



Cultivating Green Gold

A Political Ecology of Land Use Changes for Small
Yerba Mate Farmers in Misiones, Argentina

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Chapter One

Introduction: Yerba Mate in Context

Oro verde. Green Gold. This is the affectionate name that evolved for yerba mate (*Ilex Paraguariensis*), a holly tree whose leaf has changed the livelihoods and landscape of the Argentine province of Misiones. Native to the Interior Atlantic Forest of Paraguay, Brazil, and Argentina, yerba mate (pronounced yer-bah mah-tay), weaves itself into the culture of Argentine families. A hot water tea-infusion of the yerba mate leaves is shared daily between friends and family, imbuing a sense of solidarity between individuals and providing an energetic boost. As European immigrants increasingly settled in the province of Misiones in the early 20th century, plantations of yerba mate began to be cultivated, the beginning of a cultural legacy in Misiones. The legacy of Argentine agricultural policies has left an imprint on both the livelihoods and landscapes of yerba mate farmers in Misiones, Argentina, leading to a current state of land consolidation and environmental degradation. This essay will use the lens of political ecology in order to bring into focus the complex interactions of government agricultural policies, commodity markets, and green revolution agricultural technologies that have shaped yerba mate farm management and led to a gradient of social and environmental impacts for small yerba mate farmers in Misiones, Argentina. It will explore to what extent the development of an effective agricultural policy combined with strong leadership and social movements for economic justice have the potential to support small yerba mate farmers, their landscapes and livelihoods.

The complex interplay between farmers and the Argentine political economy has shaped the landscape of Misiones, Argentina. Changing landscapes and environmental degradation are a product of the local political ecology, “Soil erosion problems can be analyzed in a framework of Chinese boxes, each fitting inside the other. The individual within a household, the household itself, the village or local community, the local bureaucracy, the bureaucracy, government and nature of the state, and finally international relations all represent contexts within which actions affecting soil erosion and conservation take place” (Blaikie 1985: 88). Within the analytical framework of political ecology, environmental degradation and conservation are seen as a rational response by resource users (in this case small yerba mate farmers) to markets, state policies and structure, and social processes (Bebbington 1996: 91). The following chapters will explore the implications of state agricultural policies, green revolution technology, and neo-

liberal economic markets for small yerba mate farmers. The process of unwrapping these Chinese boxes unveils a story of marginalization of small farmers and degradation of landscapes. However, it also reveals a story of revitalization of small farm livelihoods through social movements for economic justice and conservation of ecosystems through the implementation of diversified agroforestry systems.

Methods and Site Selection

During the summer of 2008, I worked with a fellow Yale School of Forestry and Environmental Studies student, Tal Ilany, to collect data to explore the environmental and economic viability of agroforestry systems for small and medium-sized yerba mate farmers in Misiones, Argentina. While Tal implemented a study to explore soil quality in yerba mate agroforestry systems, I initiated research to explore the political ecology of land use changes for small yerba mate farmers. Through my research, I explored the following questions:

1. What are the current and historical land use practices of small yerba mate farmers, specifically focusing on the agricultural techniques implemented by small yerba mate farmers?
2. How have government agricultural policies shaped the land use and agricultural practices of small and medium-sized yerba mate farmers over the past century?

In order to answer these questions, I completed thirty semi-structured interviews with yerba mate farmers, agriculture extensionists, government officials, and university professors in Argentina. A series of questions was asked to evaluate land-use history and allocation, the agricultural techniques employed, and the political economy of yerba mate production (See Appendix A for sample interview template). Most interviews with producers included a walk through their yerba mate field and my field notes include observations of the agroforestry systems. Primary documents and information from agriculture extension offices and farmers themselves were also collected and analyzed.

After two weeks of visiting various possible research sites, two research sites were chosen. The first research site was located in the departments of Montecarlo and Caraguatay in Misiones (see map in Appendix B). Interviewees in this research site included farmers and staff that were part of the *Cooperativa Agrícola Mixta de Montecarlo, Limitada*. The cooperative has almost 750 members. Four-hundred twenty of these farmers, the majority of whom are small producers,

are actively producing yerba mate (Seifert and Kraus 2008:12). The cooperative was founded in 1930 so that immigrants to the Montecarlo region could process and commercialize their product together without middlemen (Cooperativa Agrícola Mixta de Montecarlo Limitada 2008). The cooperative has a yerba mate processing and packaging facility producing two brands of yerba mate, Yerba Aguantadora and Yerba Sinceridad. The cooperative's yerba mate is principally sold nationally in the provinces of Misiones, Entre Rios, and Santa Fe, but the cooperative is actively pursuing international markets. In order to visit farms that had a variety of management techniques and agroforestry systems, seventeen farmer interviewees were selected based on recommendations from cooperative staff and members, as well as agriculture extensionists. Interviews were also conducted with cooperative management. All interviews were conducted in Spanish and recorded for analysis.

My second set of interviews was conducted in the department of Campo Grande in Misiones with farmers who belonged to the Cooperativa Río Paraná, which is based in the city of Oberá. The Cooperativa Río Paraná has approximately 150 members who are part of the Agrarian Movement of Misiones (*Movimiento Agrario de Misiones* or MAM). Fifty of their members produce yerba mate. The cooperative rents the use of a drying and processing facility in order to produce the brands Yerba Mate Titrayju and Yerba Mate Tamandua, which are sold nationally. The brand Titrayju stands for “trabajo, tierra y justicia” (work, land, and justice) and is marketed as fair trade. Seven producers were interviewed in Campo Grande, as well as two members of the cooperative staff.

Semi-structured interviews were also conducted with agricultural extension agents in Montecarlo and Cerro Azul and with professors at the Universidad Nacional de Misiones, both in Eldorado and Posadas. Interviews were also conducted with staff at the National Institute of Yerba Mate (INYM) and the Misiones Ministry of Agriculture. Additionally, interviews were also conducted at two independent family farms that were certified organic. They both process their own yerba mate and exported their product internationally. These farmers were both in various stages of implementing agroforestry systems with native trees.

Exploring the Roots of Marginalization of Small Farmers and Degradation of Landscapes

Before the first yerba mate plantations were planted at the end of the 19th century, individuals or groups of harvesters would harvest the yerba mate leaf from naturally occurring groves within the Interior Atlantic Forest, which stretches into Paraguay, Brazil, and Argentina. The production and consumption of yerba mate was one of the main sources of wealth that the conquistadores found in the La Plata river basin (Gortari 2008: 13). During the Spanish colonial period, the yerba mate harvest was controlled by seasonal grants from the king and gangs were sent out to harvest the leaf, which was used for both regional consumption and exported to Buenos Aires (Rosin 2004: 85). As yerba mate groves became increasingly exploited and new germination techniques were developed in the turn of the 20th century, yerba mate plantations began to grow and expand in Misiones (Rosin 2004:116). Since then, yerba mate has become a valuable industry with a net value of estimated at one-billion dollars (Heck and Mejia 2007). Today in Misiones, this has grown to include a total of almost 175,000 hectares of land in yerba mate production, 5% of the total area of the province of Misiones. Of the more than 17,000 yerba mate farmers in Misiones, over 75% are small farmers with less than 10 hectares (INYM 2009). Producing over 300 million kilos of yerba mate in 2008, small farmers contributed 31% of the total yerba mate harvest in Argentina (INYM 2009). The forty-one producers with over 200 hectares are currently producing 16% of the yerba mate harvest (INYM 2009). However, the top ten leading yerba mate brands purchase and control 80% of the production in Argentina (Gortari 2008: 19).

The development of the yerba mate market has led to the domination of the forest resource by the interests of a few and the subsequent marginalization of small farmers. This trend in tropical forest development is discussed in Michael Dove's "A Revisionist View of Tropical Deforestation and Development," in which individuals that live in the forest develop a resource which then undergoes an economic boom. As a result of the boom, external political and economic interests are attracted to the resource and assume control of the resource (Dove 1993: 20). The individuals that live in the forest thereby become marginalized by more politically and economically powerful individuals in the management and development of the resource: "the problem is not that the forest peoples are poor, therefore, but that they are politically weak (and the problem is not that the forest is environmentally fragile, but that it is

politically marginal)” (Dove 1993:21). This parallels the development of yerba mate as it was originally harvested by the Guaraní Indians from the yerba mate groves and then began to be controlled through structures of colonialism in the form of seasonal grants. As yerba mate production expanded into plantation agriculture, land consolidation and mechanization of production occurred. Yerba mate markets became heavily controlled by the leading yerba mate companies in Argentina. In the current political economy, small yerba mate farmers gain minimal returns over the cost of production and are increasingly marginalized, the consequences of which lead to migration from the farm to the city and movement to other crops.

Political and economic structures resulting in the marginalization of small farmers have left an imprint of ecological degradation upon the Misiones landscape. Extending into Argentina, Paraguay, and Brazil, the Atlantic Forest is a biodiversity hotspot, embracing one of the highest levels of biodiversity in the world, home to over 20,000 species of plants and 930 bird species (Myers et al. 2000). A result of extreme forest exploitation and land conversion to agricultural and forestry plantations, 12,000 hectares of Atlantic Forest disappear every year in Misiones, an area nearly equal to the city of Boston (Carrere 2005).¹ Only 44% of the original 2.7 million hectares of Atlantic Forest in Misiones remain (Carrere 2005). In comparison, only 8% of the entire Atlantic Forest in Paraguay, Brazil, and Argentina combined is still intact (Ballve 2007: 12). Looking at the map below it is evident that the largest intact portion of the Atlantic Forest remains in Misiones, Argentina.

¹Boston has a land area of 125.4 km². “Boston.” Wikipedia article. Available: <http://en.wikipedia.org/wiki/Boston>



Figure 1. The province of Misiones, located in the circle, contains the largest remaining continuous expanse of Atlantic Forest. Source: Leal 2003.

Endemic deforestation in Misiones is a result of agricultural and economic policies that give rise to extreme forest exploitation and land conversion to monoculture agriculture and forestry plantations (Carrere 2005). The same political and economic forces that converge to marginalize small farmers also encourage farm management decisions on a household-level that can lead to either environmental degradation or conservation (Peet and Watts 1996:5). Responding to changes in Argentine agricultural policies, shifts in market demand and price structures, and the paradigmatic shifts of technological innovations of the Green Revolution, farm management practices adopted in yerba mate fields have led to a gradient of deforestation and soil degradation. However, social movements, market alternatives, and a shift in agricultural policy since 2001 has constructed a foundation, albeit a weak foundation in need of many

structural improvements, for a political economy that could contribute to the conservation of small farm livelihoods and landscapes.

How a Leaf Becomes a Commodity: Yerba Mate Production and Processing Techniques

The process through which yerba mate is produced, processed, and consumed is imbued with cultural traditions, as well as political and economic value. To understand this process, it is important to explore how yerba mate is transformed from a leaf in a forest to a commodity important to the national security of Argentina itself. In Arjun Appadurai's introduction to the social life of commodities, he explores the Marxist view of the commodity: "In most contemporary uses, commodities are special kinds of manufactured goods (or services), which are associated only with capitalist modes of production and are thus to be found only where capitalism has penetrated ... commodities become intricately tied to *money*, as impersonal market, and exchange value" (Appadurai 1988: 7-8). In the case of yerba mate, the production and processing of the leaf in its transformation into a commodity is intricately related to cultural, social, and political factors (Appadurai 1988: 15).

Yerba mate was traditionally harvested and consumed by the indigenous communities, especially the Guaraní Indians, of the region. This tradition of sharing yerba mate is a cultural tradition which holds today in Argentina, Paraguay, Uruguay, and parts of Brazil. It is shared between friends, family, and strangers alike as a sign of friendship and solidarity. Beginning in the 16th century, yerba mate became an important part of the regional economy when colonial powers gave the leaf economic value and later began to transport it down the Paraná River to population centers in Buenos Aires and elsewhere (Reed 1995: viii). As the majority of yerba mate groves are located in Paraguay and Brazil, Argentina desired to avoid dependence on these countries and the ability to cultivate and process yerba mate became an element of national security. Once yerba mate became tied to both commodity markets and national security in Argentina, the government began to promote yerba mate plantation agriculture. In Misiones, Argentina, the plantation of yerba mate became a cultural tradition for the immigrants who began to farm in the region. The shift to widespread commoditization of yerba mate and the development of yerba mate plantation agriculture parallel each other.



Picture 1. The yerba mate plant in an agroforestry system.

The development of yerba mate plantations changed the production and harvesting methods. Although there are many variations to production and management practices of yerba mate, the following provides a description of the current yerba mate production methods as observed and practiced by the researcher. To produce yerba mate, *Ilex paraguariensis*, seeds are planted in germination boxes after the mature yerba mate berries are soaked in water for several hours and the pulp is removed from the seed. After 70-120 days, the seeds will germinate. After approximately a year, the seedlings will reach 25 to 30 cm and will be transplanted into the field at a spacing of about 2.5 meters by 3 meters depending on the land and the farmer's preferences. Farmers place some sort of shade structure to protect the yerba mate so that the seedlings will not

dry up in the hot summer sun of the Atlantic Forest. Some farmers use wooden boards toward the northwest side of the plant, while others will leave trees or mature manioc plants as a living shade structure (Interview with HO, 6/9/08: 3). Farmers employ different annual maintenance regimes with the main goal of removing competitive plants and maintaining soil humidity. The leaf can be harvested after three or four years, reaching full maturity after five years. Yerba mate trees can live for several decades, but will experience declining yields after five or six years (Interview with HO, 6/9/08).



