

Linking Agroecology and Household Food Security: Producer Experiences at the
Tianguis “Comida Sana y Cercana” in Chiapas, Mexico

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A Thesis Submitted to
Saint Mary’s University, Halifax, Nova Scotia
In Partial Fulfillment of the Requirements for
The Degree of Masters of Arts in
International Development Studies

November 2012. Halifax, Nova Scotia

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Abstract

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Abstract: The attainment of food security has long been an important issue in the field of development. Interestingly, a large percentage of those considered to ‘food insecure’ belong to the households of small-scale agricultural producers. The practice of agroecology is emerging as an accessible and secure means of production for such households. Moreover, it has been argued that producers can earn higher incomes due to the increasing demand for certified ‘organic’ products. Using the case of small-scale producers in Chiapas, Mexico, this thesis seeks to explore the impact that agroecological practices can have on food security within producer households. As it shall be argued, the diversity and stability inherent in the practice of agroecology provides producers with a means of achieving household food security. Moreover, producer participation within a local food market, which provides them with fair selling conditions and a sense of community, strengthens such conditions.

November 2012

Acknowledgements

Thank you to my supervisor, Dr. Ryan Isakson, for his guidance throughout both this thesis project and much of my academic career. Many thanks to Dr. Helda Morales, for inviting me to San Cristóbal and supporting my field research. As well, thank you to Anne Greenberg for her assistance during interviews and insight into agroecology in Chiapas.

To my friends and family, for their constant encouragement and support.

Above all, I would like to thank the producers of the Tianguis for their patience, hospitality and enthusiasm throughout my field research.

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Acronyms

CAT	Technical Assistance Committee (Comité de Apoyo Técnico)
CSA	Community Supported Agriculture
DFID	Department for International Development
EP	Equipo Promotor
FAO	Food and Agricultural Organization
Glopolis	Prague Global Policy Institute
IAASTD	International Assessment of Agricultural Knowledge, Science and Technology for Development
IPC	International Planning Committee for Food Sovereignty
Ifoam	International Federation of Organic Movements
Kcal	Kilocalorie
MXN	Mexican Peso
NAFTA	North American Free Trade Agreement
NGO	Non-Governmental Organisation
NOSB	National Organic Standards Board
PGS	Participatory Guarantee System
REDAC	Mexican Network of Organic Markets (Red Mexicana de Tianguis y Mercados Orgánicos)
USD	United States Dollar

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Chapter One

Introduction

1.1 Thesis Problematic

Food insecurity and hunger have long been important issues in the realm of development. In the attempt to combat food insecurity throughout the world, a push was made to drastically increase agricultural production, as it was believed at the time, that conditions of food insecurity were a consequence of insufficient food supply. The agricultural practices that emerged rely heavily on inputs such as specialized seeds, chemical fertilizers, pesticides and irrigation and the technique of monocropping.

Though these practices have greatly increased overall production levels, very little has been accomplished in the way of eliminating food insecurity. In fact as Weis (2007: 11) states, “there has never been more food available per person on a global scale than there is today¹”, yet large portions of the global population continue to live in conditions of food insecurity.

The consequences of modern agricultural practices are widespread and far-reaching. Not only has food insecurity continued to persist but the specialization of agriculture has led to an increasingly simplification of diets worldwide. It is estimated that as many as two billion people currently suffer from some form of

¹ Though it is recommended that a person consume 2,200 calories daily, enough food is produced worldwide to provide 2,800 calories per person (Chappell & LaValle, 2011: 6).

nutrient deficiency (Frison *et al.*, 2006: 168), often referred to as “hidden hunger” (Kennedy 2003; Pisupati 2004). Such conditions are a consequence of the increasing inability of much of the global population to diversify their diets and access food items containing higher levels of micronutrients.

The environmental and social consequences have also been devastating; leading to an extensive loss of biodiversity and the erosion and degradation of the very land upon which the global populations subsists. The dependence on costly chemical inputs has placed many producers in a price squeeze, in which their expenses continue to rise as their profits drastically decrease. In fact, though they themselves are producing food, small-scale producers and their households account for “half of the hunger worldwide” (UN Millenium Project, 2005: 104). It is becoming increasingly clear that the current system of agricultural production is both insufficient in meeting the needs of the global population, as well as unsustainable.

A variety of pathways forward have been presented, one of which is the practice of agroecology. Relying on the use of locally available and accessible materials and technologies, as opposed to the purchase of various inputs, agroecology is thought to possess the potential of reshaping agricultural practices. Moreover, it is often stated that through such practices small-scale producers can earn higher profits and subsequently improve conditions of food security within their households. In order to do so however, producers need access to suitable markets and the certification of agricultural products is often necessary; which in itself provides many obstacles that can impede a small-scale producer from fully

benefiting. With this in mind, new initiatives are commencing, which seek more easily facilitate certification for such producers, as well as generate local demand for their products.

The focus of this thesis project is therefore two-fold. Firstly, it is to explore the impact that agroecological production practices can have on the household food security of small-scale producers. Subsequently, the second dimension is to explore the potential benefits that producers can derive from selling such goods and being a participant in a local food market system. This was accomplished through field research, working with agroecological producers in Chiapas, Mexico. The common denominator among these producers is that they all retail some portion of their products at a local farmer's market. Therefore, the Tianguis "Comida Sana y Cercana" provides a perfect environment in which these two elements- production and retail- intersect.

Throughout this thesis I will argue that the diversity and stability inherent in the practice of agroecology provides small-scale producers with a means of achieving household food security. Moreover, producer participation within a certified local food market program, which provides them with fair selling conditions, strengthens such conditions.

1.2 Methodology

To address the objective of this thesis project, both an extensive review of relevant literature and field research were undertaken. Field research was conducted over a six-week period between October and December 2011, with the focus of capturing the experiences of agroecological producers participating in the Tianguis “Comida Sana y Cercana”², or “Healthy and Local Food” market, located in San Cristóbal de Las Casas, Mexico. The main source of data was collected through fourteen structured interviews with members of twelve participating households³. Multiple members from two of the households were interviewed because the family representatives who sell at the Tianguis are not fully active in the production process and were thus unable to confidently answer key questions. In such instances responses were often very similar, with only few and minor discrepancies.

The sample of households interviewed was largely determined by the availability of the producers but was also selected to reflect the diversity of products and experiences among those participating. Of the twelve households, six sold vegetables at the Tianguis. Among those six households, four produce an assortment of vegetables while the remaining two market more specialized products at the Tianguis. Two households sold processed goods (namely cheese and mango products) while another three households sold prepared goods such as

² Henceforth referred to as the Tianguis, which is the Nahuatl word for open-air market.

³ Interviews were completed through the aid of a translator, who provided both a clear understanding and consistency throughout the research period.

candied fruits, tortillas and tamales. The remaining household raised livestock and sold a variety of animal products.

To accommodate producers' schedules, interviews were generally conducted at the Tianguis during market hours. However due to various reasons, not all producers were present for market days and in some cases, producers only participate on a seasonal basis. As such, a handful of interviews were conducted in the respective communities of certain producers. By conducting such interviews, experiences that might otherwise have been overlooked were recorded and provided the possibility of further analysis regarding the extent of producer participation and the impact of the Tianguis on food security.

Observations during market hours were also a key factor in the data collection process. Additionally, a handful of producers extended an invitation to visit their respective residences and plots. Such opportunities made it possible to triangulate accounts provided during interviews and provided important context regarding the functions of the Tianguis as well as household conditions.

In addition to interviews, a food recall study was conducted in order to gain a better understanding of the producers' daily eating habits. In order to get a complete understanding of consumption practices, participants were asked to recall the previous day's diet on multiple occasions. However, the shortness of my research period, combined with irregular attendance of certain producers at the Tianguis posed as limitations to this survey. In total, twenty-seven recalls were

conducted, in which each producer interviewed participated at least once, though oftentimes two to three times. Additionally, notes were taken of meals eaten during field visits and added to the total number of meals recorded. In this way the items of 28 breakfasts, 29 lunches, 28 suppers, as well as details of supplementary snacks throughout the day, were recorded or observed. A further component of the food recall was to better understand from where the food comes, and therefore for each item consumed the producers were also asked to identify whether it was purchased, acquired through a non-monetary exchange or grown/raised by the household.

The final step taken during the research period was a semi-structured key informant interview with one of the members of the *Equipo Promotor*, the body that manages and regulates participation, as well as the general functioning of the Tianguis. This interview provided important contextual information and, once again, offered an opportunity to triangulate data and gain insight from a different perspective.

The original intent of this thesis project was to compare the conditions of household food security of both agroecological and conventional producers, however in accordance with advice provided by host researchers, agroecological producers became the sole focus of this work. The reason for this is largely due to a strong suspicion of outsiders among such producers, and working with a limited budget and subsequent time constraints, it was simply unfeasible to establish the level of trust that was felt to be necessary in order to work with conventional farmers. In accepting this limitation, all field research was conducted with

producers participating in the Tianguis, with whom host researchers had a strong connection. Albeit a small sample, these producers were a willing and engaging group, with whom I was able to interact with, individually and as a whole, multiple times throughout my research period; therefore obtaining a detailed composition of their experiences.

1.3 Thesis Outline

Throughout the proceeding five chapters, my argument will be presented in full. Chapter two provides a review of the literature relevant to this thesis topic; beginning with an overview of the notion of food security, how our understanding of the topic has been shaped, as well as any criticisms, which are largely derived from supporters of food sovereignty. Additional topics to be discussed include the current practice of conventional agriculture, the alternative practice of agroecology, as well as the limitations of each. Lastly, a discussion on the evolution of organic certification and the development of local food markets will take place. As it shall be examined, a common criticism is that small-scale producers are often unable to access both certification programs and large markets. However, alternative processes in both instances, which seeking to be more inclusive for small-scale producers, are emerging. A discussion of their potential and limitations will be examined.

Chapter three provides the context in which the empirical data will be nested. Information is provided regarding the conditions of food insecurity within Mexico as well as the growth of the country's organic sector of agriculture. This chapter is concluded with an overview of the Mexican Network of Organic Markets (REDAC), of which the Tianguis "Comida Sana y Cercana" is a member market.

Chapter four is composed of a synthesis of the data collected during my field research in San Cristóbal de Las Casas. Here, key facets of the agroecological practices as well as consumption and purchasing habits of the producers are discussed, in addition to the functioning of the Tianguis. The subsequent two chapters will contain analysis and discussion of key findings (Chapter Five), as well as my conclusions and recommendations (Chapter Six).

Chapter Two

Literature Review

2.1 Food Security

Since the notion of food security serves as a prime focus of this thesis project, a firm understanding of the concept is essential for analysis. The notion of food security has been evolving over time, so much so that a multitude of definitions are claimed to exist. The term, however, originated in response to the world food crisis in 1972-1974 (Maxwell, 1996: 156). Originally, food security was defined as the “availability at all times of adequate world food supplies of basic foodstuffs...to sustain a steady expansion of food consumption...and to offset fluctuations in production and prices” (Quoted in Mechlem, 2004: 633). At the time discussion concerning food security solely took place at the state level, which as Patel (2009:676) notes, greatly impacted the development of the term in so much that it was believed that food would be accessible to all through state redistribution mechanisms so long as availability was sufficient. Therefore, this original definition arose out of concerns over a growing global population and the capability of producing enough food for all (Patel, 2009: 676), and as Pottier (1999: 11) states, conditions of food insecurity were first understood as the result of “a global supply problem.” At the time, the focus was largely placed on achieving food security at the global and national stages; however, this approach proved insufficient in fully addressing the situation. A sufficient quantity of food at the national level is not synonymous with the fair distribution of food or “food production” among the entire

population (Scialabba, 2007: 6) and conditions have proven that sufficient quantity is not enough to ensure food security for all.

The notion of food security underwent a significant reorientation in the 1980s, largely attributed to the work of Amartya Sen (Maxwell, 1996: 156) and his influential notion of food entitlement. Proposed as a way to explain the occurrence of famines and hunger even in times of an overabundance of food, Sen argues that within the current system food is not distributed equally; that access to food must be “earned” and is mediated through what he terms “entitlements” (Sen, 1999: 162). This is to say that people suffer from hunger or food insecurity during times of plenty because they lack the entitlement or ability to acquire the food that has been produced.

Under this approach, it was determined that an individual’s entitlement is a function of multiple considerations. The first is the identification of one’s endowment; being the “productive resources” that an individual possesses, and which has value in the market. Typically an endowment is derived through an individual’s ability to work and earn a wage, though it can also manifest in the form of land ownership or financial capital (Sen, 1999: 162). It is through the use of these endowments that an individual generates their entitlement, of which Sen (1981: 2) identifies four general categories: a) trade-based entitlement; b) production-based entitlement; c) own-labour entitlement and d) inheritance and transfer entitlement.

The second consideration are the present ‘exchange conditions’, through which the value of one’s endowments is contrasted with the cost of obtaining other goods and services; essentially determining the amount of food that can be acquired

with an individual's entitlement. Since food and endowments are unequally distributed, circumstances may arise in which the value of one's endowment is no longer enough to obtain sufficient sustenance. Therefore while food is available people may face hunger because their endowment isn't sufficient enough to ensure their entitlement of food (Sen, 1999: 162-163). In such cases particularly, the availability of social security programs can play an important role in ensuring an individual's entitlement to food (Sen, 1981: 6).

