TALKING ABOUT THE WEATHER IN CHIAPAS, MEXICO: RURAL WOMEN'S APPROACHES TO CLIMATE CHANGE IN NATIONAL AND GLOBAL CONTEXT

By

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LIST OF ABBREVIATIONS

CAMADDS, A.C.	Asociación Civil Capacitación, Asesoría, Medio Ambiente y Defensa del Derecho a la Salud
CCFAS	CGIAR Research Program on Climate Change, Agriculture and Food Security
CEPAL	United Nations Economic Commission for Latin America
CIAT	International Center for Tropical Agriculture
CONEVAL	Consejo Nacional de Evaluación la Política de Desarrollo Social
CSA	Climate Smart Agriculture
ECOSUR	El Colegio de la Frontera Sur
EZLN	Ejército Zapatista de Liberación Nacional
FAO	Food and Agricultural Organization of the United Nations
HDI	Human Development Index
INEGI	Instituto Nacional de Estadística y Geografía de Mexico
IPCC	Intergovernmental Panel on Climate Change
ISI	Import Substitution Industrialization
MCAC	Movimiento Campesino a Campesino
NAFTA	North American Free Trade Agreement
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme

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Through an examination of the climate change perceptions and adaptive practices of three groups of organized rural women in and around San Cristóbal de las Casas, Chiapas, Mexico, together with a critical reading and analysis of the United Nations' Climate Smart Agriculture Strategy and strategies outlined in a Central America-specific project, this thesis explores how place-based approaches in Chiapas interact with processes and ideas operating at national and global scales. I found that the women in all three organizations studied, La Red de Productores y Consumadores Responsables Comida Sana y Cercana, Mujeres y Maíz Criollo, and K'inal Antsetik, not only observed changes in climate but were also working with their organizations to actively adapt to and mitigate them. Their strategies were influenced by personal experience, gender identity and the household or community gender division of labor, indigenous or *campesino* identity, and organizational affiliation. I argue that many of the practices and perceptions I observed in the field could be considered Climate Smart Agriculture approaches, however they were successful due to their local creation, specificity to the people involved, and their context. In *Tortillas on the Roaster* there is a

greater divide between what practices were observed in this thesis, those promoted as adaptation strategies, and the conceptualization of what it means to truly adapt to or mitigate climate change. I conclude by arguing that a food sovereignty approach to climate change adaptation and mitigation is a more appropriate site-specific approach than Climate Smart Agriculture.

CHAPTER 1
INTRODUCTION

Talking About the Weather

I sat down at the market table with Esmeralda. It was early on a busy Saturday at the biweekly market in downtown San Cristóbal de las Casas, Chiapas, Mexico. The weather was hot and sunny before the afternoon rains. The market sat one block off of a walking street, or *andador*, in a popular area for tourists. Esmeralda was selling handicrafts, little prepared sandwiches, and homemade cheeses. I had initially approached her to ask if I could visit her home and conduct an interview about her perceptions of the climate and her participation in the organic market—*el tianguis*. She started going through her availability with me, travel to a workshop about women and religion, then she'd be visiting family, then to another workshop, but maybe we could get together on July 5. I noticed how slowly Esmeralda spoke to me, clearly, making sure I understood every word. She was adept at interacting with different types of people and busy traveling, organizing, and attending workshops. Intermittently we were interrupted by customers asking about her products—customers who were dressed in Western clothes and spoke Spanish with a variety of accents or not at all. Customers wandered in from the tourist areas, peppered with eco-hostels, vegetarian restaurants, and souvenir shops. This was a very different atmosphere and demographic than I'd seen in the communities surrounding San Cristóbal de las Casas.

I explored numerous paths in my fieldwork in Chiapas. I had contacted an indigenous women's organizer, Margarita, through a friend of a friend of a friend of a friend who thought she could help me meet women for my interviews. Weeks later, early on a Tuesday morning in June, I was having coffee one moment and the next I was

swept off with her and another indigenous organizer, José, to 2 small communities outside of San Cristóbal. They drove right onto the *andador*, and I took a seat in the back of the car, listening to them speak mostly in Tsotsil as we drove through the highlands. We stopped in one community where José spoke to a crowd of people gathered in the narrow, sloping street. Margarita asked if I'd like to go talk to the women who were standing together in the back of the audience. "Has traído una gringa!"[1] one woman exclaimed to Margarita as we approached. Others laughed as they commented to one another in Tsotsil. We traveled on to our final destination. People were crowded in the town center, waiting to hear the presentation and receive something in boxes piled all around the square. I turned to Margarita and asked what was in the boxes—agrochemicals. José's organization gives out agrochemicals to help recruit members. The presentation went on in Tsotsil and participants eagerly waited to sign-up and receive their rations of the fertilizers and pesticides. Margarita asked a woman, dressed in *traje típico,*[2] carrying one of the boxes how they grew maize before agrochemicals. There was no "before agrochemicals," she replied. They had always used them. Their parents and grandparents and great grandparents and so on had always used them.

We were later invited to have dinner with town leaders in a small and dark dirt-floored government building with low ceilings. Margarita and I sat down at the table with José and several other men while women and girls served us chicken soup, rice, and tortillas that they were cooking across the room. Across the muddy road from the

[1] You brought a foreigner!

[2] Indigenous dress or clothing

government building, a wall was painted with a Zapatista mural, in which women, their faces covered, stood holding machetes declaring that “otro mundo es posible”[3] while inside at the table, Margarita and I were the only women with a seat.

Background

Climate change is a global phenomenon with effects that reverberate globally at individual, local, and national scales. Individuals, communities, organizations, states, nations, and regions often have different capacities and strategies to adapt to changing environmental realities, and those nuanced experiences contribute to difficult global conversations about climate change. The United Nations reports that men and women often have different capacities to adapt to or mitigate climate change as a result of gender differences in rights, opportunities, values, situations and outcomes, and agency; and that these different capacities may be exacerbated by ethnicity, race, income level, location, and age. Risk perception and willingness to adopt adaptive practices are also considered gendered components to climate change adaptation (FAO 2012). The climate change crisis is complex and is tied to social, economic, and political systems. However, despite the complexity of both gender systems and the climate change crisis, in modern development discourses the relationship between these issues is often portrayed as a problem that can be addressed by targeting poor, rural women. Nonetheless, rural women have been underrepresented at every level of climate change conversations and policy-making.

[3] Another world is possible.

It has been well documented that global atmospheric and oceanic temperatures have increased at unprecedented rates since the 1950s, that snow and ice have diminished, and sea levels have risen (IPCC 2014). Additionally, IPCC scientists project that surface temperatures will continue to rise over the 21st century, heat waves will occur more often and for longer durations, and that extreme precipitation events will happen with greater frequency and intensity (IPCC 2014). The United Nations reports that women and men living in rural areas are particularly vulnerable to the changing climate when they are highly reliant on natural resources for their livelihoods, and that their experiences can provide valuable expertise in mitigation and adaptation strategies. They write, "[W]omen are not only vulnerable to climate change but they are also effective actors or agents of change in relation to both mitigation and adaptation. Women often have a strong body of knowledge and expertise that can be used in climate change mitigation, disaster reduction and adaptation strategies" (2009, 1).

Climate Smart Agriculture (CSA) is part of the United Nations' strategy for climate change adaptation and mitigation. It is defined as, "agriculture that sustainably increases productivity, resilience (adaptation), reduces or removes greenhouse gases (mitigation) and enhances achievement of national food security and development goals" (FAO 2013, 548). By addressing climate change, food insecurity, and poverty simultaneously, CSA is intended to be a more efficient use of resources than single-focus strategies. The Climate Smart Agriculture model includes a three-pillar approach to climate change mitigation and adaptation: (1) sustainably increasing agricultural productivity and incomes; (2) adapting and building resilience to climate change; (3)

reducing greenhouse gas emissions (FAO 2013). The adoption of such strategies has been promoted globally, and many successful applications have been documented.

The CGIAR Research Program on Climate Change, Agriculture, and Food Security (CCAFS) recently undertook the *Tortillas on the Roaster* study in Central America (Schmidt et al 2012). This study sought to predict the impact of climate change on maize and bean production in the region and suggested strategies for adaptation and mitigation of these effects. *Tortillas on the Roaster* results predicted that mean temperatures will rise by 1°C by the period 2010 to 2039 (2020s), and by 2°C by the period 2040 to 2069 (2050s) in Central America. They predict that this increase in temperatures could reduce maize and bean production by 25% due to widespread decreases in rainfall and severe soil degradation (Schmidt et al 2012, 33). Drawing on the CSA model and strategies outlined in the *2008 World Bank Development Report*, the study identified five adaptation strategies for the region: sustainable intensification, diversification, expansion of assets, increasing off-farm income, and diversification out of agriculture as a livelihood strategy (Schmidt et al 2012).

In "'Si no comemos tortilla: no vivimos:' women, climate change, and food security in central Mexico," Beth A. Bee (2014) found that the viewpoints and strategies for maintaining food security of the women she interviewed were derived from their socio-political, environmental, and economic contexts. Bee argues that the gender division of labor (women's roles in certain farming practices and tortilla making, specifically), membership in agricultural organizations, and local embodied knowledge influence the perceptions women have about climate change and food security and the adaptive practices participants are willing to undertake. She writes, "Gender and the

lived experience of women in subsistence agriculture is therefore a critical factor in not only understanding food security, but also in understanding the opportunities and challenges to maintaining food security in a changing climate. These opportunities and challenges are an important aspect to consider in developing effective policies and programs aimed at addressing food security" (616). Although Bee found that the socio-political, environmental, and economic context of interview respondents had a profound impact on their perceptions and strategies, her study does not consider the ways that indigeneity specifically intersects with these variables.

Many indigenous groups include climate in their worldview and organize daily activities around this view. However, in Mexico, little is known about indigenous perceptions of and adaptations to climate change (Sánchez-Cortés and Chavero 2009). Sánchez-Cortés and Chavero found that Zoque cosmovision significantly affected farming practices and perceptions of climate in San Pablo Huacanó, Chiapas. Pointing out the gender and generational component of this finding, they write:

> The seasonality of the rain and the association of the wind with the cardinal points are interrelated with cosmology and knowledge of the land. These aspects allow Zoques to place a cultural and practical significance to weather and climate interpretation, however, this knowledge and symbolic meanings are expressed differently, depending on generation, gender, agricultural practices and personal experience. (Ibid. 377)

Together these studies point to a need for further research on both the relationship between gender and climate change in Mexico and on the ways that indigeneity intersects with gender, class, perceptions, and practices. As Geraldine Terry (2009) writes:

> [C]limate change is not happening in a vacuum, but rather in the context of other risks, including economic liberalization, globalization, conflict, unpredictable government policies, and risks to health, in particular HIV and AIDS, that threaten poor men and women in the global South.

> Although the effects of climate change interact with and exacerbate other types of stress, poor people themselves may not perceive the climate as the most urgent or important of their problems. (Ibid. 6)

A multi-scale analysis is particularly suited to the study of climate change adaptation, mitigation, and vulnerability—situating nuanced local experiences in a global context and placing conversations happening at varying scales in dialogue. In the article "Successful adaptation to climate change across scales," W. Neil Adger et al. (2005) apply a multi-scalar analysis to the concept of climate change adaptation. They write, "Adaptations are not isolated from other decisions, but occur in the context of demographic, cultural and economic change as well as transformations in information technologies, global governance, social conventions and the globalising flows of capital (and to a lesser extent) labour" (78). In this thesis, I seek to understand how place-based approaches in Chiapas interact with processes and ideas operating at national and global scales. My multi-scale analytic framework encompasses the climate change perceptions and practices of three groups of organized rural women in and around San Cristóbal de las Casas, Chiapas, Mexico; the United Nation's Climate Smart Agriculture model; and the strategies suggested by the *Tortillas on the Roaster* report. The purpose of these observations and this analysis is to offer insight into evolving understandings and actions related to climate change.

Research Questions

Through an examination of the climate change perceptions and adaptive practices of three groups of organized rural women in and around San Cristóbal de las Casas, Chiapas, Mexico, together with a critical reading and analysis of the United Nations'

Climate Smart Agriculture Strategy and a Central America-specific project, this thesis addresses three questions:

- At what points and on what issues do these place-based practices and perceptions connect or fail to connect with processes and ideas operating at national and global scales?
- How do practices and perceptions observed in Chiapas fit into the Climate Smart Agriculture development model promoted by the United Nations?
- What insights, questions, or options emerge from conversations with women in Chiapas that might be relevant for global understandings and actions related to climate change?

Theoretical Framework

Three theoretical currents form the basis of this thesis: political ecology, critical development theory, and gender theory. I draw on a political ecology framework to facilitate the discussion of human environment relations at varying scales—those at which climate change vulnerability, adaptation, and mitigation happen. Critical development theory serves as a lens through which I assess and reassess policies and actions happening at each scale, and critically examine the ways in which both I and study participants frame visions for the future. Finally, my analysis is informed by a gender theory that treats gender as a particular sociocultural system of power, one that interacts with other systems of power, such as those informing ethnoracial, class and regional differences.

I draw on a political ecology framework to facilitate the discussion of human environment relations at varying scales and the power relations that influence both climate change itself and strategies and capacities to adapt to and mitigate it. A political ecology framework is particularly suited to the research questions here, allowing for a multi-scale analysis to situate local experiences in a global context. Additionally, political

ecology calls for an analysis of global systemic power relations well suited to the study of climate change vulnerabilities associated with socioeconomic and geopolitical differences. As Robbins (2012) writes, political ecology is “a field of critical research predicated on the assumption that any tug on the strands of the global web of human–environment linkages reverberates throughout the system as a whole” (13). While Robbins chooses to define political ecology in opposition to what he calls “apolitical ecologies,” many scholars have defined the concept in more straightforward terms. Paulson, Gezon, and Watts (2005) write:

> Political ecology’s originality and ambition arise from its efforts to link social and physical sciences to address environmental changes, conflicts, and problems. In this initiative, analyses of social relations of production and questions of access and control over resources—the basic tool kit of political economy—are applied in order to understand forms of environmental disturbance and degradation and to develop prospects and models for environmental rehabilitation and conservation, as well as environmentally sustainable alternatives. (17)

I chose this definition for a number of reasons: access and control of natural resources significantly affects climate change vulnerability and capacities to adapt; access and control of natural resources has historically been influenced by systems of power at varying scales, including but not limited to gender, economic, and political systems; and finally, the participants in this study have developed environmentally sustainable alternatives rooted in both history and a vision for the future.

