Participatory process in the soy conflicts in Paraguay and Argentina. *Ecological Economics*, 70, pp. 196-206.
- Garnett, T. (2009) Livestock-related greenhouse gas emissions: impacts and options for policy makers. *Environmental Science & Policy*, 12, 491-503.
- Gatitua Mario, E., Silva-Leander, A., and Carter, M. (2004). *Paraguay: Social Development Issues for Poverty Alleviation. Country Social Analysis. Environmentally Socially Sustainable Development*.
- Geertz, Clifford. (1973). *The Interpretation of Cultures*. Basic Books. New York, New York.
- Gereffi, G. (2005). *The Global Economy: Organization, Governance, and Development*. In Ed. *The Handbook of Economic Sociology*, by Smelser, N. & Swedberg, R. Princeton University Press, New Jersey.

- Gest, H. (2004). The discovery of microorganisms by Robert Hooke and Antoni Van Leeuwenhoek, fellows of the royal society. *Notes and Records of the Royal Society*, 58(2), 187-201.
- Goodrich, K., and Nizkorodov, G. (2017). *The Science of the Anthropocene*. In Ed. *The Social Ecology of the Anthropocene*, Matthew, R. et al. World Scientific Press.
- Gou, W., Fu, Y., Yue, L., Chen, G., Cai, X., Shuai, M., Xu, F. et al. (2020). Gut microbiota may underlie the predisposition of healthy individuals to COVID-19. *MedRxiv*, preprint.
- Gliessman, S. (2014). *Agroecology: The Ecology of Sustainable Food Systems*. Third ed. CRC Press.
- Gulmera, R., Uzzi, B., Spiro, J., & Ameral, L.A. M. (2005). Team assembly mechanisms determine collaboration network structure and team performance. *Science*, 308 (5622), 687-702.
- Gurven, M. (2006). The evolution of contingent cooperation. *Current Anthropology*, 47(1), 185-192.
- Green, J. M., Draper, A. K., and Dowler, E. A. (2003). Short cuts to safety: risk and 'rules of thumb' in accounts of food choice. *Health, Risk and Society*, 5, 33–52.
- Greene, J. C., Caracelli, V. J., and Graham, W. F. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Education Evaluation and Policy Analysis*, 11, 3, 255-274.
- Gretarsson, S. J., and Gelfand, D. M. (1988). Mothers' attributions regarding their children's social behavior and personality characteristics. *Developmental Psychology*, 24(2), 264–269.

- Griffin, K. 1979. *The Political economy of agrarian change: An essay on the Green Revolution*. London: Macmillan.
- Griffin, K. and J.K. Boyce. 2011. Reflections: Keith Griffin interviewed by James K. Boyce. *Development and Change*, 42(1), 262–83.
- Gross, S. Toombs, A., Wain, J., and Walorski, K. (2011). Foodmunity: designing community interactions over food. *Extended Abstracts on Human Factors in Computing Systems*, May 2011, 1019-2014.
- Grotto, D., and Zied, E. (2010). The standard American diet and its relationship to the health status of Americans. *Nutrition in Clinical Practice*, 25, 6.
- Guthrie, J., Lin, B. H., Frazao, E. (2002). Role of food prepared away from home in the American diet, 1977-78 versus 1994-96: Changes and Consequences. *Journal of Nutrition Education and Behavior*, 34(3), 140-150.
- Haffeld, J. (2013). Sustainable development goals for global health: facilitating good governance in a complex environment. *Reproductive Health Matters*, 21(42), 43-49.
- Harari, Y. N. (2015). *Sapiens: A brief history of humankind*. Harper Perennial, NY.
- Hardin, G. (1968). The tragedy of the commons. *Science*, December 13, 1968.
- Harvey, D. (2004). The 'New' Imperialism: Accumulation by Dispossession. *Socialist Register*, 40, 63-87.
- Hayes, S., Barnes-Holmes, D., and Wilson, K. (2012). Contextual Behavioral Science: creating a science more adequate to the challenge of the human condition. *Journal of Contextual Behavioral Science*, 1, 1-16.