Through the proposal of the Entitlement Approach, Sen ultimately shifted the focus of food security from the supply side to the ability to demand (Pottier, 1999: 12). Additionally, it has been argued that poorer households are less likely to produce a surplus over and above what they themselves require for immediate consumption, while households with this ability can transform this surplus into other forms of assets, which enables them to endure times of uncertainty (Maxwell & Frankenberger, 1992: 12).

As Sen illustrated, though a surplus of agricultural output may be achieved, it is possible that many will be unable to gain access and subsequently are forced to go without. Therefore access is a key variable in the attainment of food security. Access can be achieved either through market transactions, where individuals and households use their income to purchase food; subsistence farming, whereby food is produced for consumption within the household, or a government guarantee or social security. When food is purchased through market transactions, accessibility is highly impacted by the state of food prices at the time. High prices can place food

outside of the reach of many, leading instead to greater food insecurity (Gani & Prasad, 2007: 313-314).

Sen's proposal of food entitlements added greatly to the discussion as it revealed that food security may not be achieved on an individual or household level, even though sufficient food is available (Mechlem, 2004: 634). Perhaps most importantly, however, Sen's theory placed importance more squarely on access and entitlements as opposed to production levels (Maxwell, 1996: 157). No longer was increased agricultural production seen to be the sole requirement for food security.

The subsequent definition put forth by the Food and Agricultural Organisation (FAO) illustrates the multiplicity existent within the concept of food security, and the need for a broader focus. The FAO stated that food security exists "at the individual, household, national, regional and global levels when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (Quoted in Patel, 2009: 677). This definition illustrates how the focus has shifted from simply the mere quantity of food to that of quality and accessibility, and now includes acknowledgement of the various levels of analysis at which food security is achieved (Mechlem, 2004: 637). While diversity concerning the classification of food security continues to persist, typically all definitions contain three key features; namely 'Availability', 'Accessibility' and 'Nutritional Value'.

2.1.1 Availability

Though availability is no longer the sole measurement used to determine levels of food security, it continues to be an critical factor of consideration as food security at any level can not be achieved without obtaining a level of agricultural production that can sustain the needs of the population (Gani & Prasad, 2007: 313). In this way, Maxwell & Frankenberger (1992: 4) refer to “sufficiency” of food stocks, arguing however that generally it is the sufficiency of calories received that is the primary focus, not protein and nutrient compositions, nor “food quality and safety”. Lovendal and Knowles (2007: 64) describe availability as the “physical presence of food”, which at the household level can be achieved through self-production or market transactions. Once again however, though a sufficient quantity of available food is certainly a concern of food security, Tweeten (1997) noted that even though food may be available, fair and equal distribution is not necessarily achieved (Scanlan, 2001: 234). The fact alone that enough food is produced to feed the global population and yet large portions of said population continue to live in conditions of hunger and insecurity indicates that the mere availability of food is not enough to achieve complete security (Chappell & LaValle, 2011: 8).

2.1.2 Accessibility

Following Sen’s work, Maxwell and Wiebe (1999:828) added additional characteristics to the understanding of accessibility. They argue that in order to achieve meaningful access to food, it must be “sufficient” in two respects; that accessible food meets caloric requirements and secondly that access is ensured over

the long-term. Simply put, “a household can hardly be considered food secure if it is able to meet its current nutritional requirements only by depleting or selling its endowment of resources- yet this is what an uncritical focus on access and sufficiency implies. On the other hand, access to food must also be sufficient under all possible circumstances within any particular period of time, which raises the notion of vulnerability” (Maxwell & Wiebe, 1999: 828). This position is supported in Maxwell & Smith (1992) where it is argued that a discussion on food security must include reference to vulnerability and actions of risk avoidance within a livelihoods strategy. The literature on livelihoods is dense and within this dialogue will not be examined in its entirety⁴, however there are key insights pertaining to food security that can be drawn out.

Chambers and Conway (1992: 6) state that, “a livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living...” Maxwell and Smith (1992: 4) argue that the achievement of food security must be nested within the context of livelihoods, stating that “it is misleading to treat food security as a fundamental need, independent of wider livelihood considerations: people may go hungry to preserve assets or meet other objectives”. Similarly, the research of De Waal (1989) is used as a case study to illustrate how people attempt to sustain their livelihoods at the expense of increased hunger and therefore, food security (Maxwell, 1996: 158). Supportive of this stance is a discussion within the work of Isakson (2009: 60) pertaining to Lipton’s notion

⁴ For Further readings see Chambers & Conway (1991); de Haan & Zoomers (2005); Scoones (1998; 2009)

of the 'safety-first decision rule', in which conditions of vulnerability encourage individuals to employ actions of 'risk aversion'. In such cases, actions are generally undertaken not because individuals and households believe that they will produce the greatest return but simply because it is believed that said actions will ensure some form of stability.

Vulnerability is of key concern because as Young (2004: 4) interjects, some populations around the world are susceptible to seasonal fluctuations regarding the availability of food, a circumstance that must be taken into consideration in the attempt to achieve genuine food security. Maxwell and Wiebe (1999: 828) note that vulnerability is derived through a variety of means, such as low productivity due to environmental circumstances as well as changes in wages or prices. Like Young, they maintain that vulnerability is not always static but can also appear as a seasonal "unpredictability". Therefore, vulnerability to risk, as well as the stability of the livelihood strategy pursued is arguably of great concern.

2.1.3 Nutritional Value

Additionally, food might be available and accessible but true food security remains unachieved if food is lacking in basic nutritional benefits. Therefore the final basic characteristic of food security is the overall nutritional value of food consumed. Tweeten refers to this as 'food utilization', arguing that food security must be measured by means other than mere caloric intake (Scanlan, 2001: 234). The nutritional value of food consumed is highly important as diets lacking beneficial protein and nutrients can lead to increases in the spread and severity of

diseases and epidemics, as well as decreases in life expectancy due to malnutrition (Young, 2004: 4).

Interestingly enough, it has been argued that obesity is quickly becoming a very visible symptom of food insecurity. As Tanumihardjo *et al* (2007: 1968) state, “when food insecurity exists in a community, sufficient or even excessive energy may be provided by the limited foods available, but the nutritional quality and diversity of the foods in the diet may not support a healthy nutritional status due in part to inadequate micronutrients”. In this way it has become apparent that in many diets world wide, quality of food items is being scarified in the attempt to assure greater quantity; often through the consumption of food items that are high in both carbohydrates and fats, while greatly lacking necessary nutrients (Tanumihardjo *et al.*, 2007: 1968).

Together, concerns of availability, accessibility and nutritional value have formed a more comprehensive understanding of the requirements for food security. Though this concept has certainly evolved in order to more fully address the core conditions of hunger and malnutrition, it is not without its critics.

2.1.4 Food Sovereignty

The transnational peasant movement La Via Campesina argues that food security cannot be achieved without first the achievement of food sovereignty, a popular notion of their own coining. Though the two concepts are often placed in opposition to one another, it has been suggested that “difference between food security and food sovereignty [is that], the first one [is concerned with] setting the goal, the other [is concerned with] defining the way to realize it” (Glopolis, ND: 1). In this way, food security can be thought as a ‘technical’ approach, whereas food sovereignty is distinctively ‘political’. (Lee, 2007: 5). These observations, in fact, serve as the key criticism against food security; in so much that by focusing purely on the end goal of ensuring that the entire global population has ‘access to sufficient, safe and nutritious food’, nothing is said about the conditions through which this goal is achieved (Patel *et al.*, 2007: 90; Rosset: 2003:1).

As Patel *et al.* (2007: 90) states, “food security is agonistic about the production regime, about the social and economic conditions under which food ends up on the table”. In subsequent writings, Patel (2009: 677) continues this argument, maintaining that by neglecting to address conditions of production, food security, as it has been described, is easily achievable within imprisoned populations or under the rule of a dictatorship. Moreover, Rosset (2003: 1) maintains that true security is hardly attainable when a population’s access to food is dependant on the whims and volatility of the global market or the political agendas of external bodies. In this way, food sovereignty is seen to be an issue of not only food security but of national

security as a whole. Therefore food sovereignty seeks to go beyond the lens of food security in addressing issues of trade and production conditions.

Similarly to that of food security, the definition of food sovereignty has also undergone a process of alteration and re-thinking. In 1996, La Via Campesina defined food sovereignty as “the right of each nation to maintain and develop its own capacity to produce its basic food respecting cultural and productive diversity. We have the right to produce our own food in our own territory. Food sovereignty is a precondition to genuine food security” (La Via Campesina, 1996: 1). The International Planning Committee for Food Sovereignty (IPC) outlined four priorities, or “pillars” of the food sovereignty movement. These include: a) encouraging the universal right to “safe, healthy and culturally acceptable food” for all individuals; b) fostering conditions of improved access to resources required for production; c) advocating for the wider adoption of agro-ecological methods of agricultural production, and d) fighting towards the elimination of trade policies that negatively impact farmers, such as subsidies and low price mechanisms (Lee, 2007: 6-7).

Subsequent transitions in the definition of food sovereignty have been well recorded and analysed by Patel (2009: 666-667), beginning with that which was released in 2002:

Food sovereignty is the right of peoples to define their own food and agriculture; to protect and regulate domestic agricultural production and trade in order to achieve sustainable development objectives; to determine the extent to which they want to be self reliant; to restrict the dumping of products in their markets; and to provide local

fisheries-based communities the priority in managing the use of and the rights to aquatic resources. Food sovereignty does not negate trade, but rather, it promotes the formulation of trade policies and practices that serve the rights of peoples to safe, healthy and ecologically sustainable production.

Though the basis of this definition continues to generally reflect the four pillars previously discussed, Patel notes that the collective process through which it was created, becomes highly evident due to the inclusion of a wide range of topics as well as scales. As an example of such occurrences, he highlights the presence of the broad concern of “sustainable development objectives”, as well those specific to the circumstances of small-scale fishing communities.

The most recent definition describes food sovereignty as follows,

the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. It puts those who produce, distribute and consume food at the heart of food systems and policies rather than the demands of markets and corporations. It defends the interests and inclusion of the next generation. It offers a strategy to resist and dismantle the current corporate trade and food regime, and directions for food, farming, pastoral and fisheries systems determined by local producers. Food sovereignty prioritises local and national economies and markets and empowers peasant and family farmer-driven agriculture, artisanal fishing, pastoralist-led grazing, and food production, distribution and consumption based on environmental, social and economic sustainability. Food sovereignty promotes transparent trade that guarantees just income to all peoples and the rights of consumers to control their food and nutrition. It ensures that the rights to use and manage our lands, territories, waters, seeds, livestock and biodiversity are in the hands of those of us who produce food. Food sovereignty implies new social relations free of oppression and inequality between men and women, peoples, racial groups, social classes and generations (Cited in Patel, 2009: 666).

In this definition, Patel once again emphasises the contradictions it contains, namely that the use of sweeping statements, such as the reference to “those who produce, distribute and consume”, which could allow for the inclusion and legitimization of the desires of transnational corporations. It is argued that such an inclusive process has the potential to rally varying groupings towards a common goal, however is it only beneficial so long as a core set of ideas are established to anchor the movement.

In an important critique of food sovereignty, Menezes (2001) argues that, though an important element, food sovereignty itself is not enough to ensure food security; in so much that the right of a population to determine the items that they choose to “produce and consume” does not ensure sufficient access to food for all. He notes however, that many of the vast challenges confronting the food sovereignty movement are firmly integrated in the globalized system and are oftentimes well out of the influence of rallying groups.

2.2 Food Security and Agricultural Production

There has been much discussion regarding the relation between food security and methods of agricultural production, generally concerning productive capabilities and environmental consequences. As previously discussed, genuine food security is encapsulated within a livelihood strategy and requires that food is

available, accessible and nutritious. Therefore various methods of agricultural production would arguably have great impacts on the achievability of food security.

In line with the earlier notion that food insecurity is simply due to insufficient supply, many saw the need for agricultural production to take an intense focus on increasing the availability of food through increased productivity (DFID, 2004: 7). However, as it has already been noted, the increase in agricultural production achieved, has done little in the way of eliminating conditions of food insecurity.

It should also be noted that an attempt to simply redistribute the global surplus of food will be insufficient in fully addressing the issue of food insecurity and could moreover generate harmful unintended consequences on rural economies and populations (UN Millennium Project, 2005: 103). Therefore, while it is generally accepted that in order to continue to feed the world's ever growing population, higher levels of agricultural production will be needed (Pretty, 2009: 1). It is moreover necessary that such increases in production are concentrated in locales where the population resides in conditions of food insecurity (Altieri, 2002: 2). With this said, the solution will require a more equitable distribution of the means necessary to increase productivity (UN Millennium Project, 2005: 103), and not simply of excess food stocks.

Although suggestions for the future are beginning to emerge, a consensus regarding the pathway forward is still lacking. On one side is the argument for further intensification through technological developments, which are argued to

have served the global population well in the past. However critics point to the detrimental environmental and social consequences of such methods, as well as the fact that an exclusive focus on agricultural productivity has done little to ensure food security (Kasturi, 2009: 164).

