

A COOPERATIVE APPROACH TO FOOD SECURITY AND FOOD SOVEREIGNTY

by

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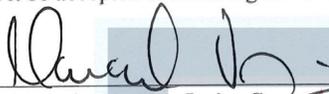
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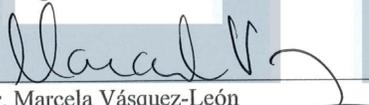


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ARIZONA

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ABSTRACT

The Paraguayan agrarian sector is highly unequal. With one of the highest levels of land inequality in the world, 94 percent of arable land dedicated to commodity crop agriculture, and entrenched alliances between large-scale agriculture producers and landowners with the country's political establishment, traditional campesino agriculture is rapidly diminishing across the country. Paraguay's transition towards a large-scale agro-export model has a raft of implications for both the food security and food sovereignty of its smallholder producers. This research explores the sugarcane cooperative Manduvirá as an alternative model for community development in rural Paraguay. Manduvirá has over 900 members who produce on five to seven hectares of land, they built, own, and operate their own organic sugar mill, and directly export to over 25 countries. Moreover, through a democratic cooperative process, Manduvirá's members have used their success in the export sugar sector to reinvest in a number of community-based initiatives to address the changing food security and food sovereignty landscape. This research examines the role that Manduvirá fulfills in addressing food security and food sovereignty in attempts to understand the broader role that smallholder agricultural cooperatives can play in the community development process.

INTRODUCTION

Only about 45 minutes from Asunción, Arroyos y Esteros is a *municipio*¹ of around 20,000 people in the Cordillera department of Paraguay. The town lays almost perfectly adjacent to Ruta 3 highway which connects Asunción with northeastern departments of San Pedro and Concepción, finally arriving at the Brazilian border in the department of Amambay. The placement of the highway along the western edge of town makes it easy for traffic to assume that the town is little more than a stop along a busy highway: a green Puma gas station is the most notable feature in plain sight and where first time visitors such as myself are advised to exit the crowded bus heading north. Vendors selling fruit and other snacks to travelers are dotted along the shoulder of the highway, pharmacies, a pizzeria and agricultural supply stores line the road, and trucks park outside a restaurant that sits mere feet from the highway which one can assume exists almost entirely to serve passersby.

A few blocks from the highway sits the unassuming offices of one of the defining features of Arroyos y Esteros: a farmer owned and operated cooperative called Manduvirá. From its humble beginnings in 1975 when a group of 39 Arroyenses opened the cooperative to take advantage of state-sponsored savings and credit incentives (Vásquez-León 2010), the cooperative has grown substantially. Today, Manduvirá is a sugarcane cooperative with over 900 producer members practicing *campesino* agriculture on plots averaging around five hectares in roughly a half dozen outlying communities of Arroyos y Esteros. The cooperative now owns and operates its own sugar mill which has the capacity to process 200,000 metric tons of sugarcane, producing around 20,000 metric tons of sugar per year. With over 8,000 hectares

¹ Roughly equivalent to a county in the American context as it includes a central town (municipality) with jurisdiction over surrounding rural areas.

organically certified by Fair Trade International, Manduvirá cultivates, processes, and exports sugar under their own label to over 25 countries.

The story of Manduvirá is by every measure an outstanding success of grassroots development. The following case study, however, is less concerned with where Manduvirá came from and more concerned with what it is doing with the success it has now gained. For all its accomplishments, Manduvirá now faces new challenges as it attempts to play the dual role of maintaining itself as a competitive player in the export sugar industry and staying faithful to the cooperative principles on which it is founded.

On one hand, Manduvirá has invested heavily in the business aspects of the sugarcane value chain: not only the massive undertaking of the mill project, but their annual plan focuses heavily on increasing financing for sugarcane production, improving infrastructure such as their communal collection centers where farmers deliver their raw sugarcane, and paying off debt. On the other hand, however, Manduvirá remains committed to maintaining its role and identity as a cooperative that exists to serve its members and its community. In order to do this, the cooperative has systematically invested in a number of initiatives aimed at improving the livelihoods of their members and the community which are at times entirely unrelated to sugarcane production.

On an institutional level, the cooperative has explicitly named both food security and food sovereignty as points of emphasis where they can most effectively apply cooperative resources. As I will establish shortly, Paraguay's rural agricultural producers are facing significant challenges in retaining sovereignty over food production as major transitions away from traditional agriculture are sweeping the country. These transitions reach beyond the agrarian sector, however, and are often accompanied by major shifts in rural livelihoods and

more specifically, food security outcomes. Indeed, there is growing evidence that Paraguay is now facing new challenges in the area of food security and nutrition that were previously unseen in the country.

Using food security and food sovereignty as its entry point, this research aims to understand how Manduvirá is navigating the competing demands from the private sector with the communal demands of its members. Employing a political ecology framework, this case study examines how cooperative members and staff perceive the issues of food security and food sovereignty, the specific initiatives the cooperative is implementing to address them, and what impact it is having. In short, this thesis addresses the question of what role can smallholder farmers' cooperatives in rural Paraguay play in addressing food security and food sovereignty.

Answering this question relies heavily on existing research on agricultural cooperatives, most directly on that of anthropologists Marcela Vásquez-León, Brian Burke, and Timothy Finan whose work on agricultural cooperatives in Latin America “address[es] the central question of how cooperative organization in a highly stratified society is able to negotiate the local context of inequality and the broader context of international markets and global competition” (2017). By exploring the ways in which Manduvirá negotiates this context to address food security and food sovereignty, I will borrow multiple components of Vásquez-León, et. al.'s analytical framework to directly confront broader questions of cooperativism, its benefits, and its boundaries. In the case of Manduvirá, the cooperative has had significant success as a market player in the sugar sector, but can success in one realm of cooperativism translate into success in the other? How does the cooperative respond and adapt to its political, economic, social and environmental context? Finally, are cooperatives adequately and realistically suited to assume this formidable undertaking?

In many ways, Manduvirá is an exceptional cooperative. There are a number of other agricultural cooperatives in and around Arroyos y Esteros, some of which are also sugarcane cooperatives that, for any number of reasons, do not have the scale or notoriety of Manduvirá. The goal of this research, however, is to look precisely at a successful cooperative as a means for understanding the role and depth of impact it can have on community development. Through a thorough analysis of the cooperative's attempts to address food security and food sovereignty, I argue that Manduvirá illustrates how collective action allows communities to exert control over their own development process within inhospitable agrarian contexts.

As I will demonstrate, agriculture and rural livelihoods in Paraguay are at a pivotal point. Traditional agriculture is being replaced by industrial agriculture at an increasingly rapid pace and many agricultural producers across the country are losing sovereignty over their means of production and their role in the agricultural value chain. The impact of these changes can be felt in many ways, including in the areas of food security and food sovereignty. Smallholder farmer cooperatives are at least in part a response to these transitions, an effort to retain the wellbeing of the producer at the center of agricultural production. In many ways, Manduvirá exemplifies this struggle as it attempts to have one foot in grassroots community development and one foot in a globalized agricultural value chain.

Chapter One of this thesis will outline the methodological approach employed in this research, its contribution to Latin American Studies, and the role of political ecology. Chapter Two will provide a brief history of Manduvirá followed by political ecological analysis of the history of agrarian reform in Paraguay. Chapter Three begins the first of three chapters which serve as both a literature review and the theoretical framework which organizes this thesis. Chapter Three focuses on food security, Chapter Four on food sovereignty, and Chapter Five on

cooperatives and collective action. Research results and conclusions are presented in Chapter Six.

CHAPTER ONE: METHODOLOGY

This research was conducted over the course of five weeks in June and July 2017 in the municipio of Arroyos y Esteros in the Cordillera Department of Paraguay as well as in the capital city of Asunción. The following research tools and methods were used for data collection and data analysis.

Field work in Arroyos y Esteros consisted of direct observation, dietary diversity questionnaires, semi-structured interviews, and small group interviews. A number of explanatory variables regarding food security and food sovereignty can be analyzed through observation: variety of food available in local stores and markets, abundance of stores and markets compared to the population density, consumer habits, food preparation practices, and infrastructure are all factors which allow for or inhibit food security. These observations complement both interviews and dietary diversity questionnaires but alone only capture part of the food security landscape as food can be available in stores but economically inaccessible to consumers. Detailed field notes—methodological, descriptive, and analytic notes (Bernard 2006)—and audio recordings were taken daily throughout the research period.

Dietary diversity questionnaires were used to standardize questions and provide background information regarding existing dietary norms and habits (Annex 1). A total of 13 questionnaires were conducted with sugarcane producing members of both Manduvirá and a smaller sugarcane cooperative in Arroyos y Esteros called Montillo in order to complement both observations and interviews. The tool was adopted from the Food and Agriculture Organization (FAO) of the United Nations' Guidelines for Measuring Household and Individual Dietary Diversity (FAO 2013). An initial Spanish-language draft questionnaire was developed prior to the research period and then modified in Paraguay—with the assistance of contacts in Arroyos y

Esteros—to reflect the local lexicon and gastronomic context. Some of these changes were as simple as exchanging the word “*papaya*” for its Paraguayan name of “*mamón*” while others were reclassifying a “*tortilla*” as a flour, cheese and egg omelet rather than unleavened corn or flour flatbread. Considering the time, resource, and logistical constraints, employing these questionnaires to determine the food security status of the community or comparing Manduvirá producers to non-Manduvirá producers was unfeasible. Thus, the tool was adopted to obtain a realistic picture of what food items are most commonly consumed, not a dietary diversity score, and provided an introductory point for interview questions regarding where specific food items are purchased or procured.

Semi-structured interviews were conducted with cooperative members, cooperative leadership, and one researcher with experience in food sovereignty and rural social movements from BASE Investigaciones Sociales, a research institution based in Asunción. A total of 15 sugarcane producing members of Manduvirá were interviewed. The initial non-probability sampling was completed with the assistance of one of Manduvirá’s technical advisors. Once these initial contacts were made, a snowball sampling was conducted where interviewees recommended other producers in the area who they believed were interested in being interviewed and could produce relevant information.

Additional interviews were conducted at two of Manduvirá’s *centros de acopio* or sugarcane collection centers. Once sugarcane is harvested, it is brought by the producer—usually in an ox-drawn cart or a small tractor trailer—to a collection center. The collection center consists of stationary crane which lifts the sugarcane off of the producer’s cart, is then weighed, and loaded onto a truck to be taken to the mill. Since research was conducted at the beginning of

harvest season, a number of producers were delivering their sugarcane and willing to be interviewed after their cargo was unloaded and weighed.

Finally, three of the 15 interviews were conducted in a sugarcane producing community of Manduvirá after a meeting of producers with Manduvirá's educational outreach director. Attendees to the meeting were invited to stay behind after the completion of the meeting if they were willing to be interviewed for this research for which there were three volunteers. Of the 15 interviewees, four were women and all but one had been a member of the cooperative for more than 10 years.

Producer interviews consisted of questions regarding the food security status of the interviewee and their families (Besides sugarcane, what else do you grow? Is it for household consumption or for sale? What are you unable to grow that you need for household consumption? Where do you purchase these items? How does this change throughout the year, either due to seasonal growing cycles or economic cycles?), their perception of the status of the community and whether or not they have seen noticeable changes in their lifetimes in dietary habits or food availability and access. Interviewees were also asked to speak about the impact of the cooperative (What do you think are the benefits of being a member of the cooperative? What do you do with your Fair Trade premium? What trainings or programs do you participate in with the cooperative? Has the cooperative played a role in your non-sugarcane production? If so, can you tell me about that role?), as well as questions regarding their opinion the cooperative in addressing food security and what other options they would have or how their lives would be different if not for the cooperative.

Initial contact with the cooperative was arranged by the thesis committee chair for this project, Dr. Marcela Vásquez-León who previously studied the cooperative and co-authored a

book chapter with Manduvirá's general manager. Once connected with the general manager, I was given the contact information of the cooperative's executive assistant who introduced me to various other staff members of the cooperative who provided rides to the mill, trainings, and collection centers where the interviews were conducted. With introductions from cooperative staff, Manduvirá producers were uniformly welcoming and gracious to an outsider seeking answers regarding the cooperative and the community. While some producer interviewees were not fully comfortable answering my questions in Spanish—in which cases I requested assistance from one of Manduvirá's technical advisors who was present at the time—and a few others only gave short answers with little elaboration which produced little relevant insight for this research, the vast majority of producers were not only willing to speak with me in length, but indulge my many follow up questions, show me around their sugarcane plots and household gardens, introduce me to other nearby producers, and in some cases conduct the interview while sharing an afternoon *mate*.

In addition to the producer interviews, semi-structured interviews were conducted with 10 different members of Manduvirá's staff and organizational leadership. Individual in-depth interviews were conducted with the cooperative's general manager, mill manager, educational outreach director, and compost manager. An in-depth group interview was also conducted with the cooperative's head of technical assistance, the cooperative president, and the president of the cooperative's member elected Oversight Board. Questions in this in-depth interview were directed at understanding their perception of food security and food sovereignty in Arroyos y Esteros, if or how it has changed over the course of their lifetimes, how the cooperative addresses these issues, what impact they believe they are having, and how they navigate the balance between addressing community issues and running a profitable sugar enterprise.

As a point of comparison and further background information on the community, sugarcane production, and food security, additional interviews were conducted with the leadership and members of Montillo. Eight producer members of Montillo were interviewed and two members of the cooperative's fulltime staff, all of whom were equally as gracious with their time as their Manduvirá counterparts. One other informal meeting was conducted in Asunción with a researcher with significant social science research experience in the country. During the final week of research, the Latin American Council of Social Sciences held a three-day conference in Asunción where various Paraguayan and South American academics presented on themes directly related to this research including the agrarian transformation in Paraguay and its direct impact on food sovereignty and rural livelihoods. Notes, audio recordings and key insights from into the social science discourse in the country which emerged from the conference also inform this research.

All interviews were recorded with the permission of the interviewees, transcribed and retained in accordance with University of Arizona's Internal Review Board (IRB) standards. IRB approval was granted for this research on May 26, 2017 (Protocol Number: 1705455702). Interviews were conducted in Spanish with few exceptions where the interviewee felt more comfortable answering in Guaraní. In these cases, the technical advisor to Manduvirá provided a Spanish translation.

CONTRIBUTION TO LATIN AMERICAN STUDIES

Across Latin America, significant strides have been made in reducing certain aspects of food insecurity which I will outline in the following chapters. However, many of the forthcoming macro-level statistics from across the region often belie the fact that certain populations are

disproportionately affected by low food access, availability, utilization and stability—particularly rural and indigenous agriculturalists (FAO 2018). Furthermore, food sovereignty complicates the progress that has been made and encapsulates a spirited debate around the role of agriculturalists in the global food production system.