- Hazell, P., et al. 2010. The Future of small farms: Trajectories and policy priorities. *World Development*, 38(10), 1349–61.
- Heaton, T., and Forste, R. (2008). Domestic violence, couple interaction and children's health in Latin America. *Journal of Family Violence*, 23, 183-193.
- Heppner, W., Kernis, M., Lakey, C., Campbell, K., Goldman, B., Davis, P., and Cascio, E. (2008). Mindfulness as a means of reducing aggressive behavior: dispositional and situational evidence. *Aggressive Behavior*, 34(5), 486-496.
- Hetherington, K. (2011). *Guerrilla auditors: The politics of transparency in neoliberal Paraguay*. Duke University Press, Durham and London.
- Hildebrandt, Z. (2001). *Marina Silva: Defending Rainforest Communities in Brazil*. The Feminist Press at City University of New York.
- Himmelman, A. (1992). *Communities working collaboratively for a change*. Humphrey Inst. Public Aff., Univ. Minn., Minneapolis.
- Holmgren, D. (2002). *The essence of Permaculture*, 2nd Ed. Holmgren Design Services. Accessed May 7th, 2020: https://files.holmgren.com.au/downloads/Essence_of_Pc_EN.pdf
- Holt-Giménez, E. (2010). Food security, food justice, or food sovereignty. *Food First Backgrounder*, 16:4.
- Holt-Giménez, E. (2006). *Campesino and campesino voices from Latin America's farmer to farmer movement for sustainable agriculture*. Food First Books.
- Holt-Giménez, E. and Altieri, M. A. (2013). Agroecology, food sovereignty, and the new green revolution. *Agroecology and Sustainable Food Systems*, 37(1), 90-102.

- Holt-Giménez, E., and Shattuck, A. (2011). Food crises, food regimes and food movements: rumblings of reform or tides of transformation? *The Journal of Peasant Studies*, 38(1), 109-144.
- Holt-Giménez, E. And Wang, Y. (2011). Reform or transformation? The pivotal role of food justice in the U.S. food movement. *Race/Ethnicity: Multidisciplinary Global Contexts*, 5(1), 83-102.
- Houtbeckers, E. (2018). Framing Social Enterprise and post growth organizing in the Divers Economy. *Management Revenue*, 29(3), 0935-9915.
- Hughes, B. (2012). *The hemlock cup: Socrates, Athens and the search for the good life*. Penguin Random House.
- Hughes, J. D. (2009). *An environmental history of the world: humankind's changing role in the community of life*. Routledge, London, UK.
- Ika (2017). Beneficial or Detrimental Ignorance: The Straw Man Fallacy of Flybjerg's Test of Hirschman's Hiding Hand. *Development Review*.
- International Displacement Monitoring Center (IDMC). (2013). *Global estimates 2012: People displaced by disaster*.
- IPCC, (2014). Summary for policymakers. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and sectoral aspects. Contribution of working group (ii) to the fifth assessment report of the inter- governmental panel on climate change*. Cambridge University Press, Cambridge, and New York, NY, pp. 1–32.
- Jacke, D., and Toensmeier, E. (2005). *Edible Forest Gardens: Two-Volume Set*. Chelsea Green Publishing.

- Jackson, P.T. (2014). Making sense of making sense: configurational analysis and the Double Hermeneutic. In eds. Interpretation and Method: Empirical Methods and the Interpretive Turn. Armonk, NY, and London: M.E. Sharpe.
- Jackson, T. (2018). The Post-Growth Challenge: secular stagnation, inequality and the limits to growth. Elsevier, 156, 236-246.
- Johns, L., and Jacquet, J. (2018). Doom and gloom versus optimism: an assessment of ocean-related U.S. science journalism (2001-2015). *Global Environmental Change*, 50, 142-148.
- Julier, A. (2013). *Eating Together: Food, Friendship, and Inequality*. University of Illinois Press, Chicago.
- Kamkwamba, W., and Mealer, B. (2010). *The boy who harnessed the wind: creating currents of electricity and hope*. William Morrow Publishers.
- Kane, L. (2000). Popular education and the Landless People's Movement in Brazil (MST). *Studies in the Education of Adults*, 32,1 pp. 36-50.
- Kerr, B. R., Kangmennaang, J., Dakishoni, L., Nyantakyi-Frimpong, H., Lupafya, E., Shumba, L... and Luginaah, I. (2019). Participatory agroecological research on climate change adaptation improves smallholder farmer household food security and dietary diversity in Malawi. *Agriculture, Ecosystems & Environment*, 279, 109-121.
- Kerr, B. R., and Chirwa, M. (2004). Participatory research approaches and social dynamics that influence agricultural practices to improve child nutrition in Malawi. *EcoHealth*, 1(2), 109-119.

- Kerr, J. and Kolavalli, S. (1999). Impact of agricultural research on poverty alleviation. Environment and Technology Discussion Paper 56. Washington, DC: IFPRI & CGIAR.
- Khurshudyan, I., Freedman, A., and Dennis, B. (2020). The Arctic is on fire: Climate crisis pummels tundra decades earlier than expected, alarming scientists. The Washington Post, July 3 2020.
- Konikow, L. F. (2011). Contribution of global groundwater depletion since 1900 to sea-level rise. Hydrology and Land Surface Studies, 38(17).
- Konikow, L. F. (2014). Long-term groundwater depletion in the United States. Groundwater, 53(1), 2-9.
- Korsmeyer, C. And Sutton, D. (2015). The sensory experience of food. Food, Culture & Society, 14(4), 461-475.
- Krueger, R. A. (1994). Focus Groups: A Practical Guide for Applied Research. Thousand Oaks, CA: Sage Publications.
- Krueger, R. A., and Casey, M. A. (2000). Focus Groups: A Practical Guide for Applied Research, 3rd ed. Thousand Oaks, CA: Sage Publications.
- Kurlansky, M. (2003). Salt: a world history. Penguin Books.
- Laerhoven, F. and Berge, E. (2011). The 20th anniversary of Elinor Ostrom's Governing the Commons. International Journal of the Commons, 5(1), 1-8.
- Lakey, C., Kernis, M., Heppner, W. And Lance, C. (2008). Individual differences in authenticity and mindfulness as predictors of verbal defensiveness. Journal of Research in Personality, 42(1), 230-238.