As Gliessman (1990: 367) states, “most of modern agricultural science has been based on more narrow interpretations of production problems. Research has been directed at maximizing production, rather than optimizing it within a particular farm’s agroecosystem limits.” The alternative that many are now pointing to is widely referred to as the ‘sustainable intensification’ (Pretty, 2009; Badgley *et al*, 2006) of agriculture, which argues that methods employing minimal or no inputs are better suited to increase agricultural yields and mend environmental conditions. Results are achieved by skilfully employing naturally available inputs as opposed to synthetic fertilizers and pesticides (DFID, 2004: 18; Pretty *et al.*, 1996: 4-5). For his part, Pretty (2009: 3) argues that the solution will not be a one-size-fits-all approach, as it must be malleable to a variety of local and environmental conditions.

Moreover, it will be essential that such agricultural practices are accessible to the populations in the greatest need. It is therefore important to also take into account the financial constraints that many of the world’s agricultural producers face. In this light, the solution will need to be available cheaply and locally, as expensive inputs are simply inaccessible for many producers (Pretty, 2009: 2).

2.2.1 Current Practices: Conventional Agriculture

Largely present on one side of the argument is the continuation and expansion of conventional agriculture⁵, the practice of which is generally characterized by the technique of monocropping as well as a heavily usage of capital, irrigation and external inputs, such as chemical pesticides and fertilizers. The function of these inputs is two-fold; as they compensate for the continual removal of nutrients from the soil, as well as lessening the potential for yield losses due to natural competition and pests (Beus & Dunlap, 1990: 594; Chappell & LaValle, 2011: 5). This approach is a product of the modernization theory of development, which advocates for the complete transformation of a society from 'traditional' and 'primitive' to one that is innovative and industrializing (e.g. Rostow, 1960). This is viewed to be the only path to development and by adhering to the actions and prescriptions of developed countries the same level of economic growth can be achieved by developing countries as well (Parayil, 2003: 277-278). The primary goal of modernization is to increase economic growth, which will eventually 'trickle-down' to the poor (Harrison, 1988: 154). While this proposal has been met with criticism, it continues to be highly influential. In accordance with the notion of modernizing, traditional knowledge is viewed as "inefficient, inferior, and an obstacle to development" (Agrawal, 1995: 413).

Within this process, the intensification of the agricultural sector is seen to be the primary requirement. By industrializing the agricultural sector, it becomes more

⁵ Also known as "Industrial Agriculture" (Chappell & LaValle, 2011: 5).

productive while requiring less labour inputs, which enables more workers to relocate into other burgeoning industries, fuelling economic growth. The intensification of the agricultural sector is also said to have the benefit of lowering food costs, thereby increasing the amount of income that the poor can use towards the acquisition of other basic necessities (Grove & Edwards, 1993: 136) and lowering real wages so that an emerging industrial sector can be cost competitive in global markets.

The history of the Green Revolution, which arose out of research regarding advances in agricultural production during the 1950s (Parayil, 2003: 975), is often cited by those championing, as well as challenging, conventional agriculture practices. By developing high-yielding crop varieties, which were highly receptive to chemical fertilizers and irrigation, it was believed that global concern over population pressure and limited availability of food would be soothed and a reduction in poverty would be noted in developing countries (Buckland, 2004: 156). The Green Revolution has been argued to be an example of “a ‘successful’ technology transfer event”, in so much that ‘modern’ practices that were first implemented in the North were introduced and applied within developing countries to increase agricultural output (Parayil, 2003: 977). However, this practice was dependant on “the adoption of a ‘modern’ package of agricultural tools and practices” (Parayil, 2003: 975), which required that the land and surrounding environment be adapted to the needs of the technology applied (IAASTD, 2009: 10). Through this process, farmers no longer play an active role in the development and “process of

innovation". Instead they merely become "recipients" of products designed in laboratories. In such a way, the farmer and the transfer of knowledge through generations are no longer essential to the continuation of production (Weis, 2007: 30)

Though Green Revolution technology has been successful in drastically increasing yields without converting further land holdings for agricultural production (Uphoff, 2002: 3; Weis, 2007: 165), its achievements are not without limits. Though Green Revolution technologies initially contributed to dramatic increases in agricultural yields, Power (1999: 188) argues that there is no evidence that this trend will continue. Moreover, advocates of conventional practices fail to consider the environmental impacts of modern technologies (Chappell & LaValle, 2011: 7). In fact, in recent years harvests have been seen to drastically decrease or languish (Uphoff, 2002: 5), the reasons for which will be clarified in subsequent discussions. Moreover, the damaged state of land currently under cultivation may in fact increase the desire to work new land holdings (Power, 1999: 188).

Moreover, the yield increases achieved by the Green Revolution in the end did not eliminate the global issues of hunger and malnutrition. Though food prices dropped, access to food continued to be problematic (Chrispeels, 2000: 3). Instead of solving the root issue, the Green Revolution simply introduced a new form of dependence, in which achievements in agricultural production were contingent on the heavy use of industrial inputs (Freidmann, 2005: 243).

2.2.2 Consequences of Conventional Agriculture

The advancement of the Green Revolution brought forth a variety of criticisms. While Green Revolution practices greatly demonstrated their potential to produce impressively high yields, they often did so with environmentally and socially disastrous consequences; many of which will be further discussed in turn.

Loss of Biodiversity

Biodiversity plays an important role in the success and continuation of agricultural production, however it is also greatly hindered by the very nature of monocropping techniques, which are dominant in conventional agriculture practices. Biodiversity can be expressed through various dimensions, two of which are of key importance in reference to agricultural production. The first is with regard to genetic diversity within a species (Srivastava *et al.*, 1996: 2), which is fundamentally important because the presence of varying traits enable a species to react and adapt to changes in their environment (Atta-Krah, K *et al.*, 2004: 184).

The disappearance of this diversity, often referred to as genetic erosion, has become of great concern due largely to crop specialization and uncertainties regarding the adoption of new varieties of seeds and their potential to drive local varieties to extinction. By reducing diversity within agriculture, crops can become more vulnerable to pests and diseases and shocks, therefore heavily impacting the stability of production (Brush, 1992: 148-149; Ehrlich *et al.* 1993: 10). For her part, Thrupp (2000) highlights the immense importance of maintaining biodiversity in relation to both agricultural production and food security. In terms of agricultural

production, genetic diversity allows for natural interbreeding and evolution of crops as well as conditions of increased resiliency and stability.

The second important dimension of biodiversity, regarding agricultural production, is simply the presence of numerous unique species (Srivastava *et al.*, 1996: 2-3), as would be found in a polyculture. The importance of this diversity lies in the fact that the cultivation of multiple species helps to ensure that the failure of one does not necessarily translate into a failed harvest (Power, 1999: 187).

Diversity among insects is also highly beneficial for agricultural production in regard to natural pest control. Not all insects have the same damaging effect on crops; in fact some serve as a natural enemy to crop pests thereby limiting crop losses. Thus, the application of chemical pesticides may have the paradoxical effect of making crops more susceptible to pests; the cycle of which is referred to as the “pesticide treadmill” and will be discussed shortly.

The loss of diversity is not only felt in the fields but also in the consumption patterns of the global population. Currently, only 30 crops account for 95 percent of the calories and proteins consumed worldwide (Weis, 2007: 16-17). Furthermore, the global population acquires approximate half of “all plant-based calories” through the consumption of three crops: rice, wheat and maize (Hillel & Rosenzweig, 2008: 333). This “one-sidedness of agriculture” (Stadlmayr *et al.*, 2011: 693), as a result of the past concentration on increasing the production of cereal crops, has led to the

emergence of increasingly simplified diets and widespread nutrient malnutrition (UN Human Rights Council, 2010: 12).

Soil Depletion

Likewise, both Ehrlich *et al.* (1993) and Thrupp (2000) observe that the maintenance of biodiversity within the soil itself is also essential. It is the work of many vital organisms within the soil to ensure the fertility and health of the soil as well as the collection and retention of necessary nutrients. Thrupp (2000) also argues however, that the destruction of biodiversity and subsequent impacts on production and food security is not necessarily a precondition for all methods of agricultural production.

However, the success of conventional agriculture is highly dependant on a few key features that often generated adverse side effects. The first was a heavy application of fertilizers, which helped farmers to achieve higher yields due to the fact that the seeds respond favourably to the additional inputs of nitrogen. However, such dramatic increases are often achieved at the expense of the 'natural nutrient cycles' within the soil itself (Ehrlich *et al.*, 1993: 11-12), as well as that of nearby water sources and aquatic ecosystems caused by seepage of residual chemicals (Weis, 2007: 31).

The environmental consequences of agricultural production is of great concern not only for the sake, and importance, of biodiversity itself but also for that fact that such neglect subsequently serves to decrease the future productive

capacity of the method, while at the same time, generates circumstances of greater food insecurity (Thrupp, 2000: 269). Therefore the productive and environmental consequences of the methods of agricultural production employed are directly related to the achievement of food security (Nijkamp & Vindigni, 2002: 495).

Furthermore, it has been noted by scholars (Ehrlich *et al.*, 1993; Thrupp, 2000) that while great progress has been made in terms of increasing agricultural output, it has come at the steep price of both quality and quantity of natural resources. The loss of vital topsoil, groundwater and biodiversity can greatly hinder the potential for increased agricultural output and the progress towards food security. In terms of soil loss, it is not only quantity but also quality of cultivatable land that is cause for concern. Some methods of agricultural production have the tendency to negatively impact soil conditions and when soil erodes or deteriorates at a more rapid pace than it can naturally regenerate, the overall productivity of agricultural practises is greatly diminished (Ehrlich *et al.*, 1993: 8) and future food production is compromised.

The Pesticide Treadmill

It's argued that the repeated use of chemical pesticides locks producers into a cyclical pattern, identified as the "Pesticide Treadmill" (Perfecto *et al.*, 2009: 54; Moore-Lappé *et al.*, 1998: 54), from which is it difficult to escape. As Perfecto *et al.* (2009: 53) highlight, pesticides are indiscriminate when it comes to the organisms that they kill. Therefore while a pesticide may eliminate pests, it also wipes out

insects that would otherwise had served as natural predators to pests. Moreover, pests have been known to develop resistance to the affects of pesticides after repeated application (Moore-Lappé *et al.*, 1998: 54). Coupled with the diminished population of natural enemies, pest populations once again increase, forcing producers to adopt more powerful chemicals, which might serve to stem the problem in the short-term but overtime simply continues to reinforce producer's dependence on such methods (Perfecto *et al.*, 2009: 54).

A similar pattern has emerged pertaining to the use and dependence upon chemical fertilizers. Prior to the creation of chemical fertilizers, producers ensured that their soil maintained the nutrients required for agricultural production through various methods that included the rotation of crops and reutilizing of organic materials. However with the advent of chemical fertilizers, producers began to forsake these past practices, which ensured that the soil as composed of sufficient organic materials and was properly managed, and began to relay exclusively on the application of fertilizers (Smil, 2001: 21). In the cycle that followed, the more fertilizer applied, lead to the recycling of less organic material in the soil, which consequently generated the need for more fertilizer, continuing the sequence of dependence (Perfecto *et al.*, 2009: 56). Though he maintains that the global population could not be fed without the use of chemical fertilizers, Smil (2001: 205) does concede that they have generated many “undesirable consequences” pertaining to soil quality. Such conditions include the reduced ability to maintain water and increased vulnerability to erosion, as well as the aforementioned lack of

organic matter. As Perfecto *et al.* (2009: 56) state, the reason for this cycle is less understood than that of the pesticide treadmill but it is assumed that the application of chemical fertilizers distorts the natural cycle of nitrogen in the soil.

Inappropriate Technology

Irrigation is also an essential feature of Green Revolution agriculture but it too comes with unaccounted environmental costs, such as increased salinization and waterlogging of the soil. Moreover, the costs associated with installing and maintaining an irrigation system has continued to climb, making it an unfeasible option for those experiencing reductions in the price of crops (Ehrlich *et al.*, 1993: 11-12).

Likewise, it has been noted that not all farmers benefited equally from the implementation of the Green Revolution. Since these technologies were engineered to thrive under the best conditions possible, they were generally inappropriate for use by poor farmers who cultivate marginal lands (Grove & Edwards, 2003: 137; Uphoff, 2002: 9). The mere cost of inputs ensure that those who have money or access to necessary credit are favoured over those without (IAASTD, 2009: 64), and consequently enables larger landholders to usurp the land of smaller producers who can not afford the technology and therefore are unable to compete (Weis, 2007: 108). While the Green Revolution did increase agricultural productivity, the benefits of the initiative were distributed in a highly inequitable manner and the notion of increased production leading to a reduction in poverty levels did not hold true (Buckland, 2004: 157; Parayil, 2003: 976).

As a result, the Green Revolution was often devastating for both farmers and the landscape. As crop diversity gave way to the practice of monocropping, farmers become caught in a “double price squeeze”, where they are trapped between the raising costs of inputs and declining profits, and with no direct contact with the market, are oftentimes forced to sell to a middleman, who subsequently claims much of the surplus generated on the farm (Friedmann, 2005: 243; Weis, 2007: 82). As it has been stated, “an agricultural system requiring financial suicide on the part of the farmer cannot be said to be sustainable” (Madden quoted in Chappell & LaValle, 2011: 11).