Picture 2 and 3. Yerba mate seedlings ready to be transplanted to the seedling nursery (left), a yerba mate seedling planted in the field with a wooden shade structure

To harvest, the branches of the tree are cut with scissors or broken by hand.



Picture 4. Farmworker in Campo Grande, Misiones harvesting yerba mate leaves and branches

The harvesters collect the branches in white tarps to bring to the processing mills where the leaves are flash dried to maintain their color in a process called *sapicado*. The leaves are then either slowly hot-air dried or smoked in a *secadero*.



Picture 5. The recently-harvested yerba mate is collected, awaiting to be placed in the *secadero*



Picture 6. The *secadero* (left) which dries the yerba mate leaves with hot air and the wood-burning oven (right) that supplies hot air to the *secadero*.

The leaves and branches are roughly milled and separated from each other, producing what is referred to as *yerba canchado*. The leaves are left to age in storage warehouses for six to twelve months.



Picture 7. Storage warehouse for the dried yerba mate leaves.

After the yerba mate ages, it is further ground and the processing mills will mix the ground leaves with the ground branches at a given ratio to allow for either a stronger flavor (with more leaf) or a milder flavor (with more branches mixed in). The mixture is then packaged and shipped to stores, where it is sold to consumers. Thus, through investment in cultivation and processing, yerba mate production regimes evolve. Through this process, yerba mate is transformed from a mere holly leaf to a commodity which follows production and processing regimes that are imbued with cultural meaning and integral to national and economic security.

Chapter Two

1900-1950: The Historical Beginnings of Regulation and Wealth in the Yerba Mate Sector

After the Triple Alliance War between Argentina, Paraguay, and Brazil ended in 1870, Paraguay and Brazil controlled most of the yerba mate groves within the Atlantic Forest ecosystem. Argentina controlled only those groves in the province of Misiones and part of Corrientes (Rosin 2004:120). Thus, self-sufficient production and processing of yerba mate in Argentina became a matter of economic security. The existing yerba mate groves that were found in the Argentine provinces of Misiones and Corrientes were quickly exploited by those who could afford to buy large tracts of land in the region (Rosin 2004: 121). As yerba mate grew in importance, powerful economic and political interests asserted power over the commodity, leading to over-exploitation and degradation of the yerba mate groves within Misiones: “Degradation of yerba mate groves was largely the result of pruning methods that removed all of a tree’s branches, limiting its ability to regenerate. Trees that did recover were often subject to subsequent harvests prior to the traditional three-year interval that appeared to favor continued growth and production from the uncultivated trees. However, any efforts to limit the extent and frequency of the harvest were perceived as interfering with the state’s goal of self-sufficiency” (Rosin 2004: 121). The rhetoric of the state combined with powerful economic interests led to the subsequent degradation of yerba mate groves due to poor management and harvesting practices.

As a result, the Argentine government began to subsidize the planting of large-scale yerba mate plantations beginning in 1910 (Rosin 2004: 120). The Argentine government also established tariff barriers on importation of yerba mate to protect Argentine farmers’ access to the Argentine market (Rosin 2004:121). At the end of the 19th century and the beginning of the 20th century, the government promoted colonization of government lands in Misiones by European immigrants. The government sold lands to immigrants with the condition that they would plant yerba mate on a certain percentage of the land (Gortari 2008: 17). These European immigrants are known as *colonos*.

Many of the older interviewees in Montecarlo related the story of how their families immigrated from Germany or Switzerland in the 1920s and came to settle in Misiones. One interviewee reported that there was propaganda in Germany for Europeans to move to Argentina to settle and work the land (Interview with AR, 6/26/08: 42). His family moved first to Brazil and then three years later to Argentina (Interview with AR, 6/26/08: 42). Another individual described how his family traveled up the Parana River in order to reach Misiones, where land was being divided into 25 or 50 hectare plots such that each would have a water source (Interview with RP, 6/28/08: 49). Misiones was settled and divided into settlements that reflected a certain level of segregation between individuals that hailed from different countries and different religious backgrounds (Interview with RP, 6/28/08: 49). The majority of my interviewees from the region of Montecarlo were of German or Swiss descendants, whereas those located at my second site around Campo Grande were mostly of Polish descent.

In order to cultivate the yerba mate plantations in Misiones, *colonos* would cut the trees, burn the field and then plough the soil in order to plant the yerba mate seedlings (Interview with AR 6/26/08: 43). Paraguayan manual labor was often used to clear Misiones' yerba mate plantations (Rosin 2004: 121). Capital investment from Buenos Aires led to the growth of many yerba mate plantations and processing companies (Rosin 2004: 121). One interviewee recalled, "Planting yerba was the fever here in Misiones for the *colonos*"² (Interview with ES, 7/4/08: 102). While world consumption of yerba mate was 129 million kilos in 1932, Argentina produced 85 million kilos (Bunge 1934: 123). With the growth of yerba mate plantations encouraged and subsidized by the Argentine government, Argentine production continued to grow and Argentina entered its first yerba mate crisis as supply for yerba mate began to overwhelm demand for the crop (Vazquez 2007: 35).

As a result, in September of 1935 the Regulatory Commission for the Production and Commercialization of Yerba Mate (the Comisión Reguladora de la Producción y el Comercio de la Yerba Mate—CRYM) was sanctioned in the Argentine Law 12,236 (Vazquez 2007: 35). The main objectives of the CRYM were to regulate the supply and demand of yerba mate and improve the quality of production and processing of yerba mate. In order to regulate the yerba mate industry, the CRYM initially established rigid quotas for the number of hectares each

² All interview quotes are translated from Spanish to English by the author, Janet Lawson.

farmer could plant and the number of kilos each farmer could harvest each year. Farmers reported that with five or ten hectares in this era, one could maintain the whole family and hired labor to hoe and clean the yerba mate plantations (Meeting with HO, 6/9/08: 1). Thus, the cultivation of *oro verde* became a tradition for small farmers in Misiones. There were rigid quotas until 1953, when the quotas were relaxed and new plantings were allowed. However, this led to oversupply in 1964 and the CRYM reestablished a new quota system from 1967 to 1974 (Fiorentino and Dean 1974: 752; Schamber 2000: 224). By limiting production of yerba mate through a quota system, prices and quality were maintained at a level that supported the livelihood of small and medium sized farmers (Schamber 2000: 237).

Chapter Three

1950s-1980s: Green Revolution Technology and Mechanization: Changing the Face of Yerba Mate Management

As land in Misiones increasingly became converted to commercial yerba mate plantations, the implementation of green revolution technological innovations was being promoted in Argentina to increase yields after World War II. Changes in government agricultural and economic policies lead to changes in the local management of agricultural systems, sometimes exacerbating environmental degradation and income inequalities (Peluso 1996:542). In Misiones, a change in agricultural policies promoted a shift to high-yielding commercial production techniques, which reflected a comprehensive green revolution paradigm shift in agricultural production. In comparing the resource use paradigm of the green revolution with that of swidden agriculture, Dove and Kammen describe mast-fruiting and swidden cultivation systems as based on a ‘moral ecology’ of exchanges between resource users and the environment (Dove and Kammen 1997: 91-92). In contrast, the paradigm of green revolution agriculture is constructed within an immoral ecology that promotes a paradigm of unsustainable resource use in agricultural production: “the real significance of the green revolution is conceptual, not technological, that its real failing is ideological, and that its long-term viability is put in doubt by the immorality of its ecology” (Dove and Kammen 1997: 91-92). The green revolution concretizes unequal exchanges between resource users and the environment. With this change in the logic of engagement with one’s resources, farmers began to implement green revolution technology that increased yields, but that subsequently had ecological and social consequences that changed the shape of the Argentine landscape.

Before commoditization and commercialization of yerba mate, the Guaraní people would harvest the leaf from the yerba mate groves in a sustainable manner, traditionally harvesting a plant every three years. With the shift to commercial production of yerba mate in the 20th century, the logic of engagement with the resource changed from an ethic of sustainable extraction to an ethic of yield maximization. As yerba mate was seen as a crop of both national security and economic importance within Argentina, the government promoted technological innovations in agricultural production in order to improve quality and increase yields. In 1956,

the Argentine National Institute for Agricultural Technology (INTA) was created with the purpose of promoting the development of agricultural research and extension that would accelerate technification of production and improve agricultural enterprises and rural life (INTA 2002). In Argentina, agricultural research stations within Misiones have devoted significant resources to agronomic research of yerba mate, while extension agencies have promoted certain agricultural techniques for the mechanization of yerba mate production (Rosin 2004: 82-83). Agronomic research has focused on clonal reproduction, mechanical harvesting methods, and the use of agrochemical inputs (Rosin 2004: 137). In order to implement these technologies, farmers would require high capital investments for yerba mate clones, agricultural machinery, and agrochemicals. However, small farmers often do not have the capital to be able to make investments in these technologies. With research emphasizing increased yields, uniformity, and mechanization of production, technologies were promoted that did not take into account the socioeconomic circumstances of small farm livelihoods and production strategies.

The adoption of green revolution technologies, which were more suited to large-scale producers, was heavily influenced by the state and the political economy of Argentina in the second half of the 20th century. As green revolution technologies often require greater capital investment, as well as an economy of scale, they are more suited to large-scale producers. Small farmers often did not have the capital to invest to green revolution technologies and were overlooked by extension agents, exacerbating class and economic differences. When technologies did filter to small farmers, assisted by state subsidies, they were often not suitable to small farm production systems. As Yapa discusses in “What are Improved Seeds? An Epistemology of the Green Revolution,” when farmers began to plant high-yielding seed varieties, “There was no serious discussion of the structure of social relations and systems of social practices through which innovations filter, nor the consequences of the adoption of an innovation. This was a crucial mistake, because interpersonal economic differences and class play important roles in determining who adopts what in rural areas of the Third World” (Yapa 1993:259). Uneven adoption of green revolution technologies was both caused by and further exacerbated income inequality in the production of yerba mate. Those farmers who had access to technologies and had the capital to implement these technologies on a large scale were able to profit from higher-yields and mechanization. Without equitable access to technologies, unequal

benefits accrue to members of different classes, resulting in further exacerbation of income inequalities.

The paradigm of green revolution technology promoted by agriculture extension agents often did not consider the whole farm system, leading to environmental degradation. Farming techniques that emphasize yield and efficiency over sustainability and on-farm diversity have led to the misapplication of green revolution technologies that are not suitable for small farm agricultural systems:

Productivity enhancing research and development in many lesser developed countries have often been harmful, where they *have* been accessible to farmers of those areas. ... Pure stands allow accurate control of the plant population and mechanization of weeding and harvesting (an implicit big farmer bias is evident here). They allow effective and profitable fertilizer and pest/disease control treatments which can be calculated more easily. They are congruent with the principal objective of increasing output of one crop (often for export and consumption in urban areas) rather than one to enhance the farm system as a whole (Blaikie 1985: 21).

Agricultural extension agents promoted a technological package to yerba mate farmers that promoted high-yields over a systems perspective of agricultural sustainability. As Yapa discusses, the promotion of high-yielding seed varieties has brought dependence on non-renewable modern technologies: “modern technologies have contributed to scarcity by destroying existing sources of supply and creating demands for new ones. Ecological relations of improved seeds provide an excellent example of this argument because they have served to replace the sustainable “reproductive capacity” of local agriculture with the “productive capacity” of nonrenewable industrial inputs (Yapa 1993:262). By changing the way that farmers engage with their resources, farmers shift from an emphasis on the sustainability of a farm system to a logic of engagement of extraction from a farm system. Thus, farmers become dependent on technology and nonrenewable inputs such as fertilizers, herbicides, and gas for tractors.

After the discovery of adequate germination techniques of yerba mate in Misiones, the next technological innovation that changed the landscape of Misiones was the chainsaw. One farmer in his sixties reported that at the age of fifteen, the first chainsaw came to the area, changing the face of agriculture in Misiones (Interview with RP, 6/28/08: 50). Lands were cleared much quicker with the chainsaw in order to plant yerba mate and this aided in the

expansion of yerba mate plantations. This was the first technology to truly change the landscape of Misiones.