The following chapters will present and analyze extant literature on Paraguay, food security, food sovereignty, and collective action. While the literature within each of these themes is expansive, it is also often siloed. This thesis relies on existing studies on cooperatives in Paraguay, for example, but food security and food sovereignty are not central to their analysis. Likewise, food sovereignty is emerging as a compelling framework for understanding the role of producers in the Paraguayan agrarian landscape (Agosto and Palau 2015), but literature on the role of collective action to address food sovereignty in Paraguay is decidedly lacking, a point confirmed in an interview with a researcher from BASE Investigaciones Sociales. This research aims to do more than simply fill a gap in the literature, however. More importantly, it builds an argument for the importance of merging these themes into one cohesive study. Through a democratic, cooperative process, Manduvirá has elected to address the issues of food security and food sovereignty. Analyzing these efforts can help inform our understanding of the role of cooperatives in community development and the extent of their ability to tackle the issues they have identified.

THE ROLE OF POLITICAL ECOLOGY

There are three converging themes in this research: food security, food sovereignty, and collective action. In their respective chapters, I will explain how each of these concepts are fluid, contested, and multifaceted. Before that analysis, however, it is important to understand the role

that political ecology plays in framing each concept, analyzing the political context of each concept, and understanding how Manduvirá asserts itself as an institution for maintaining both ecological welfare and viable rural livelihoods.

Political ecology has slowly developed since the 1970s as a response to what was often dichotomous perspectives of political scientists viewing politics in isolation of environment and ecologists and natural scientists viewing environment in isolation of politics. What has emerged in political ecology is a recognition that all ecologies are in fact political. This challenge has produced a wealth of research from wide ranging disciplines examining everything from the impact of monoculture farming in Kenya impacting rain patterns in Tanzania (Robbins 2012) to the politics of biofuels (Bailis and Baka 2011).

The goal of political ecology, according to Michael Watts, is “to understand the complex relationship between nature and society through careful analysis of what one might call the forms of access and control over resources and their implications for environmental health and sustainable livelihoods” (2000). As this suggests, once the thesis is accepted that politics is ecological and ecology is political, we must then examine the raft of accompanying implications, principally that politics inherently traffics in the exercise and distribution of power. It is here where much of the political ecology research is produced; understanding how power—and the inequality of power—impacts degradation and marginalization, conservation and control, environmental conflict and exclusion, environmental subjects and identity, and political objects and actors (Robbins 2012). According to Paul Robbins,

political ecology presents a Jekyll and Hyde persona, attempting to do two things at once: critically explaining what is wrong with dominant accounts of environmental change, while at the same time exploring alternatives, adaptations, and creative human action in the face of mismanagement and exploitation: offering both a “hatchet” to take apart flawed, dangerous, and politically problematic accounts, and a “seed,” to grow into new socio-ecologies (2012).

Thus, documenting and even critiquing the dominant narratives of environmental change is insufficient: political ecology calls researchers to explore the variable, disproportionate impacts of these changes, their political roots, and how individuals, institutions, and communities interact and cope with, adapt to, or resist these changes. These responsive socio-ecologies arise within political ecology not as romanticized, historical depictions of erstwhile cultures or customs, but as assertions of present-day communities of practice proposing alternative means for environmental health and sustainable livelihoods within dynamic processes of change.

What follows in this research is a thorough examination and critique of environmental change in Paraguay in the form of a major agrarian transition away from traditional agriculture and towards large-scale industrial agriculture with an emphasis on Stroessner and post-Stroessner era agrarian policy. The impact of this change is examined not only within the confines of agriculture and the environment, but is broadened to examine potential changes to the food security landscape of the country as well as the role of agricultural producers and communities within agricultural value chains. From this narrative will arise the story of Manduvirá; at times challenging their political and environmental context, and at times adapting to it by implementing their own process of environmental management and sustainable livelihood development.

CHAPTER TWO: BACKGROUND AND POLITICAL ECOLOGY OF PARAGUAYAN AGRICULTURE

MANDUVIRÁ FROM 1975 TO 2017

The historical trajectory of Manduvirá has evolved significantly since its founding in 1975 when a group of 39 mostly school teachers and farmers opened the cooperative to take advantage of state-sponsored savings and credit incentives (Vásquez-León 2010).² Formed under the military dictatorship of Alfredo Stroessner, the cooperative began to expand their credit services by borrowing from CREDICOOP, the National Federation of Savings and Credit Cooperatives created by the state in 1979.³ With steady access to CREDICOOP credit, the cooperative began to overextend its credit line and began to flounder, eventually going bankrupt, and spending much of the 1980s hamstrung after renegotiating its significant debt.

With the fall of the Stroessner dictatorship in 1989 came new hope of political and economic inclusion, with Manduvirá's board of directors salvaging the organization by successfully renegotiating their debt and shifting to the production of sugarcane. Initially, Manduvirá's sugarcane was processed in over 150 small, home-based artisanal sugar mills which produced molasses for local markets. Having found a profitable enterprise, cooperative continued to grow, but ultimately molasses prices dropped and artisanal sugar syrup milling became unviable. In order to survive, the cooperative needed an industrial-scale sugar mill that

² This history has been thoroughly detailed in the 2010 case study by anthropologist Marcela Vásquez-León and thus only an orienting outline of her work will be presented in this thesis.

³ Stroessner-era policies towards collective action, both in terms of the constraints the dictatorship placed on cooperatives and its attempts to use them as a form of political control, is explored in further detail in Chapter Five.

could keep up with production and needed to produce the more market-friendly crystalized sugar.

In 1997, Manduvirá turned to the only local option available, a retrofitted sugar mill known by its Spanish acronym OTISA. Owned by a wealthy industrialist in Asunción, OTISA took advantage of its monopsony in Arroyos y Esteros and paid below market prices to sugar producers. While OTISA was Fair Trade certified which is designed to give producers an additional premium on certified sugar production, OTISA often kept significant portions of the bonuses. As Vásquez-León notes, “It is clear that Fair Trade, at least in the beginning, was re-creating old hierarchical relations of power instead of fostering social justice” (2010).

The greatest pivot point in the history of Manduvirá arose in direct response to the exploitation of OTISA. In 2003, after years of a mistreatment by OTISA, Manduvirá began renting another sugar mill which had been previously shut down. Over time, the cooperative grew, obtaining its own Fair Trade certification in 2004 and exporting directly to Canada, Belgium and Italy. Throughout this period, however, cooperative leadership and members dreamed of building its own sugar mill in order to gain further independence and control over the value chain. In 2011, construction began on the Manduvirá sugar mill only a few kilometers outside of Arroyos y Esteros. The mill was completed in 2014 and the cooperative proudly boasts that it was the first sugar mill in Latin America built for exclusively processing organic sugar cane.⁴

Getting to the mill from the town center of Arroyos y Esteros by car takes about 25 minutes. It is less than four kilometers and would take only a few minutes if not for the poor state

⁴ Other organic sugar mills exist in Latin America, but were built for conventional sugar and retrofitted for organic.

of the unpaved, red clayey road which is heavily worn after years of serving as the lifeblood of the community by carrying tons of sugarcane to the mill and processed sugar to market. Less than 10 kilometers from the high speed Ruta 3 highway, the road is source of anger and protest for local residents who cite it as a visceral example of the inaction of their government to support their agrarian enterprise. In particularly rough stretches of the road, oxen-drawn carts carrying eight-foot high towers of sugarcane can progress at roughly the same pace as a car navigating over the speed bump sized ruts, oddly upending one's preconceived notions of modernity.

The mill itself is an impressive, sprawling facility which, for all its cold, industrial functionality, also serves as a triumphantly symbolic monument to the cooperative's success: a massive, one-story high green sign with yellow letters reads: "AZUCARERA MANDUVIRÁ" with the Cooperativa Manduvirá logo prominently displayed. The road approaching the mill is another juxtaposition in the modern and the traditional as it is lined with tractors with three or four trailers in tow, trucks, and oxen-drawn carts all filled to the brim with recently harvested sugarcane wait their turn to deliver their product to the state of the art mill. Despite this success, however, the cooperative's work continues: "Our goal was not to build a mill," says Manduvirá's general manager, "Our goal is to improve the lives of our members and our community."



Manduvirá's organic sugar mill, completed in 2014. Source: Stephen Oliver, 2017

Paraguay is a country of around 6.8 million people landlocked between Argentina, Brazil and Bolivia. Smaller in size than each of its neighbors, the country is in many ways a regional oddity within Latin America. Paraguay is the only country in the Americas where a majority of the population—an estimated 90 percent—speaks one indigenous language, Guaraní, despite the fact that indigenous peoples account for only five percent of the population (Romero 2012). Until the recent agricultural boom, Paraguay has historically had no natural resources lucrative enough to anchor a strong national economy, only has a small, nascent manufacturing sector, and unlike most of its South American neighbors, never experienced a period of economic isolationism and strong state protectionism (Hetherington 2014; Martin and Spinetto 2016; Nickson and Lambert 2002). The country is also one of the most rural countries in the Western Hemisphere, with over 50 percent of has the population living outside of major cities (Vásquez-León 2010; Hetherington 2014).

Since the colonization of indigenous peoples and lands by the Spanish in the 16th century up to the present day, land conflict and land inequality has consistently plagued Paraguay, often leading to tragic results (Pastore 1972; Morillo 2013). In post-Colonial Paraguay, the War of the Triple Alliance between Paraguay and the allied Brazil, Uruguay and Argentina from 1864 to 1870 proved devastating for Paraguay in both the short and long-term (Pastore 1972). In addition to losing a staggering 60 percent of its population, Paraguay lost almost 40 percent of its prewar claimed territories, and ceded significant economic sovereignty as it was forced to sell state owned lands to pay off war debt (Baer and Birch 1984; Pastore 1972). However, far from dismantling the *latifundio* system of agricultural production, the forced sale simply concretized the system by transferring the vast majority of this land to only a handful of foreign-owned firms

(Richards 2010). By the early 20th century, three firms—an Anglo-Argentine, a Brazilian, and a French—owned 34 percent of the total area of eastern Paraguay (Nickson 1981). In the Chaco, 60 individuals and enterprises obtained property rights to nearly the entire region (Kleinpenning 1984).

The policies and drive for expanding the agricultural frontier continued under the military dictatorship of Alfredo Stroessner, who ruled over Paraguay uninterrupted from 1954 to 1989 in what is the longest dictatorship in Latin America. Adopting an aggressive anticommunism stance, Stroessner curried favor from the United States during the Cold War, obtained assistance from the International Monetary Fund (IMF) and other direct foreign aid to stabilize inflation rates and grow the agricultural sector by expanding the eastern agricultural frontier, creating a construction boom and opening up new land for development and investment (Baer and Birch 1984; Hetherington 2014). Aimed at increasing export-oriented growth and colonizing the sparsely populated frontier, the government created the *Instituto de Bienestar Rural* (Rural Welfare Institute, or IBR) in 1963 to oversee the colonization of the eastern expansion (Nagel 1999).

Ostensibly, land reform initiatives of Stroessner’s Colorado Party were backed with the populist ideals of land distribution, improving rural welfare and modernizing agricultural production. In the eastern region alone, *latifundia* of more than 10,000 hectares were opened up for expropriation, vacant but privately owned lands were subject to expropriation if peacefully occupied by a “considerable number” of inhabitants, and the Paraguayan Constitution of 1967 even claimed land to be a fundamental right for all citizens (Nagel 1999).

In reality, however, distribution of frontier lands during this period was highly unequal. Japanese and Brazilian colonists—principally those linked to companies with access to

international capital—were able to take advantage of support from their own governments and favorable policies to buy and control large amounts of frontier land, primarily for soybean, wheat, and cotton production (Formento 2003). Nepotism and particularism plagued the process as Stroessner and his family, military officials, and close associates were the primary beneficiaries of the IBR reforms, much of which was turned over to foreign corporations and land speculators (Nagel 1999; Ezquerro-Cañete and Fogel 2017). Despite over 90,000 land titles being granted by the end of 1976 (Baer and Birch 1984), Paraguayan campesinos who moved to the frontier lands looking to improve their livelihoods were most often allotted a 200 by 1,000-meter plot of land but soon found themselves struggling to survive far from their place of origin and removed from their communal support systems (Formento 2003).

Stroessner and his clientelistic network within the Colorado Party successfully linked—at least rhetorically—Paraguay’s campesinos with the broader economic aspirations of the country. Yet with Stroessner deposed in a coup in 1989, the Paraguayan *campesinato* found itself as part of a much different narrative which, I will demonstrate later, continues to spur the leadership and producers of Manduvirá:

The transition to democracy, whatever else it might have been, was a powerful narrative that organized new democratic politics. The transition produced a publicly legitimated sense of past, present, and future, which in turn created exclusions in time. If the Stroessner government prior to 1989 made a great show of saying that campesinos were the future of the nation, after the coup new democrats increasingly portrayed campesinos as part of the nation’s past, and doomed to disappearance (Hetherington 2014).

Despite this transition to democracy, democratic Paraguay did not deliver more egalitarian land reform. In fact, Stroessner’s Colorado Party continued to rule in the post-Stroessner era, working to exclude traditional usufruct rights to land from the 1992 Constitution and stipulating the full, advance compensation for expropriation of even unproductive lands

(Ezquerro-Cañete and Fogel 2017). After a short-lived economic recovery in the wake of the Stroessner regime fueled by new investments and confidence from international banks, by 1995 Paraguay's economy once again fell into recession. This period was followed with wave of neoliberal reforms, including accepting IMF loans contingent on structural-adjustment programs, privatization of the state development bank, trade liberalization, deregulation and a reduction in the size and role of the state (Hetherington 2014; Nickson and Lambert 2002). Many of these reforms were aimed at increasing export agriculture through deregulation, privatization of governance (Elgert 2015), and the legalization of genetically modified (GM) soy (Correia 2017).

The expansion of the agricultural frontier combined with the astronomical increases in export agriculture, particularly soy production, has taken a significant environmental toll in Paraguay. From 1945 to 2000, Paraguay's Atlantic Forest was reduced from 73,000 km² to only 12,000 km² (Richards 2010). The area was deforested at a rate of 2,000-3,000 km² per year between 1968 and 1991 and continuing at 1,000 km² per year through the 1990s, turning complex biodiverse ecosystems into vast expanses of monoculture: by 2008, 95 percent of Paraguayan soy (2.66 million hectares) was one GM Roundup Ready strain patented by Monsanto (Richards 2010; Oliveira and Hecht 2016; Antoniou et al. 2010).

The destruction of these ecosystems is compounded by the production practices employed once they are gone. GM soy production relies on heavy uses of patented chemical pesticides and herbicides which require intensive use of fossil fuels not only in their production but their mechanized application (Antoniou et al. 2010). The Paraguayan agricultural sector, primarily soybean production which is highly mechanized, consumes around 30 percent of the country's diesel fuel which is heavily subsidized by the state (Itriago 2012). Water contamination from both production and processing facilities has also become a problem (Richards 2010) as

well as cross contamination from aerial spraying of glyphosate and other agrochemicals (Oliveira and Hecht 2016).

However, the impact of these policies is not only on the environment as the export agriculture boom in Paraguay has coincided with a precipitous drop in campesino agriculture. In 2003, campesino agriculture accounted for roughly 685,000 hectares but was reduced to 339,000 by 2014 (Villagra 2016). From 1970 to 1979 when soy production increased by 350 percent, cassava production—a staple of the Paraguayan diet—dropped by 25 percent (Baer and Birch 1984) and soy cultivation replaced maize as the most widely harvested crop in the country (Ezquerro-Cañete 2016).