In this study, I analyze these alternatives, their particular histories, and the confines limiting or enabling visions of the future through a lens that is critical of the modern development paradigm. Escobar (2010) describes post-development as an era where development ceases to be the central organizing principle of social life (12), and the participants in this study have rejected select aspects and contested certain

assumptions and values of the modern development paradigm for the opportunity to forge and carry out their own visions.

According to Wolfgang Sachs (2003):

> The last forty years can be called the 'age of development'. In its name, the South has struggled to catch up with the North, experts descended on villages near and far, and millions of people were turned into wage earners and consumers. But "development" has been much more than a socioeconomic endeavor. It is a perception which models reality, a myth which comforts societies and a fantasy which unleashes passion. (2003, preface)

Since the era of neoliberal policies and structural adjustment enacted in the name of development, Latin America has experienced what has been called a "turn to the left" in terms of governmental regimes and social policy. However, as Arturo Escobar argues, in terms of the conceptualization of development the region has seen a more radical shift. He writes, "It can plausibly be argued that the region could be moving at the very least beyond the idea of a single, universal modernity and towards a more plural set of modernities" (2010, 3). In this study, my analysis of key global policies reveals that assumptions of a single universal modernity persist in coexistence with possibilities for more plural and context-specific modernities.

Finally, gender theory plays a significant role in shaping the framework of this study. Because of the complexity of the forces that make climate change a gender issue, it is important to define gender in terms of gender systems. I adopt the definition of Ridgeway & Smith-Lovin (1999):

> Gender is a system of social practices within society that constitutes people as different in socially significant ways and organizes relations of inequality on the basis of the difference. The continued, everyday acceptance of the gender system requires that both people's experiences and widely shared cultural beliefs confirm for them that men and women are sufficiently different in ways that justify men's greater power and privilege. In this, gender is similar to other systems of difference and

> inequality such as race and class. Gender is distinctive, however, in that its constitutive cultural beliefs and confirmatory experiences must be sustained in the context of constant interaction, often on familiar terms, between those advantaged and disadvantaged by the system. (192)

This definition of gender highlights the fact that gender is a system that is perpetuated on both a societal level and an individual level, giving greater power and privilege to those recognized as men. Because Mexican society and the construct of indigenous communities in the region are historically patriarchal (Nash 1995), I chose a definition which highlights the relative advantage of men in such a system. However, as Paulson and Mendez (2014) note in their study of territorial transformation in Yucatan, Mexico, gender systems do not exist in a vacuum separate from other systems of difference. An intersectionality perspective situates gender in relation to race, class, ethnicity, sexual orientation and other social identities (Sheilds 2008). In this thesis, I take an intersectional approach to gender analysis, exploring qualitative differences between intersectional positions. The meaning and experience of being a Tseltal woman in Amatenango varies profoundly from being a Tseltal man in Amatenango which varies from that of a *mestiza* woman in San Cristóbal de las Casas and so on. Despite the complexity of both gender systems and the climate change crisis, the relationship between these issues has often been highlighted as a problem that can be addressed (in the modern development paradigm) by targeting poor rural women. The multifaceted nature of gender systems calls attention to the need for an intersectional and multi-scalar analysis of the relationship between gender and climate change.

Key Concepts

In this paper I will use the United Nations Framework Convention on Climate Change (UNFCCC) to define climate change as changes in climate over time that are

directly or indirectly caused by human activity and are in addition to natural climate variability. The Intergovernmental Panel on Climate Change (IPCC 2014) writes of the major anthropogenic causes of climate change:

> Anthropogenic greenhouse gas emissions have increased since the pre-industrial era driven largely by economic and population growth. From 2000 to 2010 emissions were the highest in history. Historical emissions have driven atmospheric concentrations of carbon dioxide, methane and nitrous oxide to levels that are unprecedented in at least the last 800,000 years, leading to an uptake of energy by the climate system. (4)

Climate vulnerability (often referred to in this thesis as "vulnerability" refers to susceptibility to and inability to cope with the adverse effects of climate change (IPCC 2007). Climate change mitigation refers to actions that reduce greenhouse gas emissions, and adaptation to climate change refers to adjusting actions to better deal with its impact (IPCC 2007). Risk refers to shocks and stresses that affect agricultural production, including economic, climatic, environmental, and political instability. Resilience refers to the capacity to cope with risk and recover from shocks (FAO 2012, 19).

Agroecology is featured in the climate change perceptions, adaptations, and mitigation techniques of many of the women who participated in this study and the organizations of which they are a part. My use of the term agroecology is based on Miguel Altieri's (2002) definition:

> [T]he holistic study of agroecosystems, including all environmental and human elements. It focuses on the form, dynamics and functions of their interrelationships and the processes in which they are involved. An area used for agricultural production, e.g. a field, is seen as a complex system in which ecological processes found under natural conditions also occur, e.g. nutrient cycling, predator/prey interactions, competition, symbiosis, successional changes, etc. (8)

Agroecosystems are communities of plants and animals that modified by humans to produce food and other products and their interactions with their physical and chemical environments (Ibid.). Because many of the participants in this study define agroecology as it has been applied in their own practices, communities, and organizations, I will also use the definition of agroecology, *agroecología,* provided by La Red de Productores y Consumidores Responsables Comida Sana y Cercana. Their definition defines agroecology as both a science (like Altieri above) and a practice:

> [L]a agroecología es una ciencia y una práctica. Los sistemas de producción basados en la agroecología son biodiversos, resilientes, eficientes energéticamente, socialmente justos y constituyen la base de una estrategia de soberanía energética, alimentaria y productiva. La sustentabilidad y la resiliencia se consiguen promoviendo la diversidad y la complejidad de los sistemas agrícolas a través de los policultivos, rotaciones, agroforestería, el uso de semillas autóctonas y criollas, y de las razas locales de ganado, fomentando enemigos naturales de las plagas, el uso de compostas y de abonos verdes para mejorar la materia orgánica del suelo optimizando su actividad biológica y capacidad de retención de agua. La agroecología está basada en el conocimiento de la gente y en conocimientos científicos. Privilegia los productos y mercados locales.[4] (2012)

Gender and Climate Change Policy

The United Nations (2009) reports that women and men living in rural areas are particularly vulnerable to the changing climate when they are highly reliant on natural resources for their livelihoods, and that their experiences can provide valuable expertise in mitigation and adaptation strategies. Agriculture, forestry, and other land use is

[4] Agroecology is a science and a practice. Production systems based on agroecology are biodiverse, resilient, energy-efficient, socially just and form the basis of a strategy for energy, food and productive sovereignty. Sustainability and resilience are achieved by promoting diversity and complexity of agricultural systems through intercropping, crop rotation, agroforestry, and the use of indigenous and native seeds and local breeds of cattle. Also by encouraging natural enemies of pests, the use of compost and green manure to improve soil organic matter and biological activity optimizing its water holding capacity. Agroecology is based on the knowledge of people and scientific knowledge. It favors local products and markets.

responsible for just under a quarter of anthropogenic greenhouse gas emissions from deforestation, agricultural emissions from livestock, and soil and nutrient management (IPCC 2014). Furthermore, according to the FAO, rural women are responsible for between 60 and 80 percent of agricultural production in developing countries (2008), yet they are severely underrepresented in all levels of policy-making related to climate change (and otherwise). The United Nations *Worlds Women 2010* documents that women represent just 17 percent of seats on national parliaments, 7 of 150 elected heads of state around the world, and only 11 of 192 heads of government. Women are similarly underrepresented at local levels and in powerful business positions (2010, x). Fatma Denton (2002) writes,

> The planet is a global concern incorporating a multitude of ecosystems, peoples, and cultures. As such, it requires collective input in its management, protection, and ultimately, its sustainability. Yet climate negotiations could be seen as a parody of an unequal world economy, in which men, and the bigger nations, get to define the basis on which they participate and contribute to the reduction of growing environmental problems, while women, and smaller and poorer countries, look in from the outside, with virtually no power to change or influence the scope of the discussions. (10)

She argues that women are absent from climate change decision-making processes and that even including some women in these processes will not guarantee that the issues faced by women in poverty specifically will be addressed (12). Denton discusses the complexity of the link between gender, poverty, and climate change. “Poverty,” she writes, “is linked in a complex way to exclusion and marginalization, and this results in the absence of people living in poverty, and a lack of analysis of the issues they face in macro-economic policy-making” (12).

In much of the research on gender and climate change policy-making, gender mainstreaming has been suggested as a solution to addressing the gendered

dimensions of climate change. According to Margaret Alston (2013), “Gender mainstreaming refers to the process of incorporating a gender perspective to any action, policy, legislation or action in order to ensure that the concerns of all are addressed and that gender inequalities are not perpetuated through institutional means” (1). Based on Walby’s three stages of gender equality policy, Alston urges governments and decision-makers to implement gender mainstreaming in climate change policy. Walby’s three stages of gender equality policy include: treatment for women equal to that of men through legal status, positive actions for both women and men, and gender mainstreaming (Alston 2013; Walby 1997). In *Gender and Climate Change: An Introduction*, Irene Dankelman (2010) also points to gender mainstreaming as strategy for incorporating women into climate change policy-making. She writes, “At policy level, the need to mainstream gender in the environmental sector and in sustainable development efforts has been recognized during the past 15-20 years, although often reluctantly” (5). Its implementation implies fundamental changes in the organization of work, the work itself, and its qualities (Ibid.); and Seager and Hartman (2005) relate its slow implementation to a hostile institutional culture, the isolation of gender research, and the inadequacies of data and analyses that support gender disaggregated research.

Gender mainstreaming and gender-focused climate change policies have not been a priority due in part to the nature of wealth-driven development policy. As many scholars have noted, economic liberalization and dominant development models are drivers of climate change and exacerbate its effects. Gerd Johnsson-Latham (2010) argues that development models have promoted increase in material wealth that

evidentially harms the climate while doing little to address root causes of gender inequality. Seager (1993) similarly writes that in order to understand environmental problems, social, cultural, and political institutions need to be analyzed. She argues that the social culture responsible for environmental problems has been largely a masculinist culture. Although women have participated in this culture, their participation in public and national decision-making positions has been limited.

Furthermore, Meike Spitzner (2008) argues that androcentrism is a barrier to achieving gender justice in the climate change crisis. "The term 'androcentrism,'" he writes, "is understood to embrace certain patterns of thought, observation and action in regard to political, economic, scientific and societal issues. These patterns place men and maleness at the center or deem them to be the yardstick and standard while seeing women and femaleness as a 'peculiarity', as a deviation from the standard" (17). He argues that androcentrism is present in both the modernization paradigm that has been a contributing factor to climate change and in climate change negotiations. Gender neutrality is assumed in climate policy-making where unequal gender relationships are known to exist (21). Geraldine Terry (2009) argues that, "If gender is mentioned at all as a climate change issue, it is usually with reference to the particular vulnerability of poor women in the South" (6). She points out that much of the climate change research and policy-making undertaken has been focused in the natural sciences. She writes, "Framing climate change as a problem that needs mainly technical and economic solutions makes it hard to find an entry point to introduce gender-equality issues into the equation" (2009: 15). Arguments for gender mainstreaming however, include gendered aspects of even technological developments. Aguilar (2010) argues that "Women's

needs, priorities, technological needs, knowledge and traditional practices have to be taken into account in developing new technologies. Ensuring direct involvement of women in technology development can help guarantee ownership by users, effectiveness and sustainability" (184).

Methodology

The research for this thesis combines three types of methods: library research; identification and analysis of development policies and programs operating at various scales; and field research which included semi-structured interviews and participant observation in Chiapas. My analysis integrates fieldwork with the critical analysis of development policies and reports.

Because all three organizations studied are connected to a network of scholars and activists based in San Cristóbal, it was important to look beyond research published in the United States and Europe into local sources of knowledge production. I visited libraries and used library resources in both the United States and Mexico. Some of the sources came in the form of master's theses from local universities and web publications by the organizations themselves. Specifically, I visited and used library resources at El Colegio de la Frontera Sur (ECOSUR), a university affiliated with some of the organizations that participated in this study. ECOSUR is devoted to the study of sustainable development on Mexico's southern border. From their website:

> El Colegio de la Frontera Sur es un centro público de investigación científica, que busca contribuir al desarrollo sustentable de la frontera sur de México, Centroamérica y el Caribe a través de la generación de conocimientos, la formación de recursos humanos y la vinculación desde las ciencias sociales y naturales.[5]

[5] El Colegio de la Frontera Sur is a public scientific research center, which aims to contribute to sustainable development of the southern border of Mexico, Central America and the Caribbean through

They continue with their Principios directrices:

> La convicción de que la investigación es esencial para construir las bases del conocimiento y capacidad requeridas para lograr un desarrollo equitativo y sustentable en beneficio de las poblaciones marginadas de la frontera sur.
>
> La necesidad de enfatizar en el proceso de desarrollo, la conservación de los sistemas culturales, recursos naturales y riqueza biológica con que cuentan las poblaciones de la región. El valor de la diversidad biológica como patrimonio humano y compromiso con las generaciones futuras.
>
> La excelencia académica, como un mecanismo que promueve la calidad y relevancia de las contribuciones de la investigación para la innovación y para la formación de recursos humanos.
>
> Una visión regional de los retos del desarrollo sustentable, comprometida con el desarrollo conjunto de los países vecinos de América Central y el Caribe.
> Un compromiso con la generación de capacidades técnicas en el ámbito local y regional, buscando fortalecer la educación superior, el desarrollo productivo y social, y los procesos de descentralización para el desarrollo.[6] (ECOSUR 2015)

Additionally, I used resources from both Latin American and international data banks

including the United Nations, World Bank, Instituto Nacional de Estadística y Geografía

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the generation of knowledge, the formation of human resources and the linkage of social and natural sciences.

[6] The certainty that research is essential to build the knowledge base and capacity required to achieve equitable and sustainable development, for the benefit of marginalized populations of the southern border.

The need to emphasize within the process of development, the conservation of cultural systems, natural resources and biological wealth on which populations in the region depend. The value of biological diversity as a human heritage and commitment to future generations.

Academic excellence, as a mechanism that promotes the quality and relevance of the contributions of research to innovation and training of human resources.

A regional vision of the challenges of sustainable development, committed to the joint development of the neighboring countries of Central America and the Caribbean.

A commitment to generating technical capacity at local and regional level, seeking to strengthen higher education, productive and social development, decentralization and development.

de Mexico, CEPAL, CEPAL Mexico, International Center for Tropical Agriculture, and the Intergovernmental Panel on Climate Change.