While the green revolution paradigm began to alter the political economy of agricultural production in Argentina, farmers began to change their cultural perceptions of the yerba mate field. Whereas farmers traditionally planted 1,000 yerba mate plants per hectare, the push for higher-density and higher yields led farmers to plant 2,000-2,500 plants per hectare (Interview with JG, 7/16/2008: 3). With the higher density plantings, farmers had to implement agricultural technologies that supported these high yields, including the use of herbicides, pesticides, and fertilizers (Interview with JG, 7/16/08: 3). The paradigm of the green revolution began to pervade the management practices and cultural conceptions of the agricultural system as farmers began to emphasize the importance of clean, weed-free fields. One farmer reported that there used to be competitions as to who had the “cleanest, prettiest” yerba field, meaning that it was completely free of weeds (Interview with EK, 6/12/08: 24). However, in the Interior Atlantic Forest, which is subject to scorching summer sun and drought periods, fields bereft of mulch reduced soil humidity and subjected the yerba mate trees to sun and drought damage, decreasing yield and plant health. With the implementation of green revolution technology along with a status quo cultural perception of clean, weed-free fields, the lands of yerba mate farmers were planted with higher-density monocultures relying on tractors and herbicides for annual maintenance regimes.

Introduction of the Tractor

Until the 1950s, yerba mate farmers used oxen to plough the fields and relied upon family labor and hired labor to hoe in-between plants. After World War II, the government began to finance the purchase of tractors and farmers could obtain good payment plans for tractors (Interview with RP, 6/26/08, 49). Good finance plans for tractors, cheap gas prices, and the green revolution paradigm combined to encourage small farmers to purchase tractors. As the industry grew, there was more pressure to increase yields, modernize production techniques, and establish monoculture plantation systems (Rosin 2004: 137). State-promoted modernization created an industry paradigm that promoted high-yielding, yerba mate monocultures. These monocultures could be planted densely and evenly-spaced to facilitate easier weed removal by

tractors, as well as more efficient harvesting.



Picture 8. One farmer with his government-subsidized tractor from the 1950s. He is making a furrow in between his young yerba mate trees in order to plant corn. Manioc had previously been planted in-between the lines of yerba mate.

Of the farmers interviewed, two-thirds reported using a tractor or a harrow in their yerba mate field (Lawson 2008). However, many farmers also noted the ecological problems that occurred in their yerba mate field when they passed the tractor or the harrow in-between the yerba mate lines. Horacio O’Lery, professor of Forestry at the Universidad Nacional de Misiones in Eldorado, reported that the tractor cut the roots of the yerba mate, thus preventing the roots from absorbing nutrients and water (Interview with HO, 6/9/08: 1). The tractor, which can weigh 2000 kilos, also produces a high level of soil compaction in yerba mate fields with 60% of compaction resulting from the first pass of the tractor (Interview with HO, 6/9/08: 4 and Interview with EK, 6/12/08: 24). The tractor leaves a layer of bare soil on the top of the field, leading to soil erosion. This also allows the hot Misiones sun to directly hit the soil, raising soil

temperatures, killing soil microorganisms, and reducing humidity levels in the soil. As one farmer reported, when he started to use the tractor and the harrow, “This did everything in” (Interview with RE, 7/6/08, 109). This particular farmer began to use herbicides as a way to keep his field weed free instead of using the plow and tractor (Interview with RE, 7/6/08, 109).



Picture 9. One farmer shows the extent of erosion from his neighbor’s yerba mate field

Despite their acknowledgement of the environmental consequences of the use of tractors on their fields, farmers that I interviewed would proudly point to their post-WWII, government-subsidized tractors. These decades-old testaments to the green revolution were still very much in use. Small farmers cannot afford to pay for a new tractor, nor could they afford to pay for manual labor on their farms if they wished to manually hoe the lines of yerba mate, instead of employ the tractor. As the green revolution paradigm began to pervade and gas prices increased, this set the scene for a new revolution in agricultural technology: herbicides.

Introduction of Herbicides

Small yerba mate farmers used the green revolution framework of yields and efficiency as a basis to implement agricultural technology that would decrease their monetary and labor costs. Thus, in the 1980s, small and medium-sized yerba mate farmers began to use herbicides. Farmers reported that they started to use herbicides because it was cheaper to use herbicides than to hire manual labor:

We used to hoe and use the harrow, but then we began to use herbicides. Everything used to be manual. When we finished the harvest, the people who harvested would hoe the fields. But now, we don't do that because we can't make ends meet. We become obligated to use herbicides, glyphosates (Interview with NB, 7/1/08, 90).

As farmers tried to cut production costs in their yerba mate field, they would switch to the use of herbicides as a means to clean the field of weeds without relying on extra manual labor.

The switch to the use of herbicides has been aided by easy access to credit for their purchase. The *Cooperativa Mixta de Montecarlo* has been giving credit to farmers for the purchase of herbicides to use on their yerba mate fields (Interview with RK, 6/24/08, 32). Horacio O'Lery, professor at the Universidad Nacional de Misiones in Eldorado reported that one worker can spray one hectare per day at a cost of \$30 (Interview with HO, 6/9/08, 2). With credit available to finance herbicides, farmers discovered that it was cheaper to use herbicides than to pay for laborers to plow or hoe the field, thus herbicides became integral to yerba mate plantation systems (Interview with RK 6/24/08, 74). Of the farmers interviewed, three-quarters reported using herbicides (Lawson 2008). Of these farmers who reported the use of herbicides on their farm, 40% reported using herbicides infrequently (every two or three years), 40% reported using them annually, and 20% reported using herbicides twice annually (Lawson 2008). Professor Javier Gortari of the Universidad Nacional de Misiones reported that farmers are more likely to use herbicides when the price for yerba mate is higher, in order to obtain a higher yield (Interview with JG, 7/16/0: 6). However, when prices go down and yerba mate is less profitable, farmers will be less likely to invest in production and use herbicides (Interview with JG, 7/16/08: 6). In contrast, on the large high-density plantations, agrochemicals, both herbicides and pesticides, are used more often as high-density monocultures require more care to keep the plant healthy (Interview with JG, 7/16/08: 6).

Farmers who employed herbicides used glyphosates, a nonselective systemic herbicide that was originally produced by Monsanto and sold under the name Roundup (Cox 2000). Glyphosate products are reported to be acutely toxic to both animals and humans, causing headache, nausea, elevated blood pressure, miscarriages, among other symptoms (Cox 2000). Glyphosate combined with a surfactant, which helps glyphosate to penetrate the plant cells, is even more acutely toxic (Cox 2000). Glyphosate is “extremely persistent” in the environment, with half-lives over 100 days, and has been found to decrease insect and bird populations (Cox 2000). Considering both the human and environmental health implications of the use of glyphosates, it is evident that the green revolution paradigm, supporting easy access to and dependence on herbicides, has led to a change in the way farmers engage with their resources and the environment.

Realizing the environmental consequences of herbicides on the farm and recognizing the economic costs of the purchase of herbicides, some of the farmers I interviewed chose not to use herbicides on their farm. Farmers cited the high cost of herbicides in times of low yerba mate prices, as well as the environmental and health consequences of herbicides, as deterrents to their use (Interviews with ES, 7/4/08 and AR, 6/26/08). One farmer I interviewed stopped using herbicides on his farm after he read Rachel Carson’s book “Silent Spring” (Interview with AR, 6/26/08, 44). As the cooperative provided credit to farmers who wanted to use herbicides to remove weeds on their farm, this farmer reasoned that the cooperative should provide credit to him in order to help him pay for farm labor to hoe his field. Thus, on October 7, 1994, he wrote a letter to the Advisory Committee of the cooperative asking for credit to help pay the cost of hoeing his field (excerpt below):

There is no credit for those who want to hoe their fields, but for those who use herbicides, they receive credit without interest. This seems to be lacking both the cooperative and the democratic spirit. Additionally, herbicides contaminate everything and the environment. I would like to ask that you harvest separately those yerba mate fields that use herbicides from those that do not use agrochemicals because we will soon need yerba that is not contaminated (Interview with AR, 6/26/08, 44, translated by J. Lawson).

No one from the cooperative responded to this letter. The culture of herbicide use was ingrained within the management techniques of the yerba mate farmers of the cooperative, thus leading the cooperative management to provide subsidies for herbicide use, but not for techniques, such as hoeing, that would fulfill the same goal of weed-removal. Although farmers still had the option

to hoe their fields manually by themselves or by paying hired labor, the cooperative was effectively sanctioning the use of herbicides by providing a subsidy to herbicides over manual labor. This letter, written in 1994, shows that some farmers were aware of the environmental consequences of herbicide use and foreshadows a movement towards organic production methods, which will be further discussed in chapters six and seven. Despite the recognized health consequences of herbicides, the green revolution paradigm has been entrenched in the yerba mate industry such that technologies such as herbicides are supported by both state and cooperative policies and structures.

The Green Revolution: Setting the Context of Degraded Landscapes

The green revolution paradigm and technologies encouraged farmers to value short-term productivity gains over the sustainability of the agroecosystem over time (Gortari and Oviedo 2001: 257). In keeping with the cultural perception of needing to keep the fields “clean” and “pretty,” tractors, harrows, and herbicides allowed farmers to maintain weed-free, bare soil. However, without mulch and organic matter on top of the soil, yerba mate fields suffered from erosion, run-off, and nutrient loss. As Blaikie discusses, agricultural technologies designed for North American agricultural systems can be misapplied in other ecological and social contexts: “Problems sometimes arise because this technology does not suit tropical conditions. Compaction of the soil by the use of heavy machinery, deep plowing causing moisture loss and exposure of humus to the sun and to leaching by heavy rainfall, ... line planting and low foliage protection (leaves are often bred out of cultivars in the pursuit of higher yields), are some of the problems that are caused by this technology” (Blaikie 1985: 143). In addition to the erosion resulting from plowing, compaction from tractors further exacerbated soil erosion and degradation.

With an emphasis on higher-density, higher-yielding agricultural systems, many farmers shifted from diversified yerba mate agroforestry systems to yerba mate plantation monocultures. Although too much shade is detrimental to the productivity of yerba mate, shade trees do provide a microclimate for the yerba mate plants that ameliorates the affects of drought, sun, and occasional frosts. In a monoculture system, plant diversity is eliminated, as well as those plants that might harbor the natural enemies to pests that began to affect the health of yerba mate plants

(Gortari and Oviedo 2001: 257). As the ecology of the yerba mate agroforestry system shifted, farmers reported a growing presence of leafcutter ants that began to nest in yerba mate fields and would destroy yerba mate plants. Although small farmers were less likely to resort to the use of pesticides because of their costliness, pesticides were used by yerba mate farmers in order to combat pests that became pervasive on monoculture plantations (Gortari and Oviedo 2001: 257). Without mulch, shade, and the incorporation of organic matter into the system, yerba mate agriculture suffered from soil erosion, nutrient loss, and decreasing yields. Despite the effects of environmental degradation from the use of tractors and herbicides, the cultural paradigm of the green revolution pervaded, promoted by the government, cooperatives, extension agents, and market pressures. With government subsidies and agronomic research promoting higher-yields, monocultures, tractors, and herbicides, the management techniques of small farmers changed to incorporate the paradigms of the green revolution. With this paradigm shift, the ecology of the yerba mate agricultural system changed, leading to degradation of the Misiones landscape.

Chapter Four

1991: Deregulation and the Era of Neo-Liberalism

In compliance with the demands of international financial organizations, President Menem instituted a series of policies to end government regulation of Argentina's agricultural sector (Rosin 2004: 146). In March of 1991, Argentina, Brazil, Paraguay, and Uruguay signed a free trade pact to create MERCOSUR, the Southern Cone Common Market. MERCOSUR reduced tariff and trade barriers and promoted the integration of southern cone economies. As MERCOSUR came into effect, President Menem eliminated the CRYM and deregulated the yerba mate industry according to decree 2,284 in November of 1991 (Schamber 2000: 222). The current governor of Misiones at the time, Huerta, owned many yerba mate plantations and wanted to expand his production (Interview with JCH, 6/24/08: 21). So he worked with President Menem to eliminate quotas in the yerba mate sector, which would allow yerba mate farmers to expand the land in production (Interview with JCH, 6/24/08: 21). Thus, a combination of powerful economic and political interests eliminated regulation in the industry.

With the elimination of the CRYM, quotas on the establishment of new plantings of yerba mate were eliminated and farmers were expected to respond to competition within the free market. The movement to neo-liberal policies in the early 1990s was symptomatic of the era as South American governments shifted away from reliance on commodity regulations to self-regulating market mechanisms:

Between World War II and the 1990s, governments had implemented state intervention, regulation, protectionism, state-owned enterprises, and collective production systems in well-intentioned attempts to implement economies that served national interests and to foster greater internal coherence by incorporating different sectors through protection policies and special-interest programs. But these efforts were critiqued because they fostered systems that were inefficient because they were not competitive. Instead neo-liberalism placed its faith in the engines of growth that individual initiative acting in free and self-regulating markets could bring about. Neo-liberal governments deregulated markets, eliminated subsidies, dismantled development programs, and privatized state enterprises (Mayer 2002: 313-314).

These neo-liberal policies are supported by the green revolution paradigm of agricultural innovation that promotes efficiency and high productivity.