It is important to note that this transition impacts even regions where soy and other commodity crops are not produced such as the Cordillera department where Manduvirá operates. With the agricultural sector increasingly dedicated to export agriculture and domestic production in decline, basic food items are cheaply imported under the MERCOSUR trade agreement which further undercuts the economic viability of campesino agriculture across the country (Correia 2017). While soy production is practically nonexistent in Cordillera, the percentage of land dedicated to campesino agriculture dropped by 46 percent between 2002 and 2014 (Ortega 2016). Across the country, the number of temporary rural laborers fell from 946,040 in 1991 to 238,674 in 2008—an astounding 75 percent decline—prompting a surge in rural-urban migration (Ezquerro-Cañete and Fogel 2017).

While Paraguay's long history of agrarian inequality has laid the groundwork for this reality, the country's current agrarian policy continues to promote large scale agricultural producers, diminish the role of smallholders such as the five to seven-hectare sugarcane farmers of Manduvirá, and systematically squelch any attempts at reform. Paraguay's tax policy, for

example, relies heavily on regressive, indirect taxation and had one of the lowest increases in tax collection in Latin America in the two decades after the dictatorship from 1990-2010 (Itriago 2012). Property taxes in Paraguay—the sole tax on capital—comprise such a marginal contribution to total revenue that they are “practically non-existent” and under the administration of local governments (Itriago 2012). Paraguay has no personal income tax and no export tax (Ezquerro-Cañete and Fogel 2017).

The two taxes associated with the agribusiness sector are the *Impuesto a la Renta a las Actividades Agropecuarias* (IMAGRO), a tax on income derived from agricultural activity which is levied on agricultural producers with over 300 hectares of land, and *Impuesto a las Rentas de Actividades Comerciales, Industriales o de Servicios* (IRACIS), a corporate tax derived from commercial or industrial activities or those that are not of a personal nature which is levied on agro-exporters. Yet these taxes are full of generous tax credits, exemptions and loopholes including allowing landowners to deduct value-added tax (VAT) payments against their IMAGRO liability (Ezquerro-Cañete and Fogel 2017). Between 2005 and 2010, agriculture made up 20 percent of total GDP while collection from IMAGRO only accounted for 0.03 percent of total GDP and 0.1 percent of the agricultural GDP (Itriago 2012). In 2011, taxes on commercial agriculture netted only \$13 million, equivalent to 0.5 percent of total tax revenue (Ezquerro-Cañete and Fogel 2017).

Despite the fact that soy production can have profit margins over 80 percent and investors in the Paraguayan agribusiness sector can expect annual profits of at least 45 percent, up to 70 percent of public expenditure on agriculture is used on subsidies, mostly benefitting large producers in the soy agribusiness sector (Itriago 2012). Between 2003 and 2008, for example, the soy agribusiness sector received fuel subsidies estimated to be worth more than \$100 million

(Itriago 2012; Ezquerro-Cañete and Fogel 2017). Combined, these policies effectively alleviate the tax burden of wealthy landowners and large scale agro-industrial producers while simultaneously depriving the coffers of the Paraguayan government: even after making some progressive changes to the tax code and improving collection in the early 2000s, social spending per capita was still three-and-a-half times lower in Paraguay than the average for Latin America from 2001 to 2009 (Itriago 2012).

On the rare cases where there is political will for large-scale political efforts to use public policy to challenge the hegemony of the wealthy landowners and exporters through progressive, redistributive taxation, it is met with staunch resistance from Paraguay's elite class and powerful agribusiness lobbying groups (Hetherington 2012). In 2008, sixty-one uninterrupted years of rule by the Colorado Party ended—at the time the longest ruling party in the world—when former Catholic bishop Fernando Lugo was elected president (Szucs 2014). Running on a platform of social reform and building coalitions between campesino organizations, rural and urban middle-class progressives, the Liberal Party, and small leftist parties, Lugo championed the redistribution of *tierra mal habida* (ill-gotten land) under the Stroessner regime, supported an overhaul of the cadastral survey in order to establish accurate land values and ownership, and proposed a six percent tax on unprocessed cereal exports (soybean, maize, and rapeseed), a modest rate in comparison to neighboring Argentina's 35 percent (Hetherington 2012; Ezquerro-Cañete and Fogel 2017).

Once in power, however, Lugo was met with well-financed political opposition, was unable to maintain his political coalition, and ultimately incapable of translating his campaign promises into legislative accomplishments (the six percent tax on cereal exports, for example, was immediately squelched in Congress) (Ezquerro-Cañete and Fogel 2017). The tragic and still

unexplained 2012 raid of a squatter community in Curuguaty where six police and 11 campesinos were killed in a shootout proved to be the catalyst for mobilizing opposition against Lugo. In June 2012, the Chamber of Deputies voted 76 to 1 to initiate impeachment on the grounds of “*mal desempeño de sus funciones*” (“poor performance of his duties”) and the following day the Senate voted to 39 to 4 to impeach (Szucs 2014; Ezquerro-Cañete and Fogel 2017). Widely considered a parliamentary coup by both Lugo supporters and the international community (MERCOSUR briefly suspended Paraguay for violating their democracy clause), the entire experience, according to Ramon Fogel and Arturo Ezquerro-Cañete, “demonstrates the resilience of the landed oligarchy and highlights how fragile the prospects for redistributive land reform continue to be in the post-authoritarian period” (2017).

Paraguay’s long history of failure to enact even modest agrarian reforms is inescapable. Today, Paraguay has a Gini coefficient for land equality of 0.93 (zero being most equal and one being the greatest level of land inequality) making it one of the most unequal countries in the world in terms of land distribution (Villagra 2016). Of the 289,000 farms in Paraguay, 63 percent are on only two percent of the arable land while only 600 farms take up 40 percent of Paraguayan land dedicated to agriculture (Villagra 2016). Currently, around 94 percent of cultivated land is dedicated to commodity crops with only the remaining six percent for traditional campesino agriculture (Palau 2015). This pressure on smallholder agriculture has been further stressed with Paraguay’s 1994 accession to the MERCOSUR trading block which, on one hand is considered economic solidarity among South American countries in the global economy, while also places smallholder producers of export products in direct competition with larger, higher yielding producers from the more developed economies of Brazil, Argentina, and Ecuador (Castillo et al. 2005; Vásquez-León 2010; Correia 2017).

Land grabbing, most often associated with soybean production, remains common in Paraguay, spiking in response to the 2008 global financial crisis and the 2007-2008 surges in global food commodity prices (Borras et al. 2012). The largest landowner currently in Paraguay is a Korean capital investment group which owns over 500,000 hectares of land in the Chaco (Villagra 2016). This glaring level of agrarian inequality has inevitably led to conflict. Militarization and repression in peasant communities on behalf of large landowners has become commonplace (Corvalán 2013) resulting in further displacement (Antoniou et al. 2010), the criminalization of resistance movements (Bray 1991), and often ending with violent confrontation (Blair 2015). As Hetherington notes in his analysis of the privatization of peasant land in Paraguay, “The organized fight against privatization is a fight not so much against the idea of private landownership but against the hypocrisy of an increasingly influential conception of property rights that tacitly excludes the poor” (2014).

Throughout this exploration of the historical antecedents and present day agrarian landscape in Paraguay are examples of how the country’s elite class exert their political hegemony over the entire agricultural sector. This manifestation of power is often to the detriment of smallholder farmers and campesino agriculture even in areas where intensive commodity crop agriculture is not present. It is only through fully examining this context and this inequality of power that Manduvirá and the challenges it faces can be understood: the economic livelihood of smallholder farmers practicing traditional agriculture is becoming increasingly economically unviable; regional trade agreements offer opportunity for some but undercut the production of others; demand for rural labor is in rapid decline leading to out-migration; land is becoming increasingly concentrated and degraded; and the political apparatus

for addressing these issues is deprived of resources and beholden mostly to other interests. In addition, the following two chapters will further examine the impact of these transitions on the food security and food sovereignty landscape.

It is from this environment that Manduvirá has arisen to address many of these challenges. In a country that has systematically prioritized another form of agriculture over that which the cooperative has chosen, Manduvirá will provide an illustrative example of a cooperative of smallholder farmers attempting to develop and enact an alternative means for sustainable rural livelihoods, environmental stewardship, and the exertion of local control of community development.

CHAPTER THREE—FOOD SECURITY

THE FOOD SECURITY FRAMEWORK

Food security is at once a rigidly structured framework yet also spacious, contested concept. For Manduvirá and its members, the structure of the food security framework is less important than the ideas behind it, yet it is essential to define and differentiate its various forms, components, and practical applications in order to define the scope of this research.

Perhaps the most commonly cited definition of food security comes from the Food and Agricultural Organization (FAO) of the United Nations which claims that, “Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life” (FAO 2018). Under this umbrella definition are the four dimensions of food security:

Availability—Food availability is simply having an adequate supply of food to meet basic dietary needs. This is perhaps the most common understanding of food security which is related to issues of undernourishment. Intuitively, high food availability correlates with low prevalence of undernourishment in most regions of the world (FAO 2015a). Perhaps counterintuitively, however, food availability is insufficient in guaranteeing food security—many times availability is not the cause of food insecurity. As Noble Laureate Amartya Sen once explained, “starvation is a matter of some people not *having* enough food to eat, and not a matter of there *being* not enough food to eat” (1981). Indeed, during many of the worst recorded food crisis in history, food was available to those that need it, just not accessible (Sen 1981).

Access—The fact that food is available does not help those who cannot access that food. Access can be defined by economic, social, or physical limitations. Paved roads and good

infrastructure are indicators of food access as the ability to trade increases the likelihood of sufficient food being locally accessible. Most importantly, however, is economic accessibility. Affordability of food as a percentage of one's income and social dynamics that factor into household decisions around the purchasing and provision of food are also considered in food access. Considering issues of obesity and malnourishment rather than undernourishment, however, food access alone is also an insufficient guarantor of food security.

Utilization—Food utilization is concerned with the way in which the body processes the food that it is supplied. Availability and access are needed in order for the food to get to the person who needs to eat it, but utilization can limit food security if that person is sick with gastrointestinal diseases or infections, if it is not nutritious enough to provide adequate nourishment or energy, or if it is prepared in way that leads to an unbalanced dietary intake. Utilization is often affected by poor water quality or unsanitary preparation.

Economic and Political Stability—Price fluctuations of food commodities, trade disputes or political upheaval can each constrict both food availability and access. In a globalized agricultural economy, smallholder farmers are precariously connected to a changing market whether they are growing products for sale in international markets or depending on the food the market provides as a source of nutrition. Environmental stability is also factored in as natural disasters often have the greatest impact on the most vulnerable and food insecure (Altieri 2009). The stability component of food security is essentially the ability of the first three components to remain stable over long periods of time.

The food security framework is applied worldwide by governments, intergovernmental organizations, non-governmental organizations, medical professionals and academics to understand the overall status of an individual, community, country or region as it relates to their

ability to meet their dietary needs for a healthy life. It has significantly expanded from its origins in the 1970s which focused mainly on food supply, later trending towards an increased emphasis on food, health, mother and child care, and moving a more holistic household livelihood approach (Frankenberger and M. Katherine 1998). Each year FAO publishes its State of Food Security and Nutrition in the World report, the Economist Intelligence Unit releases its Global Food Security Index, and the topic is discussed broadly in development circles.

Despite its ubiquity, disparate and diverging conceptualizations of food security have emerged over the past decades (Patel 2009; Garnett 2014) which underline significant variance in how food security is conceptualized and practiced. There is a significant body of criticism of the food security framework (which will be explored shortly), but food security provides a lens for exploring disparate outcomes of populations and individuals among countries, cultures, and differing dietary habits. In public health and development studies, the food security framework is often employed to understand the level of food security of a household, community, or even a country—often with a food security score or through many of the indicators I will present in this chapter. While establishing this empirical baseline is immensely helpful for not only establishing a snapshot of the food security landscape but documenting any changes over time, it does little to explain the process of change. Thus this research is less concerned with making a concrete determination of the food security status in Arroyos y Esteros, among Manduvirá producers, or comparing Manduvirá producers to unassociated producers, and more concerned with using the food security framework to understand how the cooperative is addressing the issue. Relying on the four components of food security, I investigate the ways that a smallholder cooperative is attempting to address the issue through a democratic process, with limited resources and competing demands, nominal state support, and all within a dynamic food security landscape.

According to the International Food Policy Research Institute (IFPRI), food insecurity is a global issue: “All countries in the world, bar two, that collect nutrition data experience one of the following forms of malnutrition: stunting, anemia, or adult overweight. If the anemia rates in the two outlier countries were just 0.6 percentage points higher, then all countries in the world with nutrition data would be classified as experiencing one of these three forms of malnutrition” (Haddad et al. 2015). Around the world, there are approximately 821 million people who are undernourished, about one in nine people in the world (FAO 2018).

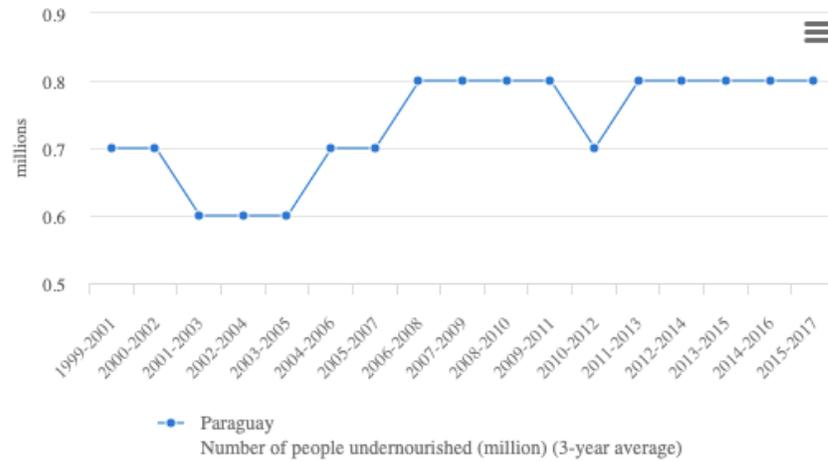
Unfortunately, these numbers are trending in the wrong direction. After seeing precipitous drops in global food insecurity from in the first part of the century, food insecurity has risen consistently across nearly every major indicator since 2014 (FAO 2018). Food insecurity was higher in 2017 than it was in 2014 in every region except North America and Europe, with notable increases in Africa and Latin America (FAOSTAT 2019). In the span of only a few years, FAO’s yearly State of Food Security in the World report has shifted from cautiously praising the slow but significant progress towards meeting the Sustainable Development Goals (SDG) for food security (FAO 2015a) to arguing that their findings constitute “a clear warning of the urgent need for considerable additional work...towards achieving the SDG goals on food security and nutrition” (FAO 2018).