Another part of the methodology for this thesis was the critical analysis of development programs related to climate change and government policies related to land reform and economic liberalization. I identified two particularly relevant climate change policies to assess and discuss in depth: Climate Smart Agriculture and the *Tortillas on the Roaster* report. I used both field research and library research to inform an exploration of government legislation and historical processes related to land reform and economic systems, including the Mexican Constitution of 1917 and the *ejido* system and neoliberal restructuring and the North American Free Trade Agreement (NAFTA).

Ethnographic interviews and participant observation supplemented the library research undertaken for this project. These came in the form of conversations and semi-structured interviews with participants and coordinators in identified organizations and observation of markets and farms where participants sell and grow their products. The research was performed over a seven-week period in and around San Cristóbal de las Casas, Chiapas, Mexico in the summer of 2014 and a follow-up visit in the spring of 2015. I used the ethnographic field methods discussed below to gain insight into the local, organizational, and individual scales—in order to identify the ways that climate and climate change are perceived and understood by women agriculturalists and local organizations and what adaptive practices are being undertaken.

Although research on climate change in the natural sciences has often overshadowed social scientists' research on its human dimensions (Barnes et al.,

2013), social science research and ethnographic methods can offer unique and important perspectives to the human dimensions of climate change. In the chapter "Fielding Climate Change in Cultural Anthropology," Roncoli et al. (2009) assert that ethnographic interviews and participant observation can provide important entry points to understanding human-climate relations, and Barnes et al. (2013) argue that through its engagement of society-environment interactions and broad holistic view of society, anthropology can offer valuable insights into climate change research (2013). In order to address socioeconomic drivers of climate change adaptation, it was important that ethnographic methods be used to gain insight into the nuanced experiences and practices of informants. Qualitative research created additional space for me to discuss the multidimensional experiences of individuals.

I chose semi-structured interviews, specifically, in order to allow for unsuspected key insights to arise and to preserve the language and expressions women used to talk about their relationship with their work and the climate. I performed nine 45-90 minute individual, semi-structured interviews, often followed by long tours of properties, organizational headquarters, or markets. Additionally, I led one eight-person focus group, with one participant serving as a translator from Tseltal to Spanish. I asked all of the participants the following questions:

1. Have you noted any change in climate in your lifetime?
2. What have you noted?
3. What do you believe to be the cause of these changes?
4. How have these changes affected your agricultural practices?

These questions, however, only served as the basis for the interview guide that provided structure. I formulated follow-up questions as interviews progressed with

respondents often raising new issues or experiences related to climate change, the environment, and agricultural practices. I recorded the interviews and personally transcribed them in order to preserve the original expressions of the respondents and their context.

I visited and observed markets and other economic outlets of the organizations studied throughout my fieldwork, participating as a customer and consumer. It was necessary, however, to not only observe the economic niches created by each organization, but to also observe the context in which those spaces were created. This facet of the research included visiting conventional markets and tourist areas, surveying newspapers, television, classified advertisements, and events and pursuing any lead that would allow me to observe or converse about local phenomena. During the eight weeks I spent in San Cristóbal de las Casas, I made numerous pages of field notes and observations not only about the three organizations with which I had the opportunity to work, but also about their context in San Cristóbal and Chiapas. I've incorporated some excerpts from those field notes into the text of this thesis. Finally, I analyzed data I gathered from my fieldwork and research at varying scales, situating my observations in local, national, and global contexts. I described and analyzed major development policies, attempting to find areas of harmony and dissonance between these policies and data gathered in the field.

Outline of the Thesis

Following the introduction, this thesis is organized into three main chapters of findings and analysis. Chapter 2 begins with a contextualization of the study, briefly introducing the issue of gender and climate change policy-making, then situating the research site socially, economically, and historically. I present policy material related to

ejidos and the Mexican Constitution, the North American Free Trade Agreement, and trade policy related to neoliberal economic restructuring. Chapter 2 concludes with a description of the three organizations who participated in the study. In Chapter 3 I present the results of my interviews using a detailed description of 3 cases, followed by an analysis of all of the interviews and their common themes. Chapter 3 ends with a discussion of climate change perceptions, adaptations, and mitigative strategies identified during my fieldwork. Chapter 4 is a summary and analysis of two major development programs related to climate change: Climate Smart Agriculture and the approach outlined in *Tortillas on the Roaster*. I then provide an analysis of the findings from my fieldwork and areas where they connect and divide with the two climate change development programs. Chapter 4 concludes with a brief discussion of other relevant policy.

CHAPTER 2
CHIAPAS, MEXICO

In this chapter I contextualize the study by situating the research site socially, economically, historically, and in context of the legislative and political landscape. The chapter begins situating Chiapas in Mexico by utilizing a widely accepted measure of development, the Human Development Index. Then I turn to a discussion of published statistics on poverty and extreme poverty, populations of indigenous peoples, and participation in agriculture for both the state and the nation. I discuss the city of San Cristóbal de las Casas as an epicenter for political activism (particularly activism around creating new development models) by means of international support for the Ejército Zapatista de Liberación Nacional (EZLN) and the emergence and existence of the EZLN as both an anti-neoliberal movement and a women's movement. I then turn to a brief discussion of maize policies and the cultural significance of maize for people, specifically women, in Chiapas. Finally, the chapter ends with a description of each organization studied, utilizing observations from my fieldwork and the missions and visions as described in each organization's web or printed publications.

The Research Site: Chiapas in Mexico

Chiapas is the southernmost state in Mexico, bordering Guatemala. The state exhibits much heterogeneity in both its physical and social geographies. Physically, the state is typified by the Sierra Madre de Chiapas, Lacandon rainforest, and the remnants of ancient Maya physical culture; and socially, by its large indigenous populations and the Zapatista rebellion. In 2012, Mexico was considered a High Human Development (61) country on the Human Development Index (HDI). However, when the state of Chiapas is assessed by the same measures, its 2012 HDI score would place it with

Medium Human Development countries on the same Index (UNDP 2013). The Human Development Index assesses the development of a country factoring in 3 components: a long and healthy life (measured by life expectancy at birth), knowledge (measured by mean years of schooling for adults and expected for children), and a decent standard of living (measured by gross national income per capita) (UNDP 2013). Table 2-1 illustrates the development disparities between the state and nation. The average life expectancy in Mexico is 76.4 years. However, Mexicans living in the state of Chiapas have a much lower life expectancy: 72.5 years (INEGI 2013). Similarly, the mean years of schooling in Chiapas is much lower than national averages. The average level of school completed in Chiapas is 6.7 years, the lowest average years of school for any state in Mexico. The national rate is 8.6 years (INEGI 2010). Chiapas has the highest rate of illiteracy in Mexico, with 17.8 percent of Chiapanecos unable to read and write, compared to only 6.9% nationally (INEGI 2010).

According to CONEVAL, in 2012, 74.7% of persons living in Chiapas were in poverty, with 32.2% considered to be living in extreme poverty. In 2012, the national figures for poverty and extreme poverty were 45.5% and 9.8%, respectively (CONEVAL 2012). CONEVAL defines a person in poverty as one who does not have sufficient income to satisfy their needs; and a person in extreme poverty as those who do not have sufficient resources to acquire a basic food basket each month. For June 2014, a basic food basket would include maize, wheat, rice, beef and veal, chicken, fresh fish, milk eggs, oil, raw or fresh tubers, vegetables and fresh vegetables, legumes (beans), fresh fruits, sugar and honey, prepared foods to eat at home, and drinks and would cost 853 Mexican *pesos* or the equivalent of 56 USD per person monthly (CONEVAL 2015).

Because the state of Chiapas exhibits such heterogeneity, with large indigenous and rural populations, the HDI may not be an accurate representation of the development of the state. According to INEGI, Chiapas is home to 13% of the country's indigenous population (2010). In 2010, 27% of the state's residents 5 years and older spoke an indigenous language, compared to a national rate of only 6.7% (INEGI 2010). At a national level, 14% of those who speak an indigenous language do not speak Spanish. The population of Chiapas is 49% urban and 51% rural. National urban and rural population rates are 78 and 22%, respectively (INEGI 2010). According to the Mexican Subsecretaría de Empleo y Productividad Laboral, 39% of economically active Chiapanecos are employed in the agricultural sector. Only 29% of women are economically active, and 4.2% of those participate in agricultural activities for income (2015). These statistics, however, do not include the number of Chiapanecos who participate in the cultivation of *milpa* or kitchen gardens for subsistence.

San Cristóbal de las Casas and the EZLN

San Cristóbal de las Casas is located in the center of the state, an hour drive southeast from the state capital, Tuxtla Gutiérrez. The city has for decades been an epicenter of political activism, most recently due to the emergence and continued existence of the Ejército Zapatista de Liberación Nacional (EZLN). The EZLN appeared publicly in 1994 in protest to the North American Free Trade Agreement (NAFTA) signed between Mexico, the United States, and Canada. In preparation for the inception of NAFTA, President Carlos Salinas de Gortari modified Article 27 of the Mexican constitution, which would end land reform started during and promised by the Mexican Revolution. Article 27 was the legal structure for community held lands, *ejidos*, occupied by countless *campesinos* and *indígenas*. However, as June Nash (1995)

points out, the *ejido* system itself was not implemented evenly, and Chiapas saw mixed effects. She writes that due in part to the isolation of the state, it took some communities 20 years or more to act on Article 27. Other indigenous communities never got state support to challenge large landowners (12). Nash (Ibid.) describes the issues raised by Zapatista rebels in relation to those raised by their namesake, Emiliano Zapata, in the Mexican Revolution and subsequent Constitution of 1917. She writes, "The demands of the modern-day Zapatistas, however, go far beyond those of the earlier revolution in calling for recognition of ethnic distinctiveness and dignity as well as participation in the democratic process as the Mexican economy becomes integrated into global markets" (8).

Deere and León (2001) discuss the gender equity of both the *ejido* system and subsequent agrarian reforms in Mexico:

> The first agrarian reform of this century, born in a revolution in which women were active participants (C. Ramons 1993), thus established a mixed precedent for women's land rights. The land rights of female household heads were formally recognized, but single women were discriminated against compared with single men. Nonetheless, in 1971 Mexico became the first Latin American country to guarantee men and women an equal chance of being an agrarian reform beneficiary. (73)

Deere and León's discussion of the gendered components of the *ejido* system make evident the fact that the abolition of Article 27 was not only a peasant/indigenous issue but also a women's issue. In fact, women's rights, equal participation, and self-determination were, at its formation and in its endurance, also major components of the Zapatista rebellion. The Zapatista Rebellion has been described in countless manners: an indigenous rebellion, a movement for democratic reform, a peasant rebellion, and also, by Karen Kampwirth (2002) as a "women's rebellion" due to the fact that women account for half of the base support and one third of EZLN combatants (84). In the

decade prior to the uprising, indigenous populations in Chiapas prepared to go to war for their autonomy, building a large support base and drafting a series of laws that included the Women's Revolutionary Law. The document begins:

> In the fight for the liberation of our people, the EZLN incorporates women into the revolutionary struggle, regardless of their race, creed, color, or political affiliation, requiring only that they share the demands of the exploited people and that they commit to the laws and regulations of the revolution. (EZLN 1994)

Drawing on a long history of women's participation in indigenous organizing (Toledo Tello and Garza Caligaris 2006), the Zapatista movement served as turning point for this process in Mexico. While participating in the struggle for land and democracy, indigenous women also began to demand more equitable gender relations within the family, community, and social and political organizations (Stephen, Speed, Hernández Castillo 2006, xi). Melissa M. Forbis (2002) writes that the political lens of women in Chiapas is rooted in their experiences living as women, indigenous, and poor and that each of these identities is inextricably linked (251). She argues that women's level of participation in the Zapatista rebellion is multi-leveled: one is collective, part of the larger struggle for indigenous autonomy, and one is personal, fighting to gain equality in their families and communities (252). Women are not disregarding traditional gender roles entirely, but actively changing gendered power relations (252).

Gilbreth and Otero (2001) also describe the rise of the Zapatista movement in their article about the Zapatista uprising and civil society:

> Just when the country was being inaugurated into the 'First World' by joining its northern neighbors in an economic association represented by the North American Free Trade Agreement (NAFTA), an armed rebellion broke out in the southeastern state of Chiapas. In the wake of a cease-fire following 12 days of fighting, a new social movement emerged that contested the direction of the nation's future as envisioned by the state and its ruling electoral machine, the Partido Revolucionario Institucional

> (Institutional Revolutionary Party—PRI). The adherents of the new movement are primarily Mayan peasants, both members and sympathizers of the Ejército Zapatista de Liberación Nacional (Zapatista National Liberation Army—EZLN), and their national and international supporters. (7)

Gilbreth and Otero touch here on the significance of the international support for the EZLN and the links between the local movement and national and international economic development models. Maria Elena Martinez-Torres (2001) describes the president's acceptance of a ceasefire as a result of information flow out of the *guerrilla* zone that fueled both a loss of investor confidence and a growing international solidarity network. She writes, "That information also flowed to members of a rapidly congealing transnational solidarity network, which today is a part of the broadening and thickening of civil society inside Mexico, in the Mexican diaspora outside the country, and among anti-globalization activists around the world" (347).

In *The Tourism Encounter* (2011), Florence Babb presents findings from ethnographic research to suggest that San Cristóbal de las Casas specifically is at the "center of an expansion of cultural tourism that draws attention to indigenous peoples and traditions as well as to the contemporary context of revolutionary practices and politics" (92). She argues that despite the decline in mainstream tourism due to armed conflict, the Zapatista's Internet presence and inclusive philosophy led to a significant upsurge in solidarity travel from all over the world. My observations about San Cristóbal de las Casas supported Babb's conclusions. At artesian markets women and men sell tiny Zapatista dolls, ski masks embroidered with "EZLN," and t-shirts depicting Subcomandante Marcos. Popular tourist restaurants show nightly films about the Zapatistas and included small stores where visitors may buy Zapatista posters, postcards, coffee, handicrafts, and more. When I visited San Cristóbal a year after my

initial fieldwork, I saw many of the same ex-pats still hanging around the Real de Guadalupe, playing guitar, selling their jewelry, and participating in Zapatista demonstrations.

This particular tourist and ex-pat demographic, combined with the high concentration of research colleges and universities in the city, makes for a highly politically aware population. This has allowed for a particular niche market to develop around local, organic, and sustainable agriculture and production. Researchers and professors from colleges and universities in the city have participated in the organizations with which I worked, and in several instances served as my liaisons to interview respondents.