- Lassey, K. (2007). Livestock methane emission: From individual grazing animal through national inventories to the global methane cycle. *Agricultural Forest Meteorology*, 14(2), 120-132.
- Lee, J. (2019). Correcting Fear arousing Disinformation on social media in the spread of a health virus: a focus on situational fear, situational threat appraisal, belief in disinformation, and intention to spread disinformation on social media. Dissertation, Syracuse University.
- Lee, S., Here, B., and Chung, K. (2012). Which senses matter more? The impact of our senses on team identity and team loyalty. *Sport Marketing Quarterly*, 22, 203-213.
- Lentz, E., Barrett, C. and Hoddinott, J. (2005). Food Aid and Dependency: Implications for emergency Food Security Assessments. World Food Programme, Emergency Needs Assessment.
- Levis, C., Costa, F. R., Bongers, F., Peña-Claros, M., Clement, C. R., Junqueira, A. B., Neves, E. G., Tamanaha, E. K., et al. (2017). Persistent effects of pre-Columbian plant domestication on Amazonian forest composition. *Science*, 355(6328), 925-931.
- Lewis, S. L. and Maslin, M. A. (2015). Defining the Anthropocene, *Nature*, 519, 171–180.
- Library of Congress (2018). Teacher’s Guide: Primary Source Set. The Dust Bowl. Accessed January 27th, 2018 at http://www.loc.gov/teachers/classroommaterials/primarysourcesets/dust-bowl-migration/pdf/teacher_guide.pdf
- Lieberman, E. S. (2005). Nested analysis: toward the integration of comparative-historical analysis with other social science methods. In ed. *Advances in Comparative-Historical Analysis*. Cambridge University Press.

- Liu, L., Wang, J., Levin, M., Armstrong, N., Zhao, H., Zhao, Y., Shao, J., Di, N., and Zhang, T. (2019). The origins of specialized pottery and diverse alcohol fermentation techniques in early Neolithic China. *Proceedings of the National Academy of Sciences*, 116(26).
- Liftin, K. (2014). *Ecovillages: Lessons for Sustainable Community*. Polity Press.
- Lipton, M. and Longhurst, R. (1989). *New seeds and poor people*. Unwin Hyman, London.
- Llor, C., and Bjerrum, L. (2014). Antimicrobial resistance: risk associated with antibiotic overuse and initiatives to reduce the problem. *Therapeutic Advances in Drug Safety*, 5(6), 229-241.
- Lv, G. Cheng, N. And Wang, H. (2017). The gut microbiota, tumorigenesis, and liver diseases. *Engineering*, 3, pp. 110-114.
- Lynch, C. (2014). *Interpreting international politics*. Routledge, New York.
- Mace, G. (2014). Whose conservation? Changes in the perception and goals of nature conservation require a solid scientific basis. *Sciencemag*, 345(6204), 1558-1560.
- Mann, C. (2011). *1491: New Revelations of the Americas Before Columbus*. Penguin Random House, LLC. NY.
- Mann C. (2018). *The Wizard and the Prophet*. Penguin Random House, LLC. NY.
- Maezumi, S. Y., Alves, D., Robinson, M., Gregorio de Souza, J., Levis, C., Barnett, R., Almeida de Oliveira, E., Urrego, D., Schaan, D., & Iriarte, J. (2018). The legacy of 4,500 years of polyculture agroforestry in the eastern Amazon. *Nature Plants*, 4, 540-547.
- Martinelli, L. A., Naylor, R., Vitousek, P. M., and Moutinho, P. (2010). Agriculture in Brazil: Impacts, costs, and opportunities for a sustainable future. *Current Opinion in Environmental Sustainability*, 2, 431-438.