These numbers help us understand the breadth of the problem on a global scale but are of little practical value as they obfuscate the very complexity of the issue (Pinstrup-Andersen and Babinard 2001). Food insecurity and malnutrition are highly dependent on geographical, cultural, and political contexts where differences are seen between races and ethnicities, social class, and gender (FAO 2018). Not only are there seemingly innumerable variables that determine food

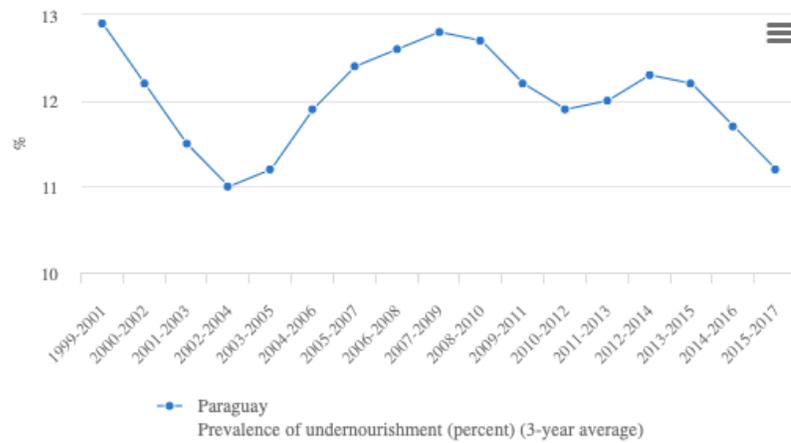
insecurity, there are drastically varying outcomes. While starvation and undernourishment tend to garner the most attention in the media and within international development circles due to the visceral manifestation of the problem, these are only two of the many outcomes of food insecurity.

In many ways, Paraguay illustrates much of the complexity of the determinates and outcomes of food insecurity. From 2005 to 2017, the prevalence of stunting in children under five (an indicator of a past episode or episodes of sustained undernutrition defined as low height-for-age) dropped from 10.9 percent of the population to 5.6 percent (FAOSTAT 2019). According to a recent longitudinal study published by Vit Bubak, the prevalence of chronic malnutrition in the country dropped from 14.5 percent in 1997 to 5.9 percent in 2016 making it one of the lowest rates in South America (2018). And while the prevalence of undernourishment (estimate of the proportion of the population whose habitual food consumption is insufficient to provide sufficient dietary energy levels) in Paraguay in the 21st century has been inconsistent, overall it has decreased from 12.9 percent in the three-year average of 1999-2001 to 11.2 percent for 2015-2017. Despite the progress in the overall percentage, the actual number of people in Paraguay who are undernourished over that span has remained relatively consistent and has actually slightly increased (FAOSTAT 2019).

Number of people undernourished (millions) (3-year average)



Prevalence of undernourishment (%) (3-year average)



Top: Number of People undernourished (millions) (3-year average) in Paraguay

Bottom: Prevalence of undernourishment (3 year-average) in Paraguay

Source: FAOSTAT. <http://www.fao.org/faostat/en/#country/169>, 2019.

These numbers tell the story of a country that is relatively stable in controlling the undernourishment outcomes of food insecurity. Indeed, the reduction in stunting and chronic malnutrition—along with similar reductions in severe and acute malnutrition—are significant achievements. Often the progress that has been made on reducing select indicators of food insecurity in Paraguay and around the world has been credited to strong economic growth: growth will lead to increased incomes which in turn leads to greater purchasing power and ultimately improved nutritional outcomes (Feachem 2001; Elgert 2015). Indeed, Paraguay’s export fueled economic growth has been strong for the past decade and with that growth have come explicit attempts to claim that large-scale agricultural production, specifically soybean production, strengthens food security (Elgert 2015). Using the food security framework, this approach centers on improving economic access as well as availability since as the economy grows, more trade will occur and healthy products will become more available in the marketplace. This line of thinking makes intuitive sense and unsurprisingly, malnutrition is lower in higher income populations (FAO 2015a).

However, the connection between economic growth and improved food security outcomes is unclear. FAO’s 2015 State of Food Insecurity Report notes that, “not all countries that experienced strong economic growth performed well in terms of hunger reduction... In general, there has been uneven progress in translating economic growth into improvements in food security” (FAO 2015b). From a national level perspective for food availability, it is insufficient and misleading to simply look at the sheer volume of food that is available to a population. In November of 2016, for example, the United Nations Special Rapporteur on the right to food warned that nearly 10 percent of Paraguay’s population face hunger and

malnutrition despite the fact that the country produces food for almost nine times its population (United Nations Office of the High Commissioner 2016).

A longitudinal study by Vollmer, et. al. analyzed data from 36 countries between 1990-2011 and found the association between national economic growth and reductions in early childhood malnutrition to be “null to quantitatively very weak” (2014). Per-capita GDP and the three outcome variables of stunting, underweight and wasting showed no significant association for children 0-11 months. Only slight improvements in odds of being stunted was found for children 12-23 months when adjusted for a 5% increase in per-head GDP, but no such correlation for wasting or overweight. Perhaps most notably, no association was found between per-head GDP and undernutrition for children in the lowest wealth quintile (Vollmer et al. 2014). This is especially problematic considering childhood undernutrition primarily effects the lowest wealth quintiles (Black et al. 2013).

As Lauren Elgert identifies in her work on the growth and impact of the Paraguayan soy boom, GDP does not take distribution into account and in a one of the most inequitable distribution of wealth in South America, “Food security, like wealth, is distributed unequally” (Elgert 2015). Thus, relationship between national level economic growth and reductions in food insecurity is not as straightforward as many suggest. In fact, increasing food availability may actually have an adverse effect on food security, particularly in developing countries. While fresh fruits and vegetables are part of a nutrition transition facilitated by strong economic growth and international trade in some parts of the world, highly processed foods, vegetable oils, meat, and soft drinks are significant factors in nutrition transitions and overnutrition (the amount of nutrients exceeds the amount required for normal growth) in other parts of the world. Increasing evidence shows that both increase of Regional Trade Agreement (RTAs) and Foreign Direct

Investment (FDI), are contributing to obesity and non-communicable diseases such as heart disease and diabetes (Hawkes and Murphy 2010; Popkin 2014; Siegel 2016).

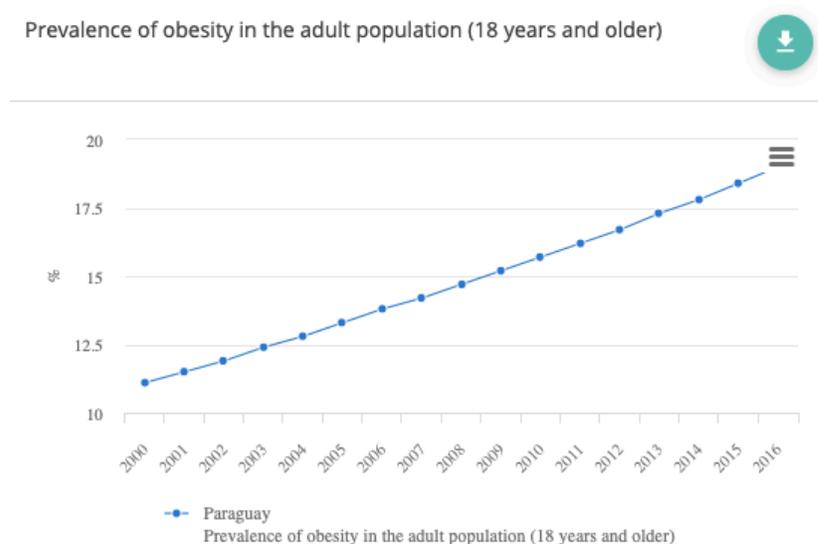
In the neoliberal wave of the 1990s, trade liberalization of agricultural commodities directly led to increases in trade in oilcrops and vegetable oils. Countries such as Paraguay—along with Argentina and Brazil—implemented policies to increase soy bean production and attract FDI into the agricultural sector while Indonesia and Malaysia followed similar paths with palm oil production by deregulating the export sectors (Hawkes and Murphy 2010). Simultaneously, China and India—two of the largest food importers—reduced barriers on imports in order to attract raw agricultural commodities for domestic processing (Hawkes 2006).

The growth of the palm oil and soy bean oil had a dramatic effect on the availability of vegetable oils, particularly in developing countries. Between 1980 and 2003, vegetable oil exports to developing countries increased by 213%, compared to 84% in developed countries. In turn, prices decreased as supply increased and consumer trends shifted with it: over the same period of time, calories available from vegetable oils per capita increased by 80.3% in developing countries while only 35.6% in developed countries (Hawkes and Murphy 2010).

Significant research has been conducted on what are termed “nutrition transitions” around the world and in fact, much of this research has come from Latin America where in recent years traditional diets have been replaced with food high in fats and sweeteners and coinciding with an increase in obesity and diet-related chronic diseases (Hawkes 2010). Defining an entire country as being part of a nutrition transition takes significant longitudinal research on dietary and anthropometric changes within individuals at a national level. Unfortunately, there is

currently a dearth of rigorous research on food security in Paraguay;⁵ even FAO has been unable to report on national level indicator for the prevalence of food insecurity in Paraguay in the past few decades (FAOSTAT 2019).

However, while some of the available indicators for Paraguay are improving, others are not. In Bubak’s study, he found that over the same period of time, 1997-2016, the prevalence of obesity in children from two to five years-old tripled from 2 percent to 6.1 percent and the prevalence of overweight more than doubled from 7.8 percent to 18 percent. FAO has been tracking this rise in obesity in Paraguay with adults 18 years or older and found similar results: an increase from 11.1 percent in 2000 to 18.4 percent in 2015, a nearly perfectly incremental increase over that period (FAOSTAT 2019).



Prevalence of obesity in adult population (18 years and older) in Paraguay
Source: FAOSTAT. <http://www.fao.org/faostat/en/#country/169>, 2019.

⁵ A researcher from Base Investigaciones Sociales, a meeting with a Paraguayan academic from a U.S. university, and email correspondence with two of his contacts confirmed this lack of research on food security outcomes and determinants in Paraguay.

Once again, the progress that Paraguay has made on reducing certain forms of malnutrition due to food insecurity is noteworthy. Other countries in Latin America, most notably Mexico, but also to a lesser extent Bolivia and Peru, are faced with the seemingly paradoxical plight of the “double burden of malnutrition” where undernutrition and over nutrition coexist in the same population in times of economic growth (Hawkes 2006; Baker et al. 2016). While there are troubling indicators of increases in micronutrient deficiencies in Paraguay in the past few decades (FAOSTAT 2019; Bubak 2018), on a national level it is seeing undernutrition trend in an encouraging direction while overnutrition trend in a disheartening direction.

In the previous chapter, I explored how the inequality of power is manifested in Paraguay, and how the concentration of land, wealth, and power is leading to a transition in traditional agriculture, the environment, and rural livelihoods. In this chapter, I introduce the framework of food security, paint a portrait of the current food security landscape in Paraguay, and further assess the potential impact of these imbalances beyond the agrarian sector. Challenging the narrative that the country’s current export agricultural powered growth is being translated into significant improvements in food security, I examine the potential relationship between food security outcomes the political economy of Paraguay. The following chapter will add yet another layer to this analysis by introducing food sovereignty and examining the role that producers play within agricultural value chains.

The four components of food security—availability, access, utilization, and stability—will be employed in this research to frame the work that Manduvirá is conducting within a

broader conceptual context. As my research will show, many Manduvirá producers staff interviewed on the subject of food security spoke about transitions away from traditional agriculture and diets, the dietary impact of economic growth on the community, and the significant changes in availability and access to food over the course of their lifetimes. Additionally, I will show which of these changes the cooperative sees as challenges to food security, which ones they have chosen to address, and how.

CHAPTER FOUR—FOOD SOVEREIGNTY

While food security offers a robust framework for analyzing everything from macro level indicators around food prices to the microorganisms which may inhibit food absorption, there are many critics who feel it is lacking in a number of crucial areas. The concept of food sovereignty has arisen in various forms as a critique, an alternative, or an expansion of the concept of food security.

The origins of food sovereignty are often credited to the Via Campesina peasant movement which began in the 1990s as a response to impact of globalization on agriculture and agricultural communities (Martínez-Torres and Rosset 2014). In broad terms, the Via Campesina and food sovereignty movement aim to decentralize the power held by corporate interests within the agricultural sector and provide legitimacy to peasant agriculture. Precisely defining food sovereignty, however, is less a task of narrowing the concept down into a precise definition than it is exploration of how the concept is irregularly applied. As Raj Patel notes, food sovereignty is not only purposefully loosely defined,

Food sovereignty is, if anything, over defined. There are so many versions of the concept, it is hard to know exactly what it means. The proliferation of overlapping definitions is, however, a symptom of food sovereignty itself, woven into the fabric of food sovereignty by necessity. Since food sovereignty is a call for peoples' rights to shape and craft food policy, it can hardly be surprising that this right is not used to explore and expand the covering political philosophy. The result of this exploration has sometimes muddled and masked some difficult contradictions within the notion of food sovereignty (2009).

It is important, both for a general understanding of food sovereignty and for the purposes of this research, to understand its relationship with food security. For many, food sovereignty is a critique to the food security framework which critics say is at best insufficient for addressing the true nature of food vulnerability and at worst entirely misguided, some going so far as to call it a

“global conflict” (Edelman 2014). Patel explores the history and evolution of the definitions food security arguing that it is based on a “technocratic faith in the ability of states to redistribute resources if the resources could only be made available” (2009). While this approach may have been appropriate for famines and emergencies, it was decidedly limited to state actors which eventually eroded under the neoliberal reforms of the 1980s and 1990s.

While there are important conceptual distinctions, the supposed polarity between food security and food sovereignty is mostly confined to academic discourse. Henry Bernstein, for example, claims that the juxtaposition of what are actually overlapping conceptualizations is mostly shorthand for broader arguments around the global food system that is spurned by academics and romanticized populist agrarian discourses of virtuous peasant farming systems (2014). Indeed, FAO has evolved and expanded its conceptualization of food security, going so far as to note that “a crucially important factor in modifying views of food security was the evidence that the technical successes of the Green Revolution did not automatically and rapidly lead to dramatic reductions in poverty and levels of malnutrition” (FAO 2003). Via Campesina has for decades claimed that food sovereignty is a necessary precondition for genuine food security (Patel 2009). It is this approach which will be applied to this research: when taken together, the two are complementary.

What all proponents of food sovereignty agree on, however, is that the food security framework does not dig deep enough. Looking at food availability and access as the primary indicators of food security is not necessarily mistaken, according to this view, but it is insufficient without understanding *how* that food is made available and accessible—under what conditions is food security achieved? The food security framework is devoid of a number of crucial factors regarding the conditions under which food is produced and procured, the

environmental impact of production, the culturally suitability and preference of food or form of agriculture, and the social and political control over the local and global food systems. Patel wryly notes that it is entirely possible for one to be food secure in prison or living under a dictatorship (2009).