The shift from state regulation to neo-liberal economic policies inaugurated a new economic paradigm in Argentina. The new paradigm supported an economic environment characterized by market competition and increased productivity in which producers were expected to respond to market signals through a process of self-regulation. In classical economics, economic units are designated as either producing firms or consumers (Mayer 2002: 316). However, farming households do not fit solely into one of the categories of producing firm or consumer (Mayer 2002: 316). Small farmers are seen as inefficient as they do not have an economy-of-scale. Those producers who are efficient and highly productive are successful within the neo-liberal paradigm, while small farm households are viewed as failures:

The neo-liberals, [households] are neither efficient producers nor expanded consumers. ... neo-liberals have decided that peasant households, in their role as producer firms, are largely inefficient and uneconomic and should disappear. According to the ideology of modernization, as Deborah Bryceson (2000:6) characterizes this view, “peasants are technologically backward and doomed by the forces of modernization and industrialization.” Policy shifts under neo-liberalism revert to these tendencies (Mayer 2002: 316).

Thus, within this paradigm, the role of the small farmer becomes unclear and precarious.

With the expansion of neo-liberal market structures, markets become the vehicle through which producers must respond to competition. If small farmers could respond adequately to market signals, then they would be considered successful: “Competition, quality, and efficiency encompass specific meanings as concepts of competitive markets. These meanings are formalized at the theoretical level as means to legitimize economic policies that rely on the assumed uniform rationality of economic actors in markets that objectively reward “correct” response to market signals” (Rosin 2004: 346-7). With increased competition in the yerba mate sector, small farmers were expected to respond to changes in the market structure by increasing their yields, while decreasing their input or unit costs. “Trade liberalization and the creation of regional trading blocs are opening agriculture to competitive pressures. These increase pressure on small farmer production to increase productivity, lower costs, increase competitiveness, and use inputs much more efficiently in technical and economic terms” (Bebbington 1996: 92). However, market structures placed pressures on small producers such that they were forced to

implement agricultural techniques that sacrificed agroecosystem sustainability for increased yields and productivity. The following section will explore how deregulation of the yerba mate combined with staunch competition within the yerba mate sector, resulted in a structural crisis within the yerba mate market.

Neo-liberal Policies and Yerba Mate: Towards a Political Economy of Structural Crisis

After the implementation of neo-liberal policies within the yerba mate sector, the land area planted in yerba mate greatly expanded, leading to oversupply of raw material within the yerba market. When the quotas for planting were eliminated, the more powerful processing firms initiated the cultivation of large, mechanized plantations: “The largest processing firms quickly moved to increase efficiency by establishing plantations that exploited efficiencies of scale facilitated by innovations in mechanized planting, maintenance, and harvesting technologies” (Rosin 2004: 146,195). In this way, the processing firms could assure a steady, secure, and cheap supply of green leaf, with lower labor costs (Rosin 2004: 146). In addition to the large processing firms that greatly expanded their cultivation of yerba mate, people that were not traditionally yerba mate farmers, including doctors, lawyers, and townspeople, bought land and began to plant yerba mate (Interview with JCH, 6/24/08: 20). People decided to plant yerba mate because it was very valuable at the time: “It is the most noble plant that there is. You rarely find diseases that affect the plant and it adapts very well to the region” (Interview with RK, 6/24/08: 31). Another farmer reported that he planted yerba mate in the 1990s because, as a perennial, it provides a stable harvest every year (Interview with CP, 6/25/08: 36). An abrupt increase in land devoted to yerba mate occurred after neo-liberal policies were implemented in the yerba mate sector.

With the increase in acreage devoted to yerba mate, supply of the green leaf began to flood the market. Yerba mate reaches its highest yields within four to six years of planting. Thus, beginning in the mid-1990s, the new plantations were reaching their peak yields producing oversupply in the yerba mate market. Despite the increase in supply, demand for yerba mate is relatively inelastic and has not grown significantly (Gortari 1998: 198). With relatively inelastic demand for yerba mate and increasing production, stocks of yerba mate were left unsold. The yerba mate market entered a structural crisis and prices began to plummet.

With the initiation of MERCOSUR in 1991, Argentina began to export its oversupply to Paraguay and Argentina at a price below the cost of production (Rosin 2004: 196). Larger firms could absorb the short-term losses: “Both the export of yerba mate at low prices and the emphasis on productivity favors the larger firms in Argentina. Because they command sufficient capital reserves, these firms are able to absorb the short-term losses of underpriced exports in expectation of gaining market position in Brazil and Paraguay. They are also in a better position to invest in more capital intensive production practices” (Rosin 2004: 196). Small producers did not have the same capital and capacity to implement higher productivity technologies, such as a move to higher-density planting and the use of fertilizers and pesticides, in their yerba mate fields (Rosin 2004: 146). Beginning in 1996, the government encouraged yerba mate producers to move out of yerba mate production - and into such crops as pine - if their yields were less than 10,000 kilos per hectare (Rosin 2004: 146). Small farmers, who could not absorb the declining yerba mate prices or invest in intensive production practices, were left in a precarious position. After ten years of deregulation, the yerba mate market hit rock bottom in 2001, changing the profile of yerba mate production.

2001: Hitting Rock Bottom: The Social Implications of the Devaluation of the Peso and the Financial Crisis

In 2001-2002, Argentina’s economy began a downward spiral, culminating in a financial crisis with the devaluation of the peso in 2001/2002. The financial crisis precipitated a parallel crisis for yerba mate farmers and their livelihoods. Due to oversupply, competition, and deregulation of the yerba mate market, the price paid for one kilo of unprocessed yerba mate, after harvest and transportation costs, had gone from 20 cents in 1991 to a mere two cents in 2001 (Gortari 2008:20). Since the big firms had their own yerba mate plantations, they could buy yerba mate cheaply from small and medium producers, thus bringing down the price of yerba mate (Interview with RE, 6/16/08: 22). The big firms would offer to buy the yerba mate from the producers and then offer them low prices, telling the producers to take it or leave it (Interview with JG, 7/16/08: 1).

The large processing firms that had begun to plant yerba mate in the early 1990s were controlling its price (Interview with RE, 6/16/08: 22). The structural crisis created a steep fall

for small and medium-sized yerba mate producers: “In 1991, the yerba mate market functioned for everyone. The small producer had a steady price that allowed him to subsist. From the year 1991 to 2001, the production of yerba mate was disfigured. In this era, a severe crisis emerged for the small producer as the prices of yerba mate leaf lowered to a minimum” (Interview with JG, 7/16/08: 1). As processing mills were paying two cents per kilo after the harvest and transportation costs, with an average of 30,000 kilos produced per producer per year, families were only earning approximately \$600 per year on their yerba mate harvest (Gortari and Oviedo 2001: 261). Even with the price drop from 20 to 2 cents, the retail price at the store was maintained around \$2 (Gortari 2008: 20). Since three kilos of unprocessed yerba mate produces one kilo of processed yerba mate, the producer earned 30% of the market price in 1991 and 3% of the market price in 2001 (Gortari 2008: 20).

With the severe decrease in yerba mate prices, there were social consequences for both yerba mate farmers and the individuals who worked on their farms. Small yerba mate farmers had to change their production and management strategies in order to sustain themselves during this crisis: “what occurred in the decade of 1991 to 2001 is the weakening of the small producers, who never completely break, because, well, what they do is plant another thing within the yerba field. Or they abandon the yerba field and dedicate themselves to produce another thing, hoping for the yerba prices to improve. However, the yerba mate crisis had a very strong social impact throughout Misiones as many families became scattered throughout the province” (Interview with JG 7/16/08: 5). In order to maintain themselves throughout the crisis, families had to look for outside work and sometimes even sell their farms (Interview with JG 7/16/08: 6). One farmer in Campo Grande estimated that two out of three households in her region have either moved away from the rural area or have sold their fields to bigger companies (Interview with AB, 7/0/08: 119). Larger producers were able to purchase tracts of land cheaply in this era and yerba mate production has become further consolidated in the hands of fewer individuals. From 1991 to 2001, the number of individuals living in rural areas in Misiones decreased from 295,000 to 289,000 people (Gortari 2002: 439). While this might seem like a minimal decrease, the number of individuals living in cities in Misiones increased by 36%, increasing from 494,000 to 674,000 individuals (Gortari 2002: 439).

As yerba mate prices plummeted, yerba mate production became less attractive for small farmers, especially for their children. Farmers encourage their children to earn an education and to find work through other opportunities. As the production of yerba mate does not provide an economic incentive for youth to stay on their farm, there has been an exodus of the youth from the farm to the city:

All of their children move to the city and never come back. The older generation passes away and they sell the fields. It's a slow process, more than a total exodus of the population from one side to another. What happens is that the young people all go to the city to look for work alternatives. The field becomes a place that does not provide a future for the youth (Interview with JG, 7/16/08).

Without a lucrative future on the farm, the youth have had to search for their own alternatives. This creates a change in the social structure of farm families as they begin to disperse all throughout the towns and provinces.

Many farmers who did keep their farms reported having outside income from other activities. One farmer's wife owned a store in the town, upon which the whole family relied upon for the income (Interview with RK, 6/24/08: 33). Two of the farmers I interviewed had established a carpentry business in their homes so that they could support themselves (Interview with ES, 7/4/08: 106 and Interview with RP, 6/28/08: 106). Another farmer had taken up a temporary job in the local manioc processing factory in order to earn money for his family (Interview with CP, 6/25/08: 40). Other farmers who I interviewed that were past retirement age supplemented their on-farm income with their retirement earnings (Interview with AR, 6/26/08: 46).

Hard hit as well were the hired laborers that would work on the yerba mate farms. Between the year 1988 and 2002, the number of permanent salaried laborers working on yerba mate farms dropped from 9,332 to 4,778, a 49% decrease (Rosenfeld and Martinez 2003: 386). These laborers are generally responsible for annual up-keep of the yerba mate farms (Rau 2005: 386). In contrast, the number of hours worked by migrant labor, generally employed in the harvest period, only decreased by 8% from the year 1988 to 2002 (Rau 2005: 386). These statistics point to two trends. First, farmers were not keeping up their yerba mate to the same level that they were in 1988. This means that the farmworkers that they would have employed to maintain the yerba mate through harrowing, plowing, hoeing, and applying herbicides, were

no longer being employed to carry out such activities on the farm. Thus, the annual management practices of yerba mate had changed in response to market conditions. Second, farmworkers faced a precarious labor situation in which there was less work and money available for their salary (Rau 2005: 387). With the drop in yerba mate prices, farmworkers also became marginalized: “with the prices that they are paying now for the unprocessed green leaf, farmworkers are obliged to work for the most part in the margins. As a result, those who harvest the yerba mate are not being paid what they should be paid. This results in a severe social problem” (Interview with NB, 7/1/08: 93). As a result of the drop in yerba mate prices, farmworkers experienced marginalization through less stable, precarious employment opportunities.



Picture 10. Farmworkers carry the harvested yerba mate branches to the truck to bring them to the drying and processing facilities

With deregulation of the yerba mate market and the ensuing financial crisis, farm labor - especially for the harvest - was often taken over by contractors. Although the yerba mate harvest has a price regulated in Misiones in conjunction with the Argentine Union for Rural Workers

(UATRE- Union Argentina de Trabajadores Rurales y Estivadores), harvesters often work on the black market receiving wages below the regulated price: “I think that the fixed price was at 12 pesos per ton, but they aren’t paid this. The producer can’t pay the harvester this price because he doesn’t have the money. If the producer is being paid 20 cents, and the harvest costs 12 cents and the transportation costs are 5 cents, then nothing is left for the producer. So, harvesters also work on the black market” (Interview with JG, 7/16/08: 8). I visited a shantytown on the margins of Montecarlo that housed 10 families that were working as yerba mate harvesters. One female harvester reported that she made 10 pesos per ton of yerba mate that she harvested (Interview with RO, 7/8/08: 118). Depending on the yerba mate field, she harvested about four tons of yerba mate per day (Interview with RO, 7/8/08: 118). She says she averaged approximately 200 pesos per month, but that the government takes out about 20% for taxes (Interview with RO, 7/8/08: 118). Although she reported that they made enough to cover food, it was not enough to purchase other things, such as clothes (Interview with RO, 7/8/08: 118). Although the Cooperativa Mixta de Montecarlo used to hire the harvesters directly, all the harvesters are now contracted workers (Interview with RO, 7/8/08: 118). They are only paid once a month and twice a month they receive credit from the cooperative supermarket so that they can purchase food and other goods (Interview with RO, 7/8/08: 118). With the change to contract labor, cooperatives and processing firms are no longer responsible for the price that is being paid to harvesters for their work. Thus, harvesters are forced to accept clandestine employment below the regulate union wage. Even worse, they are often subject to fraud even in receiving these depressed payment prices through partial payments, payment through goods, or even denial of payment (Rau 2005: 390).

In the era of the Argentine financial crisis, the social conditions of yerba mate production changed, exacerbating the marginalization of both small farmers and farmworkers. With the reality of land consolidation, migration to towns, and the sale of small farms, the small yerba mate farm typified a precarious form of subsistence living “It is very difficult now. With 10 hectares, you can earn about 1,000 pesos per hectare minus the cost of taking care of the yerba mate plot. This leaves you with five-thousand pesos per year. A farmer can live on this, but it is subsistence” (Interview with RW, 6/29/08: 59). In order to maintain a family, farmers reported that they would need anywhere between 30 and 100 hectares as a yerba mate farmer (Interview

with CP, 6/25/08: 40 and RP, 6/16/08: 54). However, only 7% of yerba mate producers have 100 hectares or more (Instituto Nacional de la Yerba Mate 2009). With over 75% of the nearly 17,500 yerba mate farmers in Misiones cultivating 10 hectares or less of yerba mate, the social conditions resulting from neo-liberal policies and deregulation leave many of these small farmers and farmworkers in a precarious position of marginalization (Vazquez 2007:33; Instituto Nacional de la Yerba Mate 2009).