Maíz and NAFTA

Throughout the governments of Miguel de la Madrid and Salinas de Gortari, Mexico radically shifted its economic and social policies away from the import substitution industrialization (ISI) model, implemented around Latin America in the mid-20th century, in what has been seen as a paradigmatic example of neoliberal structural adjustment (Moreno-Brid et al. 2009). Neoliberal reforms included a process of trade and financial liberalization, market deregulation, privatization, and a drastically reduced role of the state in economic regulation (Moreno-Brid et al. 2009). In 1994, President Salinas launched the North American Free Trade Agreement (NAFTA) between Mexico, the United States, and Canada. Since that time, Mexico has also entered into trade agreements with numerous other countries throughout the world, and in 2008, all non-tariff restrictions on agricultural goods were lifted (Moreno-Brid et al. 2009). Appendini (2014) writes of the shift in maize policy focused on modernizing the countryside,

> Its central aim was to reorient government investment towards those farmers who were considered to have commercial and competitive potential in more open market conditions. Small- and medium-scale farmers, who formerly had sustained Mexico's maize production, now became categorized as "inefficient" and 'uncompetitive' and were excluded from government credits and subsidized inputs, technical assistance and market outlets that were available through CONA-SUPO….Peasants were no longer categorized as 'farmers' but as 'poor'. (6)

Written into NAFTA was a fifteen-year transition to full liberalization, and maize continued to be protected under NAFTA until 2008 when those protections were lifted.

Maize is an important staple food in Mexico, with over 3 million smallholders growing maize for subsistence (Borja-Vega and de la Fuente 2013). In addition to the threat to maize production imposed by economic liberalization, climate change may also have a significant effect. Climate change, specifically an increase in temperatures, could reduce maize production in Central America by 25% due to widespread decreases in rainfall and severe soil degradation (Schmidt et al 2012). In addition to the importance of maize for food security, maize is also culturally significant for the country. In "'Si no comemos tortillas, no vivimos:' women, climate change, and food security in Central Mexico," Beth A. Bee describes the contributions Mexican women make to household food security through their responsibility for maintaining the *milpa*, or maize intercropped with beans, squash, and other edible plants. Chappell et al. (2013) describe the *milpa* as a centuries old polyculture system that helps to preserve biodiversity, non-economic cultural values, and food security. The title of Bee's article pinpoints the centrality of maize and the *milpa* to the lives of many Mexican women and their families. Throughout San Cristóbal and the surrounding areas, *milpas* sprout from sloping green spaces, and even many tourist products market the *milpa* and its cultural significance. Strategic essentialism can be seen, stressing the importance of the *milpa*

and maize specifically to indigenous women. Tiny embroidered coin purses for sale in Zapatista women's collectives read, "Sin maíz, no hay país"[7] and elaborate posters depict rebels in the countryside surrounded by corn crops.

Appendini (2010) links the change in maize policy and production to an overall shift in values related to globalization:

> Economic restructuring with the Mexican economy's recurrent crisis (1982, 1987, 1994-5) changed the continuity of "progress." Maize became less profitable to market, the younger generations no longer wanted to work in agriculture, nor do they have access to land which is still held by parents. Education and the social cultural impact of urban lifestyles, have changed the expectations of the young. They see more opportunities in migrating, until recently, to "the North" (USA).

Because of the importance of maize and the *milpa* to Chiapanecos, the stark differences in development indicators for Chiapas and Mexico as a nation, and the cultural, geographical, and developmental similarities between Chiapas and Guatemala, I have decided to use and analyze a climate change report about Central America in this thesis. The *Tortillas on the Roaster* report was carried out to provide specific information on the effects of climate change on maize and bean production in Central America: El Salvador, Guatemala, Honduras, and Nicaragua. However, due to the importance of maize and bean production for subsistence farming in Chiapas, I believe this report could have valuable applications for the Mexican state. In the next section, I will describe the three organizations studied in this thesis.

La Red de Productores y Consumidores Responsables Comida Sana y Cercana

La Red de Productores y Consumidores Responsables Comida Sana y Cercana is made up of 16 agricultural farming families and 15 families who sell processed

[7] Without maize, there is no country.

agricultural goods in and around San Cristóbal de las Casas, Chiapas. Founded in 2005, the group organized its first organic market in 2007 with the intention of bringing together consumers and producers interested in organic products. The idea for the organization began with a group of women who wanted to create an alternative means for the consumption of organic products. The motivation for the inception of the organization is described on their website:

> Esta iniciativa supone el intento más consolidado de ofrecer a la población de San Cristóbal una alternativa que facilite una producción y un consumo responsable. La idea de iniciar un mercado con productos sanos surgió con un grupo de amigas, todas mujeres y algunas con niños pequeños, quienes compartíamos la preocupación con respeto a la calidad y seguridad de los alimentos con la que nosotras y nuestras familias consumíamos, preocupadas principalmente por el uso de aguas negras y agroquímicos.[8] (La Red de Productores y Consumidores Responsables Comida Sana y Cercana 2009)

It continues:

> En los 7 años que llevamos de experiencia y 5 funcionando como tianguis, podemos decir que no solo se trata de comercializar. Se trata de una propuesta integral de desarrollo local, que promueve la economía local, elimina intermediarios favoreciendo la relación directa entre personas productoras y consumidoras, acercando el medio rural con el urbano. Se favorece la integración de productores y procesadores artesanales, cuya actividad es de pequeña escala. Desde Comida Sana y Cercana se fomenta la producción Agroecológica de semillas orgánicas y criollas. Además tiene una clara posición de lucha contra los transgénicos y por el libre acceso a las semillas. Se da asesoría técnica y seguimiento a las personas productoras para acceder a una práctica agroecológica…. Asimismo, se promueve el consumo responsable que va más allá de comprar y consumir alimentos sanos. Se dan talleres, conferencias, intercambios de experiencias y otras actividades.[9] (La Red de

[8] This initiative entails a more consolidated attempt to offer the people of San Cristóbal an alternative to facilitate responsible production and consumption. The idea of starting a market with healthy products emerged with a group of friends, all women, some with young children, who shared a concern with respect to the quality and safety of the food that we and our families consumed, mainly concerning the use of sewage and agrochemicals.

[9] In our 7 years of experience and 5 operating as a market, we can say that we are not only about commercializing. It is a comprehensive proposal for local development that promotes the local economy, eliminates intermediaries favoring the direct relationship between producers and consumers, bringing the

> Productores y Consumidores Responsables Comida Sana y Cercana 2009)

The Red organizes thrice-weekly markets (*tianguis*) where agriculturalists, artisans, and other producers sell products certified by the organization. Twice-weekly the markets are in downtown San Cristóbal, and once each week the market is held on the El Colegio de la Frontera Sur (ECOSUR) campus. *El tianguis* was one of the first markets I visited when I arrived in San Cristóbal. When I finally decided to study this organization specifically, I had already been visiting, shopping, and taking notes at the market for weeks. The organization has a strict application process for researchers to ensure that each study will in some way benefit its participants. A member of the Comisión de Vinculación e-mailed me explaining this during the application process:

> La idea es que cada proyecto, tesis e investigación que se haga sea para beneficio de las mismas personas tinaguistas.Te cuento el procedimiento. a) Llenas una ficha. Nos la envías. b) Esa ficha se la damos después a las personas del tianguis para que en una asamblea la revisen y sea entre todas las personas del Tianguis quiénes decidan si es posible realiza entrevistas.[10] (June 24, 2014)

On their website, they list and link to several studies undertaken through this process. One of which, a master's thesis from ECOSUR describes La Red Comida Sana y Cercana in detail. Antonieta Carolina Reyes Gomez (2010, 5) writes that the *tianguis* is much more than a market. It is a space for the exchange of information and

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rural environment to the urban. The integration of producers and artisanal processors, whose business is small scale is favored. Agroecological production of organic and heritage seeds is encouraged by Comida Sana y Cercana. It also has a clear position against GMOs and for free access to seeds. Technical assistance and follow-up is given to producers in order to access agroecological practice .... Responsible consumption that goes beyond buying and consuming healthy foods is also promoted. Workshops, conferences, skill shares and other activities are given.

[10] The idea is that each project, thesis, and research that is done is for the benefit of the tianguistas. I will tell you the process. A) Fill out the form. Send it to us. B) We give the form to the tianguis for review in an assembly and the people of the tianguis decide if it is possible to conduct interviews.

products, linking producers and consumers, and creating new ways of understanding development at the local level:

> En la actualidad, el Tianguis se ha convertido en un espacio de información e intercambio de productos, en donde se comercia de manera directa entre los productores y los consumidores. La oferta y la demanda han crecido en relativamente poco tiempo, así como el número de sus participantes. Mostrando nuevas formas de entender el desarrollo, no solo el comercial sino también del humano al implementar otras estrategias de organización, de comunicación y de toma de decisiones.
>
> Dentro del espacio del Tianguis, están presentes voluntades individuales en torno a un objetivo en común: la comercialización de productos locales que mantienen prácticas o técnicas similares a la producción orgánica. El colectivo del Tianguis, se conforma de actores sociales heterogéneos que articulan una acción colectiva que genera un cambio en los sujetos y en la sociedad. Como colectivo, elaboran su identidad en conjunción con otros actores sociales; facilitan nuevas formas de participación ciudadana y; la re-significación de lo "orgánico" a nivel local.[11]

Mujeres y Maíz Criollo

Mujeres y Maíz Criollo is a collective of Tseltal women that formed in 2008 with the purpose of strengthening women's initiatives to produce tortillas, tostadas, and other maize-based products. Their products are sold at markets in and around San Cristóbal de las Casas (including at El Tianguis de la Comida Sana y Cercana) and at the Milpa Comedor Comunitario, a community restaurant run by women participants in Mujeres y Maíz Criollo. The organization promotes the use of heritage maize varieties grown in

[11] Currently, the Tianguis has become a space for information and exchange of products, in which items are traded directly between producers and consumers. Supply and demand have grown in relatively little time, as have the number of participants. Demonstrating new ways of understanding development, not only economic development but also human development to implement other strategies for organization, communication, and decision-making.

Within the space of the Tianguis, individual volitions center on a common goal: the commercialization of local products maintained by practices or techniques similar to organic production. The collection of the Tianguis is made up of heterogeneous social actors articulating a collective action that generates change in subjects and society. As a collective, they develop their identity in conjunction with other stakeholders; facilitate new forms of citizen participation; and the re-signification of the "organic" at the local level.

Amatenango, Chiapas, specifically, due in part to the fact that participants prefer this type of maize for their personal tortilla-making. Funds generated from La Milpa Comedor Comunitario and other markets and economic outlets are used to construct energy-efficient wood burning stoves and hold workshops and events. These stoves use less firewood and decrease smoke inhalation. From the Mujeres y Maíz Criollo website:

> Para mejorar los procesos productivos se promueve el uso de fogones ahorradores de leña, los cuales además expulsan el humo a través de una chimenea, por lo que las mujeres ya no están expuestas al humo permitiendo con esto disminuir los riesgos en su salud.
> Además realizamos reuniones, talleres e intercambios de experiencias enfocados a mejorar la calidad, higiene y diversificación de sus productos. Fortalecer los lazos entre mujeres que realizan las mismas actividades y fomentar el trabajo organizado.[12] (Mujeres y Maíz Criollo 2013)

Additionally, Mujeres y Maíz Criollo participates in organized public events that promote the use of heritage varieties of maize and maize products. The cultural significance of heritage maize and the *milpa* is a fundamental driver of the organization. Mujeres y Maíz Criollo embrace the importance of maize production in their mission, focusing not only on the consumption of maize and maize products, but the process of seed selection, and the physical act of tortilla-making. Their community restaurant is called La Milpa Comedor Comunitario, and its logos and imagery depict a woman literally sprouting from stalks of maize (Figure G-1). Their website statement continues:

> Participamos y organizamos eventos públicos (como el Festival del maíz y la tortilla) para fomentar el consumo de alimentos elaborados con maíz criollo así como fortalecer la cultura del maíz. Los eventos en los que participamos incluyen exposiciones de maíces criollos, intercambios de

[12] To better the productive process we promote the use of energy efficient wood stoves, along with being energy efficient, by expelling smoke through a chimney the women are no longer exposed to the smoke which lowers certain health risks. In addition we do meetings, workshops, and discussions of different experiences focused on better quality, hygiene, and diversification of products. Strengthening the ties between the women that engage in the same activities and encourage organized work.

> semillas, carteles informativos y actividades culturales…Otro de los puntos calves de este proyecto es la creación de relaciones solidarias encaminadas a crear una comunidad rural/urbana que vincula de productores/procesadoras/consumidores de maíz criollo en la región, la cual dará difusión a la "cultura del maíz", para la revaloración de su producción y consumo. [13] (Mujeres y Maíz Criollo 2013)

In a meeting described in detail below, an organizer of Mujeres y Maíz Criollo linked the inception of their organization to the liberalization of agricultural imports into Mexico in 2008 and the crisis of maize production in Chiapas. Forming a collective provided protection and assistance when, due to economic liberalization, governmental protections were no longer available. Furthermore, the organization provided a means of resisting the disappearance of traditional maize varieties. Participants reported that in their community men did most of the farming and made most of the decisions about agricultural inputs (they were still using agrochemicals), and women made handicrafts (pottery) and tortillas and tended to kitchen gardens.

I met with one organizer, Mari, at the Milpa Comedor Comunitario with before visiting the Tseltal women who live in Amatenango del Valle. The Milpa Comedor Comunitario is in a very southern part of San Cristóbal de las Casas, past the bus stations and far from the tourist areas. Mari worked for La Asociación Civil Capacitación, Asesoría, Medio Ambiente y Defensa del Derecho a la Salud (CAMADDS, A. C.), a civil organization devoted to improving the quality of life for *campesinos* and *indígenas* in Chiapas by strengthening local development in health, the

[13] We participate and organize public events (Like the Festival of Corn and Tortilla) to encourage the consumption of food made with heritage corn as to strengthen the culture of corn. The events we participate in include presentations on heritage corns, exchanges of seeds, informational posters and cultural activities…Another of our key points of the project is the creation of solidarity to create a rural/urban community that is connected to the producers/processors/consumers of heritage corn in the region, which will spread "the culture of corn," to revalue the production and consumption of heritage corn.

environment, and agroecological production. Mari explained to me the motivation behind starting Mujeres y Maíz Criollo and the projects they are undertaking. Mujeres y Maíz uses traditional, local corn varieties grown in Amatenango, Chiapas to make tortillas. Mari described the corn they grow as more yellow, almost an orange, and the women prefer to make tortillas with this type of maize over the whiter corn that makes very white tortillas. They are slowly switching to organic agriculture, but it has been difficult because of the perceived risks. Although the women make a lot of decisions, most major decisions are still made by men in their community. Mari described the women in Amatenango as more forceful and less timid than women in many indigenous communities. All of the women who participate are Tseltales, and men in their families and communities are beginning to go to workshops with groups that are using agroecological methods. Mari said these workshops are successful because the men who participate are learning from other *campesinos* and Tseltales. Therefore they are more comfortable and more trusting. It is a solid example of *campesino a campesino* agriculture, but women are excluded.