2.3 Agroecology

As previously mentioned, in light of the limitations of current conventional practices, a call has gone out for a shift in both the focus and thinking surrounding agricultural production, and has subsequently led to the re-emergence of traditional knowledge and practices in agricultural production. Agroecology has emerged as a method of agricultural production that falls inline with Pretty *et al.*'s (1996: 5) notion of sustainable intensification. The focus of this approach is agroecosystems, which Altieri (2002: 8) describes as “communities of plants and animals interacting with their physical and chemical environments that have been modified by people to produce food, fibre, fuel and other products for human consumption and processing.” It is by recognizing and appreciating these exchanges, that agroecology seeks to generate greater levels of productivity, with the minimal use of additional

inputs and the subsequent creation of environmentally and socially harmful consequences (Altieri, 2002: 8).

Grove and Edwards (2003: 139) argue that unlike industrial-input technology, which requires the implementation of a complete “technological package”, agroecological approaches are better suited to adapt to changing and imperfect circumstances in the fields. Embedded in agroecology is the notion that human beings should employ agricultural methods that are tailored to their local environment (Altieri, 1995: 55). In this way, agroecology differs greatly from conventional agriculture, which has undergone a process of ‘distancing’, in which technology and practices have been constructed independently of the environmental considerations in which they will be applied (Norgaard & Sikar, 1995: 28-29). Furthermore, while conventional agricultural practices rely heavily on new innovations regarding machinery, pesticides and fertilizers to maintain productive capabilities, agroecology is comprised of a variety of less intrusive methods, including crop rotations, the planting of polycultures, integrated pest and nutrient management, use of crop covers, water harvesting and livestock integration (Pretty, 2006: 13; Altieri & Nicholls, 2005: 33-34). Unlike the technology developed through the Green Revolution, agroecological practices are not a package to be applied in the same fashion in all environments and circumstances, and therefore must conform to the reality of many differing situations (Altieri, 2002: 16).

The United Nations Human Rights Council (2010: 10) has labelled agroecology to be a “knowledge-intensive” approach, in so much that it combines

breakthroughs in ecological science with the local knowledge and practices of farmers themselves to implement agricultural practices that are environmentally sustainable and productive (McAfee, 2006: 10), and by extension, demonstrates the validity of varying epistemologies (Norgaard & Sikar, 1995: 21). However, the high level of knowledge can also pose as a limitation to the adoption of agroecology.

Moreover, a producer cannot simply stop applying chemical inputs and expect to achieve similar yields; moreover, the process of converting from conventional agriculture to agroecological methods can oftentimes take years to complete (Altieri, 1995: 192). Therefore, Pretty (2009: 4) argues that to make the transition, producers “must first invest in learning”. Due to the push towards specialisation and monocropping, producers must re-familiarize themselves with practices that encourage diversity, oftentimes through on-farm experimentation or informational sessions. However, as Weis (2007: 30) notes, it is often difficult for farmers to regain knowledge that has been lost. For her part, Scialabba (2007: 6-7) argues that social organisation can help to negate such limitations. As part of a larger grouping, producers can learn from one another, allowing many to overcome their lack of inexperience and knowledge. Such organisations can result in improvements to productivity levels, the designation of higher importance regarding local knowledge and methods, as well as a greater sense of control over the agricultural system. As such, though successful transitions require access to information and knowledge, social organisations can be used as a means to overcome this oftentimes, insurmountable seeming obstacle.

Therefore, a shift towards agroecology should not be interpreted as a shift away from scientific knowledge and development as further research is required to understand the inner workings of various environments (Weis, 2007: 170). Pretty (1996: 5) argues that critics are often quick to label it as a 'backward' approach to agricultural production. However agroecology should instead be understood as an approach that absorbs lessons from both technological advances and the tested practices of farmers and applies them in a more environmentally sustainable and productive manner.

2.3.1 Criticisms of Agroecology

There are however, many who continue to strongly vocalize the superiority and general need for the continuation and improvement of conventional agriculture practices. Current efforts are being made at reviving the Green Revolution with a distinctively African focus; relying heavily on the repackaging of conventional practices such as improved seed varieties, irrigation and chemical inputs to improve the productivity of small-scale producers (Rockerfeller Foundation, 2006: 9). For his part, Seavoy (2000: 31) argues that such modernization of is a necessary facet in achieving economic development. Moreover, Borlaug (2000: 488) passionately denounces those who support an alternative method as a hindrance to further progress and achievement.

Criticisms concerning the agroecological approach fall into a variety of categories, with its productive potential and need of natural fertilizers often acting

as the starting point. An additional concern is the greater use of human labour, each of which will be discussed in turn.

Productivity

It has been argued that the implementation of agroecological practices would have minimal impact on overall food production since large portions of the global population already employ low-input methods; lacking the means to acquire the equipment necessary for conventional agricultural (Chrispeels, 2000: 3). However, Badgley *et al.* (2006: 88) state that though a large percentage of agricultural production in developing countries is achieved through the use of low intensive methods, designating them 'agroecological' would be inappropriate and, in fact, yield increases have been documented in such situations when a conversion to agroecology has taken place.

It should be noted, as McAfee (2006: 5) argues, that critiques based on productivity are generally faulty due to their limited perspective. Productivity is generally measured by "yields per unit of surface area" but this ignores aspects such as soil quality and future productive capacity. Therefore, as McAfee contends, it is contentious to place importance on the short term over the long term, as do many who calculate the productivity of these two approaches.

With that said, the debate surrounding yields is largely between the technique of monocropping versus polycropping in which the former "implicitly regards agriculture as a mechanical process, with inputs being converted into

outputs by some fixed formula, whereas polycropping recognizes the inherently biological nature of agriculture” (Fernandes *et al.*, 2002: 29). When compared, Uphoff (2002: 15) states that larger, more extensive operations seldom surpass smaller, more intensively managed ones in terms of output per unit of land. Though large farms might be deemed more profitable than small- scale farms, it would be wrong to assume them to be more productive. Instead, “substituting capital for labour through mechanization in larger holding does not necessarily raise yields, though it can raise profits for owners of capital, especially if subsidized” (Uphoff, 2002: 15).

Altieri (2009: 105) notes that when the overall output of small, diversified farm is taken into consideration, instead of merely focusing on the yields of a single crop, such farms are found to be more productive than larger, monocropped landholdings. This is largely due to the technique of polycropping, otherwise known as intercropping, in which a variety of crops are planted interspersed, each possessing specific attributes that are beneficial for their neighbors (Liebman, 1995: 108-109). This is referred to as “facilitation”, in which a crop is able to enhance the surrounding environment to the advantage of other crops (Altieri, 2002:10; Power, 1999: 186).

Increased stability and pest resistance are also cited as benefits of polycropping techniques. As Scott (1998: 269) states, “diversity is the enemy of epidemics”. It’s argued that disease and pests are capable of spreading at a more rapid pace when crops are “genetically uniform, numerous and overcrowded” (Hillel & Rosenzweig, 2008: 332) and that these conditions, which are generally found in

monocropped fields, can lead to widespread crop losses. Conversely within polycultures, if the production of one crop is hindered, it is possible for neighbouring crops to increase their own productivity, using the now available resources, a possibility that could not arise had the crops been planted independently (Power, 1999: 187). Therefore polycultures are capable of achieving higher “productivity in terms of harvestable products per unit of area”, realizable because their structure leaves little room for weeds, encourages pest and disease resistance and more efficiently processes available resources. (Altieri, 2002: 10; Holt-Giménez & Patel, 2009: 113; Liebman, 1995: 108-109; Power, 1999: 186).

In addition to a more efficient use of resources, Chappell & LaValle (2011: 10) cite a “relatively high labour quality”, which is generally due to family participation in the production process, through which members have a “stake in farm success rather than alienated outside workers”, as well as an independence from purchased inputs as additional reasons why small-scale producers are more productive.

In response to criticisms regarding the vast environmental consequences generated by Green Revolution technology, Dr. Norman Borlaug argues that in order to achieve similar levels of productivity, in the absence of such technologies, it would have been obligatory that millions of hectares of land were converted into farmland. He furthermore questions the environmental implications of such a transformation (Borlaug, 2000: 488). However for her part, Power (1999: 188) argues, “there is no convincing evidence to date to support the notion that

increasing productivity of agricultural systems will protect neighbouring natural areas.” In fact, she continues by suggesting that attractive profits achieved through increased productivity could serve to generate higher interest in the field and subsequently the conversion of additional land. In support of this suggestion, Chappell & LaValle (2011: 7) cite case studies in which it was concluded that agricultural intensification, achieved by way of increased use of capital, did in fact led to increased deforestation and conversion of land for agricultural purposes. Conversely, intensification achieved through increases in labour did not encourage further deforestation, and moreover has the added potential of reducing rural unemployment and urbanisation (Chappell & LaValle, 2011: 7).

Moreover, comprehensive research conducted by Badgley *et al.* (2006) suggested that the intensive application of agroecological production methods could “contribute substantially” to ensuring sufficient production levels required to feed the global population; doing so in a way that such production levels could be achieved through the use of less land than is currently being farmed. Such findings also negate the argument that additional land would be required for agroecological methods to achieve the same results as conventional agriculture.

Limited Availability of Natural Fertilizers

Dr. Borlaug is also among those who question the quantity of natural fertilizers available. His argument that the global population could not be fed without the use of chemical fertilizers is based on the assumption that production

levels could not be matched without the use of such fertilizers and that any attempt at amassing a sufficient supply of natural fertiliser, via animal manure, would require vast tracks of land to be converted into pastures for livestock (Hesser, 2006: 184). As similar argument is put fourth by Smil (2001: 204), who states that it would be impossible to feed the global population without the use of chemical fertilizers and moreover that billions of people owe their very existence to the creation of such fertilizers.

In light of these objections, a study by Badgely *et al.* (2006: 91-93) examined the potential of green manure; an input comprised of crops that are tilled into the soil to enhance nitrogen levels and act as a fertiliser for subsequent yields. This practice alone, not in conjunction with additional agroecological techniques that could also enhance nitrogen levels, was found to generate more nitrogen than is currently used under conventional methods, not only achieving comparable yields but also leading to improved soil fertility and retention of water, as well as in some situations, resiliency to disease.

Greater Need for Labour

In terms of labour requirements, it holds true that agroecological approaches are generally more labour intensive, however some would argue that this characteristic should not be viewed as a negative consequence of the approach. In fact, the industrialization of agricultural production has lead to loss of employment in this sector and subsequently food insecurity of portions of the global population (McAfee, 2006: 7). Additionally since the demand for labour is generally required

year round, agroecological methods of production possess the potential of re-stimulating demand for agricultural labour, generating relatively stable conditions of employment for rural population, contributing to food security in further households as well as possibly stemming urban migration and the spread of shantytowns (Altieri, 2009: 106; Badgley *et al.*, 2006: 94; McAfee, 2006: 7).

2.3.2 The Potential of Agroecology

Having reviewed the criticism of agroecology, it is clear that such concerns are generally unfounded and in fact, in one specific case, namely that of the greater need for labour, the supposed criticism could actually be an advantage. The practice of agroecology possesses additional benefits as well, especially for those populations who, as Altieri (2002: 2) argues, could benefit the most.

Accessibility

As stated by Altieri (2002: 15) “farmers cannot benefit from technologies that are not available, affordable or appropriate to their conditions.” With its focus on the use of available technologies and techniques, agroecology is perfectly suited to address this reality, and moreover, has the potential to greatly improve the lives of small scales producers by breaking the cycle of continued indebtedness that is often generated from a dependence on costly chemical inputs (Scialabba, 2007: 6).

Furthermore, since agroecological methods are adapted to suit the environment in which they are applied, they are being used to generate greater

levels of production in very marginal conditions and are subsequently improving the food security of households that often face high levels of instability (Uphoff, 2002: 11-12).

Environmental Benefits

Aside from productivity levels, Pretty (2009: 6) states that agroecological practices can also generate positive environmental consequences, limited not only to improved soil fertility and reduced erosion but also cleaner water and greater biodiversity. Environmental improvements can in turn greatly enhance the sustainability and longevity of a producer's livelihood, as in the case of natural inputs such as manure and compost, which not only vastly improve soil quality but also strengthen the health of the crops, making them less susceptible to damage caused by pests or weather events (Altieri, 2002: 10). In fact, it is furthermore argued that when confronted with extreme weather conditions and events, agroecological plots are far more "resilient" (Holt-Giménez & Patel, 2009: 101). Research conducted in Central America in the wake of Hurricane Mitch revealed that the plots conventional farmers incurred greater levels of damage than did their agroecological neighbours, who used methods such as intercropping, crop covers and agroforestry (Altieri, 2002: 10; Holt-Giménez, 2006: 192). Many of the agroecological techniques have the benefit of creating conditions of increased stability, which reduces vulnerability to unforeseen events (Scialabba, 2007: 7).

Improved Social and Human Capital

Moreover it has been argued that the beneficial reach of agroecological methods is not merely limited to environmental conditions or productivity, but can also greatly enhance what Pretty (2009: 6) refers to as “human potential”. He notes that some of the manifestations of such improvements include “the enhanced ability to experiment and solve problems, coupled with an augmented sense of self-esteem and worth” (Pretty, 2009: 6). Correspondingly, Uphoff (2002: 13) noted that farmers practising agroecology gained both the skills and confidence to tackle problems and expand their knowledge. Such improvements not only accrue on an individual basis but also are discernable at the community level through the development of stronger cohesion and social ties (Pretty, 2009: 6).