Javier Gortari, professor of Humanities and Social Sciences at the Universidad Nacional de Misiones and strong advocate of government intervention in the yerba mate market, succinctly summed up the effects of neo-liberal policies: “They threw to the winds 55 years of management experience in the yerba mate sector. They returned to the same state as 1936, when the conservative government had considered state intervention in the yerba mate market essential to sustain social stability in the regional economy” (Gortari 2008: 20). Without state policies to support farmers, the social and ecological consequences of neo-liberal market structures have been the dual marginalization and degradation of small farm livelihoods and the landscape of the Interior Atlantic Forest ecosystem.

Chapter Five

2001-2008: Revitalizing Degraded Livelihoods

In response to the increasing marginalization of small farmers through the market conditions that were created as a result of neo-liberal policies, small and medium-sized yerba mate farmers initiated a series of social movements in order to revitalize degraded livelihoods. With the top ten leading companies controlling 80% of the production of yerba mate in the province of Misiones, it was necessary for the farmers to assert themselves within the political economy (Gortari 2008: 19). Thus, small and medium-sized farmers began to unite in the 1990s and the beginning of the 21st century as a response to intense competition within the market: “Conventions theory, as formulated by Storper (1997), suggests that otherwise competing economic agents within a region (in this case yerba mate processors) often act cooperatively in response to external competition” (Rosin 2004: 435). Yerba mate farmers organized into cooperatives were often the individuals who took the lead in initiating social movements in Misiones. As cooperatives promoted an ethic of solidarity, integrity, and equality, combined with an institutional structure and economic power within the yerba mate market, cooperatives began to find their voice within the political economy.

The management of the Cooperativa Agrícola Mixta de Montecarlo was one of the first entities to push for reform in the yerba mate sector. Organized primarily by the yerba mate cooperatives and the Misiones Agrarian Movement, a popular march of more than 10,000 people occupied the central plaza of the provincial capital of Posadas (Rosenfeld and Martinez 2003: 352). This was a unique march as many of the small and medium-sized yerba mate farmers traveled from their fields to the capital on their tractors. The Cooperativa Mixta Agrícola de Montecarlo paid for a bus to take people to the protest and the mayor of Caraguatay sent farmers on tractors over 200 kilometers on the main highway in order to attend the protest in the central plaza of Posadas (Interview with ES, 7/4/08: 106). This collection of antique post-WWII government-subsidized tractors was the culmination of three years of roadblocks and struggles for a change in government policies (Rosenfeld and Martinez 2003: 352). Occupying the Plaza 9 de Julio, this *tractorazo* included producers, union members, professors, and students asking for an increase in the price for yerba mate (Rosenfeld and Martinez 2003: 360). As a result of the

tractorazo, the government promised to provide a production subsidy to yerba mate farmers (Rosenfeld and Martinez 2003: 360). One farmer reported that the subsidy that the government paid was 150 pesos per year, however, even though the government had promised to pay the subsidy each year, it was only paid once (Interview with RR, 6/30/08: 70).

In response to the demands of lengthy protests in the provincial capital of Posadas in 2001, the *Instituto Nacional de Yerba Mate* (INYM-The National Institute of Yerba Mate) was created in 2002 in order to set prices for the harvested green leaf and to promote domestic and international markets. Professor Javier Gortari gives an overview of the process through which INYM was finally established:

“During the year 2001, the crisis produced protests and marches. Producers settled here in the Plaza 9 de Julio. It was the first strong *tractorazo*. This initiated a series of protests and conversations. In 2002, a new regulatory framework was approved by the national congress. The National Institute of Yerba Mate is still functioning to this day” (Interview with JG. 7/16/08: 1).

Cooperatives and yerba mate producers were successful in their request for a regulatory body for yerba mate. However, the initiation of a somewhat weak regulatory body in the yerba mate sector has had a varied impact for yerba mate farmers.

INYM: Regulating the Yerba Mate Market in the 21st Century, Successes and Failures

The National Institute of Yerba Mate (INYM) was created in 2002 through Argentine law 25,564 in order to regulate the yerba mate market, set prices for the harvested green leaf, and promote domestic and international markets. INYM, created as a private regulatory institution by national law, aims to strengthen the production, processing, and commercialization of yerba mate (INYM 2008). The governing committee of INYM is managed by twelve people: two representatives of the yerba mate industry, two representatives from cooperatives, one representative of a drying mill, three yerba mate producers, one farmworker, one delegate from the executive branch of the Argentine government, and one representative each from the provincial governments of Misiones and Corrientes (Gortari 2008: 21). Although INYM has many facets and responsibilities, its most important and contested role is to set yerba mate prices, both for the harvested green leaf and the processed yerba mate leaf.

The advisory council of the INYM sets this price through an arduous process of consensus. Members of the advisory council will present and discuss the price that they believe that yerba mate should be set at. The producers argue for a higher price, while the industry members want a low price (Interview with RE 7/16/08: 156). The government desires a lower price, as government officials worry that increasing yerba mate prices will lead to inflation (Interview with RE, 7/16/08: 156). The yerba mate industry has more pull in the decision than the yerba mate producers do: “What is occurring now is that the industry has two representatives. But the producers from the south are in-line with the industry members, as well as some cooperatives. So more members of the council are in agreement with industry, creating a majority opinion” (Interview with JG, 7/16/08: 5). However, if a decision is not reached by the advisory council, the National Secretary of Agriculture will end up deciding the prices of the green leaf (Gortari 2008: 21). Since INYM began to function in 2002, all of the yerba mate prices have been decided by the National Secretary of Agriculture (Gortari 2008: 21). INYM began by setting prices at 12 cents per kilo in 2003, then 16 cents in 2004, up to 48 cents per kilo in 2007. The price set by INYM was 52 cents per kilo for the harvested green leaf in 2008.

However, not a single farmer interviewed reported receiving this price. It is common practice within Argentina that farmers sign papers with the drying mills or cooperatives saying that they were paid the price set by INYM, but in reality, farmers are paid less. Javier Gortari explained the price breakdown for yerba mate producers: “The price was set in April [of 2007] at 48 cents per kilo. Despite the law, the industry fixes the price at 30 cents per kilo, advances 11 cents to harvest the yerba mate and the rest is financed in lengthy quotas of 120 days on the backs of the producer. To harvest the yerba mate costs 19 cents per kilo, meaning that the producers end up in debt” (Gortari 2008: 425). The Cooperativa Mixta de Montecarlo paid 36 cents per kilo to the producer (Interview with RK, 6/30/08: 75). However, from this 36 cents, producers reported paying between 22 and 28 cents per kilo for harvest and transportation costs (Interviews with RK, 6/24/08: 34; RP, 6/28/08; RW, 6/29/08; RK, 6/30/08). Thus, producers are making approximately 13 cents per kilo and also have to pay the cost of maintaining the yerba field and taxes (Interview with RK, 6/30/08: 75). Farmers reported that one needed to harvest at least 6,000 kilos per hectare in order to earn a profit (Interview with RK, 6/30/08: 75 and RR, 6/30/08: 69).

Javier Gortari reports that the yerba mate industry, which packages and commercializes the yerba mate, says that they cannot pay a higher price because they must keep the supermarket price at five pesos per kilo in order to avoid an increase in the cost of living for Argentines (Interview with JG, 7/16/08: 8). However, the yerba mate industry refuses to pay the price set by INYM for processed yerba mate, thus, it is the farmer and the farm worker that become marginalized within the system: “If the yerba mate companies don’t pay the price to the drying mills, the drying mills can’t pay the price to the producer. And the producer pays less to the farmworker. It produces a chain reaction” (interview with JG, 7/16/08: 7). Despite the fact that INYM fixes prices for yerba mate, there is currently no enforcement mechanism as farmers are forced to sign papers saying they were paid the price set by INYM .

Because of INYM’s inability to enforce prices, many producers had become disillusioned with the institution that they had protested to create in 2001. Farmers saw the INYM merely as a bureaucracy that maintained statistics of yerba mate through the sale of four cent stamps that were required to be placed on every kilo of processed yerba mate sold in Argentina (Interview with JCH, 6/24/08: 19). They also recognized that the large yerba mate companies and grinding and packaging facilities had more power than the producers: “The role that the INYM was created to do, it does not fulfill. ... INYM has not been effective because the yerba mate market is controlled by powerful economic interests such as the large yerba mate companies Las Marias, Rosamonte, Amanda, and Rio La Plata” (Interview with NB, 7/1/08: 94). One female farmer felt that INYM was a wonderful institution – if it was used for small farmers (Interview with EP, 6/28/08: 53). Even with the establishment of a regulatory body within the yerba mate sector, it has been relatively ineffectual in maintaining a price for yerba mate. Thus, small and medium yerba mate farmers are looking for alternatives to escape further marginalization of their livelihoods by economic policies that have left them few possibilities. The following section will look at how two cooperatives have responded to competition within the market in order to create alternatives for their members.

Establishing a Social Movement for Fair Trade: Cooperativa Río Paraná

In response to the financial crisis, low yerba mate prices, and consolidation of the yerba mate market by large businesses, the Cooperativa Río Paraná, is searching for alternatives to

support its membership of small farmers. Formed by members of the Misiones Agrarian Movement in 2001, the Cooperativa Río Paraná has approximately 150 members. Each of their members has approximately eight to ten hectares total and fifty of these members are yerba mate producers (Interview with RE, 6/16/08, 23). In 2001, the state gave credit to the cooperative so that they could process their first yerba mate harvest (Interview with EB, 7/10/08: 121). In conjunction with the Centro de Comercialización Campesina e Indígena (CeCoCaI- The Center for the Commercialization of Farm and Indigenous Products), the cooperative initiated the development of a brand of yerba mate. The cooperative hoped that they could support a system of fair trade through the production and commercialization of their yerba mate: “The Cooperativa Río Paraná was made up of 48 yerba mate producers – poor and indebted, with minimal financial capital – and the decision to begin to commercialize their own brand, developed an alternative marketing plan: sell directly to the consumer” (Vazquez 2007: 39). The name adopted for this yerba mate was “Titrayju” which was a synthesis of the words tierra (land), trabajo (work), and justicia (justice).

The brand Titrayju was created to initiate an alternative market that overcame the problem of consolidation within the yerba mate market. The goal of the cooperative in initiating a fair trade market was to support the small producer and overcome big companies’ control of the yerba mate market: “Fair Trade was a question of breaking a chain that was hurting both producers and consumers. Also, the goal was to recognize the producers that before practically were forced to give away their product at low prices” (Interview with RE, 6/16/08: 23). They began to market their product through CeCoCaI which would promote it as a fair trade product to other organizations in Argentina. It was a way to not only earn a higher return on their yerba mate, but also to make people aware of the marginalization of the small yerba mate farmer: “We spoke to many social groups and brought them our yerba mate. We explained that our problem was the monopolies and concentration in the yerba mate sector, which worked together to fix the prices. Our intention was to sell directly from the producer to the consumer” (Interview with RE, 6/16/08: 23). The cooperative worked in solidarity with other social movements in order to create an alternative market that would overcome competition with large yerba mate firms to support the small producers. Citing that international markets would require a great deal of

bureaucracy and costly certifications for small farms, the cooperative only sells to a domestic market (Ballve 2007: 11).

Realizing that dependence on one crop makes small farmers economically vulnerable to fluctuating market conditions, the cooperative also promotes diversified production. Several of the members of the cooperative participated in regional farmer's markets. At the farmer's market I attended in Campo Grande, nineteen small producers sold a variety of products at the market, supplementing small farm incomes and promoting diversification of production (Interview with AB, 7/10/08: 124). Members of the cooperative were also participating in the development of agricultural high schools that would teach sustainable agriculture techniques, animal husbandry, and business skills to children from farm families. The cooperative also is participating in small agricultural development projects that provide agricultural training and some basic materials, including initiating a project with Heifer International to provide fencing so that pigs can feed on the weeds in the yerba mate fields (Interview with AB, 7/10/08: 121). Although the cooperative promotes an ethic of solidarity and alternatives for small farmers to overcome their own marginalization within the world market, the cooperative still struggles to maintain itself based on its own self-ascribed principles of fair trade.

The cooperative is currently renting their drying equipment as they do not yet have the capital to purchase it. The cooperative's capacity to dry, package, and age the yerba mate is quite limited. It currently only has the capacity to accept 10,000 kilos of yerba mate from each of its producers, which is usually only a portion of the yerba mate harvested by each member (Interview with CD, 7/11/08: 146). Also, although the cooperative has pledged to pay the price set by INYM, members reported that they still have not received 20% -30% of the declared prices (Interview with FP, 7/12/08: 141 and CD, 7/11/08: 146). The expenses of processing, packaging, and commercializing the yerba mate, along with paying back loans, has meant that the cooperative does not yet have enough money to pay the promised fair trade price (Interview with AB, 7/10/08: 122). Even with a strong social movement and institutional support of the cooperative, small producers are still trying to create a successful alternative niche in a competitive market structure.