K'inal Antsetik

K'inal Antsetik, which means "Land of Women" in the Tseltal language, is a non-profit organization that has been working since 1992 for "empowerment of indigenous women in the state of Chiapas, Mexico" (K'inal Antsetik 2014). Their work centers on health, economic development and production, leadership training, and human rights—including indigenous women's rights to the environment. Their mission and vision from their website situate indigenous women's participation in their communities into a global context. It states:

> K'inal Antsetik envisions a world built with the participation of women and men, without discrimination on the basis of gender, ethnicity, class or any other status, a world in which the participation of indigenous women is ensured in all walks of life. Through the education and training of indigenous women, Kinal Antsetik seeks to strengthen women's organizations and to have women leaders play a key role in the economic and social development of their communities, thus transforming the traditional role of women in society. (K'inal Antsetik 2014)

They include caring for the environment and rights to a healthy environment in their health objectives:

> La formación y capacitación para el cuidado del medioambiente, en el marco de la concepción del derecho a un medio natural saludable como parte integral del derecho a la salud. La formación y capacitación abarca en este caso el desarrollo de iniciativas de reciclado de residuos y la producción de cultivos y elaboración de fertilizantes de tipo orgánico.[14] (K'inal Antsetik 2014)

K'inal Antsetik describes their main demographic as indigenous women from low-income rural areas throughout Chiapas. They currently work with 5 different groups of indigenous women throughout the state. While most of their work doesn't center on agricultural practices or the importance of certain agricultural products, the majority of the women who work for and with the organization come from rural areas and have participated in agriculture throughout their lives. Their work extends to agriculture through the transformation of gender relations at the household and community levels and through their work with indigenous women's rights to the environment.

K'inal offers full scholarships to women to attend a training program for young indigenous women. While they attend the training program, they live in the Education and Training Center. The program seeks to provide alternative livelihoods to women

[14] The formation and training for the care of the environment is in the framework of the concept of the right to a healthy environment as an integral part of the right to health. The education and training includes in this case the development of waste recycling initiatives and crop production and processing of organic types of fertilizer.

through continuing education and to encourage leadership. Additionally, K'inal works with Mujeres Artesanas Jolom Mayaetik, a cooperative of indigenous women textile artisans. The group is comprised of 236 indigenous (Tstotsil and Tseltal) women artisans from 11 communities in Chiapas. Their website describes the expansion of Jolom Mayaetik into work on the health and human rights of women and their families:

> Jolom Mayaetik has created several committees to expand on different areas of the cooperative. The committee for the quality assurance of production and selling includes women who represent Jolom Mayaetik at fairs nationally and internationally. The committee of health and rights of women is active in promoting various initiatives within these fields in their respective communities. This includes education on healthy living practices, the use of herbal remedies and organic farming initiatives. In addition to health these committees specialize in the field of women's rights, including participation in outreach activities for the defense of women against violence in their communities. (K'inal Antsetik 2014)

The three organizations highlighted in this thesis have all developed locally in the particular context of the socioeconomic and geopolitical makeup of San Cristóbal de las Casas, Chiapas, Mexico. La Red de Productores y Consumidores Responsables Comida Sana y Cercana saw the demand for an organic market, developed from an environmentally and politically aware population and tourist demographic. Drawing on their own cultural practices and embodied knowledges, Mujeres y Maíz Criollo developed their organization in response and resistance to economic liberalization by the Mexican government. K'inal Antsetik was created for the empowerment of Tseltal and Tsotsil women in Chiapas and has continued expanding their cooperative based on the changing needs of indigenous women in the state.

Figure 2-1. La Milpa Comedor Comunitario

Source: Mujeres y Maíz Criollo 2013

Table 2-1. Chiapas in Mexico

Indicator	Mexico (national)	Chiapas
Life expectancy	76.4	72.5
Years schooling	8.6	6.7
Illiteracy	6.9%	17.8%
Poverty	45.5%	74.7%
Extreme Poverty	9.8%	32.2%
Urban	78%	49%
Rural	22%	51%
Indigenous language	6.7%	27%

Source: INEGI 2010, 2013; CONEVAL 2012, 2015; UNDP 2013.

CHAPTER 3
INTERVIEW RESULTS

In this chapter I describe findings from interviews with participants in all three organizations, beginning with a detailed description of three key interviews (cases). I then discuss commonalities and differences between all interview responses, and finally describe climate change perceptions, adaptations, and mitigative practices expressed therein. I argue that personal experience, identification as a woman (and the household or community level gender division of labor), *indígena*, or *campesina*, and organizational affiliation have affected perceptions, adaptations, and mitigative practices of the women interviewed.

Doña Carmela, La Red de Productores y Consumidores Responsables Comida Sana y Cercana

Doña Carmela lives in Teopisca, Chiapas. She and her family are members of La Red de Productores y Consumidores Responsables Comida Sana y Cercana, and were active participants in *El Tianguis*. When I interviewed Carmela at her home, she noted a significant change in the climate that resulted in numerous negative impacts to her property and her crops. At the time of the interview she was unable to sell at the markets because she had recently suffered a huge landslide on her property. Earlier in the year an atypical windstorm had caused her to lose the flowers from many of her avocado trees, resulting in decreased yields at harvest time. Of all the respondents her experiences with unpredictable climatic events were the most significantly negative. She noted that both the rainy and hot seasons had started earlier in recent years. This year, specifically, there had been a lot more rain, resulting in the disaster on her property. She attributed the landslide not only to the increased rain, but also to land erosion that was precipitated by her neighbors cutting down trees.

> Nos afecta en erosión de tierra… porque muchos compañeros campesinos que todo viven arriba, talan muchos de los árboles.[15]

Like many other respondents, for her climate change could not be isolated from other factors related to social, economic, and environmental issues.

I met Carmela through a professor contact I gained in the area. I was able to arrange a meeting with this professor at a small coffee shop one Wednesday afternoon. She is a friend of several women farmers who sell at *el tianguis*, and called Carmela while we were having coffee. Carmela agreed to have me visit her the following day. The next day I walked up and down the crowded strip of bus terminals listening for drivers yelling that their van, or *combi,* would take passengers to Teopisca. When I finally found the right *combi*, it was about a 30-45 minute ride from San Cristóbal de las Casas to my stop. I was given strict instructions on how not to get lost from the professor who put me in touch with Carmela. I had a lot of information about Carmela before I visited her, specifically that she is not currently selling in the *tianguis* due to numerous problems she has had with her crops. In February high winds caused her to lose the flowers on her avocado trees, and two months ago a landslide occurred on her property, resulting in catastrophic damage. We even met a young man from Argentina who had just been helping her with repairs for two days.

I got off the *combi* at a school called Cobach, crossed the highway and walked down a gravel road to its bend and up the mountain a ways to Carmela's house. I was told to look for a barking golden retriever and a white truck. When I got to the fence, as predicted, there was a huge dog barking to announce my arrival. Carmela hurried to the

[15] It affects us in land erosion…because many of our fellow farmers that live above us cut down many trees.

gate and let me in. We settled into her living room to talk. Her house had a few areas insulated with four walls, but the kitchen and living room area were open to the outside. She swept off the floor by the chairs and couch before I sat down. She had what I came to learn was a domestic worker cleaning and cooking while she talked to me. She lives on her property with her mother, father, and children. The property once belonged to her grandparents. They all work on the land, growing mostly avocados, but also raising chickens and rabbits and growing lettuces, fruits, and *milpa*.

She told me that she has started diversifying their practices due to problems with the avocados. They are infested now with small worms that burrow through the flesh of the avocados into the pit. After our interview she showed me the worms in a number of avocados found on the ground during a tour of the property. She said that due to this problem her family has started making avocado oil. The worms don't affect the meat, so they can still produce oil from the infested fruit. She also said they have started making jams from their fruit trees. She and the other women who participate in the *tianguis* seem to have a good support network through the *Red* and the markets. She was able to have volunteers come repair her property after the rain-induced landslide, and she has an outlet to sell diverse products like the avocado oil and jams.

I asked her thoughts on how and why the climate had been changing and she had a lot to say. Her thoughts returned time and again to a responsibility to care for the earth. She feels a responsibility to do no damage to the earth for future generations, touching on how the earth belongs to and is inhabited by all of us. I asked her about her switch to agroecology in relation to this, and she told me that when her father first began farming, they used pesticides and chemical fertilizers, but her mother got very ill. They

later began the process of turning to agroecological methods, to which her trees took several years to adjust. Carmela gave me a tour of her property, climbing fences and precariously balancing on rocks where the landslide happened. She showed me many times where the water came from—the top of the steep incline up the mountain. She described where the level of the rocks used to be, told me how the disaster had affected a number of her projects. She said it was all rainwater, due to the excessive rain that they have been experiencing this year. Carmela showed me the chickens, rabbit, lettuces, *milpa* and fruit trees she grows. She picked a fig, an apple, and an orange and gave them to me to try.

Doña Carmela spoke at length about agroecology and how it intersected with her beliefs about the earth, ecosystems, and human responsibility to the environment. Her family decided to stop using agrochemicals when her mother became ill years prior. Her description of this change illustrates the decision-making process involved (her father making the decision and having the default knowledge about the process), and the effect both the experience and the adaptation had on their farm and her beliefs. She said:

> Entonces iba prosperando más rápido pero fue un … todo había por las insecticidas… mi papa… y empezamos a ver que mi mama empezaba enfermar pero era por los químicos entonces eso fue otra de las cosas que mi papa hizo cambiar. [Papa] dice no pues ella está enfermando al rato pues a mí me enfermara y quien va a trabajar esta vuelta? Entonces era fue un montoncito de cosas y todo que nos hizo de cambiar a lo agroecológico. [16]

She continued about the response of their crops to the change:

[16] Then we were prospering more rapidly but there was a….it was all by insecticides…my father…and we started to see that my mother was getting sick, but it was because of the chemicals, so that was one of the things that my father changed. [My father] said no because she is getting sick soon I will get sick and then who will work? So it was a heap of things that made us change to agroecology.

> Para nosotros sí fue un poco difícil también porque los árboles y todo porque son árboles grandes no es igual como empezar desde que los árboles que vienen creciendo ellos se van acostumbrado a ese tipo de jabón o de fertilizante entonces si también nos disminuir un poquito lo que era la cosecha pero…año con año vaya pasando los árboles van ir adaptando a la nuevo alimenta.[17]

Carmela spoke about her belief that climate change and specifically the negative weather-related experiences she has had were caused by a change in human practices and their effects on the ecosystem. She spoke specifically of falling trees and the use of pesticides and chemical fertilizers. Her beliefs about what had been done to damage the ecosystem and what could be done to repair it were centrally based in her personal experience as a *campesina* and the actions of other *campesinos.* Other interview participants spoke about generational evolution of values or the practices of corporations or wealthy nations, but, illustrated by the following statements, Carmela's interview responses remained centered on the role of the *campesino* in climate change and environmental degradation and protection.

> Eso es a través … a contaminación, talación, pero nos cuesta mucho volver a regresar y todo como vivíamos antes pero... somos muy pocos que vamos intentando pero esperamos...que un día sea mucho más gente.[18]

> Principalmente con la tierra… cuidando la tierra y no contaminándola… yo siento que solamente de esa manera podríamos volver a cambiar nuestro planeta.[19]

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[17] For us, yes it was a little difficult also because the trees and all that.. because they are large trees it is not the same as beginning when the trees are still growing. They are used to that type of soap and fertilizer so it diminished the harvest a little but…year by year the trees will adapt to their new nourishment.

[18] It is through contamination, cutting down trees, but we find it hard to return and go back to how we all lived before but…we are very few that are trying but we hope…that one day there will be many more people.

[19] Principally with the land…caring for the land and not polluting it…I feel that is the only way we can return to change our planet.

> Y cada vez estamos destruyendo lo más y muchos campesinos no empiezan a cambiar su forma de trabajo pues cada vez va a ser más difícil para poder. Las personas que siguen destruyendo sus terrenos yo pienso que en un lapso de tiempo ellos no van a poder cosechar ella.[20]

> Incluso tantas cambios de clima es porque nosotros tenemos demasiadas plagas y por lo mismo que los campesinos le ponen tanto químico en la tierra también los animalitos y todo nosotros nos estamos interrumpiendo su ciclo de vida su ecosistema que ellos tenían.[21]

During the interview, I asked Carmela if she had received any government support after the landslide, and she assured me that no formal support was available from the government. I mentioned that I met a volunteer from Argentina in San Cristóbal who had come to her house to help. She said that *la red*, the organization, had provided both economic support and volunteers to help repair the damages:

> Por parte de ellos sí, hemos tenido apoyo. Pues han venido 3 voluntarios ayudarnos dos días y nos ayudaron económicamente y nos ayudaron para.. para poder este (pointing around).[22]

She also said that people from ECOSUR had come to her house to try to help with the pests that were plaguing her avocado trees. She explained that through ECOSUR and *el tianguis*, she and her family were learning to coexist with other ways of life and work more collectively with other *campesinos.*

[20] And each time we are destroying it more and more farmers are not starting to change their practices then each time it is going to be more difficult to do. The people that continue destroying their land I think that after a while they won't be able to harvest it.

[21] A lot of climate change is because we have too many pests and for that reason farmers put so many chemicals on the land and the little animals we are interrupting their life cycle and the ecosystem that they have.

[22] For some of them yes, we have had support. Three volunteers have come to help us for two days and they helped us economically and helped us to.. to.. do this.

> A través de lo .. de tianguis y de la ECOSUR pues hacemos aprendiendo a convivir con otra manera incluso va a trabajar un poco más en colectivo.[23]

Lucy, Mujeres y Maíz Criollo

I met Lucy through Mari, an organizer of Mujeres y Maíz Criollo. Lucy lives in Amatenango, a community of Tseltal farmers and artisans around 40 minutes from San Cristóbal de las Casas. She lives down the street from her aunts, cousins, and grandparents. After meeting with Mari at the Milpa Comedor Comunitario, I got a ride to Amantenango a few days later from her and a number of other professor-types who were going to Teopisca to work with a new group of women for Mujeres y Maíz. When I arrived in Amatenango, the woman I was meeting (Lucy) wasn't home yet, so I was told to wait at her grandmother's house. Mari introduced me to Lucy's aunt and left. Lucy's aunt then introduced me to the grandparents and brought me a chair while I waited. The grandparents were extremely elderly. The *abuelita* kept telling me she was sick and speaking Spanish that was very difficult for me to understand (not her first language since she and the *tia* were speaking Tseltal mostly). The *abuelo* kept walking back and forth with his cane from a patio out-of-sight to where I sat with the *abuelita* and *tia.* The *tia* was sifting *arena* for the clay pots women in Amatenango traditionally make. She said the *arena* was wet, so she was letting it dry in the sun. Lucy arrived and went to get her cousins and other aunts for me to interview. We sat on the formerly out-of-sight patio and talked for over an hour. Lucy served as a translator from Tseltal to Spanish because many of her aunts and cousins were monolingual.