- Masud, M., Aldakhil, A., Nassani, A., and Azam, M. (2017). Community-based ecotourism management for sustainable development of marine protected areas in Malaysia. *Ocean & Coastal Management*, 136, 104-112.
- Matthew, R., Harron, C., Goodrich, K., Marahamli, B., and Nizkorodov, G. (2016). *The Social Ecology of the Anthropocene: Continuity and Change in Global Environmental Politics*. Ed. World Scientific Press.
- Mazoyer, M., and Roudart, L. (2006). *A History of World Agriculture: From Neolithic Age to the Current Crisis*. Earthscan, London.
- McDonald, B. (2010). *Food Security*. Polity Press, MA, USA.
- McCune, N., Rosset, P., Salazar, T., Moreno, A., and Morales, H. (2017). Mediated territoriality: rural workers and the efforts to scale out agroecology in Nicaragua. *The Journal of Peasant Studies*, 44, 2, pp. 354-376.
- McGee, H. (2004). *On food and cooking: the science and lore of the kitchen*. Scribner, NY.
- McMichael, P. (2009). A food regime analysis of the 'world food crisis'. *Agriculture and Human Values*, 26, 281-295.
- McMichael, P. (2009). A food regime genealogy. *The Journal of Peasant Studies*, 36(1), 139-169.
- McMichael, P. (2014). Historicizing food sovereignty. *The Journal of Peasant Studies*, 41(6), 933-957.
- McMichael, P. (2007). Peasant prospects on the neoliberal age. *New Political Economy*, 11, 3; 407-418. McMichael, P. (2009). The world food crisis in historical perspective. *Monthly Review*, 61(3), 32.

- Montgomery, D. and Bikle, A. (2016). *The Hidden Half of Nature: The Microbial Roots of Life and Health*. W. W. Norton & Company, NY.
- Mollison, B., and Holmgren, D. (1981). *Permaculture one: a perennial agriculture for human settlements*. International Tree Crop Institute.
- Mollison, B. (1988). *Permaculture: A designers manual*. Tagari Publications.
- Murphy, S. (2008). Globalization and Corporate Concentration in the Food and Agriculture Sector. *Development*, 51, 4, pp. 527-533.
- Muyembe-Tamfum, J., Mulangu, S., Masumu, J. Kayembe, J., Kemp, A. and Paweska, J. (2012). Ebola virus outbreaks in Africa: Past and present. *Onderstepoort J. Vet.*, 79.
- Myers, S., Smith, M., Guth, S., Golden, C., Vaitla, B., Mueller, N., Dangour, A., and Huybers, P. (2017). Climate change and global food systems: political impacts on food security and under nutrition. *Annual Review of Public Health*, 38, pp. 259-77.
- Nabi, R., and Myrick, J. (2018). Uplifting fear appeals: considering the role of hope in fear-based persuasive messages, 34(4), 463-474.
- Nagel, B. Y. (1999). "Unleashing the fury": the cultural discourse of rural violence and land rights in Paraguay. *Comparative Studies in Society and History*, 41, 1, 148-181.
- Nyström, M., Jouffray, J., Vorström, A., Crona, B., Jørrgensen, P., Carpenter, S., Bodin, ö., Galaz., and Folke, C. (2019). Anatomy and resilience of the global production ecosystem. *Nature*, 575, 98-108.
- NOAA (2018). Trends in Atmospheric Methane. Global Greenhouse Gas Reference Network. Accessed May 2nd, 2018 at: https://esrl.noaa.gov/gmd/ccgg/trends_ch4/

- NRDC (2017). Food Matters: What Food we Waste and How we can Expand the amount of food we rescue. Issue Brief, October 2017. <https://www.nrdc.org/sites/default/files/food-matters-ib.pdf>
- O'Mara, F. P. (2011). The Significance of livestock as a contributor to global greenhouse gas emissions today and in the near future. *Animal Feed Science and Technology*, 166-167, 23, 7-15.
- Orzi, R. (2017). ¿Otra moneda para “otra economía”? La necesidad de las monedas complementarias para el desarrollo sustentable de los emprendimientos de la economía social y solidaria. *Revista del Departamento de Ciencias Sociales*, 4(3), 155-171.
- Ostadrhimi, A., Taghizadeh, A., Mobasseri, M., Farrin, N., Payahoo, L., Gheshlaghi, Z. B., and Vehedjabbari, M. (2015). Effect of probiotic fermented milk (kefir) on glycemic control and lipid profile in type 2 diabetic patients: a randomized double-blind placebo-controlled clinical trial. *Iran Journal of Public Health*, 44(2), 228-237.
- Ostrom, E. (1990). *Governing the Commons: the evolution of institutions for collective action. Political Economy of Institutions and Decisions*, Cambridge University Press.
- Ostrom, E. and Walker, J. (2003). *Trust and reciprocity: interdisciplinary lessons for experimental research*. Ed. Russel Sage Foundation, NY.
- Ostrom, E. (2008). Polycentric systems for coping with collective action and global environmental change. *Global Environmental Change*, 20(4), 550-557.
- Otero, G. (2012). The neoliberal food regime in Latin America: state, agribusiness transnational corporations and biotechnology. *Canadian Journal of Development Studies*, 33(3), 282-294.