Improved Household Nutrition

Toledo and Burlingame (2006: 478) advocate for deeper investigation into the link between biodiversity and nutrition, arguing that it is essential in addressing concerns of malnutrition. As previously discussed there is growing concern over agricultural specialization and the consequential dependence on a limited variety of items for consumption (Hillel & Rosenzweig, 2008; Stadlmayr *et al.*, 2011; Weis, 2007). It has furthermore been argued that the diversity encouraged through agroecology can translate into more diversified and stable household consumption patterns, not only by way of a greater variety of grown crops, but also the integration of meat and other animal products into household diets (Pretty, 2009: 6; Scialabba, 2007: 9). Moreover, it’s suggested that there exists “a significant elasticity

of consumption” within many rural households, meaning that larger yields are not necessarily sent straight to markets for sale but instead, greater quantities are consumed within households (Pretty, 2009: 6).

Aside from the aforementioned benefits, it has also been argued that producers can profit greatly from the sale of their agroecologically-produced items, as such products can command higher market prices; enabling producers to generate a more reliable source of income (Chappell & LaValle, 2011: 11) and possibly, by extension, increase household food security (Scialabba, 2007: 6). In order to do so, producers must be able to differentiate their products from those that have been conventionally produced. In this way, certification becomes an important matter for discussion.

2.4 Organic Certification and Local Food Markets

In terms of certification for agricultural practices, products are typically labeled as ‘organic’, while agroecological certification is significantly less prevalent. As defined by the National Organic Standards Board (NOSB), “Organic agriculture is an ecological production management system that promotes and enhances biodiversity, biological cycles and soil biological activity. It is based on minimal use of off-farm inputs and on management practices that restore, maintain and enhance ecological harmony” (cited in Allen & Kovach, 2000: 222). However, the practices of agroecology and organic agriculture are not necessarily synonymous and in fact, as

it will be discussed shortly, oftentimes certified organic products fail to meet the standards of agroecology.

2.4.1 The Need for Certification

During the 1970s and 1980s, when the push for organic certification first emerged, standards were generally enforced on a 'voluntary and self-regulatory' basis; known as 'first party certification', as those participating represented a fairly small and closely linked community of producers and consumers. However, due to increased demand, the subsequent expansion of the organic sector and the accompanying expanse between active parties, this form of certification was no longer sufficient to ensure wide scale confidence in the organic nature of the products bearing the label. Thus the shift was made to "third party certification", through which organic standards and measures of accountability were established by outside parties (Nelson et al, 2010: 228).

It was the elongation of the supply chain, and the ever-expanding distance between producers and consumers that generated the need for certification; the role of which is two-fold and impact both sides of the transaction (Källander, 2008: 4). On one hand, certification enables producers to differentiate their products from those that are conventionally produced, subsequently enabling them to demand a higher price. Moreover, certification processes protect producers from a loss of both market share and profit, due to an influx of falsely labelled products (Lohr, 1998: 1125; Morales Galindo, 2007: 90). Guthman (2007: 458) notes that though

producers might participate in a certification program because they share a similar set of values, the general premise is that labeling works as a compensation method.

From the consumer's standpoint, certification creates a sense of confidence in the products, assuring consumers that though organic products might bear no visible difference from other products, they were in fact grown or processed according to sanctioned practices and are therefore worth the higher prices (Lohr, 1998: 1125; Morales Galindo, 2007: 90).

2.4.2 Criticisms of Organic Certification

The Conventionalization of the Organic Sector

Guthman (2007: 461) argues that if a labelling system is to have any merit, a mandatory condition is that all producers cannot meet the requirements; otherwise it would be impossible to differentiate between products. In this logic, regulations must serve as obstacles to entry into the system. However, those that do satisfy expectations are rewarded with the right to apply the label to their product, and subsequently receive higher prices from consenting consumers. Such a system has been described as a potential means for income redistribution, as the producers "who do things differently" are rewarded by consumers. However there has been growing concern over the integrity and virtue of certification. Many researchers (Allan & Kovach, 2000: 224-5; González & Nigh, 2005: 499; Friedmann, 2005: 253) have highlighted the growth of the organic sector and argued that the potential for increased profits has appealed to producers who might otherwise not share a sense of commitment to the foundations of organic agriculture.

Moreover, Raynolds (2000: 303) argues that the lax standards of many certification programs places the organic sector in grave risk of becoming nothing more than a facet of the conventional system. It has been argued that the guidelines for certification are generally only capable of dictating what inputs are permissible for use and which are not, instead of fully encapsulating the ideals of the agro-ecological movement, both in environmental and social terms (Nelson *et al.*, 2010: 228; Rigby & Brown, 2003:5). Due to this, it has become legitimate to merely replace chemical inputs with newly marketed biological inputs (Allan & Kovach, 2000: 224). In this way, Freidmann (2005: 230) questions whether the growth of the organic sector is simply generating space for an organic input industry, in lieu of chemical inputs. Further examples include farmers no longer allowing for fallow periods to rejuvenate their land, or in some cases, have begun to monocrop organic products, both practices which are not in line with the original ideals of agroecological production, but can be allowable under some certification programs (Allan & Kovach, 2000: 224; Altieri, 2009: 111).

Such circumstances were also recorded in Guthman's (2009) research, involving organic producers, of various sizes, in California. She found that though the majority of the producers interviewed were employing practices that were acceptable under the auspices of organic farming, such practices often fell far short from the broader ambitions of agroecology. An 'input-substitution' approach to agriculture production was quite prevalent, as producers simply purchased permissible inputs as oppose to using on-site inputs and employing techniques such as crop covering and composting; both of which are techniques championed by

agroecology (Guthman, 2009: 261). It was moreover argued that the acceptability of such practices within organic certification leaves producers with little “incentive to incorporate and ideal practice when an allowable one will suffice” (Guthman, 2009: 265).

In terms of social conditions, Nelson *et al.* (2010: 228) argue that certification requirements do “little or nothing to foster ideals such as prohibiting the entry of large agribusiness into the market, protecting small scale family farms, ensuring fair treatment of workers, limiting the extent of monocrop production, or favouring local production and consumption networks. As a result, mainstream certification systems leave the organic sector vulnerable to the aforementioned process of ‘conventionalization’”. Raynolds (2000: 298) shares this concern and argues that organic certification has a very restricted focus on conditions of production. Though much is delineated in terms of the environmental dimensions of production, little is said regarding social conditions. Therefore, in the absence of social regulations, producers can achieve organic certification despite “gross labour violations”; once again leaving the organic sector vulnerable to becoming incorporated as merely another segment of the conventional system (Raynolds, 2000: 303).

Limited Access for Small-Scale Producers

Additionally, and of the utmost importance to this thesis research, is the fact that studies have begun to challenge the notion small scale producers are benefiting the most from the international organic model. In fact, it has been argued that a

large proportion of the industry is manipulated by medium or large scale producers who have identified the expanding organic market to be “a good commercial proposition” (Raynolds, 2000: 302-303). Moreover, though organic production is widespread through out the world, the vast majority of the products are destined for foreign and international markets (Altieri & Nicholls, 2005: 264), where small-scale producers face a multitude of obstacles in the attempt to compete at that scale (Raynolds, 2000: 303) In many ways the organic sector is seen to have moved out of the reach of many small-scale producers (Nelson et al, 2010: 227).

Much of the criticism stems from the certification process itself, which is often a long and tedious process, regularly requiring multiple years to reach completion and in many way effectively bars small-scale producers from aspiring to and subsequently obtaining certification. To begin with, many producers lack information regarding organic production methods, certification and moreover access to consumers and markets (Raynolds, 2000: 302). Moreover, filing the necessary paper work is often difficult for a large portion of small-scale producers who are typically illiterate or semi-literate (Raynolds, 2004: 736). Furthermore, obtaining organic certification is both costly and time consuming. The costs of land inspections alone are often too expensive for many producers to bear (Källander, 2008: 6; Raynolds, 2004: 736) and the transformation process that might be required to meet certification requirements can potentially take years. Morales Galindo (2007: 90) suggests that this waiting period provides producers with time to become educated not only with the certification proceeds but also market

availability and various methods of production. However, during this time frame, producers are required to pay the necessary fees for certification but are not compensated equally for the organic nature of their products. Such requirements are found to discourage small-scale producers from seeking certification and as such, they do not receive equal monetary compensation for their efforts (Nelson *et al.*, 2010: 229).

2.4.3 “Beyond Organic⁶”: Participatory Guarantee Systems

In the attempt to move beyond the criticisms surrounding organic certification and the accessibility of the sector by small-scale producers, Participatory Guarantee Systems (PGS) have emerged as an alternative to the third-party system of certification (Nelson *et al.*, 2010: 230). Linked to the original system of first party certification, which was superseded in the 1990s, this movement is comprised of “locally focused quality assurance systems [that] certify producers based on active participation of stakeholder and are built on a foundation of trust, social networks and knowledge exchange” (IFOAM, 2011: 1). Though PGSs comply with the norms of the International Federation of Organic Agriculture Movements (IFOAM), they differ in that they require less rigorous steps for verification, much lower associated costs and place importance on educating both producers and consumers on various social and environmental topics (Gómez Tovar *et al.*, 2007: 7).

Though PGSs certainly differ from each other, they are all built upon a few basic premises. The first is multifaceted participation; as such regulations and

⁶ (Nelson *et al.*, 2010: 227)

accountability measures are typically generated through the input of producers, consumers and researchers (Nelson *et al.*, 2010: 230). In so doing, a sense of 'collective responsibility' is fostered and conditions of increased dialogue among actors encouraged (May, 2008: 4). However, as Källander (2008: 22) highlights, it is sometimes difficult to ensure constant participation on the part of consumers. With that being said, the importance of consumer participation should not be overlooked as they have the potential of contributing significantly in various areas. Moreover it is suggested that participation also serves to educate consumers, which in turn can lead them to "happily pay fair prices for the produce" (May, 2008: 5-6).

Transparency and trust are also two important and interconnected elements of a PGS. Transparency requires that no information is held off limits and that everyone involved has at least some understanding of the PGS as well as a means to have any questions answered. Such conditions subsequently feed into an environment of trust. Lastly, PGSs are intended to be "non-hierarchical", in so much that responsibilities are shared among those involved (May, 2008: 7-8).

It should be noted however that in many countries, however, for a product to be legally considered organic it must be certified through the method of third-party certification and oftentimes PGSs are not recognized. Thus, a push for a wider acceptance of certification methods has begun (IFOAM, 2011: 2-3).

Moreover when accepted, certification under a PGS is not sufficient enough for products to be exported under the label of organic, but is rather solely for products consumed domestically. However, this is not seen as a limitation as the focus of the PGS approach is upon small-scale producers and internal, local food

markets. In these shortened commodity chains, trust and relationships between producers and consumers replaces the need for third party monitoring (Nelson *et al.*, 2010: 230).

The International Federation of Organic Movements (IFOAM) (2011:2) highlights multiple benefits that small-scale producers can derive from being part of a PGS. As has been previously discussed, certification is often a long and costly process, however PGSs generally rely more on voluntary time commitments than financial commitments, arguably making certification and entry into the market more accessible for producers. Moreover, the impact of incorporating consumers into the certification process is two-fold. Such participation serves not only to educate consumers, but to also generate a local demand and connections. Finally, PGSs are often viewed to be empowering and serve to generate and enhance social capital.

2.4.4 Benefits of Local Food Markets

Local food markets have grown in popularity and take on a variety of forms, the most popular generally being community-supported agriculture (CSA) and farmers' markets. CSAs derive their name from the fact that consumers purchase a "share" of a farmer's harvest at the start of the season and, in return, receive a weekly supply of fresh produce throughout the season. In this way producers receive a return on their effort from the onset and the potential risks associated with agricultural cultivation are not shouldered solely by producers but are also

shared with consumers (Hinrich, 2000: 299; O'Hara & Stagl, 2001: 545). Farmers' markets function in a way that consumers can purchase goods from and interact directly with producers. Products are often harvested the day prior to, or morning of, market days so that they are fresh when purchased, thereby requiring no additives to ensure their keep (La Trobe, 2001: 182).

Local food markets can provide benefits for both of the parties involved, consumers and producers. While such markets provide consumers with access to fresh and affordable food items (Hinrich, 2000: 297; La Trobe, 2001: 189), the benefits accrued by producers are largely monetary, in so much that producers can maintain a greater portion of their earnings by selling directly to consumers and forgoing any type of middleman, which arguably enables them to maintain a greater degree of control in the decision making process and capture a greater share of the economic surplus (Hinrich, 2000: 297; La Trobe, 2001: 184). Additionally, it has been indicated that the average consumer will pay additional money to purchase locally produced goods, and is in fact willing to pay even more when they are dealing directly with the producer at a market⁷ (Parrlberg, 2010: 149)

Moreover, by selling locally, the distance that producers and their products must travel to market is often drastically reduced. This has the added consequence of allowing producers to determine what to grow or produce based on quality and taste, as opposed to how well the items survive transportation (Stagl, 2002: 152-3).

⁷ This statement however calls into question the earlier claims regarding the affordability of products from local farmer's markets, however this paradox is left unmentioned in the literature.