[23] Through the tianguis and ECOSUR we are learning to coexist with other ways even going to work a little more collectively.

At the time of the interview, they were building an oven at her house for making tortillas. She described the ovens as a better alternative because they use less firewood and keep women from inhaling as much smoke. When I asked what they thought about climate change the group reiterated what I've been told many times: that the rain and drought is variable and drastically affects their harvests, that unpredictable winds have also affected their crops. The group said that before, it was easier to find trees for firewood but now they have to travel farther, using cars and making sure to use all of the limbs and branches, whereas in the past they would only use the trunk. They said that men are responsible for these tasks now, although I saw women carrying small limbs in the streets. The group reiterated the gender division of labor, telling me that in their community women make a lot of clay goods and men are responsible for the majority of farming. After the interview, I accompanied Lucy to her house where she showed me her land and the construction of the oven on her property. Two young men in Western clothes were building it. She said that despite the workshops men in her community have attended, they still used agrochemicals and that a switch away from them has been very difficult. As we walked, she pointed out chemical fertilizers sprinkled among stalks of maize.

When I asked the group if they had noted any change in climate in their lifetimes, Lucy translated the question into Tseltal to the rest of the group, and they all started talking very excitedly, raising their voices over one another. It was the first question I'd asked that elicited such a response. Lucy explained to me that they had all seen increased droughts, along with too much rain, and also illnesses due to the variability of the weather. I asked the group if they thought these changes were an important issue,

and one of Lucy's cousins began crying while she explained in Tseltal that it was a major worry for them. Lucy translated:

> Los cambios climáticos son importantes para el mundo y la comunidad porque es una preocupación que estamos haciendo…cual es lo…lo que está pasando?[24]

She said that the changes in climate were due to cutting down trees, that this was negatively affecting the environment and also making it more difficult to collect firewood. She said that it was now necessary for men in their families and community to collect firewood, because they had to travel farther via motorcycle or car. Lucy later added that *contaminación*[25] was also a contributor to climate change, explaining to me that "…anteriormente sembrada sin nada … pero ya …la revolución verde empezaba usar los químicos."[26] Now the majority of *campesinos* in their community used agrochemicals. However, some were changing to organic practices. Mari, the organizer who had gotten me in touch with Lucy and her family, explained to me previously that there was resistance to the reduction or discontinuance of agrochemical use and that many of the men in these communities were particularly resistant to her input because she is neither a man nor a *campesino*.

During the focus group interview with Lucy and her family members involved in Mujeres y Maíz, they described the negative effects of the increased rain on their families and work. Not only could they not leave the house during heavy rains, "estamos encerradas en la casa," but also this constriction affected their ability to work

[24] Climate change is important for the world and for the community because it is a worry that we have been having… what is it…what is happening?

[25] pollution/contamination

[26] Before we planted without anything…but…the Green Revolution started the use of chemicals.

both in the fields and making and selling pottery. Lucy explained that if maize and bean crops are lost, they have to buy them because they are their main source of nutrition. They believed that men in their communities were most negatively affected by the changes they described. Because men were responsible for agricultural production, they had to find other work when there was a decreased harvest.

Elvia, K'inal Antsetik

I interviewed Elvia in a large conference room with huge murals that depicted indigenous women marching and organizing painted on the walls at the K'inal Antsetik offices in San Cristóbal de las Casas. I was introduced to her through a few visits with the organization, presenting them with my *carta de presentación* and explaining my project to them. Because of the nature of K'inal and its mission, many of the women living in San Cristóbal and working in their offices are involved in Outreach, teaching workshops and traveling to communities. Elvia explained to me that she grew up in a community near the border between Guatemala and Chiapas, working in *el campo* growing maize and beans with her family. She got involved with the Education and Training Center and now works providing workshops for K'inal Antsetik. She is interested in sustainable agriculture and indigenous women's rights to the environment.

Elvia appears to be in her 20's and wears Western-style clothes rather than *traje*. Elvia grew up working on her family's farm and now helps organize workshops to help families change their agricultural practices—cooking with sunlight to use less *leña*, how to produce more from small spaces, and how to grow aromatic crops to repel pests. She told me a bit about how she thinks men and women think differently about the earth and the environment. She believes that women feel they need to care for the environment and men just want to produce more and more quickly. She reiterated resistance to

changing agricultural techniques and that the workshops are important so that people can physically see them in practice. She explained to me part of the resistance is because she is a young woman, “Eres una niña!”[27], and many *campesinos* do not think she can teach them anything. She talked with a lot of passion and excitement about trying new agricultural practices and had some personal experiences with strong winds and excessive rain. She reiterated what almost everyone has said about too much rain, too much heat, and droughts.

Because Elvia had visited so many communities giving workshops, she had a lot to say about how the climate was changing and how it was affecting *campesinos* in the state. “Que pasa con el tiempo?”[28] She explained to me that in the past one could expect certain weather at certain times of year, *tiempo de calor*, *tiempo de lluvia*[29] but now it is disorganized: one will expect heat and it will be cold, expect rain, and it will be dry, and so on. The heat is tremendous, and maize yields have lessened because of it.

“Los campos se inunda y se imagina cuanta gente pierde allí.”[30]

I asked what farmers in this situation do, and she explained to me that many *campesinos* have more than one field. When one is one location does not yield harvests, they are able to depend on the other field or on the *milpa* in a third location. She said that in many communities there is also a network to give land or work to those who have had problems with their harvests. She believes it is because humans are

[27] You are a little girl!

[28] What is happening with the weather?

[29] hot season, rainy season

[30] The farms are flooded and you can imagine what people lost there.

"destruyendo la selva, los bosques, los arboles"[31] and continued to explain its relationship to consumption patterns:

> Yo considero que es como un afectación, no? …del tanto exceso tal vez de.. de lo consumir de productos procesados o fabricados de la industria.[32]

She believes that it is everyone's responsibility to change consumption patterns and begin caring for *madre tierra*. She explained that many people believe their individual actions are too small to have an effect. After the interview she took me on a tour of K'inal Antsetik. I had already seen much of the property previously, but Elvia showed me their small organic garden and their composting area, both used for workshop instruction.

Common Themes

In the following section I describe and analyze the data obtained from my field research in Chiapas, identifying common themes at the micro scale—the individual, family, or immediate community. In many instances, interview participants spoke abstractly about the world, the future, and their place in it. However, participants also spoke about very concrete and personal experience, identity, and culture. I argue that the economic activities undertaken, the types of seeds sown, and the adaptive practices participants were willing to undertake were all informed by personal experience, organization affiliation, and personal or community identity. Furthermore, personal and family safety and ethnic and gender identities shaped the missions and visions of the organizations.

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[31] destroying the rainforests, the forests, the trees.

[32] I consider it like an affectation, no? ..of so much excess maybe of..of the consumption of processed and industrially manufactured products.

During interviews, several women spoke to me about a specific experience or catalyst they attributed to the decision to change their farming or economic practices. For example, two respondents from La Red de Productores y Consumidores Responsables Comida Sana y Cercana described the personal experience of having a community or family member fall ill from what they attributed to the use of agrochemicals as a catalyst for their transition to agroecology. Doña Carmela attributed an illness her mother experienced to her family's decision to stop using agrochemicals. She said that several members of her community had also fallen ill or died due to exposure to agrochemicals. Another respondent from the same organization also experienced a community member falling ill at age 27 due to exposure to agrochemicals. The mission of La Red de Productores y Consumidores Responsables Comida Sana y Cercana reflects this concern about the safety of chemical fertilizers and pesticides, citing worry about the safety of agrochemicals for members' families. Members of Mujeres y Maíz Criollo also expressed concerns about the health and safety of their families. Participants in the focus group all reported increased illness due to more variable climates. Additionally, wood burning stoves are installed on members' properties to decrease the negative health impacts women face due to smoke inhalation. These concerns about the quality of food, the health and safety of family members, and the need for more efficient stoves is a reflection of the gender division of labor in many households, with women responsible for caregiving and meal preparation. Members and organizers of K'inal Antsetik also reported concerns for health and the right to health as important drivers of their work.

Organizational affiliation played a significant role in the perceptions and adaptive practices of women interviewed. Much of what respondents attributed to be the causes of climate change and their resulting adaptive practices could be found in the mission statements of their organizations. Members of La Red de Productores y Consumidores Responsables Comida Sana y Cercana considered unsustainable agricultural practices to be a driver of climate change, choosing to use agroecology as an adaptive and mitigative strategy. Furthermore, organizational affiliation increased social capital, providing access to networks and workshops, and increasing knowledge of alternative agricultural practices and access to niche markets. Organizational affiliation also provided access to disaster assistance. For Doña Carmela, La Red de Productores y Consumidores Responsables Comida Sana y Cercana provided assistance to repair the damages when no governmental assistance was available. She also reported that students and faculty came from ECOSUR to assist with the pests in her avocado trees. For members of Mujeres y Maíz Criollo, the lack of government regulation of agricultural imports (NAFTA) was offset by the creation of the organization.

For a number of respondents, identification as a *campesina* or as an *indígena* was important in their decisions to continue farming despite challenging or even disastrous circumstances. Many respondents employed strategic essentialism to stress the importance of their message. One respondent said, “De la tierra vienes y a la tierra te vas”[33] to describe a *campesina*’s relationship to the land. Furthermore, the importance of personal identity and cultural heritage can also be seen in the missions and visions of the organizations. From Mujeres y Maíz Criollo (2013):

[33] From the earth you come and to the earth you go.

> Otro de los puntos claves de este proyecto es la creación de relaciones solidarias encaminadas a crear una comunidad rural/urbana que vincula de productores/procesadoras/consumidores de maíz criollo en la región, la cual dará difusión a la "cultura del maíz", para la revaloración de su producción y consumo. [34]

In response to an influx of corn from the United States, Mujeres y Maíz Criollo cites the cultural significance of heritage maize varieties as an organizing principle. Similarly K'inal Antsetik's work centers on the representation and empowerment of indigenous women in Chiapas, specifically. When touring their offices in San Cristóbal de las Casas, I was shown a small classroom with Tseltal words written on a white board. I knew that K'inal Antsetik provided health and translation services to women who did not speak Spanish, but my guide explained to me that they also teach Tseltal and Tsotsil to members who do not speak, read, or write an indigenous language.

K'inal Antsetik's website states that one of the most important missions of the organization is to contribute to the "transformation of gender relations" at the household and community levels. They write, "K'inal works to help women gain representation, and thus influence the collective construction of social justice, democracy and autonomy" (K'inal Antsetik 2014). Household and community level gender relations played a significant role in the farming or other adaptive practices respondents were able to undertake. Members of Mujeres y Maíz Criollo described their families' and communities' reliance on agrochemicals despite their insistence that they discontinue their use. Because women in their community play only a small role in farming and

[34] Another of our key points of the project is the creation of solidarity to create a rural/urban community that is connected to the producers/processors/consumers of heritage corn in the region, which will spread "the culture of corn," to revalue the production and consumption of heritage corn.

decision-making related to agriculture, they were often unable to change or influence adaptive practices. Elvia reported this dynamic as common in her work with *campesinos*. La Red de Productores y Consumidores Responsables Comida Sana y Cercana also cites a need to develop new means of communication, decision-making, and organization at the micro-level.

A focus on small-scale, locally based strategies for sustainable development can be seen in the missions and visions of the three organizations. La Red de Productores y Consumidores Responsables Comida Sana y Cercana state that they promote the production and consumption of small-scale locally sourced products and direct trade of products from producer to consumer to bring together rural and urban environments. Antonieta Carolina Reyes Gomez (2010) cites *el tianguis* as a space for new forms of organization, decision-making, communication, and demonstration of new forms of development. Additionally, K'inal Antsetik seeks to change local and community level gender roles for indigenous women as part of a process for societal change. Each organization is not only linked to a network of scholars and activists from the university system present in San Cristóbal, but the organizations are also linked to one another, strengthening local networks. Participants in Mujeres y Maíz Criollo sell their products at *el tianguis* de Productores y Consumidores Responsables Comida Sana y Cercana.

Perceptions of Climate Change

"Hay sequía y hay mucho demasiado de lluvia."[35]

All interview respondents had observed some change in climate patterns during their lifetimes, specifically noting increased variability and intensity in temperatures,

[35] There is drought and there is too much rain.

wind, and precipitation. Additionally, many participants had adapted or diversified their income generating activities in response to these occurrences.

Many participants attributed the changes in climate they experienced to cutting down trees, the use of agrochemicals (literally heating up the *tierra*), and an overall change in lifestyles and values. One respondent reported that, “Es químico lo que hace calentar la tierra.”[36] Other respondents cited the destruction of habitats, of ecosystems as catalysts for climate change and preoccupations for the future. Many interview participants expressed nuanced views about globalization, modernization, development, and how their activities and the activities of their organizations fit into these global processes. The use of agroecological methods and heritage maize varieties were often linked not only to thoughts and observations about climate change but also to their views about the environment, globalization, and modernization.

“Porque antes este la vida era más saludable, más sana, más tranquila”[37]

Adaptive and Mitigative Practices

Membership in organizations, creating and utilizing niche markets, agroecology, seed selection, and diversification of economic activities were all adaptive strategies undertaken by interview respondents. Membership in the organizations themselves provided an important network and support system to aid in disaster relief, share skills, and generate income.

Agroecological methods, a focus on locally produced and consumed products, and the construction of fuel efficient wood burning stoves were all mitigative strategies

[36] It is the chemical that heats up the land.

[37] Because before this life was healthier, purer, more tranquil.

undertaken by participants. Because many participants believed that agrochemicals contributed to climate change, I consider their use of organic and agroecological farming methods a mitigative strategy. Additionally, the focus on small-scale local production and consumption not only reduces the use of fuel and carbon emissions, but can also be considered a mitigative strategy due to participants' views about globalization and modernization as drivers of climate change. Many participants attributed climate change to cutting down trees, a loss of forest cover, and the destruction of habitats. The construction and use of fuel-efficient wood burning stoves reduces both carbon emissions and the need for firewood and is also a mitigative strategy.