- Palinkas, L. A., Horwitz, S. M., Green, C. A. Wisdom, J. P., Duan, N., and Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Adm Policy Ment Health*, 42, 533.
- Palma, I. P., Toral, J. N., Parra Vazquez, M. R., Fuentes, N. F., and Hernandez, F. G. (2015). Historical changes in the process of agricultural development in Cuba. *Journal of Cleaner Production*, 96, 77-84.
- Palmer, I. (1972). *Food and the new agricultural technology*. Geneva: United Nations Research Institute for Social Development.
- Parashar, A., and Udayabanu, M. (2017). Gut macrobiotic: implications in Parkinson's disease. *Parkinsonism & Related Disorders*, 38, 1-7.
- Park, J. L., Johnston, C., Colalillo, S. and Williamson, D. (2018). Parents' attributions for negative and positive child behavior in relation to parenting and child problems. *Journal of Clinical Child & Adolescent Psychology*, 47(1), S63-S75.
- Patel, R. (2013). The long green revolution. *The Journal of Peasant Studies*, 40(1), 1-63.
- Patel, R. (2007). *Stuffed and starved. Markets, power and the hidden battle over the world's food system*. Portobello Books, London, UK.
- Patton, M. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: Sage.
- Peacock, A., Leung, J., Larney, S., Colledge, S., Hickman, M., Rehm, J., Giovino, G. A., West, R., Hall, W., Griffiths, P., Ali, R., Gowing, L., Marsden, J., Ferrari, A. J., Grebely, J., Farrell, M., and Degenhardt, L. (2018) Global statistics on alcohol, tobacco and illicit drug use: 2017 status report. *Addiction*, 113, 1905– 1926.

- Pechlaner, G., and Otero, G. (2008). The third food regime: neoliberal globalism and agricultural biotechnology in North America. *Journal of the European Society for Rural Sociology*, 48(4).
- Perusini, J., Meyer, E., Long, V. et al. (2016). Induction and Expression of Fear Sensitization Caused by Acute Traumatic Stress. *Neuropsychopharmacol*, 41, 45–57.
- Perez, J., Beale, E., Overholser, J., Athey, A., and Stockmeier, C. (2020). Depression and alcohol use disorders as precursors to death by suicide. *Death Studies*, DOI: 10.1080/07481187.2020.1745954
- Phelan, A., Ruhanen, L., and Mair, J. (2020). Ecosystem services approach for community-based ecotourism: towards an equitable and sustainable blue economy. *Journal of Sustainable Tourism*, 28(10), 1665-1685.
- Piketty, T. (2013). *Capital in the twenty-first century*. Belknap Press.
- Pingali, P. L. (2012). Green revolution: impacts, limits, and the path ahead. *PNAS*, 109(31).
- Pink, S. (2008). Sense and Sustainability: the case of the slow city movement. *The International Journal of Justice and Sustainability*, 13(2), 95-106.
- Pollan, M. (2006). *Omnivore's dilemma: a natural history of four meals*. Penguin Press.
- Pollan, M. (2008). *In Defense of Food*. Penguin Press.
- Polletta, F., Trigoso, M., Adams, B., and Ebner, A. (2013). "The limits of plot: accounting for how women interpret stories of sexual assault." *American Journal of Cultural Sociology* 1, 289-320.
- Popkin, B. (2004). The nutrition transition: an overview of world patterns of change. *Nutrition Reviews*, 62, s140-s143.

- Popkin, B. (2006). Global nutrition dynamics: the world is shifting rapidly toward a diet linked with noncommunicable diseases. *American Journal of Clinical Nutrition*, 84, pp. 289-98.
- Prado, E., and Dewey, K. (2014). Nutrition and Brain Development in Early Life. *Nutrition Reviews*, 72(4), 1.
- Rabiee, F. (2004). Focus-group interview and data analysis. *Proceedings of the Nutrition Society*, 63, 655-660.
- Raup, D. M. and Sepkoski, J. J. (1982). Mass extinctions in the marine fossil record. *Science*, 215(4539), 1501–1503.
- Rockstrom, J., and Sukhdev, P. (2016). EAT Forum. Stockholm Resilience Centre. Accessed at: <https://stockholmresilience.org/research/research-news/2016-06-14-how-food-connects-all-the-sdgs.html>
- Rogers, J. (2020). How our global battle against coronavirus could help us fight climate change. World Economic Forum.
- Richards, D. (2010). Contradictions of the ‘new green revolution’: a view from South America’s southern cone. *Globalizations*, 7(4), 563-576.
- Ringen, E., Duda, P., and Jaeggi, A. (2019). The evolution of daily food sharing: a Bayesian phylogenetic analysis. *Evolution and Human Behavior*, 40(4), 375-384.
- Ritchie, J., and Spencer, L. (1994). Qualitative data analysis for applied policy research. In *Analyzing Qualitative Data*, pp. 173–194.
- Robinson, W. (2008). *Latin America and Global Capitalism: A Critical Globalization Perspective*. John Hopkins University Press, Baltimore.