Thus, food sovereignty centers around one rather basic idea: that people have the right to define their own food and agricultural systems. From this broad declaration branch a number of conceptualizations, practices and movements perhaps best illustrated by this 2007 declaration from Via Campesina:

Food sovereignty is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. It puts those who produce, distribute and consume food at the heart of food systems and policies rather than the demands of markets and corporations. It defends the interests and inclusion of the next generation. It offers a strategy to resist and dismantle the current corporate trade and food regime, and directions for food, farming, pastoral and fisheries systems determined by local producers. Food sovereignty prioritises local and national economies and markets and empowers peasant and family farmer-driven agriculture, artisanal fishing, pastoralist-led grazing, and food production, distribution and consumption based on environmental, social and economic sustainability. Food sovereignty promotes transparent trade that guarantees just income to all peoples and the rights of consumers to control their food and nutrition. It ensures that the rights to use and manage our lands, territories, waters, seeds, livestock and biodiversity are in the hands of those of us who produce food. Food sovereignty implies new social relations free of oppression and inequality between men and women, peoples, racial groups, social classes and generations (Via Campesina 2007).

What starts as rather simple declaration of rights quickly meanders into much more ambitious and imprecise issues of inclusion, production practices, gender, race and social class. It is therefore easy to understand how food sovereignty can be opaque, irregularly interpreted, and contested. Thus, the need to concretize food sovereignty into practice has in part coincided with the emergence of the field of agroecology.

If food sovereignty is the goal, agroecology is the tool for implementation (Agosto and Palau 2015; Martínez-Torres and Rosset 2014). The study of agroecology began as a scientific discipline that explored the application of ecology in agriculture (Wezel 2011). While the field continues to evolve, that same broad understanding of agroecology still applies to this day. Specific attempts to define and identify agroecology, however, have changed drastically in both the scale of implementation and patterns of implementation.

The term “agroecology” first appeared in publication in 1928 by the Russian agronomist Basil Bentsin who was conducting research into the ecological interactions within agricultural production systems. The idea spread through Germany, Italy, and France, taking on new meaning and being applied to different aspects of agroecology from pest management and the economic impacts of pest damage to the quantity and quality of yields in agroecosystems (Wezel 2011). It was not until the 1960s and 1970s that agroecology slowly began to morph into a social movement, particularly in the U.S., in part in response to growing concerns over the environmental impact of the Green Revolution (Silici 2014).

Over this same period of time, the conceptual scale of agroecology vastly expanded. What was once a scientific study of agriculture within small ecosystems, became not only a response to the global agro-industrial model, but also a path towards so called “sustainable development” and a way to express the relationship between society and agriculture (Silici 2014). This movement was particularly prevalent in Latin America where it was promoted as an exercise in liberation from the increasing dependence on agricultural input suppliers (Argüello 2015).

At its core, agroecology is a set of principles aimed at transitioning food systems away from a fossil fuel based system which promotes monoculture agriculture for export and biofuels

(Altieri and Toledo 2011). These principles focus on the idea of food sovereignty via the reduction or elimination of external inputs which cause farmers to become dependent on chemical fertilizers, pesticides, herbicides and patented GMO varieties. Claiming that organic agriculture follows the same model of dependency of external inputs, proponents of agroecology view it as “the only viable option to meet [Latin America’s] food needs in this age of increasing oil prices and global climate change” (Altieri and Toledo 2011). Therefore, according to proponents of agroecology, the path to achieving this goal is through diversification of plant species over space and time, using native seeds, recycling nutrients and energy within the farm system, utilizing livestock instead of tractors, improving water retention, and controlling pests through balanced ecological systems (Gliessman 1998; Altieri and Toledo 2011).

Agroecology is one-part science, one-part practice and one-part social movement. The three are not mutually exclusive, although at times they may be at odds. As strictly a science, for example, the notion of agroecology being an ideological response to the Green Revolution is irrelevant. Studies on the efficacy of community supplied inputs versus external chemical inputs are just that—ways to experiment with a new set of variables in a controlled environment. As a social movement, however, the results have implications of either confirming or challenging the basis on which the movement is built. This has led some to conclude that “the science has become progressively less ‘neutral’” (Silici 2014).

Additionally, some identified as practitioners of agroecology by both those in the scientific community as well as the social movement do not always identify with the term specifically or many of the broad themes or ideas behind it (Nelson et al. 2009). Presenting them as diametrically opposed to the industrial agricultural system is not always an accurate

representation of many farmers who find themselves somewhere in the middle (Silici 2014). As I will later explain, this is certainly the case for Manduvirá.

In Paraguay, food sovereignty and agroecology are gaining increasing traction as many see the expansion the agribusiness sector as the greatest threat to food sovereignty in their country (Palau 2015). In 2015, the Asunción based social research institute BASE Investigaciones Sociales published a one hundred page manual titled “Towards the Construction of Food Sovereignty: Challenges and Experiences in Paraguay and Argentina” (Agosto and Palau 2015). The Coordination of Rural and Indigenous Women (CONAMURI, in Spanish) in Paraguay has adopted food sovereignty as a guiding principal in their efforts to protect native seeds and traditional agriculture (CONAMURI 2017). In July of 2017 during the period of this research, the Latin American Council of Social Sciences held a three-day conference in Asunción where various Paraguayan and South American academics presented on the agrarian transformation in Paraguay and its direct impact on food sovereignty and rural livelihoods. In a country where 75 percent of the arable land is dedicated to a single crop (Correia 2017), a crop which has never been a part of the Paraguayan diet, culture, or agricultural tradition (Doughman 2011), of which less than six percent ends up ends up as human food (Oliveira and Hecht 2016) and which is highly mechanized and labor exclusionary (Carter, Barham, and Mesbah 1996), it is understandable how food sovereignty and agroecology might find a receptive audience.

In in order to explicate the institutional challenges that Manduvirá faces in their efforts to exert control over their own livelihoods and community development, I have described the political, social, and food security context in which Manduvirá exists. Food sovereignty helps complete this picture not only by providing a framework for understanding how this context can

deprive producers of sovereignty, but also by providing a structure—not a blueprint—for how Manduvirá aims to exert this control. Important for this research is understanding the complementarity of employing both food security and food sovereignty. First, Manduvirá engages in both of the approaches in its external literature, strategic plan, and in interviews conducted with cooperative leadership. This provides further evidence to the claim that the supposed contradiction in the two is less a practical matter to those who are attempting to achieve the goals of food security and food sovereignty than it is to those who conceptually debate it. Second, this research will employ food security as a practical way of analyzing the food systems which govern the availability, accessibility, utilization and stability of food in Arroyos y Esteros. Food sovereignty will provide a complementary view of these food systems, their cultural suitability, their environmental impact, and the role that producers play within it.

CHAPTER FIVE—COLLECTIVE ORGANIZATION

The study of cooperatives is inherently both very limiting and quite broad. On one hand, cooperatives are a distinct organizational form which are not wholly private enterprises nor public institutions. Instead, cooperatives include important elements of both. On the other hand, however, cooperatives are ubiquitous organizational structures fulfilling almost every human need from childcare to banking to water and gas, while providing employment to over 100 million people and including more than 800 million members worldwide (Curl 2009). In the United States alone, by 2008 about 40 percent of the population was a member or one of the 48,000 cooperatives (Curl 2009). Cooperatives can be multi-million dollar businesses or an assembly of no less than three people organized around basic cooperative principles for any combination of innumerable economic, cultural or purely pragmatic reasons.

According to the International Cooperative Alliance, a cooperative is “an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs, and aspirations through a jointly owned and democratically controlled enterprise” (ICA 2019). In the United States, other similar definitions are maintained by the organizations such as the National Cooperative Business Association and the USDA (Fairbairn 2004) and many more exist internationally codified into law by governments that officially recognize cooperative organizations. Article 3 of Paraguay’s Law 438 similarly defines a cooperative as “the voluntary association of people who associate themselves based on their own efforts and mutual aid to organize an economic, social and non-profit business with the aim of meeting individual and group needs” (INCOOP 1994).

Certainly, what Kim Zeuli refers to as the “nebulous theory of cooperation” semi-formalized into an organizational structure is as old as civilization and commerce themselves

(2004). In his comprehensive study of cooperative movements, for example, John Curl points to the *ejido* system in Mexico to illustrate the indigenous origins of what we would now recognize as a cooperative structure which was later formalized under the Spanish crown in the late 17th century (2009). Similarly, in Paraguay, the *minga* system of work collectives formally organized by the Jesuits in the 17th century for agrarian activities had deep indigenous roots:

The pre-Columbian indigenous peoples that inhabited Paraguay for centuries already had certain associative and solidary practices that were expressed, on the one hand, in *jopoi*, which in the Guaraní language means supporting one another, distributing, giving to one another, helping one another; and on the other hand, in *minga*, which was a practice of community work between families or social groups, and an agreement to specific needs: planting, harvesting, cleaning, building a house (Carosini 2012).

A defining moment and inflection point in the history of cooperatives on a global scale was the Industrial Revolution, particularly with the advent of the Rochdale Pioneers in Rochdale, England in 1844. According to Zeuli's work on the evolution of the cooperative model, the Rochdale consumer cooperative uniquely contributed to the cooperative movement by codifying a guiding set of principles for the creation of a business model. "It can be supposed that the existence of a formal organizational structure and principles...fostered the subsequent widespread attention given to the cooperative idea in both business and policy" (2004).⁶

Particularly in South America, cooperatives were often later formed by immigrant communities, which according to Vásquez-León, et. al., "were instrumental in allowing them to re-create their own forms of social and economic organization while remaining detached from local populations and systems of government" (2017). In the 1920s, Mennonite immigrants arrived in Paraguay from Canada, the Soviet Union, the United States, and Mexico who formed

⁶ The seven Rochdale Principles are: voluntary and open membership; democratic member control; economic participation of members; autonomy; education, training and information; cooperation among cooperatives; and concern for the community.

agricultural cooperatives in the Chaco with another wave arriving at the conclusion of World War II (Carosini 2012). It was not until the 1940s when the first Cooperative Law in Paraguay was formulated and the first official cooperatives were established under the Ministry of Agriculture and Livestock (Vásquez-León, Burke, and Finan 2017).

Ostensibly, the formal emergence of cooperatives and adoption of the Rochdale Principles is aimed at eliminating—or at the very least ameliorating—structural inequality within a given value chain. In reality, however, the results vary drastically. First, cooperatives can serve vastly different constituencies and therefore equating all cooperatives with those struggling against structural inequality is misleading. Under Stroessner, for example, large livestock and soy cooperatives were supported by the regime in the eastern region of Paraguay to appease the United States, expand the agricultural frontier, and fuel the agro-export boom:

Stroessner himself was pressured to promote cooperatives as a condition for foreign assistance from the United States. He grudgingly complied, but the new cooperative laws included complex bureaucratic requirements that discouraged campesino leadership and reinforced the exploitative patronage system between Stroessner's party, rural elites, and campesinos. Stroessner's government suppressed the political aims of grassroots campesino organizations and maintained indirect control of United States-supported cooperatives (Burke and Piekielek 2011).

Furthermore, equating all cooperatives as noble, grassroots organizations allows large, power-laden cooperatives to co-opt the otherwise admirable ideals of cooperativism, reinforcing historical power relations (Vásquez-León, Burke, and Finan 2017). As Christina Bolke Turner explains, Stroessner's U.S.-supported cooperatives “was [an] attempt to control who was organizing cooperatives and how. Furthermore, it allowed the familiar system of power brokerage and patronage to exploit the peasant population and dominate potential trouble-makers through their own organizations” (Bolke Turner 1998). Indeed, Stroessner's government violently suppressed cooperatives supported by the Catholic Church aimed at improving the

moral and economic life of the poor peasantry (Burke and Piekielek 2011; Bolke Turner 1998; Vásquez-León, Burke, and Finan 2017).

Since the end of the Stroessner regime, cooperatives in Paraguay continue to vary in form, function, and desired outcomes. By 2015, there were 1,043 registered cooperatives in Paraguay—251 of them agricultural—with over 1.2 million members (INCOOP 2019) In 2012, Paraguayan cooperatives constituted eight percent of total exports from the country, mainly in soy, wheat, sugarcane, fruit, dairy products, and meat (Carosini 2012).

Despite the variability across sectors, scales, constituencies, and geographies, research on cooperatives is vast but often siloed. One of the most prolific areas of research on the topic comes from economics and resource management field which attempts to quantify the economic and productive impact of agricultural cooperatives. Wanglin Ma and Awudu Abdulai, for example, found that members of an apple producing cooperative in China had higher yields than non-members, particularly those on smaller farms (2016). Cooperative members were also more educated, more likely to own a computer, and have stronger links to government extension agents than non-members despite having no difference in access to credit (Ma and Abdulai 2016). Other similar studies include a quantitative analysis of Fairtrade Certification on cooperatives (which Manduvirá has) (Johannessen and Wilhite 2010), or the impact of different trading regimes on farmer cooperatives (Luna and Wilson 2015).

There is, however, a second general body of research which either directly or indirectly challenges the economic model of cooperative analysis. In his 1983 review of social science literature on cooperatives, John Bennett countered the idea that economic analysis alone can quantify the impact of cooperatives:

Cooperative development implies *movement*: self-help, bootstrap-lifting, progress, and an approach to security and equity. It can flourish as a purely local movement

(and is often most successful that way) or it can provide a bridge to national institutions and resources. Cooperation is a social as well as an economic strategy, and its benefits are great even when its material accomplishments may seem modest. Cooperation is—or can be—a re-socialization of the human group and personality, and this should be remembered lest we become overly concerned with purely economic criteria (1983).

This perspective is very much aligned with the analytical framework of Vásquez-León, et. al. (roughly outlined in the introduction) which emphasizes good governance in order to build solidarity and social cohesion, nurture a collective identity, and foster a spirit of collective ownership (Vásquez-León, Burke, and Finan 2017). Marcela Vásquez-León's case study on the Paraguayan cooperative Capiibary, for example, examines the cooperative's struggle to survive after the plummeting of the international cotton market, deforestation as a result of the expansion of the agro-industrial frontier, and rising food insecurity. Capiibary was faced with even greater social issues as these struggles spurred the out-migration of young adults, particularly troubling for young women who often left children behind and became exploited laborers in Argentina or Asunción. In turn, Capiibary turned to a technical strategy of ecological diversification by combining forestry projects with production for both household consumption and export markets, including soy, maize, and cotton. In addition, the cooperative fostered a strong cooperative spirit among its members, focusing their vision to become agents of change. Through this, Vásquez-León paints picture of a cooperative which chooses to address issues—including food security—much broader than jockeying for greater market position.

In their compilation of case studies on Paraguayan cooperatives, Brian Burke and Jessica Piekielek argue that cooperatives are most effective when they intersect and engage with politics rather than a narrow focus on economic development (2011). Timothy Finan and Piekielek explore the Brazilian cooperative CAMTA, its attempts to not only provide economic livelihood of its members but also implement environmentally sustainable agricultural practices in the

complex Amazon Rainforest ecosystem in addition to providing health care, education, youth groups and women's groups (2017).

While collective action did not lead to the idealistic outcomes that many of the first progressive academics who studied cooperatives originally envisioned (Vásquez-León, Burke, and Finan 2017), what these examples and others show, is that cooperatives can provide significant insight into Bennet's "re-socialization of the human group" (1983). In cooperatives that represent poor farmers while earnestly attempting to challenge the status quo, this is most often attained not through economic outcomes but through strong governance which can foster a cooperative spirit and a common purpose. As Bertram B. Fowler noted, cooperatives, when enacted in faithful accordance with the Rochdale Principles, are the "true and full expression of democracy" (1947).