Cooperativa Agrícola Mixta de Montecarlo: Self-Regulation and Diversification

The Cooperativa Agrícola Mixta de Montecarlo is coping with the current economic environment of the yerba mate market by trying to support its members through regulation mechanisms and by promoting on-farm diversification. A member of the cooperative management reported that it could not afford to pay the 52 cent per kilo price set by the INYM (Interview with RW, 6/29/08: 57). Last year the price was 48 cents per kilo as set by INYM, but the cooperative was only able to pay 40 cents per kilo (Interview with NB, 6/21/08: 94). Due to competition within the market, the cooperative is limited to selling their yerba mate at five pesos per kilo at the supermarket (Interview with NB, 6/21/08: 94). Thus, with the combined costs of commercialization, cooperative administration management, and grinding, drying and packaging the yerba mate, one cooperative representative said that they could not afford to pay the producer the price set by the INYM (Interview with NB, 6/21/08: 94).

In order to support the cooperative members in an era of competition and depressed prices, the cooperative has initiated its own quota system in order to deal with oversupply of yerba mate. Beginning in the 1990s, the cooperative adopted a quota system for each of its producers (Interview with RK, 6/24/08: 34). Since there is oversupply in the region, the cooperative decided to self-regulate the number of kilos each producer is allowed to bring to the cooperative in order to maintain a higher price for the unprocessed yerba mate. The quotas were calculated based on each producer's past harvest and the number of kilos they had brought to the cooperative in prior years. For cooperative members that harvest more than their quota, they can sometimes sell the extra harvest to the cooperative or sell it to a private drying mill in the area (Interview with ES, 7/4/08: 104). While not always popular with cooperative members, the movement to self-regulation of the number of kilos each cooperative member is allowed to sell to the cooperative has allowed the cooperative to avoid a structural crisis of oversupply while maintaining a higher price for the purchase of the unprocessed green leaf.

Another way in which the cooperative is trying to cope with competition and support the small and medium yerba mate farmer in Misiones is through diversification of agricultural systems. The cooperative built a factory to process manioc flour and purchase manioc from its cooperative members. Manioc can easily be intercropped within an agroforestry system. The cooperative also started to work with pulp and paper companies in order to negotiate a better

price for its cooperative members for the sale of pine (Interview with NB, 7/1/08: 94). Through a diversified agricultural system, the hope is that yerba mate farmers will be able to absorb changing commodity prices and be able to maintain their families and their farms. Through social movements and cooperative structures, farmers are developing alternatives within the political economy in order to revitalize and support livelihoods that have been marginalized by neo-liberal policies and economic structures.

Chapter Six

2008: Small Farm Management Techniques: Leaving Imprints on the Landscape

Incorporating the paradigm of the green revolution, neo-liberal policies fostered an economic environment of competition, placing pressure on small farmers to increase production and efficiency or get out of the market. The current political economy of yerba mate production has produced changes in the implementation of on-farm management techniques. Farmers respond to the market in different ways: “Farmers’ understandings of emerging exchange relations are affected by the actions of the state, rural development organizations, and yerba mate processors. The success of farmers’ response to this change is largely determined by their ability to incorporate representations of competitive market concepts (competition, quality, and efficiency) within local knowledge systems” (Rosin 2004: xiv). In 2008, small farm management was mainly influenced by the following three factors: (1) state promotion of a specified package of management techniques, (2) a political economy of yerba mate characterized by competition and consolidation within the market, and (3) the appearance of social movements aimed at creating alternative markets and ameliorating the marginalization of small farmers and farmworkers. Depending on their experiences within the political economy and their knowledge of yerba mate production systems, yerba mate producers chose to adopt a variety of different production techniques examined below (Rosin 2004: 82).

The Role of the State in Promoting Yerba Mate Management Techniques and Conservation

As the implementation of green revolution techniques on yerba mate farms beginning in the 1950s had resulted in deforestation and environmental and soil degradation, the state was forced to recognize the misapplication of green revolution technology in small farm agricultural systems. Due to the current state of soil erosion and ecological degradation on yerba mate farms, yields from yerba mate farms were decreasing and the ecology of the agroecosystem was unbalanced. Thus, state institutions became involved in the promotion of soil conservation techniques: “Effective soil conservation involves itself in quite fundamental social change, sometimes involving people who live outside the affected area altogether. It is because the state

becomes involved in soil conservation that soil erosion has *already* become a political-economic issue in the first place” (Blaikie 1985:2). As soil erosion and degradation had become political and economic issue for yerba mate production, two institutions INTA (the National Institute for Agricultural Technology) and INYM (the National Institute for Yerba Mate) began to develop and promote new recommendations for the management of yerba mate agricultural systems.

A manual on yerba mate production techniques written and distributed by INTA and INYM in 2006, posits a new system of techniques to minimize soil and ecological degradation. But first, the manual acknowledges the degrading effects of agricultural technologies promoted and implemented in the second half of the 20th century:

After a century of cultivation in Argentina, yerba mate has experienced great changes in the management of soil and the corresponding management techniques. Until the end of the 1980s, it was very common to use the tractor/harrow and the hoe on yerba mate plantations. These techniques were used to remove weeds and turn the soil. In many cases, these techniques were used multiple times a year, running the harrow and plow across the fields and producing negative effects (soil erosion from rains and/or destruction of organic matter by the sun), which was further exacerbated by the increase in use of tractors and an increase in the size of these machines. In the 1980s, the use of herbicides was popularized to clean the yerba mate fields. At first, the elevated costs and unknown effects of herbicides slowed the spread of their use, but in the last few years, the use of herbicides has become popularized (Burtnik 2006: 21; translates from Spanish by J. Lawson).

Based on a nine year research study of yerba mate agricultural techniques initiated by INTA in 1992, the manual recommends the implementation of different management techniques in yerba mate fields. It emphasizes the minimization of the use of tractors, harrows, and plows in yerba mate fields in order to reduce the effects of rain and sun on the soil (Burtnik 2006: 23).

Correspondingly, the manual recommends the use of cover crops and green manures both in the winter and summer months in order to provide organic material to the soil and preserve the physical and chemical conditions of the soil (Burtnik 2006: 23). As a means to increase the production of yerba mate, optimizing both efficiency and profits, the manual recommends the use of fertilizers including chemical fertilizers and compost in order to increase soil nutrients and organic matter (Burtnik 2006: 24). In reference to the use of herbicides, they recommend the use of glyphosate herbicides if there are spots of competitive weeds, however they recommend the use of cover crops as a first line of defense to eliminate the growth of competitive weeds (Burtnik 2006: 23).

In a conversation with an agricultural extensionist and research scientist at the INTA in Cerro Azul, Misiones, he suggested similar techniques for small farmers. He recommended that small farmers did not use a harrow to clean the soil of weeds, but instead plant cover crops, including black oats or rye grass in the winter and jack bean (a nitrogen fixing legume) in the summer (Interview with MM, 7/15/08). He also recommended minimum disturbance of the soil and the use of a subsoiler to break up the hardpan caused by years of tractor usage (Interview with MM, 7/15/08). He recommended the use of glyphosate herbicide once or twice a year in the yerba mate field (Interview with MM, 7/15/08). Also, in order to increase yields per hectare, a relatively dense plantation of yerba mate was recommended at 3 meters by 1.5 meters or even denser with 2.5 meter by 1 meter (Interview with MM, 7/15/08). Lastly, he recommended a soil analysis in order to determine fertilizer use, but recommended a 30:30, Nitrogen:Potassium, fertilizer (Interview with MM, 7/15/08).

Teaming up with INTA in order to promote soil conservation and environmental sustainability in yerba mate agricultural systems, INYM established the Program of Technical Assistance to the Yerba Mate Sector (PRASY) in May 2007. Since 2007, PRASY funded an initiative to work with 180 small and medium-sized producers working with INTA agricultural extension agents in order to train farmers in the use of cover crops (Interview with RE, 7/16/08: 156). I attended one of these training workshops, led by an INTA extension agent, in which approximately twenty farmers belonging to the Cooperativa Jardín América attended a talk on soil conservation and the use of cover crops. Producers participating in these workshops reportedly received cover crop seeds (including black oats, rye grass, and jack bean) from local INTA offices (Interview with JCH, 6/24/08). Both before and after planting the cover crops, a soil analysis is taken at each of the producers farms in order to determine how the cover crops affected soil nutrient levels (Interview with RE, 7/16/08: 156). Although the workshop appeared to be well received by participants, the program reaches only a small percentage of small yerba mate farmers in the region who could potentially benefit from the training. The PRASY program is working on expanding its network building on these pilot experiences working with small and medium farmers to plant cover crops in their yerba mate fields.



Picture 11. A workshop taught by INTA extension agents at the Cooperative Jardín América on the importance of cover crops and soil conservation. The workshop was organized and funded by PRASY. The system pictured is black oats with yerba mate.

Despite the programs and extension services that have developed to encourage the implementation of more sustainable techniques in yerba mate fields, the population that the program reaches is still quite minimal and production techniques seem to be more geared towards production by medium-sized yerba mate farmers. Professor Javier Gortari critiqued PRASY for the narrowness of the program in that it only dealt with cover crops, one partial solution to soil erosion and environmental degradation. Furthermore, the incorporation of cover crops and green manures on a wide scale also requires the use of certain machinery and technologies. However, small farmers often do not have the capital to invest in these technologies: “The use of cover crops also requires that the producer has a tractor to be able to enter into the field, plant the cover crops, and take care of. It requires a certain level of capital on the part of the producer. If they don’t have these technologies, they won’t be able to fully implement the cover crops” (Interview with JG, 7/16/08: 7). Even though both INTA and

INYM are working to develop and promote soil conservation and environmental sustainability in yerba mate systems, adequate education and training in these techniques do not reach the majority of small farmers. In addition, without the capital to invest in technologies, tools, and seeds necessary to implement these agricultural techniques, small yerba mate farmers often continue to work marginal lands with minimal inputs and assistance.

Small Farmer Management Responses to Neo-Liberal Economic and Political Structures

The political economy of yerba mate, combining an economic environment of competition with a green revolution paradigm of increased production and efficiency, resulted in the adoption of varying management systems on yerba mate farms. Yerba mate farmers adapted their management techniques to the physical conditions of their agricultural system, their experience in the market, and their social perceptions and knowledge of agricultural management systems: “The ability and willingness of local producers to adopt alternate means of production and to realize efficiency gains differ widely depending on local perceptions of the potential and viability of cultivating the tree crop” (Rosin 2004: 82). The following section will explore how the political economy shaped pruning and harvesting techniques, annual maintenance regimes, soil conservation techniques, and crop densities on small and medium-sized yerba mate farms.

Since the price for yerba mate has gone down so significantly and farmers are not earning as much, the wages of the farm laborers that are hired to complete the harvest also suffer. With less economic incentives, yerba mate farmers reported that the harvesters are not taking as much care to cut the yerba mate branches in the right place (Interview with JCH, 6/24/08: 16). Without the correct harvesting and pruning techniques, the yerba mate yields for the following year decreases (Interview with JCH, 6/24/08: 16). One small farmer reported that harvesters will break the yerba mate branch in order to harvest the leaf quickly (Interview with CP, 6/25/08: 38). He manually harvested all of his yerba using scissors so that the yerba mate would successfully re-sprout and provide high yields for the next year (Interview with CP, 6/25/08: 38). One medium-sized farmer gave two of his harvesters battery-operated scissors so that they could harvest the yerba mate quickly and prune it well to promote sprouting (Interview with NB, 7/1/08: 92). Where yerba mate farmers could afford slight improvements in technology (in this case the use of scissors or pruning shears), a more accurate and careful harvesting and pruning

job could be undertaken in order ensure yields for the next year's harvest. However, with low wages paid to farmworkers resulting from low yerba mate prices, lower quality harvesting techniques were employed leading to decreases in future yields.

With lower yerba mate prices, farmers reported that they would reduce the inputs and labor that they invested into annual maintenance regimes of their yerba mate system. Annual maintenance of yerba mate fields is primarily focused on weed control within the yerba mate plantation (Rosin 2004: 180). Farmers reported that the costs of annual maintenance of yerba mate fields included the purchase of herbicides and gas to run tractors, as well as the cost of farm labor. Farm labor was variably hired to spray herbicides, to harrow, and to hoe weeds from the yerba mate field (Interview with RW, 7/7/08: 57). The cost of annual maintenance of one hectare of yerba mate (excluding harvest costs) was estimated to be between 120 pesos and 450 pesos per hectare (Interviews with RW, 7/7/08: 57; RR, 6/30/08: 67; and CD, 7/11/08: 134). Multiple farmers interviewed reported that they had greatly reduced their annual maintenance regimes as it was too expensive to purchase inputs (i.e. herbicides and gas) and to pay for farm labor (Interviews with CH, 6/29/08: 61; RR, 6/30/08: 67; and RK, 6/30/08: 80). Thus, the yerba mate fields are neglected. However, since yerba mate is a perennial, farmers are reluctant to remove the tree to plant another cash crop: "Yerba mate lasts 30, 50 years when it is well taken care of. Thus, no one wants to remove it because it is a large investment to replant a yerba mate field. So, what happens is that farmers will abandon their field and not take care of the soil or implement annual maintenance activities. They abandon the yerba mate until the harvest and then what they earn from it is fine because they had no investment in the yerba mate field" (Interview with JG, 7/16/08: 2). In response to low prices resulting from a structural crisis fostered by oversupply and neo-liberal economic policies, many farmers reduced - or even abandoned - the annual maintenance regimes for yerba mate.