- Rockstrom, J., Steffen, W., Noone, J., Perrson, K., Chapin, F. S., Lambin, E. and Foley, J. (2009). Planetary boundaries: Exploring the safe operating space for humanity, *Ecol. Soc.*, 14(2), p. 32.
- Roser, M. (2013). Employment in Agriculture. Published online at OurWorldInData.org. Retrieved from: '<https://ourworldindata.org/employment-in-agriculture>'
- Roser, M., Ortiz-Ospina, E. and Ritchie, H. (2013). Life Expectancy. Published online at OurWorldInData.org. Retrieved from: '<https://ourworldindata.org/life-expectancy>'
- Rosset, P. M., Sosa, B. M., Roque Jaime, M. R., and Avila Lozano, D. R. (2011). The Campesino-to-Campesino agroecology movement of ANAP in Cuba: social process methodology in the construction of sustainable peasant agriculture and food sovereignty. *The Journal of Peasant Studies*, V. 38, 1, 161-191.
- Ruiz, D. M. (1998). *The Four Agreements: a practical guide to personal freedom (A Toltec wisdom book)*. Amber-Allen Publishing, CA.
- Sacco, D., Moretti, B., Monaco, S., and Grignani, C. (2015). Six-year transition from conventional to organic farming: effects on crop production and soil quality. *European Journal of Agronomy*, 69, pp. 10-20.
- Sacco, T., and Sacchetti, B. (2010). Role of secondary sensory cortices in emotional memory storage and retrieval in rats. *Science*, 329(5992), 649-656.
- Sanchez, G., and Achilli, L. (2020). Stranded: the impacts of COVID-19 on irregular migration and migrant smuggling. Migration Policy Centre, Policy Briefs 2020.

- Sandy, M. (2019). The Amazon is completely lawless': the rainforest after Bolsonaro's first year. The New York Times, Dec. 5th, 2019. Accessed at: [nytimes.com/2019/12/05/world/americas/amazon-fires-bolsonaro-photos.html](https://www.nytimes.com/2019/12/05/world/americas/amazon-fires-bolsonaro-photos.html)
- Saunio, M., et al. & Zhu, Q. (2016). The global methane budget 2000-2012. *Earth System Science Data*, 8, 697-751.
- Schwartz-Shea, P. and D. Yanow. (2012). *Interpretive Research Design: Concepts and Processes*. Routledge Series on Interpretive Methods. New York, New York.
- Shah, A. (2013). Poverty facts and stats. *Global Issues*, accessed at: <http://www.globalissues.org/article/26/poverty-facts-and-stats>
- Shehata, S. (2014). Ethnography, identity, and the production of knowledge. In ed. Yanow and Scharz-Shea, *Interpretation and Method*. 209-227.
- Shepard, D., Setren, E., and Cooper, D. (2011). *Hunger in America: Suffering we all pay for*. Center for American Progress.
- Selwyn, B. (2018). Poverty Chains and Global Capitalism. *Competition and change*. 23(1), 71-97.
- Singh, R. (2000). Environmental consequences of agricultural development: a case study from the Green Revolution state of Haryana, India. *Agriculture, Ecosystems, and Environment*, 82, pp. 97-103.
- Small, M. (2009). How many cases do I need? On Science and the logic of case selection in field-based research. *Ethnography*. Vol. 10, 1, pp. 5-38.

- Smith, P., House, J. I., Cunha Bustamante, M. M., and Pugh, T. A.M. (2016). Global change pressures on soils from land use and management. *Global Change Biology*, 22, 3, 1008-1028.
- Spears, L. and Lawrence, M. (2016). *Practicing servant leadership- succeeding through trust, bravery and forgiveness*. Jossey-Bass, San Francisco, CA.
- Suddaby, R. (2006). From the Editors: What Grounded Theory is Not. *Academy of Management Journal*, 49, 4, pp. 633–642.
- Sunstein, Cass R., Albert Hirschman's Hiding Hand (June 10, 2014). Available at SSRN: <http://dx.doi.org/10.2139/ssrn.2448357>
- Stake, R. E. (1995). *The art of case study research*. Sage, Thousand Oaks, CA.
- Stan, K., Sanchez-Azofeifa, A. (2019). Deforestation and secondary growth in Costa Rica along the path of development. *Reg Environ Change* 19, 587–597.
- Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M. and Soëlin, S. (2015). Planetary boundaries: Guiding human development on a changing planet, *Science*, 347(6223), pp. 736–746.
- Stirling Hill, T. (2016). Paraguay battles over land rights in the courts and across the airwaves. *The Guardian*. Available at, <https://www.theguardian.com/global-development/2016/may/03/paraguay-battles-over-land-rights-in-the-courts-and-across-the-airwaves>
- Stokols, D. (2018). *Social Ecology in the digital age: solving complex problems in a globalized world*. Elsevier.
- Stokols, D., Gryzwacz, J., McMahan, S., and Phillips, K. (2003). Increasing the health promotive capacity of human environments. *American Journal of Health Promotion*, 18(1), 4-13.