Building on the foundation of Paraguayan power imbalances and how they manifest in the agrarian, food security, and food sovereignty sectors, cooperatives themselves are manifestations of power—existing either to challenge power structures or to uphold them. Recalling Michael Watts' notion of political ecology as the understanding of "forms of access and control over resources and their implications for environmental health and sustainable livelihoods," cooperative analysis can not only illustrate entrenched power imbalances, but can highlight adaptations, coping mechanisms for survival, and attempts to build resilience within them. This was perhaps best articulated by Manduvirá's general manager, saying their goal is "*comercio justo en un mundo injusto*" ("fair trade in an unfair world").

As I have demonstrated, the forms of access and control are structurally and systematically limited for smallholder farmers in Paraguay, and the implications for

environmental health and sustainable livelihoods are stark. Despite this inauspicious context, cooperatives such as Manduvirá can reveal the dynamic role that collective action plays in addressing not only the inequality of power but, how they address specific outcomes of that inequality. Manduvirá has resourcefully built itself into a highly successful cooperative, overcoming significant obstacles to access and control from managing its way out of debt to ending the exploitative monopsony of the OTISA sugar mill. Now, Manduvirá is assuming an ever greater role and addressing new challenges in food security and food sovereignty, raising questions about the ability of cooperatives to translate economic success into broader community-based initiatives, the capacity of cooperatives to adapt to inhospitable socio-political environments and the feasibility of cooperatives as community development organizations.

CHAPTER SIX—FINDINGS

On a June Saturday evening in Arroyos y Esteros, cars and motorcycles zip from one end of town to another, two women running a *lomiteria* stand open for the night on one side of the plaza and a soccer match is playing in a small family bar on the other. As night comes, I catch a ride to Urundey, a nearby community of Arroyos y Esteros, with two staff members of Manduvirá who are relaxed, made up, and dressed for a night out. In the darkness it is difficult to see beyond the headlights of the car which bounces erratically on the same unpaved road that leads to the mill, until slowly colorful lights in the distance begin to come into view. Cars and motorcycles line the road and vendors crowd the entrance to a field where a few dozen white plastic chairs face a large, outdoor stage with colorful party lights spraying the sky.

Throughout the communities of Arroyos y Esteros, Manduvirá hosts various community engagement events, and on this night, it was Urundey's turn for a singing competition. On the stage is Manduvirá's educational director who, with his booming voice and commanding presence, serves as the event's master of ceremonies. On one side of the stage a local music teacher sits at the piano and plays background music while young men and women take their turns entertaining the audience and serenading a panel of judges with both Spanish-language pop songs and traditional Guraní folk songs. The crowd is lively and encouraging throughout and after deliberation from the judges, the winner is announced. He wins, among other things, a bag of sugar courtesy of Manduvirá.

The economic and cultural impact that Manduvirá's exerts in Arroyos y Esteros is broad. In addition to the more than 900 producer members and their families,⁷ untold numbers of day

⁷ Average household size in the communities of Arroyos y Esteros is five people according to the cooperative.

laborers and *peladores* at harvest time are employed as a result of the booming sugarcane enterprise. Once harvested, the sugarcane is weighed in one of the many collection centers where members decide each year who will operate the crane which unloads the sugarcane from the cart on which it was delivered, weighs it, and loads it onto another cart or truck for transport to the mill. The crane operator, which is increasingly more likely to be a woman, is paid three Guaranis for every kilo that they weigh and send en route to be processed.

The cooperative mill itself employs over 250 people and is in operation year round—once the harvest ends, the equipment must be cleaned and damaged parts repaired before the next harvest begins. Twice a day, a deep whistle signaling the shift change blasts out from the mill and echoes throughout Arroyos y Esteros. In the first building one encounters entering the mill are the offices of the mill’s management staff and a small laboratory for testing the quality and purity of the processed sugar. In it, about a half dozen young women move about the laboratory operating the equipment in practiced, familiar manner.

During the period of this research was Manduvirá was leading the effort to get Arroyos y Esteros officially recognized as a *Ciudad de Comercio Justo*, a Fair Trade City.⁸ An official designation from Fair Trade International, the five core requirements are: local council passes a resolution supporting Fair Trade and agreeing to use Fair Trade products; Fair Trade products are readily available in the area’s shops and served in local cafes/catering establishments; Fair Trade products are used by a number of local work places and community organizations (faith groups, schools, universities etc.); attract media coverage and popular support for the campaign; a local

⁸ Manduvirá’s website reveals that Arroyo y Esteros did in fact earn this designation in April 2018: <https://www.Manduvirá.com/index.php/en/news/140-declaracion-de-arroyos-y-esteros-como-ciudad-por-el-comercio-justo-2>

Fair Trade steering group is convened to ensure continued commitment to its Fair Trade Town status (Fair Trade Towns 2018).

Back in Manduvirá's offices in the town center, another couple dozen employees work on the administrative side of the cooperative's operations. According to one female employee interviewed, the office is staffed by roughly 70 percent women. In all, Manduvirá claims that the cooperative is responsible for 60 percent of the economic activity in the area, a number impossible to corroborate but entirely plausible.

FOOD SECURITY AND THE ROLE OF MANDUVIRÁ

In terms of food availability, for both Manduvirá producers as well as other sugarcane producers in Arroyos Y Esteros, the community appears to be representative of Paraguay as a whole: there is an adequate supply of food available—either through direct cultivation or for purchase—to meet basic needs. Questions from dietary diversity questionnaires regarding lack of food or lack of resources to purchase food revealed that not only were respondents not going hungry, unable to feed their families, or facing undernourishment, but that this simply did not occur in their community. The very idea of a food shortage was an unknown experience to interviewees.

Where the food is available, however, is more complex. Every Manduvirá producer interviewed was also cultivating at least some food for household consumption. Nearly all were growing at least one of the three staple crops of mandioca (cassava), corn, and legumes, including peanuts. Fruits such as papaya, mango, melon, orange, and banana were the most commonly grown by producers while vegetable crops included lettuce, carrot, tomato, onion and chili peppers. What is perhaps most notable about the availability of these foods due to

household production is that many producers told me they rarely, if ever, have to purchase these food items. Providing evidence for this claim, I found that there was virtually nowhere outside of the town center to purchase any fresh fruits or vegetables. At first this seemed to indicate a lack of availability of such items, but a lack of market availability does not mean they are in fact unavailable: producers confirmed that there is little market for such items outside of the town center since individual production generally meets household demand.

Follow up from the dietary diversity questionnaires revealed the most commonly purchased food items by producers were meat, eggs, flour, noodles, rice, bread, vegetable oil and sometimes corn. In some communities it was possible to purchase these items from smaller household stores, but others had to travel up to an hour into Arroyos y Esteros to purchase at the supermarket—both of which come at a higher cost to more rural producers, but not so much as to limit access due to the physical distance from market.

One major change in consumer habits has recently taken place in Arroyos y Esteros. In 2014, a supermarket opened in the town center directly across the street from the Manduvirá office. It is the first and still the only supermarket in town which sells almost everything one could need from staple food items to school supplies to a small selection of clothing. According the supermarket's owner, Arroyenses were enthusiastic about the opening since it meant they no longer had to travel long distances to Caacupé or Asunción for anything above the basic necessities. Business has been very good, the owner claims, even exceeding her initial expectations when her daughter convinced her to move back to Arroyos y Esteros and open the supermarket after living for 30 years in Asunción. Indeed, the store was constantly busy with patrons perusing the aisles of mostly name brand, packaged foods that were unavailable anywhere else in town.

Inside the supermarket sits a large, five-doored refrigerator replete with fresh produce: bell peppers, cabbage, apples, cucumbers, and tomatoes. Next to it is more unrefrigerated produce including carrots, potatoes, beets, onions, garlic, oranges, pineapple, banana and ginger. The store owner tells me that all of this produce is purchased in Asunción, much of it originally grown in Argentina. “If someone has oranges in their garden, they are going to eat them and not sell them to me,” she claims. Prices of staple foods such as rice and flour, I am told, are cheaper in the supermarket than they are in other stores in the communities.

A range of opinions were encountered on the subject of whether or not consumption patterns in the community were changing. Some believed that diets and diet-related health issues were relatively stable and had been throughout their lives. Others, however, had a bleaker outlook. Some producers pointed to the sweets and sodas that are sold to children on their way to and from school, others referenced in one form or another what one producer called “industrialized products” available in the supermarket, while others believed a reduction in household agriculture was the culprit. In an interview with three members of Manduvirá’s leadership team, the cooperative takes a more historical perspective, claiming that major changes in food security and food sovereignty occurred in the 1970s and 1980s. The changes were not only related to food consumption, they argue, but were “within the society itself.”

All of the companies that wanted to sell their products began to market principally to children and youths. So if they opened a [coloring] book, what do you draw? They’d find Coca-Cola, they’d find McDonalds; it’s that way even now. So against all of this, what do we do? It’s not easy, it’s not easy because it’s everywhere: on the radio, on television, in the newspapers and magazines, and now the internet.

Other changes were occurring at the same time including the arrival of electricity and with it refrigeration. A member of Manduvirá’s technical support team present for the interview who is the daughter of a producer and grew up in the *campo* claimed that she never had soft

drinks as a kid in part because there was no refrigeration, “Now kids are born and they already know how to drink soda” she told me laughing. Her companion interjected to add “*En vez de decir ‘leche’ dicen ‘Coca-Cola, Coca, Coca!’*” (“Instead of [babies] saying ‘milk’ they say ‘Coca-Cola, Coca, Coca!’”). The result of these changes, according to those interviewed from Manduvirá, was a cultural shift away from what they once consumed and a battle they have been fighting ever since.

While the types of products and technology introduced in the 1970s and 1980s have not gone away, according to many the situation has stabilized and there is an increased level of consciousness regarding the pernicious impact of changing diets. Since then, however, there is a new wrinkle in the physical access for Manduvirá’s producers. When asking about changes in food consumption in the communities where producers live, the same member of Manduvirá’s technical support team was relatively unconcerned with any recent changes in availability and access in the rural communities but rather pointed to their ability to access food outside of their communities:

In fact, in the *campo* and the rural communities, [recently] there isn’t a big change in access, but what has happened? The distance has been shortened. Everyone has their motorcycle or other means of transportation and they can make it to the town center where they have access to the supermarket. We’re talking about 10 years ago when there were a lot less sales of fast food or access to a store or supermarket where you can buy much more. But now they have more access because they have mobility, their motorcycles or cars. In other words, the trip is shorter. The producers can now come on the weekends to get steak or hamburgers that they don’t have out in the *campo* where they have to eat in their homes.

This illustrates a key insight into how one of the major components of food security is transforming in Arroyos y Esteros. It is important to note that the ability to purchase a motorcycle was cited in multiple conversations with producers as one of the positive tangible outcomes of the increased profitability of their sugarcane enterprise. Increased mobility of rural

producers to more easily access the town center and the services available there—not only the supermarket and restaurants, but a bank with an ATM, the Manduvirá office, the municipality office—is in fact a promising indicator of rural development which was celebrated by nearly everyone with whom I spoke. What this quote illustrates, however, is the potential for negative externalities—increased access to unhealthy foods—associated with these positive developmental outcomes. Perhaps more importantly, the acknowledgement of these negative externalities on the part of the cooperative.

A number of producers as well as the cooperative’s leadership cited another example of how growth has an impact on economic access to food: as producers’ profit margins grow, their priorities begin to change. The same member of Manduvirá’s technical support team succinctly explained:

The real problem we have today in the *campo* is growing because technology has arrived to the *campo*. People now have access to the communication system, they have to buy gas for their motorcycles, they have to buy credit for their phones, they have to pay for television channels because it’s not just the local channels they can access anymore so they have to buy a plan for various channels. So the need to cover these expenses is growing and the margin for buying food is shrinking.

This same sentiment was expressed by producers who also noted the amount of money spent by some of their community members, likewise specifically citing gas and phone credit. As one Manduvirá member and mother of three told me, “When people get money, they don’t take advantage of it. They don’t spend it on anything useful.” It is important to note that there may be important generational or myriad other factors involved in the discomfort that some expressed towards shifting financial priorities. Yet the point about shrinking margins for buying food deserves serious consideration as it lends credence to the theory previously outlined that economic growth does not necessarily correlate to improved food security outcomes.

It is also important to note that what are unfavorable outcomes for some, are desirous outcomes for others. Recall that the previous quote from the member of Manduvirá's technical support team comes from the perspective of a woman who grew up in the *campo* as the daughter of a Manduvirá producer without electricity and refrigeration. She understands not only the process of change taking place in the community but also where it is coming from—she is careful not to idealize a past to which she is uneager to return. An exchange with another member of Manduvirá's leadership perfectly illustrates this same dynamic.

Speaking of food security and food sovereignty, we have lost a lot since the '70s and '80s. Paraguay used to have that. There was a saying in Guaraní about Paraguay that translated [into Spanish] means, "Poor, but well fed." And that's how it was. Every house, every family had everything they needed in their house and they didn't have to buy anything. But that has been lost and it's very difficult to recover. It's hard work that takes all day, takes all of your time.

What starts as a nostalgic recollection of a bygone era, quickly turns to a frank acknowledgement of precisely why it is a bygone era: producing enough food to feed a family rather than purchasing some or all of it is hard work that leaves little time and insufficient profits for other basic needs and desires. While some producers lamented the younger generation for not working in agriculture, others spoke proudly of their children being able to study in Caacupé or Asunción due to the money they earned from their sugarcane production and association with Manduvirá. In a statement that anyone who has been allowed to pursue their interests without the burden of producing their own sustenance should appreciate, one producer plainly stated: "It's much easier to buy mandioca than it is to grow mandioca."

With this we can see the bind that Manduvirá must navigate. On one hand, the cooperative's growth has not only been positive for their members but has been a major boon to the local economy. However, the cooperative also acknowledges that economic growth alone is insufficient in addressing some of the most important needs in the community. In an even more

self-reflective acknowledgement, Manduvirá understands that their success plays a part in changes in both physical and economic access to food, not all of which are necessarily positive.

FOOD SOVEREIGNTY AND THE ROLE OF MANDUVIRÁ

Manduvirá's activities also have significant implications for the state of food sovereignty among sugarcane producers in Arroyos y Esteros. At first glance, the export-oriented sugar that Manduvirá produces may not be that different from the other commodity crops that have overtaken Paraguay such as soybeans. After all, while some sugar is consumed locally or distilled into rum for local consumption, the majority of both products are destined for foreign markets. It is also a relatively new crop to the region, only becoming the main income generating crop around the year 2000 (Vásquez-León 2010). In other words, neither of these crops directly contribute in any significant or meaningful way to the consumption or culture of consumption of the producers and both can threaten traditional, local, subsistence-based agricultural production.