CHAPTER 4
POLICY AND PROGRAMS

There are areas of both harmony and dissonance between conversations I had in the field and strategies outlined in the CSA and *Tortillas on the Roaster* report. In this chapter I summarize and point out key aspects of both reports and assess the gender component of each. I then place observations from the field into the context of each of these programs, identifying areas where they come together and divide. I argue that many of the practices and perceptions I observed in the field could be considered Climate Smart Agriculture approaches, however they were successful due to their local creation, specificity to the people involved, and their context. Many of the strategies outlined in *Tortillas on the Roaster* report were also observed. However, diversification out of agriculture as an adaptation strategy was not practiced and was not an option for participants in this study. Furthermore, the *Tortillas on the Roaster* report does not offer suggestions for mitigation strategies although all of the women and organizations who participated in this study were strategically mitigating climate change. In the last section of this chapter, I analyze policies previously used to contextualize this study, observations from field research, and the CSA and *Tortillas on the Roaster* report.

Climate Smart Agriculture

Climate Smart Agriculture is “agriculture that sustainably increases productivity, resilience (adaptation), reduces or removes greenhouse gases (mitigation) and enhances achievement of national food security and development goals” (FAO 2013, 548). By addressing climate change, food insecurity, and poverty simultaneously, CSA aims to be a more efficient use of resources than single-focus strategies. The Climate Smart Agriculture (CSA) model includes a three-pillar approach to climate change

mitigation and adaptation: (1) sustainably increasing agricultural productivity and incomes; (2) adapting and building resilience to climate change; (3) reducing greenhouse gas emissions (FAO 2013). At the very base of CSA is a focus on more sustainable farming, forestry, and fishery practices; and the concept contributes to the United Nations 17 Sustainable Development Goals. CSA is not a single specific practice or technology that can be universally applied. It requires site-specific assessments to identify appropriate agricultural technologies and programs.

The Climate Smart Agriculture Sourcebook points out that climate change may be felt in agriculture in the form of both variability and slow onset changes. They write that the focus of most research has been on the effects of these slow onset changes, while less is known about the effects of variability, which may in fact be felt sooner. Because variability changes are easier for farmers to comprehend, adaptations to increased variability may be a way to also prepare for slow onset changes (6). While agriculture may account for 13.5 percent of global GHG emissions (IPCC 2007), the CSA Sourcebook highlights the need to look vertically "beyond the farm" into the food chain, food system, and forest impacts (7).

The CSA Sourcebook focuses on the need for more efficient systems. It states, "Reducing emissions per kilogram of a given output might well be, for food security and agriculture, one of the main targets. Direct gains through increased efficiency also imply a series of indirect gains. These indirect gains include reduced emissions from deforestation as less land is necessary to produce the same amount of food" with a footnote that considers the challenge in comparing "outputs" due to the fact that foods have varying nutritional content (8). For plant agriculture they cite the need for

sustainable crop production intensification or “save and grow” techniques. Save and Grow intensification is productive while also conserving and enhancing natural resources, using an ecosystem approach. In this section of the report, they acknowledge problems associated with the overuse of agrochemicals:

> Increasing the sustainable intensification of crop production is achievable. This can be done through increasing resource use efficiency and cutting the use of fossil fuels. This saves money for farmers and prevents the negative effect of over-use of particular inputs. Inefficient fertilizer use is common in many regions. In some cases, this is a consequence of government subsidies. Yet over-use does not have the intended impact on plant growth and can result in the contamination of ground and surface water. Inappropriate insecticide use may actually induce pest outbreaks by disrupting the natural population of predators. Overuse of herbicides can lead to the emergence of herbicide-tolerant varieties of weeds. (2013, 11)

While the report at no point uses the term “agroecology” both “Save and Grow” techniques and the landscape approach identify and promote practices that are commonly included in agroecological strategies. The landscape approach uses the principles of natural resource management that recognize “the value of ecosystem services to multiple stakeholders” (45). The landscape approach includes societal concerns related to sustainable development. Furthermore, the CSA Sourcebook later promotes the diversification of crops to improve resilience of agricultural systems and the inclusion of legumes in crop rotations to exploit microbes that fix nitrogen (*frijol* in *milpas*). They attribute the diversity of production at farm and landscape level to increased income and the development of local markets (23).

The CSA Sourcebook calls for a gender-sensitive approach, asserting the importance of gender-aware approaches in bringing about results from a CSA project. The report acknowledges the diversity of gender relations, demographic trends and cultural identities, and that failing to acknowledge these processes into a CSA system

could “cause profoundly negative consequences for long-term sustainability” (55). It is, however, somewhat difficult to analyze the gender component of CSA through the CSA Sourcebook. A simple search for “gender” in the document yields only 43 results in 557 pages. “Women” are mentioned specifically 97 times. Although two women are featured on the cover of the Sourcebook, a mention of women or gender specifically does not occur in the Executive Summary or in the main text of Module 1: Why Climate-smart agriculture, forestry and fisheries. The first five mentions of women are in “boxes” outside of the central text of the Sourcebook. Module 2 features the first mention of women or gender in the main text, (page 54) briefly mentioning that both men and women should be represented in the planning of landscape approaches to Climate Smart Agriculture. All in all, women are mentioned in “boxes”, tables, reference lists, and photo captions 61 out of 97 total mentions, which leaves 36 instances where women were mentioned specifically in the main text of the CSA report. 28 of the 43 mentions of the word “gender” are also in boxes, tables, reference lists, or photo captions. Men were specifically mentioned only 20 times and only in relation to women (“men and women”, etc.).

Tortillas on the Roaster

The purpose of the *Tortillas on the Roaster* study was to predict the impact of climate change on smallholder maize and bean production in Central America and identify adaptation strategies. Although the majority of the report deals with expected climate change impacts at a local and regional level, the report includes adaptation and mitigation recommendations based on a “vulnerability analysis” of the region. The authors cite two main activity lines: analysis of climate change impact and targeting future interventions (16). They identify “hot spots” for each country and focus areas for

different adaptation scenarios across all the countries. The adaptation areas are as follows:

- Areas where maize-bean systems are no longer an option – Hot Spots
- Areas where maize-bean systems can be adapted – Adaptation Areas
- Areas where maize-bean systems will be established – Pressure Areas (29-30)

The report is mainly a technical report, predicting and illustrating rainfall, temperature, and production changes by country and city, so I will focus on the chapters that predict socio-economic impacts and focus area vulnerability. The authors collected information on vulnerability through focus group assessments and farm-level surveys. They write:

> The survey information is primarily aimed at the estimation of the vulnerability index of the household, which is composed of three composite indices: 1) the level of exposure of the maize-beans cropping system to changes caused by climate change, 2) The level of sensitivity of the household to the change in maize-beans production, and 3) the resilience or adaptive capacity of the household. (32)

In a section called “Development of local adaptation strategies” the authors say they “tried to generate ideas from participants” and incorporate those ideas into their strategy. Unfortunately, nowhere in the report do they detail those ideas and how they were incorporated. Although their report found that maize and beans are the primary sources of energy for the households who participated in the study, due to the difficulty estimating household consumption, only income generated from maize and beans, exposure to climate change and household adaptive capacity were used to estimate household sensitivity. The adaptive strategies outlined are sustainable intensification, diversification, expansion of assets, increasing off-farm income, and diversification out of agriculture as a livelihood strategy. The report defines sustainable intensification as

agriculture that is “aimed at increasing physical productivity while preserving natural resources (land and water) in productive systems (eco-efficiency)” (107). Diversification is defined as creating an integrated system that includes livestock, varied crops, and agroforestry systems. The authors define expansion as both the increase of land occupation and the increase in “natural, physical, financial, human and social capitals” (110).

It is impossible to analyze the gender implications of this report, because there is no identification or discussion of gender dimensions whatsoever. A search for the term “gender” yields zero results. Men specifically are not mentioned at all, and women mentioned only once. The report does not indicate the gender of *campesinos* who participated in focus groups or interviews or a typical gender division of labor for a household in the region. While the report does mention briefly that maize and beans are integral to regional culture, they do not include this factor into their recommendations for adaptation and do not take into consideration the cultural appropriateness of proposed strategies. Ironically, despite these findings, the report is named after tortillas—a maize product typically made by women.

Climate Smart Agriculture in Practice

Because the CSA approach recommends site-specific programs for adaptation to and mitigation of climate change, many of the strategies undertaken by women participants in the three organizations could be considered a Climate Smart Agriculture approach. In Table 4-1 and the following section I organize some of their practices into the three pillars of CSA.

Participants in all three organizations were sustainably increasing agricultural productivity and incomes (pillar 1). Through membership in organizations, participants

were able to learn and teach new agricultural techniques, gain social capital, and in many instances were provided with access to niche markets through their organization. *El tianguis* provided members of their organization with both an outlet to sell organic products for higher prices than would be gained at the traditional market and a customer base interested in organic produce and specialty products. For Doña Carmela, for example, membership in La Red de Productores y Consumidores Responsables Comida Sana y Cercana provided her with an economic outlet to sell avocado oils and preserved fruits when her harvest was compromised by natural disasters and pests. Membership in Mujeres y Maíz Criollo provided women and their families with a collective that could increase income and protect against economic shocks. The organization also provided members with access to niche markets at both La Milpa Comedor Comunitario and *el tianguis*. Advocating a *cultura del maíz*, as Mujeres y Maíz Criollo seeks to do, generates income by promoting their product and cultivating a consumer base interested in traditional and heritage maize varieties and products. All of the women interviewed considered agroecological methods more environmentally sustainable and less input intensive.

Participants were adapting and building resilience to climate change (pillar 2) also through agroecological methods, diversification of activities and products, the creation of collectives and networks through their organizations, and the transformation of gender relations at the local level. Members of K'inal Antsetik explained the promotion of varied crops, planting vegetables, aromatics, maize, and beans to build a healthier agricultural ecosystem and also ensure income and food security if one crop suffers a loss. All of the participants who advocated for agroecology explained that it

created healthier and more resilient soils and healthier and more resilient individuals and communities. Many participants adapted to changing environmental realities by diversifying their products and economic outlets—making cheeses, jams, and oils to sell in *el tianguis.* The social and professional networks and communities that organizational membership provided were also tools (social capital) to adapt and build resilience to climate change. Organizations provided both access to support for disaster relief and culturally and situationally appropriate expertise. The collective capacity of Mujeres y Maíz is an adaptation strategy. Forming a collective provided protection and assistance when, due to economic liberalization, governmental protections were no longer available. Every organization and interview respondent adapted their agricultural practice by attending or providing workshops to share and learn new knowledges and skills. Furthermore, I consider a transformation of gender relations to be an adaptation strategy. Because the gender division of labor, household or community level gender relations, and personal gender identity were found to significantly affect the adaptation strategies participants in this study were willing or able to undertake, cultivating more positive and equitable gender roles and relations creates new possibilities for and added insights to climate change adaptation.

Interview respondents also participated in mitigative activities (pillar 3) through their organizations. Each of the mitigation strategies that participants undertook was related to what they perceived to be a driver of climate change. For members of Mujeres y Maíz Criollo, the organization was able to help them install fuel-efficient wood burning stoves that decreased both carbon emissions and the need for firewood. The women who participated in the focus group cited difficulty accessing firewood as

evidence of tree cover loss that contributed to increased climate variability. The input intensity of using agrochemicals, coupled with the belief that they were contributing to climate change, make agroecology a mitigative activity for the women who participated in this study. Agroecology's holistic ecosystem approach garnered increased understanding of how agricultural systems might contribute to changing environmental realities. The women who participated in this study expressed complex views about how globalization and modernization contributed to climate change by provoking shifts in cultural values. Through the cultural revaluation of maize, the *milpa*, and traditional agricultural practices, participants were also mitigating climate change. Finally, and related to this revaluation approach, participants were focusing on local development as a mitigative strategy. The organizations in this thesis valued, small-scale, locally sourced products and markets, decreasing fuel use and carbon emissions through lengthy transport of export and import goods.

The identification and targeting of niche markets created by a politically and environmentally aware customer base in San Cristóbal generated opportunities for building resilience, sustainably increasing livelihoods, and decreasing carbon emissions. Although many of the practices I observed in the field fit into this Climate Smart Agriculture framework, their success was wholly dependent on their context—rooted in the history, economics, politics, and the social and cultural composition of the city, state, and country. Participants built and organized their programs through sharing knowledges of the past, experiences of the present, and visions for the future. Each of the organizations attributed their creation to a common concern, experience, or interest. While every organization was connected to scholars and activists in the area, many

involved in the organizations noted that *campesinos* and *indígenas* preferred to learn and were more receptive to learning from other *campesinos* and *indígenas.* I found from my interviews that personal identification and personal experience had profound impacts on the adaptive practices of farmers and their families. CSA calls for culturally appropriate, site specific, and gender sensitive agricultural programs for climate change, but participants and organizations involved in this study reached beyond this—seeking to transform and create new pathways for local development.

The CSA Sourcebook mentions gender mostly as an aside—referencing cases where women were involved in a program, the particular vulnerability of women, and the need to consider local gender relations and the gender division of labor when implementing this approach. However, in the three organizations featured in this thesis, gender identity and gender relations were integral to the process of developing and working in their organizations. In many cases the transformation of gender relations or the gender-specific roles women and men played in agricultural activities were foundational aspects of the organization. Many women interviewed saw gender identity as an important factor in how decisions about agriculture and the environment were made at household, community, and societal levels.

Tortillas on the Roaster in Practice

The *Tortillas on the Roaster* report provides valuable data for the prediction of climate change "hot spots" and its effects on maize and bean production. Because maize and beans are so important for food security and cultural identity in the region, predicting future climate change impacts on these crops could better prepare farmers to adapt to and mitigate changes. Three of the five adaptation strategies outlined in the *Tortillas on the Roaster* report have many observed applications in the field. The

adaptive strategies outlined are sustainable intensification, diversification, expansion of assets, increasing off-farm income, and diversification out of agriculture as a livelihood strategy. While many study participants were sustainability intensifying and diversifying their products through workshops and networks created by their organizations (described above), diversification out of agriculture was not practiced and not a possibility for many interview respondents. In Table 4-2 and the following section, I organize the observed practices and perceptions into the five adaptation strategies in *Tortillas on the Roaster.*

Applying the definition of sustainable intensification provided by the authors of the report, participants in this study were undertaking this adaptation strategy by practicing agroecology. All of the women interviewed considered agroecological methods more environmentally sustainable and less input intensive. Participants diversified through agroecological methods, planting *milpa*, raising small animals, and making oils, jams, tortillas, and other prepared products. Furthermore, participants were diversifying economic outlets through utilizing niche markets at *el tianguis*, ECOSUR weekly markets, and the Milpa Comedor Comunitario. Because the author's used such a broad definition of "expansion of assets," a large portion of the adaptive practices observed fall into this strategy. Organizational membership increased social capital in numerous ways: by providing networks of support and exchange, increasing knowledge of agricultural practices, and through the transformation of gender relations at the community level. Additionally, as Elvia and others described, maintaining two plots of land is common practice and provides a safety net if problems arise on one plot.