- Stokols, D., Hall, K., Taylor, B., & Moser, R. (2008) The science of team science: Overview of the field and introduction of the supplement. *American Journal of Preventive Medicine*, 35(Supp. 2), S77-S89.
- Stokols, D., Hall, K.L., Moser, R., Feng, A., Misra, S. & Taylor, B. (2010) Cross-disciplinary team science initiatives: Research, training, and translation. In R, Frodeman, J.T. Klein, & C. Mitcham (Eds.), *Oxford Handbook on Interdisciplinarity* (pp. 471-493). New York: Oxford University Press.
- Stokols, D., Lejano, R., and Hipp, J. (2013). Enhancing the resilience of human-environment systems: a Social Ecological Perspective. *Ecology and Society*, 18(1), 7.
- Strauss, A., and Corbin, J. (1994). *Grounded theory methodology: an overview*. In Ed. *Strategies of Qualitative Inquiry*, Denzin and Lincoln. Sage, Thousand Oaks, CA.
- Strier, R. (2010). The construction of university-community partnerships: entangled perspectives. *Higher Education*, 62, 1, pp. 81-97.
- Stuckler, D., and Nestle, (2012). Big food, food systems, and global health. *PLoS Medicine*, 9, 6.
- Sun, J., and Chang, E. (2014). Exploring gut microbes in human health and disease: pushing the envelope. *Genes & Diseases*, 1, pp. 132-139.
- Tang, A., Choi, J... and Kahn, M. (2017). Endothelial TLR4 and the micro biome drive cerebral cavernous malformations. *Nature*, 545, 305-310.
- Team Scholarship Acceleration Lab. (2020). Team scholarship at UCI. Accessed at: <https://tsal.uci.edu/>

- Thomas L, MacMillan J, McColl E, Hale C & Bond S (1995) Comparison of focus group and individual interview methodology in examining patient satisfaction with nursing care. *Social Sciences in Health* 1, 206–219.
- Tubiello, F. N. et al. & Smith, P. (2015). The Contribution of Agriculture, Forestry and other Land Use activities to Global Warming, 1990-2012. *Global Change Biology*, 21, 2655-2660.
- Turrentine, J. (2019). Jair Bosonaro to a horrified world community: “the Amazon is Brazil’s, not yours.” Natural Resource Defense Council, Aug. 30th 2019. Accessed at: <https://www.nrdc.org/onearth/jair-bolsonaro-horrified-world-community-amazon-brazils-not-yours>
- Turzi, M. (2016). Colonization: Paraguay. *The Political Economy of Agriculture Booms*, pp. 101-116.
- Transparency International (2020). Costa Rica Country Data. Accessible here: <https://www.transparency.org/country/CRI>
- Trilla, A. (2020). One world, one health: the novel coronavirus COVID-19 epidemic. *Medicina Clinica*, 154(5), 175-177.
- United States Geological Survey (USGS). (2014). Nitrogen and Water, available at <http://water.usgs.gov/edu/nitrogen.html>. Accessed on 7 July 2015.
- Ver Ploeg M., Breneman, V., Farrigan, T., Hamrick, K., Hopkins, D., Kaufman, P. et al. (2009). Access to affordable and nutritious food—measuring and understanding food deserts and their consequences: report to congress. Washington, DC: Economic Research Service, United States Department of Agriculture, June 2009.

- Winans, K., and Deng, K. (2017). The history and current applications of the circular economy concept. *Renewable and Sustainable Energy Reviews*, 68(1), 825-833.
- World Bank. (2019). Measuring Poverty. World Bank Topics. Accessed at: <https://www.worldbank.org/en/topic/measuringpoverty>
- World Bank. (2018). Piecing Together the Poverty Puzzle. Poverty and Shared Prosperity 2018. Accessed at: <https://openknowledge.worldbank.org/bitstream/handle/10986/30418/9781464813306.pdf>
- World Bank. (2019). The world bank in Malawi. World Bank Country Overview. Accessed at: <https://www.worldbank.org/en/country/malawi/overview>
- World Bank. (2019). World Bank Open Data. Accessed at: <https://data.worldbank.org/>
- World Health Organization (2013). Global and regional estimates of violence against women: prevalence and health effects of intimate partner violence and non-partner sexual violence, p.2. Department of Reproductive Health and Research, London School of Hygiene and Tropical Medicine, South African Medical Research Council.
- World Hunger Education Service. (2018). 2018 World hunger and poverty facts and statistics. WHES and Hunger Notes. Accessed at: <https://www.worldhunger.org/world-hunger-and-poverty-facts-and-statistics/#hunger-number>
- Qaim, M. (2005). Agricultural biotechnology adoption in developing countries. *American Journal of Agricultural Economics*, 87(5), 1317-1324.
- Quammen, D. (2014). Ebola: The natural and human history of a deadly virus. W.W. Norton & Co.