A further benefit for both consumers and producers is derived from the social nature of local food markets, specifically CSAs or farmer's markets, in which people are generally required to assemble and interact at predetermined times (Hinrich, 2000: 298). Such an arrangement works to enhance communication between both parties (Stagl, 2002: 146) and provides consumers with the opportunity to ask questions directly to the producers themselves, which can generate conditions of confidence and trust in products (La Trobe, 2001: 183). As Hinrich (2000:298) states: "One could come to a market, expecting to see a certain farmer, whose eggs or rhubarb or spring greens one especially fancies. The relationship between producer and consumer was not formal or contractual, but rather the fruit of familiarity, habit and sentiment, seasoned by the perception of value on both sides". However, La Trobe (2001: 190) highlights the need for verification and assurance of the products sold at farmer's markets, since it is possible for consumers to be misinformed or misled regarding their purchases. Suggestions to counter such possibilities include, proof of certification or plot visits to ensure the quality of products. Overall however, studies show that producers generally enjoy selling at such market because of the environment, as well as the added benefit of higher earning potentials (Hinrich, 2000: 298).

Local food markets are argued to possess additional benefits for consumers. First, Stagl (2002: 153) states that local food markets can satisfy multiple consumer demands at the same time. Though consumers may attend a local food market primarily to purchase fresh products, it is also possible for them to act in accordance

with other desires, such as out of support for local producers or environmental sustainability, and social interactions with like-minded consumers and producers. Once again the ability to converse directly with producers is important, as it allows consumers to ask questions regarding topics such as production condition, which they otherwise not have the ability to ask, and therefore make well informed choices regarding the purchase that they make (La Trobe, 2001: 184).

Regarding this topic, Dubuisson-Quellier & Lamine (2008: 59) discuss Micheletti's idea of individualized collective action, which states, "in the hands of knowledgeable consumers, shopping baskets and caddies can become a kind of ballot paper". In this way they argue that by satisfying various desires, individual choices can lead to collective action. However, Guthman (2007: 472-473) questions whether such decisions should be left to consumers, and moreover, how such decisions could be expected to generate benefits for the general population. Of key concern for Guthman is the fact that the use of labels as such a regulatory tool, signals that a price can be placed on ethical decisions. This in turn, renders them as nothing more than a commodity within the market system and diminishes the potential for change and action to be initiated through forums other than that of the market.

Additionally, local food markets improve nutrition among consumers, as they not only have greater access to "healthy and fresh" products (La Trobe, 2001: 189) but also a greater variety of said products. It would be erroneous to conceive that consumption of local products equates to limited varieties or choices. In fact,

studies have shown that a wide variety of products can be obtained through local food markets, since producers are often keen on adding to their repertoire of products. Consequently, this has led to better health conditions for consumers as they have been found to consume a higher quantity and a wider variety of fruits and vegetables (Stagl, 2002: 155).

Though local food markets can provide benefits for both producers and consumers, the literature on the topic largely pertains to the benefits of the latter. In fact much of the discussion concerning producers merely focuses on income possibilities, while consumers have the ability to exercise greater choice, fulfill multiple desires and improve their nutrition and food security. Due to this imbalance in much of the literature, it is therefore important to explore the potential benefits for producers. The experiences of producers at the Tianguis “Comida Sana y Cercana” will serve as a case study to explore the impact that participation in local food markets, as well as the practice of agroecology can have on the household food security of producers.

Chapter Three

Context: Food Insecurity and Organic Production in Mexico

3.1 Food Insecurity in Mexico

In Mexico, food insecurity is largely due to limited access to food rather than limited availability. In fact, data shows that between 2003 and 2005 food production levels in Mexico were at 3,270 kilocalories (kcal) per capita per day, which is well above the 1,850 kcal generally agreed to be essential (Juarez & Gonzalez, 2010: 3). In fact, Juarez & Gonzalez (2010: 1) state that in each of the Mexican states, at least 10 percent of the population has insufficient access to food. Such statistics are far greater in the southern regions of Mexico, as 47 percent of the Chiapas population was found to live in conditions of “food poverty⁸”. Mexico is currently experiencing a “nutritional transition” (Alvarez Gordillo, *et al.* 2009: 34) in which the increased consumption of sugars, fats and refined carbohydrates is greatly increasing. In fact processed food items are being more accessible for much of the population, as they are generally cheaper than fresh products. Due to such circumstances obesity, diabetes and other dietary diseases are increasingly resulting from food insecurity

⁸ As defined by Juarez and Gonzalez (2010: 4), a household is understood to be living in food poverty when “they did not have enough income to purchase goods from the basics [food] basket, even if they used their total income”.

3.2 Organic Agriculture in Mexico⁹

The state of Chiapas is home to Mexico's second largest indigenous population, accounting for 30 percent of the general population. As a consequence, traditional agriculture, which focuses on the cultivation of maize and coffee, as well as polycultures of additional crops, continues to endure. However due to limited access to both credit and "technical support", these small-scale producers are finding it progressively harder to participate in the global market (Skeffington *et al.*, 2008: 1).

Mexico's organic sector was created from the onset to satisfy foreign demand for such products. In the late 1980s Mexican producers who had been overlooked by the Green Revolution and the subsequent adoption of chemical inputs were sought out by foreign companies looking to export their organically produced crops (Gómez Tovar *et al.*, 2007: 2). Since that time, organic agriculture in Mexico has continued to expand. In fact while Mexican agriculture on a whole has faltered, the organic sector has experienced widespread growth, in terms of employment, land use and income (Nelson *et al.*, 2008b: 1). In 2008, more than 300 000 hectares of land were reportedly being organically farmed by over 83 000 producers. The vast majority of these producers (98 percent) farm less than three hectares of land each and more than half are indigenous (Nelson *et al.*, 2008a: 24).

However, organic production in Mexico is highly specialized, not only in terms of the crops grown, but also in terms of the consumer base. Coffee, cocoa as

⁹ Much of the literature surrounding the organic sector, the Organic Network of Markets, as well as Participatory Guarantee Systems in Mexico has been written collaboratively by a small group of researchers.

well as various fruits and vegetables are all grown organically, however 85 percent of all products are exported to foreign markets (Nelson *et al.*, 2008a: 24). Gómez Tovar *et al.*, (2007: 3) however note two exceptions to this rule, as large quantities of organic honey is consumed domestically, as for the most part is all of Mexico's organically produced meat and dairy products.

It is argued that this export-orientated strategy limits the creation of domestic markets and can generate conditions of vulnerability due to instabilities in international commodity prices (Nelson *et al.*, 2008a: 24). Moreover, much of the supposed organic products are produced through the practice of monocropping, which is known to create conditions of soil infertility and susceptibility to pests (Gómez Tovar *et al.*, 2007: 2).

Of the 15 percent organic products that are consumed domestically, it is believed that only one-third is in fact marketed as organic, while the reminding products are sold among their conventionally produced counterparts. Such circumstances are generally linked to limited consumer knowledge regarding organic products as well as willingness to pay the higher prices that are attributed to such items (Gómez Tovar *et al.*, 2005: 463-464). Though the greater majority of organic products are destined for foreign markets, a local movement is building, in which stores are carrying local products and organic markets are greatly increasing in number (Gómez Tovar *et al.*, 2007: 3).

3.3 The Mexican Network of Organic Markets

The Mexican Network of Organic Markets¹⁰ (REDAC), created in 2004, has played a large role in the local demand for organic products. Originating with only four markets, this network is now comprised of seventeen such markets, which are located in nine states, often through the support of local universities, non-governmental organisations (NGOs) and participation of both producers and consumers (Nelson *et al.*, 2008a: 24).

The prime objective of REDAC is two-fold. In terms of environmental considerations, REDAC seeks to reduce the distance products travel to market, as well as garbage generated from excess packaging, and furthermore, promotes both environmentally friendly methods of production as well as consciousness. Socially, REDAC seeks to ensure that local, healthy products are accessible to all citizens and that producers are fairly compensated for their efforts. (Nelson *et al.*, 2008a: 24; (Gómez Tovar *et al.*, 2007: 4). Moreover, the markets are not simply places of exchange but more importantly are areas of trust and community. In order to encourage the growth of such conditions, many of the member markets host workshops and other such activities for consumers and producers alike (Nelson *et al.*, 2008a: 24). Similarly, these markets are seen as places where both producers and consumers can express themselves politically (Nelson *et al.*, 2008a: 24), as it has been argued that agroecological production in Chiapas is “an act of rebellion”, linking the practice to the Zapatista uprising which began as a direct result to Mexico’s acceptance of the North American Free Trade Agreement (NAFTA) in 1994

¹⁰ “Red Mexicana de Tianguis y Mercados Orgánicos”

(Skeffington *et al.*, 2008: 6). While the uprising itself falls outside of the scope of this thesis project it is important to note the immense impact it has had in many facets of life in Chiapas. In many ways, the Zapatista community has sought to disassociate themselves from the Mexican government and the neo-liberal ideology, including agro-exports as a means of generating foreign exchange and promoting economic growth. In so doing these communities have embraced the practice of agroecology through various techniques (Skeffington *et al.*, 2008: 6).

Concerning the overall situation of organic agriculture in Mexico, REDAC has had an impact on making certification more accessible for small-scale producers. In 2006, the Mexican government created a law that made certification mandatory should a producer wish to market his/her goods as being “organic”, both domestically as well as abroad. The introduction of said law was expected to present a great obstacle to small-scale producers; as previously discussed, certification can be an expensive and time-consuming process. In light of this, REDAC successfully fought to have the use of PGSs legitimized for products sold locally (Nelson *et al.*, 2010: 231). As a direct consequence of the REDAC’s efforts, producers who are certified through a PGS can legally market their products as being of organic nature¹¹ (Nelson *et al.*, 2008a: 25).

The legitimation of PGS certification could greatly impact the circumstances of small-scale producers, who continue to be highly prevalent in the Mexican

¹¹ It should be noted however that there has been some concern that “lawyers and legislators involved in the process may lack sufficient understanding of PGS to ensure its successful incorporation into the legislative framework” (Nelson *et al.*, 2010: 231).

organic sector, since organic certification tends to be a difficult and expensive endeavour, and is therefore often inaccessible to many such producers. In fact, it is estimated that 25% of land that could be certified has not received such a designation (Nelson *et al.*, 2008b: 1-2). Consequently, REDAC has deemed the development of PGSs among member markets to be of the utmost importance, as a large majority of the participating producers are considered to be small-scale, most of whom have not acquired certification through other means (Nelson *et al.*, 2010: 231). Though a generally new concept in Mexico, many member markets are already beginning to generate their own PGS (Gómez Tovar *et al.*, 2007: 7).

3.3.1 Limitations

However it is important to note that these markets do not function without some difficulties. Perhaps one of the biggest obstacles is obtaining the funding required to ensure the continuation of the markets themselves. As such, the markets are often managed through volunteer labour and are sometimes unable to cover the costs of renting space for the actual market (Nelson *et al.*, 2008a: 25).

Limited funds can also hinder the expansion of such markets as training or education sessions may have to be forgone. Gómez Tovar *et al.* (2007: 6) state that while an increasing number of producers have expressed interest in converting their practices and participating in such markets, many lack the knowledge and finances to do so. Such circumstances can moreover lead to an inability to satisfy consumer demand.

Chapter Four

Case Study: Tianguis “Comida Sana y Cercana”

4.1 The Evolution of the Tianguis

What would later develop into a weekly farmer’s market in the heart of San Cristóbal de Las Casas, Chiapas, began in 2005, when a group of four women began sharing concerns about the quality and production conditions of the food that they and their families were consuming. Concerns were particularly focused on the use of water contaminated by untreated sewage (*‘aguas negras’*) in agricultural purposes. Though not agricultural producers themselves, they began to nurture the idea of generating a means through which they could improve selling conditions for small-scale producers in the state of Chiapas. They believed that this could be achieved through the formation of a collective, which would generate better conditions of interaction between consumers and producers and ideally eliminate the middleman from transactions (Melgoza, 2009: 4). The women recognized that there existed multiple producers who were already employing agroecological methods of production and began to seek them out among the stalls of the central market. In this way, they met with local farmers who used clean water reserves and refrained from employing chemical inputs in the production of their products, even though, within the confines of the market, their products were not marketed differently from those produced through conventional methods (Reyes Gómez, 2010: 48). By seeking the advice of local researchers and reviewing literature on similar

experiences, the project began to take shape, and in July 2005 the *Canasta Orgánica*, or “Organic Basket,” project began (Melgoza, 2009: 7).

From the outset, the goals of the project were to improve household access to clean and healthy agricultural products, while generating conditions for dialogue and trust between producers and consumers and enhancing environmental awareness and the need for responsible consumerism (Reyes Gómez, 2010: 49). As described during an interview with one of the members of the Tianguis’s leadership team, the Organic Basket project functioned similar to the Canadian equivalent of Community Supported Agriculture: consumers completed a weekly order form, which outlined available products. Orders were either emailed or phoned in mid-week and picked up on Saturdays. The costs of running and maintaining this project were covered by a 15% increase in the price charged to the consumers (Escalona Aguilar, 2009: 244).