Some participants were increasing off-farm income. Members of Mujeres y Maíz Criollo described off-farm work men in the community would do when there were problems with crops or low yields, and women in Amatenango made clay pottery to sell at roadside markets. Furthermore, the Milpa Comedor Comunitario provided additional non-agricultural income, although many of the products sold were reliant on agricultural inputs from member farms. At *el tianguis*, many vendors sold prepared foods (also reliant on agricultural inputs) and non-agricultural products such as medicines, and woven or fabric items. While many participants generated income off-farm, diversification out of agriculture was not observed and was not a possibility. *Campesino* identity, the consumption of maize, and the cultivation of *milpa* were ultimately defining factors in many participants' lives—sin maíz, no hay país, etc. Even for Doña Carmela who had suffered so many setbacks she was not able to sell at *el tianguis* when I interviewed her, discontinuing agriculture was not an option.

Although agriculture is one of the leading causes of greenhouse gas emissions, the *Tortillas on the Roaster* report does not offer suggestions for mitigation of the climate change impacts it predicts. The authors write that "sustainable intensification" strategies are "climate smart" and a "win-win situation" through the possibility of mitigating effects (114). Insinuating that mitigation activities need be accidental for Central American farmers discounts the strategic ways participants in this study have contributed to reducing carbon emissions. Because the women who participated in this study were part of organizations that not only practiced certain mitigating activities amongst themselves, but also promoted their practices through workshops and cultural activities, their mitigative potential was much higher than one smallholder on-farm might

have. La Red de Productores y Consumidores Responsables Comida Sana y Cercana wrote a short article on their website on November 11, 2010 describing climate change. The article concludes with the following:

> Las acciones individuales tienen consecuencias globales. Cada cosa que haces tiene repercusiones en tu vida y en el medio ambiente…Haz parte de la lucha contra el cambio climático.[38] (La Red de Productores y Consumidores Responsables Comida Sana y Cercana 2010)

Other Policies and their Implications

The process of trade and financial liberalization, market deregulation, privatization, and a drastically reduced role of the state in economic regulation associated with neoliberal reforms (Moreno-Brid et al. 2009) pushed the agricultural sector away from small-scale or subsistence production towards agro-industry, a known major contributor of greenhouse gas emissions. The practices observed in my research in Chiapas and the climate change adaptation and mitigation programs discussed also exist in the context of social, political, and economic systems and historical processes. The effects of NAFTA was cited as a catalyst for the creation of Mujeres y Maíz. I argue that NAFTA, the historical processes leading up to NAFTA (*ejido* system and a legacy of uneven development and disenfranchisement of indigenous peoples), and the resulting indigenous rebellion have created a population with a particular social and political consciousness in San Cristóbal de las Casas and a niche market to accommodate it. La Red de Productores y Consumidores Responsables Comida Sana y Cercana and Mujeres y Maíz Criollo utilizes and strengthens this niche market created

[38] Individual actions have global consequences. Each thing that you do has repercussions en your life and in the environment…Be a part of the fight against climate change.

by EZLN solidarity tourism and local movements towards sustainable (post) development.

Appendini writes that small farmers and maize producers were considered "inefficient" in the context of Mexico's push for modernization in the 20th Century (2010, 6). The CSA Sourcebook reiterates this push for "efficiency" to smallholders in order to adapt to and mitigate climate change, using the words "efficient" or "efficiency" 404 times throughout the text. CSA defines efficiency as producing more of a given output by using less of a given input, including less land, less fertilizer, and less energy (2013, 8). However, just as Doña Carmela described the slow transition in cultivating her trees with agroecological methods, moving to more sustainable practices may not yield results that fit this definition of efficiency. In San Cristóbal de las Casas at *el tianguis*, organic and agroecologically produced goods sell for higher prices than those at conventional markets; and for many interview respondents and their organizations, the cultural significance of certain (possibly inefficient) methods, varieties, and networks had value that could not be factored into the CSA definition of efficiency.

Table 4-1. Adaptive Practices and Perceptions into CSA Pillars

Climate Smart Agriculture Pillar	Practices Observed
Sustainably increasing agricultural productivity and incomes	working with organizations to learn agroecological methods & promote traditional seed varieties, diversifying markets and products, access to niche markets
Adapting and building resilience to climate change	diversifying crops, farming practices, products (making oils, jams, tortillas, raising small animals), and markets (La Milpa Comedor Comunitario of Mujeres y Maíz Criollo, el tianguis and ECOSUR weekly markets), attending and holding workshops, creating networks, collectives, and communities of support, transformation of gender relations at the local level
Reducing greenhouse gas emissions	building ovens to reduce firewood use, reducing the use of and reliance on agrochemicals (considered a driver by respondents), reducing transport of products, reducing the use and cultural significance of processed and packaged foods

Table 4-2. Adaptive Practices and Perceptions into *Tortillas on the Roaster* strategies

Tortillas on the Roaster Strategy	Practices Observed
Sustainable intensification	practicing agroecology.
Diversification	diversifying crops/polyculture systems, diversifying markets and products, farming practices, products (making oils, jams, tortillas, raising small animals), and markets (La Milpa Comedor Comunitario of Mujeres y Maíz Criollo, *el tianguis* and ECOSUR weekly markets).
Expansion of assets	attending and holding workshops, creating networks, collectives, and communities of support, transformation of gender relations at the local level, planting two or more agricultural plots.
Off-farm income	La Milpa Comedor Comunitario, selling non-agricultural products at *el tianguis*, men in Mujeres y Maíz households/communities earning off-farm income.
Out of agriculture	Not observed.

CHAPTER 5
CONCLUSION

In this chapter I begin by specifically reiterating the findings of this thesis as they related to the research questions proposed in the introduction, addressing how place-based approaches connect with global and national processes and projects, including Climate Smart Agriculture and the strategies outlined in Tortillas on the Roaster. Based on my research findings, I then offer suggestions for more effective policymaking, including agroecology and food sovereignty approaches. The chapter ends with suggestions for further research.

Research Questions

At what points and on what issues do these place-based practices and perceptions connect or fail to connect with processes and ideas operating at national and global scales?

The place-based practices and perceptions discussed in this thesis are *part of* processes and ideas operating at national and global scales. Each organization and its members connected with these ideas and processes when they developed their organizations and adapted their practices to changing environmental, social, political, and economic realities. Participants built and organized their programs through the shared experience of these processes. To see the ideas promoted locally by these organizations on a global scale would mean a radical economic and social reorganization and cultural revaluation. However, many of the driving factors behind these organizations (mostly those related to the environmental sustainability of food systems) are present in new strategies like Climate Smart Agriculture in extremely diluted forms. In reports like *Tortillas on the Roaster* there is a greater divide between what practices were observed in this thesis, those promoted as adaptation strategies,

and the conceptualization of what it means to truly adapt to or mitigate climate change. Interview participants and their organizations framed their perceptions of climate change and their adaptive and mitigative practices through personal and cultural identity and experiences, and the *Tortillas on the Roaster* report completely fails to consider these facets of agricultural decision making.

How do practices and perceptions observed in Chiapas fit into the Climate Smart Agriculture development model promoted by the United Nations?

Participants in all three organizations were sustainably increasing agricultural productivity and incomes (pillar 1). Through membership in organizations, participants were able to learn and teach new agricultural techniques, gain social capital, and in many instances were provided with access to niche markets through their organization. Participants were adapting and building resilience to climate change (pillar 2) also through agroecological methods, diversification of activities and products, the creation of collectives and networks through their organizations, and the transformation of gender relations at the local level. Interview respondents also participated in mitigative activities (pillar 3) through their organizations. Each of the mitigation strategies that participants undertook was related to what they perceived to be a driver of climate change. These practices included installing fuel-efficient wood-burning stoves, cultural revaluation of maize, the *milpa*, and traditional agricultural practices, agroecology, and a focus on local development. Although many observed practices fit within the CSA approach, I argue that their success is wholly dependent on their context and local creation. Through the research undertaken for this thesis, I found that social, cultural, historical, economic, geographical and political contexts, personal identity and gender identity all had profound effects on perceptions of climate change and its causes and

the adaptive and mitigative activities participants were willing or able to undertake. CSA calls for culturally appropriate, site specific, and gender sensitive agricultural programs for climate change, but participants and organizations involved in this study reached beyond this to transform and carryout new visions of development.

Furthermore, the CSA program mentions gender mostly as an aside while the organizations featured in this thesis cited gender as both foundational and driving aspects of their work. Gender identity and gender relations were integral to the process of developing and working in their organizations, and the transformation of gender relations or the gender-specific roles women and men played in agricultural activities were foundational aspects of the organizations. Many women interviewed saw gender identity as an important factor in how decisions about agriculture and the environment were made at household, community, and societal levels.

What insights, questions, or options emerge from conversations with women in Chiapas that might be relevant for global understandings and actions related to climate change?

The results of the conversations I had with women in Chiapas have many relevant applications to global understandings and actions related to climate change. Much of the development literature about to gender and climate change casts women as victims (or a particularly vulnerable segment of the population) that can be used strategically for adaptation and mitigation projects dreamed up by development practitioners and policymakers. However, the women who participated in this study had their own ideas about climate change, the environment, and the meaning of development. With the help of their organizations they created communities of practice, strengthening markets and the cultural value of certain practices and products.

Furthermore, participants reiterated that *campesinos* and *indígenas* were more apt to learn from other *campesinos* and *indígenas*, meaning that the top-down implementation of agricultural development programs is less likely to be effective than locally developed strategies. Locally developed strategies such as those discussed in this thesis are also more able to create culturally and situationally appropriate strategies, such as the utilization of niche markets, the revaluation of maize and the *milpa*, and the establishment of collectives and networks to provide protections against the effects of trade liberalization and a lack of governmental support.

Food Sovereignty, Agroecology, and Campesino a Campesino

Based on the findings from my field research and the analysis of policy reports, I believe that a food sovereignty approach to climate change adaptation and mitigation is a more appropriate site-specific approach than Climate Smart Agriculture. Food sovereignty is an idea launched and promoted by La Via Campesina, an international peasant movement for small-scale agriculture. They write:

> Food Sovereignty is the right of peoples to healthy and culturally appropriate food produced through sustainable methods and their right to define their own food and agriculture systems. It develops a model of small scale sustainable production benefiting communities and their environment. It puts the aspirations, needs and livelihoods of those who produce, distribute and consume food at the heart of food systems and policies rather than the demands of markets and corporations. (La Via Campesina 2011)

Using examples of agroforestry, *milpa*, and uses of wild varieties in smallholder systems, Chappell et al. (2013) argue that a food sovereignty framework that utilizes agroecological methods would support biodiversity, rural livelihoods, and global food production. They write:

> Food sovereignty is an approach originating from the rural poor of Latin America (and beyond) that unites efforts to address unbalanced

> international trade policies, historical legacies and continuation of inequality, and the continuing consolidation of agricultural modernization policies often associated with negative impacts for small-scale farmers and sustainable ecosystems….The high on-farm biodiversity associated with smallholder agroecological practices has been empirically tied to greater stability in income and recovery from environmental disaster (i.e., resilience) greater food security, and generally positive effects for associated biodiversity. (10)

Food sovereignty advocates for a systemic change founded on the aspirations, rights, and needs of people. While CSA requires site-specific assessments to develop appropriate programs, the strategies undertaken by the organizations and their members in this study were locally developed and rooted in shared experience and cultural practice. Furthermore, food sovereignty incorporates the transformation of gender, class, generational, and racial relations into its philosophy (Nyéléni Declaration 2007).

Techniques from Movimiento Campesino a Campesino (MCAC) as described by Eric Holt-Giménez (2006) could also be utilized as climate change mitigation and adaptation strategies. Because many participants in this study reported that farmers preferred to learn from other farmers or specifically from other indigenous farmers, sharing approaches to climate change adaptation and mitigation farmer to farmer would increase the likelihood that beneficial changes will be adopted. Holt-Giménez (Ibid.) describes the transformative nature of this movement:

> As such, sustainable agricultural development cannot be viewed as just a collection of projects and techniques, but as part of a larger process of *social change*. With hundreds of thousands of members and over a hundred grassroots organizations, the MCAC provides us with a view from the actors on the ground involved in this change. (xvii-xviii)

Similarly, members of all three organizations in this thesis saw their practices and organizational participation as part of social transformations based on their alternative

visions for the future. Utilizing grassroots organizations and community-level exchange of knowledges for social change makes possible the integration of a transformation of gender relations into agricultural movements.

Limitations of the Study and Suggestions for Further Research

Spending only eight weeks in San Cristóbal de las Casas limited my ability to make contacts and arrange visits and interviews with a larger sample of participants. The study would have greatly benefitted from more interviews and site visits. Additionally, because I only interviewed women who participated in the three organizations outlined in this thesis, their experiences are not necessarily representative of most rural women in Chiapas. While their particular experiences are vital to understanding the value of support networks and organizations on farmer adaptation and mitigation strategies, their approaches to dealing with economic or environmental struggles do not represent the full range of possibilities. Specifically, no participants in this study had a family member migrate or leave agriculture because of economic or environmental pressure.

The women I interviewed for this thesis had profound statements and visions about agricultural practices and development. Therefore I suggest further study into grassroots movements as approaches to climate change adaptation and mitigation. Rather than policy reports with boxes (asides) outlining case studies in which women participated, the transformation of gender relations should be integrated into climate change development policies. Looking to movements like La Vía Campesina and Moviemiento Campesino a Campesino could provide insight into this process. Just as Holt-Giménez (2006) and Terry (2009) argue, agricultural practices and climate change cannot be isolated from the larger processes of social change (in Terry's case gender

justice). The organizations and their members who participated in this study saw the links between their own practices (and household and community level gender relations), national and global policies, and societal change. Further research and policymaking should also consider these linkages. Finally, research on climate change would benefit from further study into organizations and support networks as climate change adaptation strategies.

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