Some small farmers did report implementing conservation techniques on their farm. Conservation techniques on small farms were implemented as a result of farmer-to-farmer diffusion of conservation technologies, as well as through the influence of agricultural extension agents from INTA. The most common soil conservation technique implemented on small farms is the incorporation of green manures and cover crops within the yerba mate fields. In the winter, black oats and rye grass were the two most popular cover crops that were sown within the

yerba mate fields, while jack bean (and to a lesser extent cowpeas and velvet bean) were planted as nitrogen-fixing green manures in the summer (Interviews with RW, 6/29/08: 57; NB, 7/1/08: 90; and CD, 7/11/08: 145). A couple of farmers reported that agricultural extension agents had brought them cover crop seeds to plant in their fields and that they would germinate in subsequent years (Interview with EB, 7/10/08, 125 and RW, 6/29/08: 57). Another farmer reported that he received seeds for rye grass from a friend and that it keeps his soil healthy and moist (Interview with CD, 7/11/08: 145).



Picture 12. A farmer shows jack bean (*canavalia*), a type of green manure that fixes nitrogen in the soil. *Canavalia* is planted in between rows of yerba mate. This farmer's fields also had black oats in between the yerba mate.

Some farmers also received training in conservation techniques from a couple of agriculture schools that emphasized agricultural sustainability, including the school Línea Cuchilla and the Agrarian Family Schools (EFA) (Gortari and Oviedo 2001: 304). While farmer-to-farmer diffusion of technology and agricultural extension agents were proponents of

conservation strategies, with the disregard for annual maintenance regimes discussed above, there is a corresponding decrease in the implementation of cover crops.



Picture 13. One family plants rye grass in between the rows of yerba mate.

The current political economy of yerba mate has also produced changes in cropping densities. On the one hand, some farmers responded to pressure for increased efficiency and productivity by increasing the density of yerba mate plants in their fields. One farmer reported that people used to plant yerba mate at a distance of 4 meters by 5 meters and let it grow taller and fuller (Interview with AR, 6/26/08: 43). However, now INTA recommends the plantation of yerba mate at 1.5 meters between trees and 3 meters between lines or even denser at 1 meter by 2.5 meters (Interview with MM, 7/15/08). In order to increase the density of plantings, yerba mate trees are maintained as shorter trees, resembling large shrubs (Interview with AR, 6/26/08: 43). In contrast, other farmers responded to the decrease in yerba mate prices by maintaining the wider spacing of the yerba mate fields to allow intercropping of various food and cash crops in-

between the yerba mate lines. Manioc and sugar cane were the two crops most often found intercropped within the yerba mate fields of farmers that were interviewed. For members of the *Cooperativa Mixta de Montecarlo*, manioc was the crop of choice to be planted within the yerba mate field as the cooperative owned a starch processing factory to which cooperative members could sell their manioc (Interview with JCH, 6/24/08: 18). One member of the *Cooperativa Río Paraná* planted sugar cane within his yerba mate field in order to feed to his animals (Interview with EB, 7/10/08: 125). While increased plant density promoted higher productivity, this strategy is only viable for large and medium sized farmers who have the capital to mechanize their production regimes. For small farmers, a strategy of intercropping within the yerba mate agroforestry system for both subsistence and cash income appeared to be a more successful coping strategy within the political economy. The following section will explore to what extent small and medium-sized yerba mate farmers have diversified their agricultural systems through intercropping of both exotic and native trees species.

Pine in Degraded Landscapes

As yerba mate cultivation becomes increasingly mechanized, soil degradation and low market prices for yerba mate have led many yerba mate farmers to plant pine within their yerba mate fields. As exotic pine species from North America (*Pinus elliotti* and *Pinus taeda*) can mature within 25 years, the production of pine in Misiones provides a rapid and abundant supply of pulp and wood for the paper and saw mills. The three largest pulp and paper companies in the region buy up thousands of hectares of land, clear the land, burn the biomass, spray herbicides to prevent weed growth, and plant pine in its place (Interview with JCH, 6/24/08: 21 and AP, 7/1/08: 87). The Argentine government, influenced by foreign-owned paper mills, has been providing subsidies for the plantation of pine, but only for those farmers who plant more than ten hectares (Interview with CP, 6/25/08: 39). Thus, yerba mate farmers in Misiones have witnessed the conversion of many lands from native forest and yerba mate agroforestry systems to pine plantations.



Picture 14. Yerba mate interplanted with pine.

With the promotion of pine through government subsidies, yerba mate farmers have begun to plant exotic pine species in their degraded yerba mate fields. A staff member of the Cooperativa Rio Parana stated: “Politically, we are against the policy to create incentives to plant pine because pine is replacing food crops” (Interview with RE, 6/16/08: 23). Once the yerba mate farmers have converted their yerba mate fields to pine, they can no longer harvest the yerba mate to sell to the processing companies as the pine needles fall and leave pine resin on the leaf, producing a foul taste when dried and toasted. The Cooperativa Mixta de Montecarlo would not accept pine adulterated yerba mate leaves, but they did work with their members to negotiate a higher price for the sale of pine to the paper companies. However, in spite of this, with the increase in raw material, payments for pine pulp and wood have also declined. This leaves small yerba mate farmers with the problem of both low yerba mate and pine prices: “You can earn

more money with yerba mate than with pine. Pine pays very little and practically isn't worth it to harvest. If you hire someone to harvest the pine, you end up with nothing. In this moment, there is no price" (Interview with CP, 6/25/08: 39). The plantation of exotic pine monocultures in Misiones results in a series of environmental consequences. The plantation of pine plantations in the place of native forests and yerba mate agroforestry systems changes the ecology of the Interior Atlantic Forest, replacing the native flora and fauna (Interview with RE, 6/16/08: 23). Pine has now begun to naturally regenerate within Misiones, overtaking the native vegetation (Interview with RE, 6/16/08: 23). Pine cultivation adds to an emerging status quo that alters the ecology of the Interior Atlantic Forest and makes small farmers even more vulnerable to market fluctuations.

Native Agroforestry Systems: A Solution for Small Farmers?

One alternative that small and medium-sized farmers are exploring is the implementation of yerba mate agroforestry systems with native trees. Many farmers within the department of Montecarlo were implementing yerba mate agroforestry systems intercropped with the native Paraná pine (*Araucaria angustifolia*). Farmers reported that they could intercrop Paraná pine with the yerba and earn income from the pulpwood and timber over the thirty year span of the Paraná pine (Interview with JCH, 6/24/08: 16). Paraná pine earned more than twice the price that the exotic *Pinus elliotti* received (Interview with RK, 6/24/08: 32 and RE, 7/6/08: 111). One farmer reported that when the yerba mate was not earning much income, at least the Paraná pine would continue growing. The Paraná pine provides some organic matter to the soil from pruning and provides a microclimate to protect from frost and sun damage to the yerba mate plants (Interview with JCH, 6/24/08: 16). Although the Paraná pine provides some needed shade to the yerba mate tree, this shade could also reduce yerba mate production (Interview with JCH, 6/24/08: 16). Farmers that planted Paraná pine seemed generally satisfied that they could continue harvesting the yerba mate beneath the Paraná pine until it had reached a certain level. Once the farmer had harvested the Paraná pine, the yerba mate would still be present for harvest.



Picture 15. Yerba mate interplanted with Paraná pine.

Three farmers that I visited had planted their yerba mate under the shade of a native tree canopy. They had removed the underbrush and sub-canopy from the forest in order to plant the yerba mate under the native trees. These farmers cited that they left the canopy of the native trees in order to provide shade to the yerba mate from the native tree crowns and to provide organic matter to the soil from the leaves (Interviews with AR 6/26/08: 44 and CP 6/25/08: 38). For some farmers, there has been a shift in the way they perceive the yerba mate agricultural system and more farmers have started planting native trees within their yerba mate field. This is a significant shift in the mentality of yerba mate agroforestry: “My grandparents and parents cut down the trees in order to plant yerba and tea. I am returning to the plantation of native trees” (Interview with MK 6/12/08: 6). Farmers noted that they had decided to plant native trees within their yerba mate fields for windbreaks, protection from frost, shade, organic matter, weed

control, and in some cases, to sell (Interviews with CD 7/11/08: 145; MK 6/12/08: 7; JCH 6/24/08: 17). Despite the beneficial environmental effects of interplanting diverse native trees within the yerba mate agroforestry system, if the yerba mate receives more than 20% shade, yields will begin to decrease (Interview with HO, 6/9/08:2). Thus, small farmers must weigh the effects of incorporation of native trees into their yerba mate agroforestry systems and the reduction in yields in order to create a balanced system.



Picture 16. Yerba mate interplanted with native trees

Creating niche markets for shade-grown and organic yerba mate have been successful in supporting a movement toward more sustainable agroforestry systems. Two of the larger family farms that I visited (each with more than 100 hectares of yerba mate each) were incorporating native trees in their yerba mate fields. Both of these farms were producing, processing, and exporting their own yerba mate as organic. One of the farms had been incorporating native trees

in the yerba mate agroforestry system since the farm was initiated in 1925. The other farm began to plant native trees a couple of years ago, supported by their partners in the U.S, EcoTeas. Their U.S. partner was funding the purchase of native tree seedlings and the manual labor to plant the trees (Interview with MK, 6/12/08). Their partners in the U.S. began to work with them in 2001 when they were looking for a source of certified organic yerba mate to export to the U.S. (Schachter S., 4/7/09). This family farmer reported that his partners not only provided funding, but also provided psychological support to shift to this system, which entails a reconceptualization of the yerba mate agricultural system. These two family farmers have been successful in creating a niche market for shade-grown yerba mate. However, they also have significantly more land and capital invested in their yerba mate plantations than the average small yerba mate farmer. With medium-sized family farmers adopting niche markets for shade-grown, organic yerba mate, it is possible that these farmers are building a market that small farmers could potentially take advantage of in order to support sustainable yerba mate agroforestry systems.

Chapter Seven

Conclusion

Beyond Marginalization and Degradation: Towards a Coherent Agrarian Policy for Small Yerba Mate Farmers

The political economy of yerba mate production in Argentina has historically marginalized small yerba mate farmers, leading to the implementation of agricultural techniques and technologies that resulted in the degradation of Misiones' soil and landscapes. Incorporating a green revolution paradigm of agricultural production promoted by state subsidies and agricultural extension agents, farmers adopted the use of costly technologies such as tractors and herbicides - technologies that were often misapplied on small farms and that produced serious health and environmental consequences for small farmers. Responding to a structural crisis of oversupply induced by a change to neo-liberal economic policies in 1991, small farmers who stayed on their farm responded to low yerba mate prices through decreased investments in annual maintenance regimes and conservation strategies. With some support for on-farm conservation by the state, some small farmers are implementing more sustainable management techniques that emphasize the cultivation of cover crops and the implementation of a diversified agroforestry system.

In December of 2007, there was another round of protests in the central plaza of Posadas demanding that yerba mate processors respect the price set by the National Institute of Yerba Mate (INYM) (Interview with JG, 7/16/08: 7). Although the price paid to producers has increased due to protests and roadblocks, it is still below the official price set by INYM (Interview with JG, 7/16/08: 7). As yerba mate production is integral to the livelihoods of many individuals in Misiones, when the yerba mate price is low, the social conditions of the whole province suffer as a result: "In reality, there are almost 20,000 yerba mate producers and another 20,000 yerba mate harvesters. With all their families, you are talking about almost 30% of the population of Misiones. This has a very severe effect on social conditions" (Interview with JG, 7/16/08: 7). As Misiones livelihoods are tied up in yerba mate, the social indicators for health, education, and nutrition decline when the price of yerba mate goes down. (Interview with JG,

7/16/08: 7). When the prices of yerba mate decline so as to undercut the price of production, small farmers become marginalized.