The project experienced steady growth, though as participation in the project grew it soon became logistically difficult to prepare the desired number of baskets. The *Equipo Promotor* also was faced with increased producer interest in the project but ultimately had to reject many inquiries due to lack of information concerning the origin and conditions of production of the products in question. As it was explained, in the beginning there were very few requirements to participate, needing only the use of clean water, absence of agrochemicals and for all products to be of local origin. It soon became clear that the implementation of further requirements was needed as numerous vendors arrived with goods of questionable origins (Personal Interview, 2011). With an increasing amount of both consumers

and producers interested in the project, the project took on a new element, changing from organic baskets to a full-fledged market in which consumers and producers directly interacted with one another. In so doing, Tianguis was able to fully integrate into REDAC (Reyes Gómez, 2010: 53).

The goals of the Tianguis remained very much the same to those of the *Canasta Organica*, with the addition of a stronger focus on agroecology and responsible consumerism. The *Comité de Apoyo Técnico*¹² (CAT) was created in one sense to confirm the conditions of the producers' plots and ensure that the products sold at the Tianguis were produced in accordance with agroecological principles (Melgoza, 2009: 15-17), but also as means to support and educate producers on how to improve their techniques (Skeffington *et al.*, 2008: 5). Though some plots were less than ideal, the requirements for producers of fresh products included the identification of the exact locations of the producers' plots, the knowledge of which ensured that they are not cultivated in regions employing contaminated water, as well as the guaranteed use of clean inputs and a promise to reduce the quantity and toxicity of pesticides (Melgoza, 2009: 15-17). In short, producers pledged to produce according to a set of agroecological guidelines established by Tianguis promoters. They could do so immediately or over an established period of time.

The focus on agroecology has continued to develop at the Tianguis as producers have attended workshops concerning clean production techniques and pest management, among other topics. Such workshops are participatory environments in which producers are encouraged to share their own knowledge

¹² Technical Assistance Committee

with the wider group. There have also been opportunities when producers have visited one another's plots, both to learn techniques and to give advice (Melgoza, 2009: 26).

Currently the Tianguis members are in the process of adopting and implementing a PGS. During an interview with an EP member, she discussed how the process up until this point has been lengthy, though necessary, in order to ensure that it is truly participatory and reflective of the desires of all involved. Presently, committee formed by producers, consumers and agroecologists have generated a document detailing the norms and procedures of Tianguis' certification process. It is important to note, that they are not seeking to certify the products as being of 'organic' nature, but instead 'agroecological'. As it is stated, though the norms may reflect and bear similarities to many of those found in organic certification processes, that of the Tianguis differs in so much that an input-substitution approach to agricultural practice is insufficient as it continues to generate a cycle of dependence among producers; no matter if the inputs are of chemical nature or not (Morales *et al.* 2011: 1-2). Therefore, the certification process drafted requires that producers go beyond the minimal standards often set through organic certification, and strive to implement practices that are truly agroecological.

As outlined by Morales *et al.* (2011), there are three overarching standards must be met for a producer to gain certification. The first is that products destined for sale at the Tianguis must be considered 'clean', meaning that they were produced without the use of hormones, antibiotics, or agrochemicals. Moreover,

water sources must be unpolluted and the plot should be free of any garbage that could impact the health of both consumers as well as neighbours.

The second standard is that production is agroecological in nature. Important consideration is given to the care and improvement of soil conditions. Rotational cropping and the use of compost and other organic material are recommended actions, as well as the construction of terraces, when necessary, to reduce soil erosion. Importance is also placed on ensuring the growth of biodiversity. Producers are encouraged to grow numerous varieties of crops, a portion of which should be native to the area.

The final standard is that of social justice. In cases where most of the work is completed by family members, it must be ensured that children attend school and that household decisions are made in a just and inclusive manner. In situations where paid labour is employed, the length of a workday should be reasonable and workers must be justly compensated.

The question guide, which is to be completed upon certification visits to producer's plots, clearly demonstrates each of these standards required to gain certification. This guide is comprised of in-depth questions pertaining to a variety of agricultural aspects such as, but not limited to, how the soil and nearby water sources are cared for; the cultivation of biodiversity; pest management techniques; and elements of animal production and care. However, also included are additional questions regarding the social conditions of both household members and paid workers (Morales *et al.* 2011: 10-18).

There are no direct costs for certification, however producers may be asked to help cover or provide for various indirect costs which may arrive, such as transportation, accommodations and the provision of food during the certification visit. Moreover, producers can receive differing tiers of certification. Transitional certification status is provided to producers who have satisfied the minimal requirements for participation but need to continue to make improvements to their agricultural practices (Morales *et al.* 2011: 6). During my field research, the first plot received certification under the Tianguis' PGS; with the confidence that more would follow shortly.

Nevertheless, though the Tianguis has thus far been quite successful, it does not function without limitations. In discussion with the EP member, it was her opinion that the most pressing obstacles facing the continuation of the Tianguis are funding, participation, technical support and finding adequate physical space. The EP is managed by way of volunteer hours and while it was felt that the producers have come to be more active and take greater initiative among themselves, there is still much organizational work to be done by the EP. Limited funding also feeds into the issue of finding a suitable market facility to rent. A handful of producers and the EP member alike all cited frustrations over their current rental space, which is often quite hot and muggy and as thereby felt to compromise the freshness of their products. Moreover, the current facility does not provide room to grow, nor do they currently have access to an area where they could host meetings or workshops, circumstances that were of great disappointment to the EP member.

Moreover, producer participation is also a concern and the member with whom I spoke wondered if the producers felt as if they were part of a community or if the Tianguis was more than simply a place to sell their products. Such concern is founded on the perceived need for the EP to entice producers to participate in various activities outside of the Tianguis. This concern, and the sentiments of the producers concerning the importance of the Tianguis will be discussed in greater depth in a subsequent section.

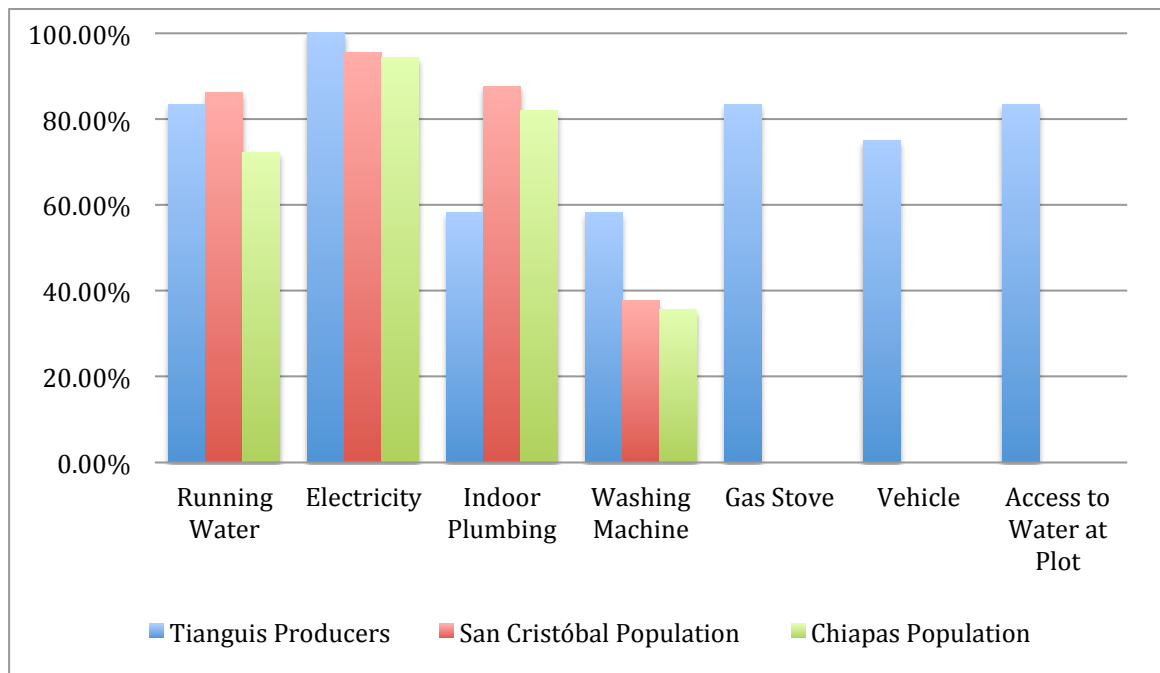
The final limitation was regarding limited technical support, in which it was stated that the researchers, who have been very active in the Tianguis, cannot always be expected to be available. In the past though aid from local university students was also sought after, it was felt that such experiences were not always successful. However, there are differing opinions on this topic. Conversely, an academic involved with the Tianguis felt that the EP has continually turned down outside offers and opinions.

Despite such limitations, the EP member was optimistic about the future of the Tianguis. The simple fact of continual existence was seen to be a great achievement, as the Tianguis has managed to stay more or less intact and unified since its creation. Visions for the future include the purchase of space for the market as well as truck, which would enable them to visit neighbouring markets, and continued activities to increase the public consciousness.

4.2 Household Characteristics

As aforementioned, diversity abounds at the Tianguis, and not simply with regard to the products available. The experiences and socio-economic position of each producer vastly varies. The average household size of the selected sample is 4.75 people, comprised of 2.58 adults and 2.17 children, however even this statistic hides the fact that household sizes ranged from two to nine members.

To better appreciate the household conditions of producers, a wealth index survey was conducted and when possible, the results of the sample were compared to the characteristics of the general public in both San Cristóbal de Las Casas and Chiapas as a whole.



Sources: Survey data collected by author and Mexico (2010b).

Figure 1: Wealth Index Survey

As indicated by Figure 1, the majority of producers had access to the items or services indicated in the wealth inventory. The lack of a vehicle or access to water at

the household's plot were viewed as limitations by those interviewed, however the latter even more so. Without a vehicle, producers were forced to rely on public transportation such as taxis or collective buses, which can be a costly and time-consuming process since many of the producers travel into San Cristóbal de Las Casas from outlying towns and communities. For the two households without access to water at their plots, the limitations were extensive. In the case of one household, which also did not have running water within the house, they were required to purchase and ration a weekly supply of water. Though costly, doing so enabled them to continue to cover not only all their personal needs but those of their livestock as well. The second household had running water at their homestead, which was located a fair distance from the agricultural plot they worked, forcing the producer to rely exclusively on rainwater. This greatly limited the household's ability to not only achieve self-sufficiency but also to participate in the Tianguis, as the household only sold their excess vegetables. In this way, this producer only sold her products seasonally, since sellable surpluses were only common during the rainy season.

For a large majority of producers, selling at the Tianguis only represents one element in their often-diversified livelihood strategies. In fact of the twelve interviewed, only one producer household relies exclusively on the income generated at the Tianguis. Figure 2 is an attempt at demonstrating the diversity of livelihood activities among producers at the Tianguis. As illustrated, each household has a very different livelihood strategy, often comprised of many income-generating activities. The three topmost bars represent the three households that rely solely on

their agricultural production, while all other households receive income or support from other sectors. The divisions should not be mistaken to represent the extent to which each household relies on a certain income or support, but instead as a mere representation of the different types of activities that go into the different members' livelihood strategies.

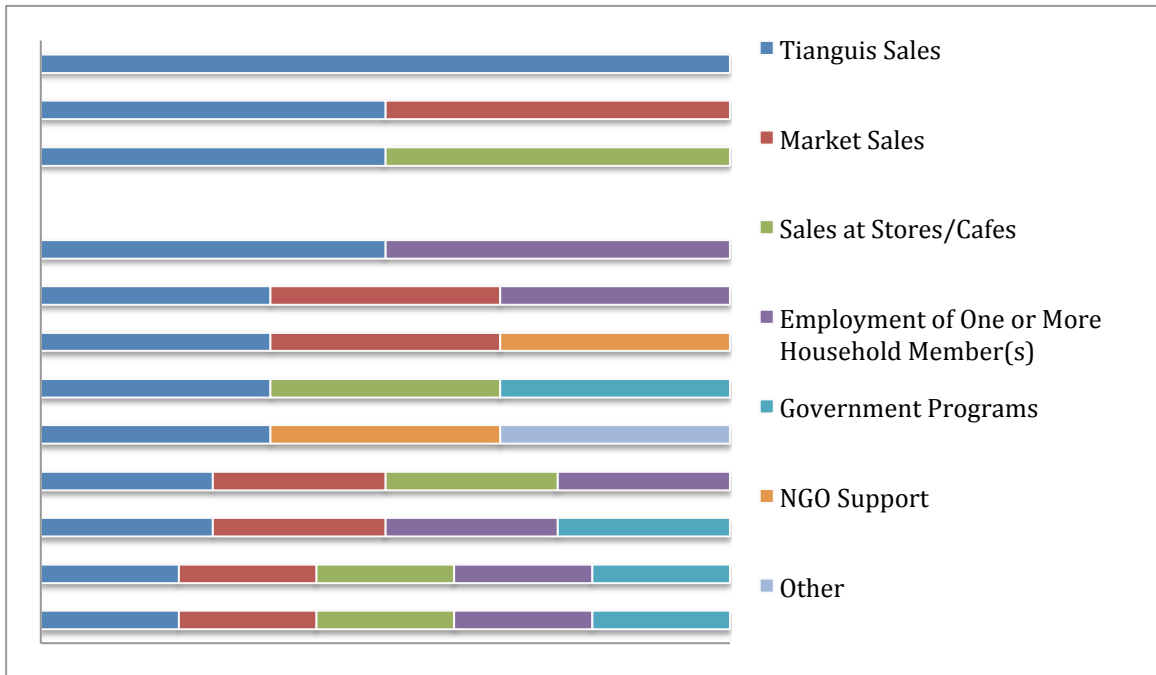


Figure 2: The Livelihood Strategies of Producer Households

During interviews with producers, it often became apparent that the extent to which participation in the Tianguis has the potential to improve both food security and general living conditions is greatly dependent on the degree to which this activity factors into their livelihood strategy. At one end of the spectrum, one producer confessed that once various costs, such as that of transportation, are taken into account, she often doesn't know if she breaks even when coming to the Tianguis. Selling there plays a very minor part in her livelihood strategy as she

makes most of her income from selling her products in organic stores located in Mexico City. In her case, the primary motivation for her participation at the Tianguis is a sense of conviction to the cause as well as the desire to purchase agroecological produce for consumption within her own household. These circumstances can be contrasted with those of another producer, in which aside from the Tianguis, the household relies upon the sale of her products in local cafes, as well as the casual employment of another family member. Though in this case, the producer does not generally sell substantial quantities at the Tianguis, any additional income contributes significantly to ensuring that the needs of the household are met.