- UNFPA. (2009). State of the world population 2009. Facing a changing world: Women, population and climate. United Nations Population Fund 2009.
- USDA. (2019). Food Security Status of U.S. Households in 2018. United States Department of Agriculture - Economic Research Service. Accessed at: <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/key-statistics-graphics.aspx>
- U.S. Department of Transportation, (2017). Border Crossing/Entry Database. Bureau of Transportation Statistics. Accessed at: <https://www.bts.gov/content/border-crossingentry-data>
- United States Environmental Protection Agency (EPA). (2015). Sources of Greenhouse Gas Emissions, available at <http://www.epa.gov/climatechange/ghgemissions/sources.html>. Accessed on 9 July 2015.
- United States Geological Survey (USGS). (2014). Nitrogen and Water, available at <http://water.usgs.gov/edu/nitrogen.html>. Accessed on 7 July 2015.
- USDA (2016). Food security status of U.S. households in 2016. Accessed at April 23, 2018 at: <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/key-statistics-graphics.aspx#foodsecure>
- Via Campesina. (2003). Food Sovereignty. La Via Campesina, International Peasants Movement. Available at: <https://viacampesina.org/en/food-sovereignty/>
- Voosen, P. (2016). Why is atmospheric methane surging? (Hint: It's not fracking). Science Magazine, Dec. 21, 2016.
- Wang, B., Yao, M., Lv, L., Ling, Z., and Li, L. (2017). The human microbiota in health and disease. Engineering, 3, 71-82.

- Walker, B. and Salt, D. (2011). Resilience thinking (Island Press, Washington, DC).
- Wakeford, J. J., Lagrange, C. K. (2016). Managing the energy-food-water-nexus in developing countries: case studies of transition governance. QGRL Working Paper.
- Williams, J. M. (2017). Building community capacity for food and agricultural justice: lessons from the Cuban permaculture movement. In: Werkheiser I., Piso Z. (eds) Food Justice in US and Global Contexts. The International Library of Environmental, Agricultural and Food Ethics, vol 24. Springer, Cham.
- Wolford, W. (2003). Producing Community: the MST and land reform settlements in Brazil. *Journal of Agrarian Change*, 3, 4. Pp. 500-520.
- Worden, J. R., Bloom, A., Pandey, S., Jiang, Z., Worden, H., Walker, T., Houweling, S. & Rockmann, T. (2017). Reduced biomass burning emissions reconcile conflicting estimates of the post-2006 atmospheric methane budget. *Nature Communications*, 8, 2227.
- World Bank. (2015). GINI index (World Bank estimate): Brazil. Accessed on April 24, 2014 at: <https://data.worldbank.org/indicator/SI.POV.GINI?locations=BR>
- World Bank. (2018). The World Bank In Uruguay: Overview. Accessed at: <http://www.worldbank.org/en/country/uruguay/overview>
- Xu, Z. (2017). The global food regime: crisis and restructuring. Master's Thesis, Howard University.
- Yang, B., Wei, J., Ju. P., and Chen. J. (2019). Effects of regulating intestinal microbiota on anxiety symptoms: a systematic review. *General Psychiatry*, 32(2).

- Yanow, D. (2014). Thinking Interpretively: Philosophical Presuppositions and the Human Sciences. In ed. Yanow and Schartz-Shea, *Interpretation and Method*. 5-26.
- Yanow, D. and Schwartz-Shea, P. (2014). *Interpretation and Method: Empirical Methods and the Interpretive Turn*, eds. 2nd edition. Armonk, NY, and London: M.E. Sharpe.
- Yapa, L. S., and Mayfield, R.C. (1978). Non-adoption of innovations: Evidence from discriminant analysis. *Economic Geography*, 54(2), 145–56.
- Yazan, B. (2015). Three approaches to case study methods in education: Yin, Merriam, and Stake. *The Qualitative Report*, 20(2), 134-152.
- Yin, R. (2003). *Case Study Research: Design and Methods* (3rd edition). Sage. Thousand Oaks, CA.
- Young, E. (2016). *I Contain Multitudes: The Microbes within us and a grander view of life*. Harper Collins, NY.
- Zalidis, G., Stamatiadis, S., Takavakoglou, V., Eskridge, K., and Misopolinos, N. (2002). Impacts of agricultural practices on soil and water quality in the Mediterranean region and proposed assessment methodology. *Agriculture, Ecosystems and Environment*, 88, pp. 137-146.