Land consolidation has characterized the landscape of Misiones since deregulation of the yerba mate industry in 1991. The ten largest firms control 80% of the yerba mate market and are able to drive down the yerba mate price despite the rhetoric of the official price set by the INYM (Interview with JG, 7/16/08: 2). For many farmers, selling off their farm becomes the only option and many small farmers are migrating to the towns. The small farmers I spoke to generally responded pessimistically about the future of the small yerba mate farmer: “Sometimes I think I will sell everything and leave, too, because you kill yourself working. ... And you ask yourself, what is this life?” (Interview with CP, 6/25/08: 41). One farmer summed up the situation succinctly: “A lot of land in few hands, and lots of hands without land” (Interview with EB, 7/10/08: 131). The institutionalization of neo-liberal policies combined with the production paradigm of the green revolution catalyzed the concentration of high-yielding, mechanized plantations into the hands of few producers. Many small yerba mate farmers called for a change in government policy as the most effective way to support the small yerba mate farmer in Misiones:

“If the government doesn’t change its policies, I see the future as very bad for us. If there isn’t any change here, people are not going to plant, they are not going to produce. The small producer cannot subsist with the policies that we have. If the government doesn’t change its path, than there will be a complete holocaust. The big producers will stay and the small producers will disappear” (Interview with RR, 6/30/08: 71).

In the face of the marginalization of the small farmer in the current political economy, the development of a coherent agrarian policy is integral to maintaining social stability and economic justice within the yerba mate market.

Defining a Coherent Agrarian Policy: Creating Markets that Support Economic Justice

A partial remedy for the future of the small yerba mate farmer lies in the development of a coherent agrarian policy that supports both small farm livelihoods and environmentally sustainable agricultural production. The state plays a significant role in impacting the agricultural systems and management techniques of small farmers. To begin a shift towards environmentally sustainable yerba mate production that supports the livelihoods of small

farmers, the state must foster policies that create economic and social conditions that foment agricultural sustainability:

“It is unrealistic to claim productive, ecological management without making it compatible with “social ecology.” The transition to socially and environmentally sustainable agricultural models is inextricably linked to the development of a state policy that is aimed at: improving the quality of life of producers; ensuring the future commercialization of the product through the development of new markets; guaranteeing the right of consumers to safe and healthy food; reducing unemployment and rural and urban marginalization; and preserving the environment from contamination” (Gortari and Oviedo 2001: 312; translated from Spanish by J. Lawson).

One program that the provincial government has initiated is a system to integrate transparency into yerba mate production and processing. The Center for Yerba Mate Transactions (CTYM) was established within the Misiones Ministry of Agriculture in order to monitor the sale and purchase of yerba mate throughout the entire production chain. The Center was founded in 2007 and is refining the system and processes through which it receives and records data about the yerba mate harvests and sales. They will monitor the purchase from the producer to the drying mills and then from the drying mills to the grinding and packaging firms. This system of transparency was initiated with the goal of creating a mechanism to actually enforce the price set by INYM for yerba mate. The system of transparency has yet to be fully implemented. One pitfall to the system is that inspection mechanisms are not fully in place and could tend toward corruption, leaving yerba mate to be sold on the black market (Interview with JG, 7/16/08: 4). However, the hope of the system is to create greater economic security for farmers and create accountability in the transactions between the producer and the drying, grinding, and packaging facilities.

Another project that was presented to the national congress in June of 2007 was the creation of a *Mercado Consignatario*, a marketing board, in order to regulate the production and sale of yerba mate. The *Mercado Consignatario* would change the law that created the INYM in order to give it a regulatory function similar to the CRYM that existed between 1936 and 1991. Through the purchase of all processed yerba mate through consignment, the *Mercado Consignatario* would guarantee the purchase of the unprocessed yerba mate from the farmer at the official INYM price. However, the government would have to subsidize the first purchase of yerba mate in order to begin the market. The *Mercado Consignatario* would support small

farmers as it would ensure that drying and processing firms respect the official yerba mate price as set by INYM: “With the creation of the *Mercado Consignatario*, we are looking to defend an agrarian structure that is based on small rural producers and that guarantees the minimum price established by INYM to the producer. With this, we are trying to uphold the original spirit of the law of INYM, in the sense that we want to achieve sustainability in the sector through the creation of mechanisms that favor the production of the smallest producers” (Yerbales de Pie 2007). Although the creation of a *Mercado Consignatario* would support the purchase of yerba mate at the official INYM price, many of the yerba mate processing firms are against the enactment of this law as it would require them to purchase yerba mate at a higher price. The legislation for the *Mercado Consignatario* is currently stuck in the senate.

In addition, the state could also help to foment the growing markets for organic and fair trade yerba mate in order to support alternative market opportunities for small farmers. Organic markets that give value to the implementation of sustainable agricultural techniques without the use of herbicides and pesticides could provide a niche for small farmers. The INYM sent representatives from three cooperatives and one organic family farm to North Africa in order to promote yerba mate and open up new markets there (Interview with MK, 6/12/08: 10). The Cooperativa Mixta de Montecarlo is also discussing establishing an organic brand called Yerba La Pampa. The management of the cooperative recognized that it would be possible for some of their members to switch to organic, especially since many small farmers have not been using herbicides or agrochemicals in the past few years due to the low price for yerba mate (Kraus and Seifert 2008: 12). One caveat is that the price for paying for organic certification is quite high. The other caveat is that the creation of an organic market also requires that some small farmers shift their production techniques in order to implement a sustainable agroforestry system without the use of herbicides. This requires a deeper paradigm shift in the way that farmer conceptualize their agroforestry systems.

The Future of the Small Yerba Mate Farmer: Paradigm Shift

As the current political economy has led to the marginalization of the small farmer and to land degradation, a paradigm shift both in state policies to support economic justice within yerba mate production and in the conceptualization of sustainable agricultural systems is necessary. To

foment this paradigm shift, the state should widen its programs to work with small farmers to implement soil conservation techniques and sustainable agroforestry techniques. Although current funding for yerba mate research goes to support studies on increasing yields in yerba mate production through such methods as cloning, the state should fund research on the implementation of sustainable agricultural techniques on small farm systems in order to determine which techniques are most suitable for small farmers. In addition, an emphasis should be placed on diversity in the agricultural system. With a diversity of subsistence crops, gardens, fish farming, animal husbandry and alternative cash crops, small farmers will be better equipped to support themselves and their families in a changing market structure. Also, the state could increase its support to farmer's markets within regional towns so that small farmers could have direct access to local markets and not have to go through middlemen.

In addition to the development of a coherent agrarian policy, the development of strong leaders and social movements that integrate the concepts of economic justice and environmental sustainability in yerba mate production have the potential to further foment a paradigm shift. The strength of social movements is evidenced by the creation of the Cooperativa Río Paraná and its fair trade brand Titrayju. Cooperatives such as the Cooperativa Mixta de Montecarlo, along with the Misiones Agrarian Movement, students, and professors, came together to demand the creation of the INYM through protests in 2001. The strength of these social movements is evident in their ability to begin to institutionalize structures and paradigms of economic justice. Although these institutions are still quite flawed in their ability to implement their goals, movements for accountability, transparency, and organic production systems have evolved to support economic justice and environmental sustainability in the yerba mate sector. Combining coherent agrarian policies with strong leadership and social movements, hopefully a framework for economic justice and environmental sustainability within the yerba mate sector will evolve in order to promote the revitalization of yerba mate livelihoods and the conservation of Argentine landscapes.

Acronyms

CeCoCaI - Centro de Comercialización Campesina e Indígena (The Center for the Commercialization of Farm and Indigenous Products)

CRYM - Comisión Reguladora de la Producción y el Comercio de la Yerba Mate (Regulatory Commission for the Production and Commercialization of Yerba Mate)

INTA – Instituto Nacional de Tecnología Agropecuaria (National Institute of Agricultural Technology)

INYM – Instituto Nacional de la Yerba Mate (National Institute of Yerba Mate)

PRASY – Programa Regional de Asistencia al Sector Yerbatero (Program of Technical Assistance to the Yerba Mate Sector)

Appendix A: Sample Interview Template

Household Demographics

Parents	Hijos (M/F)	Abuelos	Tíos	Otros

Notes:

Oral History of Settlement

¿Por cuántos años han vivido acá?

¿Porqué se mudaron acá?

¿Cómo consiguió su tierra?

Land Use and Allocation

Superficie (ha.)	yerba mate (edad/ha.)	pino (edad/ha.)	Aurucaria	eucalipto	otros cultivos	monte

¿El monte provee algun beneficio?

¿Hace cuanto tiempo que han echado-tumbado el monte para plantar cultivo? ¿Cuál cultivo se plantó en aquel lugar? ¿Porqué?

Land Use History of Yerba Mate

¿Porqué decidió plantar la yerba mate?

¿Tenía semillero o vivero para su yerbal o compraste plantines de un vivero? ¿De dónde conseguiste las semillas?

¿Tenía otro cultivo en el yerbal antes de que se plantó la yerba mate? ¿o era monte?

Cuidados Culturales: History of Planting

Se Quemó	Usaba Tractor	Aplastó los yuyos	Dejaba árboles nativos

¿Porqué hizo esto?

Cuidados Culturales: Intercroping ¿Tiene cultivos en el yerbal?

Mandioca	Maíz	Abonos Verdes	Otro

¿Cada año se planta? ¿Porqué?

Cuidados Culturales: Annual Maintenance

¿Se Limpia el yerbal?	Machete	Herbicidas	Rastra /Disco/ Tractor	Poda	Troza o replantar
sí/no					
veces/año					

¿Porqué?

¿Tiene problemas con plagas o enfermedades? ¿Cuáles son? ¿Qué se hace para esto?

Cuidados Culturales: Agroforestry ¿Tiene árboles en el yerbal?

edad; P-se plantó; R-regeneración natural

Pino eliotti	Aurucaria	Kiri	Cítricos	Otros: Laurel, Timbó, Pindó, Guatambu, Ambai, Coco, etc.

¿Porqué decidió plantar los árboles dentro del yerbal?

¿Los árboles tienen algun beneficio para la yerba mate? ¿para el suelo?

¿Ralea o poda los árboles nativos?

¿Tiene problemas con plagas o enfermedades?

¿Para qué va a usar los árboles? ¿madera?

Cuidados Culturales: La Cosecha de la Yerba Mate

Época de la Cosecha	kilos/ha.	Precio de hoja verde	Costo de la Tarefa	Costo del flete

¿Cómo se cosechan la yerba? ¿Dónde aprendiste a cosechar la yerba mate?

Durante su vida, ¿has visto un cambio en los cuidados culturales de la yerba mate o de la chacra?

¿Qué por ejemplo?

¿El número de kilos que se cosechan del yerbal está cambiando?

¿Dónde se vende la yerba mate? ¿Porqué?

¿Siempre has vendido la yerba mate a la cooperativa? ¿Porqué?

¿Cuánto paga por la hoja verde? ¿Es un precio justo?

¿Recibe ayuda de la cooperativa? ¿De qué clase?

Other Income: Agroforestry

¿Se vende los árboles en el yerbal?

¿Cuántos años lleva hasta que se puede cortar y vender el árbol?

¿A quién se vende la madera?

¿Cuánto recibe por la madera?

¿Es un precio justo?

Other Income: Pine Plantations

¿Echó monte para plantar los árboles? ¿Hace cuántos años que plantó el pino?

¿Porqué decidió plantar pino?

¿Recibió un subsidio para el pino?

¿De dónde consiguió las semillas para plantar los pinos?

Cuidados Culturales: Annual Maintenance of Pine

¿Se Limpia el pino?	Raleo	Poda	Rastra /Disco/ Tractor	Herbicidas/ Pesticidas	Fertilizantes
sí/no					
veces/año					

¿Porqué?

¿A quién se vende el pino? ¿Cuánto recibe para el pino?

¿Recibe un precio justo?

Other Income

¿Se vende otros cultivos? ¿Cuáles son?

¿Tiene otro fuente de ingresos aparte de la yerba mate? ¿Cuáles son?

¿Sus hijos trabajan en la chacra también?

Political Economy of Yerba Mate

¿Hay organizaciones que dan capacitaciones a los productores para manejar la yerba mate?

¿INTA o la cooperativa? ¿Vos fuiste a una capacitación para los yerbateros? ¿de qué se trataba?

A mi, me parece que muchas personas han plantado la yerba mate hace 10, 15 años...¿es cierto y porqué plantaron la yerba mate en este época?

¿Qué pensaba de las cuotas para la producción de la yerba mate que se eliminó en los años 90?

¿Qué piensa del Instituto Nacional de la Yerba Mate?

¿Cómo fijan los precios? ¿Los precios cubren los gastos de la producción de la yerba mate?

¿Los precios cubren lo que necesita una familia para vivir? ¿Porqué?

¿Cuántas hectáreas de la yerba mate necesita una familia para sobrevivir? ¿Antes, cuántas necesitaban para sobrevivir? ¿Porqué cambió?

¿Había un tiempo cuando el gobierno estaba promoviendo la producción de la yerba mate?

¿Qué piensa del paro y de lo que está pasando entre los ruralistas y el gobierno ahora?

Defining Sustainability

¿Cómo definiría la sustentibilidad?

¿manejo ecológico?

¿producción orgánica?

¿Qué quiere decir el comercio justo para Ud.?

Looking Towards the Future

¿Va a continuar produciendo la yerba mate? ¿Porqué?

¿Estás pensando en cambiar a otro cultivo?

¿Vive en su chacra o en el pueblo? ¿Porqué?

¿Cuál es el futuro del pequeño yerbatero? ¿del pequeño productor en Argentina?

Appendix B: Map of Misiones, Argentina



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