However, what food sovereignty calls for is the right of producers to define their own food and agriculture systems. When I asked Manduvirá producers what else they would cultivate if not for sugarcane, no one was able to identify a crop that could supply the income they needed to provide for their families. One producer who lived in Argentina for 33 years told me that if he could not grow sugarcane he would not have returned to Arroyos y Esteros. Another mentioned that she could grow fruits and vegetables to sell in Asunción but would not make nearly as much money and is at greater risk of losing her crop due to extreme weather. Although some alternatives were proposed—livestock, petitgrain to be processed into essential oils, sesame—none of these offered the same profitability and market stability as sugarcane.

While this implies sugarcane production more out of market practicality than anything else, Manduvirá interviews with producers revealed commitment and pride with sugarcane production. Multiple producers cited the fact that sugarcane production is difficult work but also that sugarcane—and the work that Manduvirá has done in marketing it—has been a godsend to their community. Despite the fact that sugarcane is essentially the only profitable crop available to farmers in the region, not one Manduvirá producer even hinted at feeling as if they have produce sugarcane against their desires. On the contrary, it is a major source of pride.

As important as defining what Manduvirá is producing is defining *how* it is produced. Manduvirá is a certified organic, non-GMO cooperative and it becomes clear when speaking with both producers and cooperative leadership that this a profound, nearly existential commitment. The cooperative's general manager emphasizes the role that the cooperative plays in maintaining the symbiotic relationship between the producers and the environment, telling me that they expand their vision of the cooperative to think about five generations in the future. As a local, farmer-run cooperative, this commitment is not an abstract exercise, it is a series of practical decisions they made to ensure the survival of the cooperative and the agricultural livelihoods of the cooperative's members. "The future is green," he tells me, a declaration less imbued with an ideological air than a pragmatic statement implying that future *must* be green, "We cannot continue to pollute the earth and expect to also live in it." He is quick to point out that this is not a perspective that would dominate if producers were subject to purely private sector export agricultural markets without cooperative protections.

This attitude is also present in the producers themselves, one even referring to himself as a "socio orgánico" (organic member) implying a certain level of self-identification with organic agriculture. When asked about the difficulty of adhering to the certification's organic standards,

the majority of producers essentially shrugged off the requirements stating that it is all normal for them, nothing more burdensome than what they would be doing anyways. One producer spoke about how conventional agriculture clearly has its benefits but then shortly after, transitioned to how he takes pride in producing organically and the work that it takes. Another cited what he had recently heard about environmental degradation in Haiti for why Manduvirá producers need to continue on the path of organic agriculture.

In all, Manduvirá's producers have over 8,000 hectares of land organically certified. Since the organic certification applies to a producer's entire plot of land and not just where they cultivate sugar, production for household consumption is also entirely organic. As part of its educational training programs, the cooperative promotes agroecology along with the production of organic compost and pesticides, and helps producers troubleshoot problems in their gardens. When I asked producers what trainings they felt most worthwhile from the cooperative, organic production for household consumption was often the first one mentioned. Interestingly, the term "organic" was often used as shorthand for "nutritious" in the minds of many Manduvirá producers—perhaps a testament to the efficacy of these trainings.

According to the cooperative's general manager, there is a bit of irony in all of this. Manduvirá is now taking advantage of the broadening of the organic sugar market which was once much more niche: by attaching the organic Fair Trade certification to their final product, they are profiting off of organic production in a way that was previously impossible. The general manager tells me that people used to look down on Manduvirá's organic production as "*atrasada*," an insult meaning backwards or retrograde. Now, however, Manduvirá has flipped the script. Their *atrasada* form of agriculture is worth more than conventional sugar and the cooperative is intent on selling this story at a premium: every producer receives a premium for

each kilo of sugarcane produced under their certifications from Fair Trade International and Hand-In-Hand. Both internationally recognized, the certifications set binding criteria not only for organic production but also working conditions, wages, and transparency.⁹ Each year members vote on how much of the premium goes to the producer and how much remains with the cooperative to fund its community initiatives (which I will elaborate on shortly), usually between 30-50 percent going to the cooperative.

There is one more broad, perhaps counterintuitive objective: Manduvirá's general manager tells me that his ultimate goal is for the cooperative to become increasingly less dependent on sugarcane production. While sugarcane has been the lifeblood of the cooperative and the community for decades, cooperative leadership sees their dependence on sugarcane as an organizational and environmental risk which needs to be mitigated through diversification. In order to do this, the cooperative is experimenting with a number of initiatives which use agroecological practices to gain further food sovereignty and increase food security which will be examined shortly.

On a grand scale, however, Manduvirá is setting a course towards crop diversification by cultivating stevia to mix with processed sugar—they currently offer a product which is one percent stevia and 99 percent sugar but are banking on greater market demand in stevia to increase that percentage. They are also subsidizing sesame production among producers for which they have found a growing market in Japan. A number of cooperative members report that they have had success in growing sesame and have been slowly increasing their sesame

⁹ Manduvirá has 10 other certifications, including USDA Organic, but they do not directly provide per kilo premiums.

production every year. Petitgrain, a citrus leaf used for essential oils, is another option the cooperative continues to explore as a means of diversification.

As noted in the chapter of food sovereignty and agroecology, these concepts are sometimes associated with a movement intent on ideological purity that diminishes the role of market-based agriculture for agriculture intended for proximate consumption. Manduvirá, however, finds itself in the middle and instead of choosing one path at the expense of the other, has set a path that allows it to thrive in the production, processing, marketing and exporting of sugar without ceding sovereignty over its methods of production and ultimate goal of improving the overall wellbeing of their agrarian community.

MANDUVIRÁ INITIATIVES: COMPOST PROJECT

On a lot adjacent to the Manduvirá mill is small plot of land with a garden, a pile of recycled sugar bags below an open aired corrugated metal roof, and a newly completed, but unoccupied brick building. The loud, bustling mill dwarfs the unassuming lot, but it is here where Manduvirá is conducting perhaps its most innovative venture. On the far end of the plot of land lay two rows of compost about a meter high, two meters wide, and 100 meters long. The fine, nearly black compost sits in sharp contrast to the reddish clay soil below.

The manager of the project tells me that the vision of Manduvirá producing its own organic compost was born out of the same dream as the mill project, but with an alteration on their conceptualization of what a mill truly is, “It’s not a mill,” he says, “it’s a recycling center.” One year after the mill opened, Manduvirá presented a plan to the Ministry of Agriculture that would allow them to use the byproduct of the milling process along with other raw organic materials to recycle and produce their own organic compost. The project was funded and the

Ministry of Agriculture covered the equipment,¹⁰ the covered areas for storage, labor, and the empty brick building which was slated to become a soil analysis laboratory where Manduvirá producers can bring soil samples to be tested.¹¹

The compost is composed of 70 percent sugarcane byproduct of the milling process and remaining 30 percent is made up of animal waste, vegetable waste, green organic material for nitrogen, and charcoal to speed the decomposition. The rows of compost are uncovered to aid in the aerobic process but the manager is hoping to secure funding for an open-aired roof to keep it dry during the rainy season. The tractor mixes the compost and when it is ready for use, is packaged in recycled sugar bags from the mill.

The project also provides employment for four full-time and one seasonal staff member whose salaries are covered by certifications from Fair Trade and Hand-In-Hand. As part of the project, the team planted the small garden near the entrance using the compost as the only fertilizer. The perfectly manicured garden boasts bright green lettuce, carrots, lettuce, tomato sprouts, beets, parsley, cilantro and *locote*, a large green chili pepper. In addition, the cooperative strategically selected 30 sugarcane plots in different areas where Manduvirá producers cultivate sugarcane to test the compost, all of which showed promising results.

In order to cover costs and keep the project sustainable, Manduvirá producers purchase the compost at roughly \$100 (US) per hectare of sugarcane which includes transportation. First priority is given to Manduvirá producers but non-members can also buy the compost for slightly

¹⁰ Principally a large upside down u-shaped machine which fits over the rows and is pulled by a tractor to mix the compost

¹¹ At the time of this research, Manduvirá was in the process of securing funding for the laboratory equipment and staff but according to their website, it was opened in April of 2018 (Cooperative Manduvirá Ltda. 2018)

higher cost and the cooperative is trying to work out deals to support school and community garden projects as well.

In the past, cooperative members have faced a number of issues with soil management and procuring organic compost. In the 1970s, the region suffered from poor soil management and low productivity which led to a pattern of out-migration during that period (Vásquez-León 2010). One cooperative member told me that she and her husband cultivate sugar on two plots of land in different communities of Arroyos y Esteros: one which they own and was badly over farmed before they bought it, and another which they rent. The plot they own produces about 30 tons of sugarcane per hectare while the plot with quality soil produces 70 tons per hectare. She is currently using the cooperatives' compost and is expecting her production to slowly increase.

Another recurring issue regarding compost is in its provenance: as a certified organic cooperative, the compost applied to the sugarcane has to come from a certified label. Not only can it be prohibitively expensive without taking out loans from the cooperative, some producers have failed certification because they purchased compost which was organic, but was not on the certifiers' list of approved suppliers. Transportation to remote plots is also a major cost which Manduvirá has included in its pricing of compost for its producers. Furthermore, Manduvirá producers are spread out across different areas with different soil compositions, the laboratory at the compost plant is designed to give producers the specific compost blend they need, something which is much harder to do when purchasing compost in bulk on the open market.

When asked about the compost project, nearly every producer mentioned their plan to purchase compost from the cooperative for the next years' crop. One producer told me that he wanted to cultivate all of his four and a half hectares with sugarcane but did not have enough compost so was forced to only plant one and half. He now plans on purchasing the compost for

the next year and planting his four and half hectare capacity. Another believed that she could double her production the next year with higher quality compost.

While Manduvirá's compost initiative thus far appears to be a technical success, it also has ramifications for food security and food sovereignty. Perhaps most directly, if the cooperative is able to work out a structure for schools and community garden projects (discussed below) to access the compost at a reasonable price, this could potentially have a sizable impact on the productivity of these gardens which are specifically created to improve the food security of the community. It also ensures that soil productivity is maintained or increased, leading not only to greater income from sugarcane production but also increasing the productivity of food for household consumption. As noted, whether or not that increased income is translated into improved food security outcomes is unclear. The connection between increasing productivity for household consumption and food security is much more direct, however.

Another key element of the compost project is that it provides the cooperative greater control over the sugarcane value chain. As discussed, reducing reliance on external inputs is a major agroecological practice at the heart of food sovereignty, making this perhaps the most innovative aspect of this project: by producing their own compost, Manduvirá is essentially converting what was once a wasted byproduct of the milling process into greater organizational autonomy.

Finally, this project is directly related to the cooperative's emphasis on diversification rather than monoculture sugarcane production. In order for the cooperative's wager on the financing the sugar mill to pay off, it needs to be running at near full capacity throughout the harvest months which means the cooperative needs to grow in order to remain solvent. In this dynamic lays one of the greatest struggles that the cooperative is facing, where the business of

running a competitive, export-oriented cooperative can lead to the greatest impact on the environment, food security, and traditional agriculture. In essence, how can the cooperative meet the demand required to be solvent while simultaneously not promoting sugarcane production over the cultivation of other products which their members rely on for consumption, livelihood, and biodiversity?

As one member of the cooperative's leadership team explained, one way to achieve this growth is through expansion of sugarcane production among its members. In fact, this is perhaps the most viable option: currently only around 45 percent of the land that is certified under Manduvirá is currently used for sugarcane production. In other words, Manduvirá could nearly double its production without having to certify another hectare of land or add another member. According to the cooperative, there is some potential for expansion within the land currently under its certification, yet they are committed to the ideal that it can only come without a reduction in diversification.

Thus, the cooperative has employed a threefold strategy to avoid this burgeoning conflict of sugarcane expansion into land designated for household consumption. The compost project of intensification rather than expansion is the principal tool to implement that plan. The second part of the strategy is to increase the number of members. There are an increasing number of producers who want to join the cooperative but need to get their land to be certified organic. This can take from one to three years depending on the history of the land use under production and if chemical fertilizers and pesticides had been used there. The third point of emphasis is on the children of producers, facilitating a process for them to become producers themselves rather than leaving for the city or leaving agriculture.

Through the production of their own compost and emphasizing technical assistance in soil management, the cooperative believes that it can significantly increase productivity on the land already under cultivation. Once again, the project has taken years of planning, required external funding from the Ministry of Agriculture as well as significant organizational resources and four full-time staff in order to increase productivity when they are currently only utilizing half of their productive land for cooperative benefitting agriculture. All of this in a country that is systematically moving away from traditional agriculture and towards export-oriented monoculture. As one member told me, “We are small producers and we don’t have the ability to buy more land, to just go get a hold of more and more land, we have to improve the quality of the product in the same land that we have.”

This, of course, is also highly related to the issues of food sovereignty which Manduvirá is committed to addressing. Manduvirá has decided that it wants to be a player in the export agricultural market while simultaneously retaining its own function as food producers for their community. Yet it is not only the function of food producers which they are retaining, but the form as well. Recall the first line of the 2007 Via Campesina declaration of food sovereignty: “the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems.” Through a strategy of intensification over expansion, soil management practices aimed at the long-term sustainability of their organization, and retention of traditional agriculture for household consumption, Manduvirá is increasingly defining their own food and agricultural system.

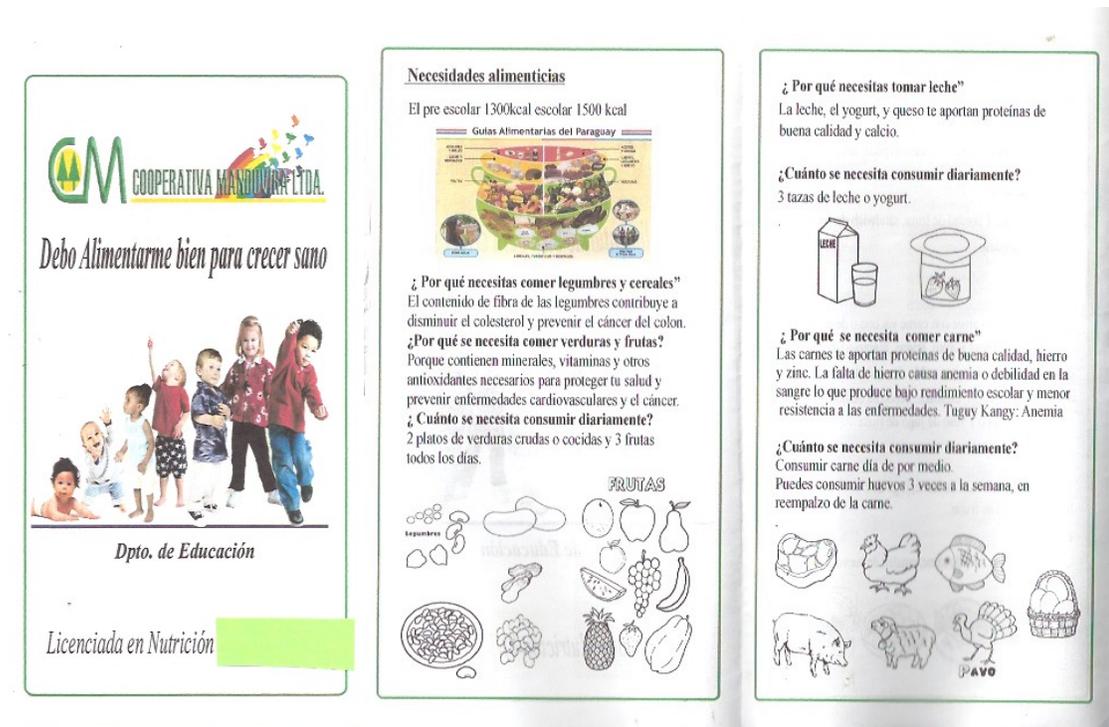
NUTRITION

Manduvirá's nutritionist lives in one of the sugarcane producing communities of Arroyos y Esteros and studied nutrition in Asunción. Her mother is a Manduvirá member and I spoke with her in her home not far from the mill about the current state of nutrition and food security in the area and her work with the cooperative.

Currently, Manduvirá's nutritionist is working with school children aged six to ten in seven schools in the rural communities around Arroyos y Esteros with the goal of eventually expanding to all 15 schools in the area. Taking advantage of the fact that the children come from predominantly agrarian families in an agrarian region, she teaches nutrition through the provenance of different foods and food products. For example, she explains, every one of her students understands intimately the process of sugarcane production: from soil to seed to harvest to processing. This is something they all intuitively understand and the logic is easy to follow for other fruits and vegetables. How then, she asks, do we get soda? What about other snacks or candies available in the stores? When their intuition fails to answer these questions, she explains the difference between natural and processed foods, the properties of each, the role of vitamins and minerals, and their effect on the students' health. Presently, there is no official nutritional curriculum in Paraguay so this may be the only formal education on the subject that these students ever receive.

This classroom-based curriculum is paired with a number of didactic lessons and resources. Students are given pamphlets with nutritional information that double as small coloring books; an interesting contrast to the coloring books mentioned by Manduvirá's leadership. Recipes and cooking lessons are also part of her curriculum which is not limited to Manduvirá producers. "Recently," the nutritionist told me, "a woman told me that her son came

home and told her about all of the properties of different vegetables and she is not a member of Manduvirá. So the beneficiaries of this aren't only the children of the members."



Nutrition Pamphlet: Developed by Manduvirá's nutritionist for teaching basics of nutrition in schools around Arroyos y Esteros. Source: Cooperativa Manduvirá

The program is also not limited to working directly with school children. Manduvirá's nutritionist provides training to teachers, works with administrators to improve school snacks, and works on the cooperative's school garden project. I later toured one of the schools in the program where an assortment of fruit trees were planted around the border of the schoolyard and a small, but well-tended garden was showing the first sprouts of various vegetables.

Every Friday morning just outside the Manduvirá office and across the street from the supermarket, two women set up a small table to sell produce such as tomatoes, lettuce, peppers, pineapple, juices, and other seasonal fruits. In the summer they make fruit salads and some days prepare juices, *mbeju*, or tortillas. They are friendly and familiar with the Manduvirá staff and Arroyenses who steadily stream through to purchase something or just chat for a few minutes. From the street, there is little else of note about this modest produce stand.

The story behind the produce stand, however, is highly important to understanding Manduvirá's efforts to address food security and food sovereignty. The women running the stand are all either Manduvirá producers or the wives of producers and are part of a project that incentivizes the production and sale of healthy, locally produced food by women's groups in sugarcane producing communities. Every Friday one of the six women's groups takes a turn selling outside of the Manduvirá office and once a month all six groups—together with other school garden groups, cooperatives, and venders—set up a market in the town plaza.

About a half hour from the market where the produce is sold is the farm of one of the growers and venders. Just past her house from the road sits a large, modern greenhouse roughly 100 feet long. Inside are six perfectly straight rows that extend the length of the greenhouse—tomatoes neatly trained along the far side, lettuce in various stages of growth in the middle rows, and assorted vegetables in the last row along the near greenhouse wall.

The project is the result of a network of contributions from the cooperative, the producers, and the Ministry of Agriculture. The cooperative worked to identify communities where women's groups were willing and able to participate then solicited funds from the Ministry of Agriculture for on-farm greenhouses. The producers provide the land and labor and

the cooperative provides the producers with seeds, compost, technical assistance and transport to and from market. Technical assistance comes in the forms of direct trainings but also troubleshooting on an as-needed basis: one of the women told me she calls the cooperative's technical support director about once a month to help her work through issues she has with pests or quality control.

The same producer tells me that she consumes a small amount in her household and is able to sell the rest of what she produces through Manduvirá's markets. All of the profits are for the women to keep. Considering the majority of inputs are provided by the cooperative, the enterprise is indeed proving to be profitable for her and the other women. Even so, her sugarcane production remains more profitable but also seasonal: the garden provides a steady income throughout the year while the sugarcane provides the majority of her income at harvest. As a point of personal pride, she tells me her cooperative success story: she and her husband had land but not enough money to cultivate sugarcane so got a loan from the cooperative for their first harvest and have been steadily improving their production and increasing their profitability ever since. She mentions that her children are all in school, one studying to be a veterinarian the other accounting and business administration—in her mind the direct result of her involvement with the cooperative.

This project is only one part of a much broader initiative to address issues of food security and sovereignty. Staff from both Manduvirá and Montillo, another sugarcane cooperative which often collaborates with Manduvirá, held a meeting with the middle school-aged children of their producers where they promoted youth group garden projects. Anything they produce could be sold in the monthly market and the profits would be theirs to keep. A total of 570 producers participated in the previous monthly market, 420 of which were women.

Manduvirá's garden projects have the multiple desired outcomes. It provides the urban-based population of Arroyos y Esteros with healthy, locally sourced produce while simultaneously creating a profitable enterprise for women and youth in the outlying communities. By doing this, Manduvirá is incentivizing and directly facilitating the creation of a market for healthy food.

FUTURE CHALLENGES

Of the greatest importance to the survival of the cooperative is having sufficient sugarcane production to meet market demand and to keep the mill running at capacity. The cooperative's leadership is confident in their ability to do so, but knows that it will require increased production. There are only three possible sources of increased production: new members, increasing productivity, and expanding production into land previously dedicated to other forms of agriculture. While the cooperative has thus far been able to successfully promote the first two options, the pressure and short-term benefit of employing the third will always exist. If Manduvirá is going to continue its commitment to promoting household agriculture as a means of generating household and community food security, then it must continue to find innovative ways to grow without detrimentally impacting the ability of its membership to produce for household consumption.

Up to this point, Manduvirá has been successful in diversifying within the sugarcane value chain. It first started producing sugar syrup for local consumption and has expanded to different varieties and consistencies of white and brown sugar as well as organic molasses and crystalized sugar mixed with stevia. They have also been able to gain significant control over the

sugarcane value chain from supplying their own inputs in the form of organic compost to owning and controlling their own mill, to directly exporting under their own brand name.

Despite this, the cooperative is determined to become less dependent on sugarcane which has been the cash crop of the organization for decades. Transitioning to new crops such as sesame requires entering into a new value chain in which they will likely not enjoy the same level organizational sovereignty. The cooperative will be faced with a raft of questions regarding which external inputs are required for transitioning to new crops, what level of processing can be done by the cooperative, what functions will need to be outsourced, and most importantly, what level of market stability can Manduvirá producers expect. In addition to the potential impact this transition may have on food sovereignty, it must also be carefully managed in order to not impact the food security of the community: once again, the cooperative will be forced to find the balance between sugarcane production, production for household consumption, and the new crops it intends to introduce.

Manduvirá's sustainable growth strategy relies on both the intensification of current cultivation and the integration of new members. While the cooperative claims that there are many producers and landowners in the area who want to become members, some within the cooperative express concern about the next generation of sugarcane producers. Education is becoming increasingly available for many youths in and around Arroyos y Esteros who are able to travel to Asunción or Caacupé for professional studies. A number of producers proudly pointed to the education of their children as a significant benefit of being associated with the cooperative and Manduvirá even offers scholarships for the children of producers to study. This is undoubtedly immense progress for the community and in particular those students who are able to take advantage of increased access to education.

For some within the cooperative, however, it signals an increasingly smaller pool for the next generation of Manduvirá's sugarcane producers. Asunción, a city of over half a million people, is only 45 minutes away and may be more appealing for young, educated Arroyenses. Because of this, Manduvirá is heavily promoting activities with youth within the community to foster a spirit of cooperativism and pride in the work required for sugarcane production. But with a new generation comes new expectations, new leadership, a new voting block of members which will set the priorities of the cooperative, and a perhaps a new set of values.

CONCLUSIONS

This case study complements existing research on collective organization in an attempt to answer the question of what role smallholder farmers' cooperatives can play in addressing issues of food security and food sovereignty. By placing Manduvirá within a broader historical, political, economic, organizational, and environmental context, I demonstrate both the relevance and importance of collective organization on smallholder farming communities in Paraguay. This case study contributes a model of development that extends beyond the economic enterprise of the cooperative and into targeted initiatives aimed at the social welfare of the cooperative's members and the community at large.

For food security, the issues Arroyos y Esteros is facing are not going anywhere. While Manduvirá can continue to educate young Arroyenses on household production and incentivize markets for healthy food, they can do very little about the macroeconomic forces which dictate which products become available in their supermarket, how much they cost, or what advertisements the community members are exposed to. Unlike the problem of the unscrupulous

mill owner, this is not a problem that Manduvirá can “solve.” Instead, they will have to continue their attempts to mitigate the negative impacts of these changes which will require both resources and institutional commitment via a democratic process.

Continuing to address a fluid state of food security will require a frank acknowledgement by the cooperative and its members that increasing incomes does not guarantee better food security or nutrition outcomes. For all the economic success Manduvirá has achieved, its acceptance of the rather inconvenient fact that increasing the purchasing power of its members comprises only one facet of community development is one of the cooperative’s most noteworthy characteristics in the realm of food security. Devoid of action, however, this acknowledgement would mean very little, and Manduvirá has developed a strategy to address each of the four components of food security.

In the area of food sovereignty, Manduvirá has implemented a number of agroecological practices aimed at increasing their autonomy over what they produce and how they produce it. Only a little over a decade ago, the sugarcane producers’ role in the value chain ended when they had no other option but to sell their harvest to a local mill for below market price. Now, that role begins in pre-cultivation with the production of their own compost and extends through the cultivation, into post-harvest processing, product testing, packaging, branding and exporting.

Paraguay is a deeply unequal country and perhaps nowhere is that manifest more than in the agrarian sector. From colonialism to Stroessner and through present day, the ever increasing concentration of land has made it one of the most unequal land distributions in the world. This concentration of power has been facilitated by the Paraguayan state which is fiscally unable and politically unwilling to challenge the structures of this paradigm.

The ramifications of this inequality of power leaves smallholder farmers facing an increasingly difficult set of challenges: traditional agriculture is rapidly decreasing while monoculture export crops are expanding to cover the vast majority of the country's arable land; rural labor is plummeting while migration is increasing; imported products are undercutting domestic production and shifting traditional consumption patterns. While Paraguay's national economy is strong, it is perhaps little comfort to those who are confronting these formidable difficulties.

In the case study of Manduvirá, we see a local, farmer-led cooperative confronting these challenges through well-managed, long-sighted collective action. With an emphasis not only on sustaining economic livelihoods, but acknowledging that economic success does not guarantee many of the basic needs of those in the community, Manduvirá is making concerted efforts to strengthen the food security of Arroyos y Esteros and work towards gaining increasing control over their means of production. Through a democratic cooperative process, the cooperative invests its limited resources in social programs and agricultural initiatives aimed sustaining their agrarian livelihoods for five future generations.

Furthermore, Manduvirá provides greater understanding of how a cooperative can employ collective action to cope with the changing food security landscape, to effectively adapt their form of agriculture to take advantage of the benefits of export agriculture and international markets while mitigating environmental degradation, and resisting the loss of sovereignty of agricultural producers. From within a context of deep structural inequality, Manduvirá offers an example of how collective action allows communities can exert control over their own development process offering an alternative model for rural agrarian development.

For years, sugarcane production in Arroyos y Esteros was seen as *atrasada*. The region was not ideal for the new wave of agriculture that was sweeping across Paraguay that employed mechanization, genetic modification, miracle pesticides, herbicides and fertilizers which could produce untold tons of commodity crops destined for international markets. Instead, Manduvirá was doomed to produce on depleted soils with a retrograde form of agriculture where they were the victims of extortion from a wealthy mill owner.

The story of sugarcane producers in Arroyos y Esteros could have easily ended there. Manduvirá, however, has spent the past decades challenging this narrative. Through collective action, determination, and long-term vision, their “backwards” form of agriculture and organization is now the economic engine of Arroyos y Esteros and a tool for addressing the needs of the community as they see them.

ANNEX 1: DIETARY DIVERSITY QUESTIONNAIRE

PREGUNTAS DIVERSIDAD DIETÉTICA DEL HOGAR		
DEBE ESTABLECER SI LA SEMANA PASADA FUE UNA SEMANA NORMAL SIN UNA OCASIÓN ESPECIAL, COMO UN FUNERAL O UNA FIESTA	SI	NO
¿La semana pasada fue una semana común, normal?		
Ahora me gustaría preguntarle sobre los tipos de alimentos que usted o cualquier otra persona en su casa consumió la semana pasada durante el día o por la noche. ¿Consumieron ustedes...		
¿Pan, arroz, fideos, pasta, cereales u otros alimentos hechos de maíz, arroz, trigo, avena?		
¿Papa, mandioca, otras raíces/tubérculos o alimentos hechos de raíces o tubérculos?		
¿Zanahoria, batata, zapallo, u otros vegetales amarillos, anaranjados?		
¿Verduras: hierbas, (acelga, lechuga, espinaca), u otras verduras?		
¿Mamón, mango, (frutas amarillas, anaranjadas)?		
¿Otras frutas?		
¿Vísceras, menudencias, panza, moronga, hígado, riñones, corazón u otros órganos?		
¿Carne de res, cerdo, cordero, chivo, conejo, pato u otras aves?		
¿Huevos o tortillas?		
¿Pescado fresco o seco, mariscos?		
¿Porotos, manías, lentejas, habas o alimentos hechos a base de ellos?		
¿Queso, crema, leche de vaca (líquida o en polvo), leche de cabra, yogurt u otros productos lácteos?		
¿Aceite, mantequilla, margarina, manteca?		
¿Azúcar, melaza, miel de abeja o panela?		
¿Cualquier otro alimento, tales como condimentos, café o té, aguas gaseosas, dulces o chocolates?		
¿Soja u algún producto hecho de soja?		
¿Otros?		
En los últimos 30 días ¿en algún momento no hubo comida de ningún tipo en su casa debido a la falta de recursos para conseguirla?		
¿Cuántas veces ocurrió esto en los últimos 30 días? ¿Raramente (1 o 2 veces), algunas veces (3 a 10 veces), o a menudo (más de 10 veces)?		
En los últimos 30 días ¿usted o algún otro miembro de su hogar se acostó con hambre debido a que no había suficiente comida?		
¿Cuántas veces ocurrió esto en los últimos 30 días?		
En los últimos 30 días ¿usted o algún otro miembro de su hogar pasó todo el día y la noche sin comer nada en absoluto porque no había suficiente comida?		
¿Cuántas veces ocurrió esto en los últimos 30 días?		

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