Generally, the Tianguis played a significant role in the livelihood strategies of the households interviewed, however, further variances were recorded. Three of the producers interviewed only sell at the Tianguis on a seasonal basis. For two of these producers, it is due to the fact that while they grow a variety of crops, only one is cultivated for sale at the Tianguis. Therefore they only participate when their product is in season. The remaining household is that which is greatly hindered by limited access to water and thus sells on a sporadic basis.

The amount of hours dedicated to agricultural production also varied among producers. In terms of the number of hours each producer works at an activity directly related to their production, 41.67% of producers work five hours or less each day, while 33.34% work eight hours or more. The remaining producers were unable to specify the typical number of hours that they work each day since the time that they dedicated to agricultural production as more sporadic. With regard to any

changes in hours worked, just over half of the producers stated that the amount of time spent working every day has increased since joining the Tianguis. The most widely identified reason was the acquisition of new ideas or crop varieties, which require additional commitment. Two further reasons, each identified by one producer respectively, were an increase in the value placed on their work and the fact that the Tianguis provided a stable selling environment. In addition to agricultural production, producers also cited time spent working other jobs or household chores and responsibilities.

When asked how many hours they sleep each night, three quarters of the producers stated that each night they sleep eight to nine hours, while the remaining quarter sleep six to seven hours a night. With regard to changes in hours slept due to Tianguis activities, three producers stated that the nights prior to market days, they sleep an average of 3.5 hours less than they usually would. A shared characteristic of these producers is that they sell various prepared food items and attribute their lack of sleep to the nature of their work and the desire to ensure that their products are sold fresh on market days.

4.3 Agricultural Practices

The majority of producers interviewed have a family history of agricultural production, and though previously understood by other names, agroecology is often described as a 'family tradition'. Half of the producers have been employing

agroecological methods of production for over twenty years. 16.67% have been doing so for ten to nineteen years and the remaining 33.34% have only been employing such methods for nine years or less. In terms of chemical usage, 41.67% of producers stated that they had at one point used chemical inputs, such as fertilizers or pesticides, but subsequently stopped after noticing either the damage that was being caused to their plot, or a decline in production.

One producer noted that a member of his household continues to grow corn, on a separate plot, with the help of chemical fertilizers. Though interested in the potential of farming organically, the producer stated that his father is not yet convinced and he himself feels that he has no right to force the issue as his father's livelihood is dependant on his corn production, and he can not guarantee a sufficient yield. However, the household has rented a small plot where they have begun experiments of growing corn with reduced applications of chemical inputs. When describing the results, it was felt that after two harvests the household had both gained and lost. For the first test, instead of putting down two rounds of chemical fertilizer, the producer used only one and reaped a good harvest. The second time around however, he received poor results; though he felt that it was due to the fact that he planted two months later than he should have, than with the less chemically intensive method of production.

While such a limited household experiment is in no way conclusive, this anecdote highlights the important considerations that producers need to take into account when changing their method of agricultural production. The producer also noted that while his father has yet to completely overhaul his production methods,

he has begun to make significant changes. One such example is the act of returning harvest waste to the soil, instead of simply burning it.

In terms of how long each producer has been participating at the Tianguis, almost half (41.67%) joined when the project first began, six years ago, while 16.67% have only been active for one year or less.

Though varied, the majority of producers currently have five hectares of land or less under production, as demonstrated in Figure 3. Included in this calculation are the two producers who raise livestock, either for their dairy products or as meat. Respectively, they work 25 and 6 hectares of land. Generally, all land is owned by the household and in the majority of cases was acquired through inheritance. Only two producers currently rent land; one a small plot to hold her sheep and the other is the aforementioned test plot for growing corn.

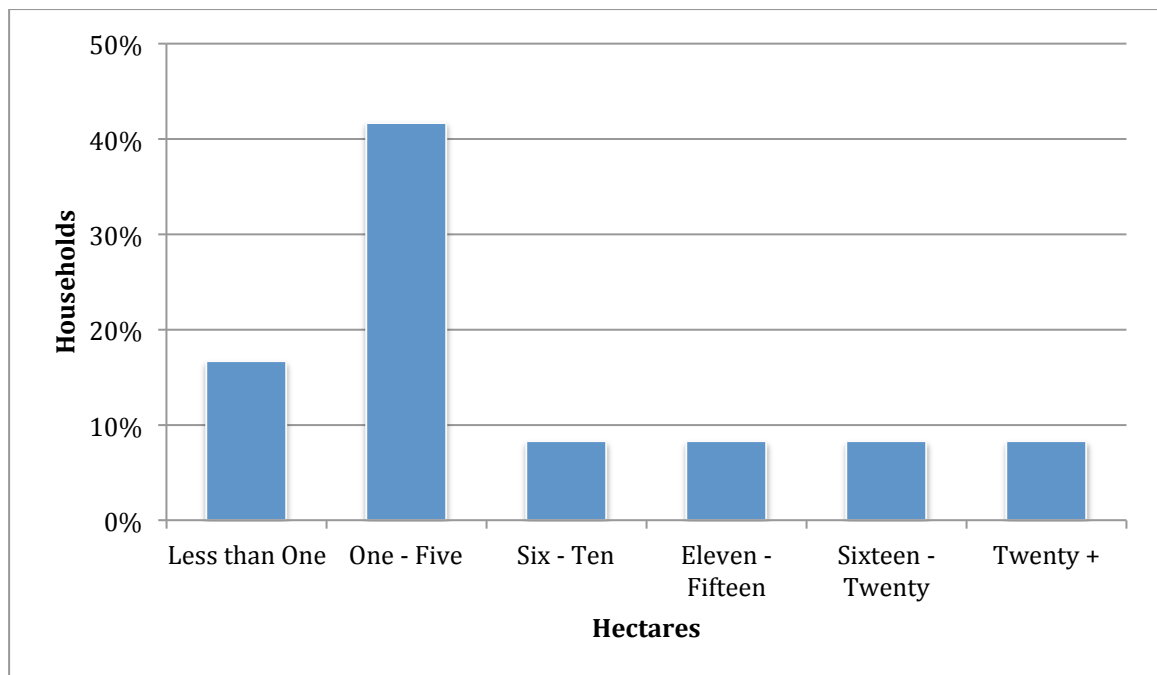


Figure 3: Hectares of Land Under Production per Household

It should also be noted that one producer was excluded from these calculations because she does not own or rent any land but instead purchases inputs from another producer in town, which she then processes into candied fruit. She is able to participate in the Tianguis on the basis that the producer from whom she purchases the fruit employs acceptable agricultural production methods.

4.3.1 Agricultural Inputs

On the whole, Tianguis producers purchase relatively few agricultural inputs, the only exception being the candied fruit producer. The most commonly purchased input is labour power, hired by just over half (58.34%) of the households sampled. Among those, 43% hire multiple full time labourers, while the others employ casual labour, typically for short periods during planting or harvesting times. In terms of the cost of labour, the majority of producers pay their workers between 100-130 pesos per day, which is well above the daily minimum wage in the region, set at 56.70 pesos (Mexico, 2012). However, two households employed the labour of boys, who were paid significantly less, at 30 pesos per day and 800 pesos per month, respectively.

Seeds were the second most commonly purchased input; reported by 41.67% of producers. However, it is important to note that seeds are generally only purchased on an occasional basis, as the large majority of producers attempt to regularly save their seeds from previous years. Other purchased inputs include manure (25%), materials such as packaging and food additives (i.e. fruit and vanilla) (25%), animal feed (16.67%), compost (8.34%) and water (8.34%). When

discussing the purchased inputs of his household, one producer stated that while it could potentially be argued that his yields are smaller than those achieved through conventional means, he derives great satisfaction from the fact that he doesn't have to pay high input costs.

Limited dependence upon purchased inputs does not mean that the farmers are not attentive to the fertility of their soil, or to pest and weed management. All producers described their own natural pest remedies, and 90% stated that they apply some form of compost and employ intercropping techniques. Crop rotations were also highly prevalent. During one plot visit, the producer explained his technique of building a compost pile in various spots in his field. Once the compost has broken down, he plants directly on top of the pile and begins the process again elsewhere on his land.

All agricultural producers attested to having experienced some form of crop failure, largely caused by various pests or weather conditions; however many attributed the lack of widespread devastation to the various management techniques that they employ. The most commonly cited pests included worms and moths, which were described as yearly annoyances but were generally controlled by means of a homemade remedy. Weather events such as frost, rain and hail proved more difficult to mitigate, the results of which sometimes destroyed newly planted seedlings. Regarding livestock, one producer cited animal injury and illness as a key concern, arguing however that by providing their animals with superior care and supervision, they are able to significantly reduce the spread and severity of such

occurrences. Cold weather however is also a problem, especially for the growth of eggs and newly hatched chicks.

Only one producer disclosed that she experienced a widespread crop failure, losing large portions of her cocoa crops to a new pest the past two years. Currently her employees are attempting to address the issue by pruning the plants to both encourage better air circulation and remove infected branches. The producer felt that this new pest would soon run its course and leave the area. She also felt that the damaging impacts of past hurricanes had weakened her land, causing her plants to be more susceptible when this pest arose.

While the pest management solutions used by the producers varied greatly, all are derived from an accumulation of knowledge, sometimes passed down through family tradition, or as neighbourly advice. One producer in particular felt that her household's crops were still greatly susceptible to pests because they still have much to learn, concerning repellents and remedies, highlighting the importance of knowledge acquisition in the success of agroecological methods.

When asked to describe the quality of the land they own, the large majority of producers insisted that their land is of good quality, though various issues were also revealed. During field visits, plots of mixed soil quality were encountered, as well as a couple with sloped portions and one that was particularly rocky. As with pest management solutions, however, all producers had found ways to work within the confines of their given situations. One was in the process of installing terraces to prevent further erosion, while another refrained from planting on sloped areas

during the dry season since the crops would be unable to take full advantage of the limited water resources.

Producers were also vocal about their commitments to their land and the necessity of 'giving back' was often stated. With regards to improved land quality, the majority of producers strongly felt that the work and natural inputs that they have been putting into the land was the prime factor contributing towards improved conditions. It was often stated that without such contributions they could not possibly reach or maintain their current level of production. Of the producers who cited no improvement, two claimed that their land has always been of good quality and that they have simply worked to maintain it.

4.3.2 The Importance of Agroecology

The producers at the Tianguis vocalized very strong convictions about the importance of employing agroecological practices. Though opinions varied, they were largely associated with three broad interrelated themes: health, food quality, and the importance of the land.

It was widely perceived that agroecological practises enabled the producers and their household members to consume healthier items and eliminated the need to worry over the potential effects of chemicals used by conventional farmers. In fact for some producers it was this concern that initially peaked their interest in agroecology and the practice of growing for household consumption. A newfound confidence in the quality of food items consumed within households was also mentioned by multiple producers, as was an improvement in taste. One producer

spoke passionately against the speed at which crops are currently grown, arguing that now everything is “express” and that while ears of corn might now be larger than those previously grown, he does not trust the product, or the method of production. Instead he views agroecology as a way to establish a higher level of food quality and to “rescue what their grandparents left them”. Concerns over the health of animals as well as future generations were also stated, both intrinsically linked to the immense importance that the producers placed on the land, which was commonly referred to as “a gift” and “an investment”. Many producers viewed agroecological practices to be a way to contribute to the health of the environment and give strength back to the land that sustains them.

Many also felt very strongly about the importance of sharing their knowledge with others. One producer stated that people often tell him that his methods are a lot of work. Nevertheless, given his conviction that agrochemicals destroy the soil and render land worthless, he believes that it is a worthwhile investment. He has been working his land for many years yet it has retained both its quality and value, which he attributes to his agricultural practices.

Beyond such concerns, two producers also stated that they derive immense enjoyment from their methods of agricultural production, both in the actual work that goes into the process but also from the satisfaction of providing health products for their households and the wider population.

4.4 Functioning of the Tianguis

The Tianguis is held three times a week, on Wednesdays, Fridays and Saturdays, from 10am until 3pm. On Fridays, it's held at a local research centre, while the two remaining market days are held in the courtyard of a restaurant in the city centre. Attendance of the producers is neither mandatory nor regulated, but is instead dependant on the discretion of each producer. One EP member explained that in the beginning the Tianguis was only held on Saturdays, but that the producers themselves pushed for additional market days on Wednesdays and Fridays.

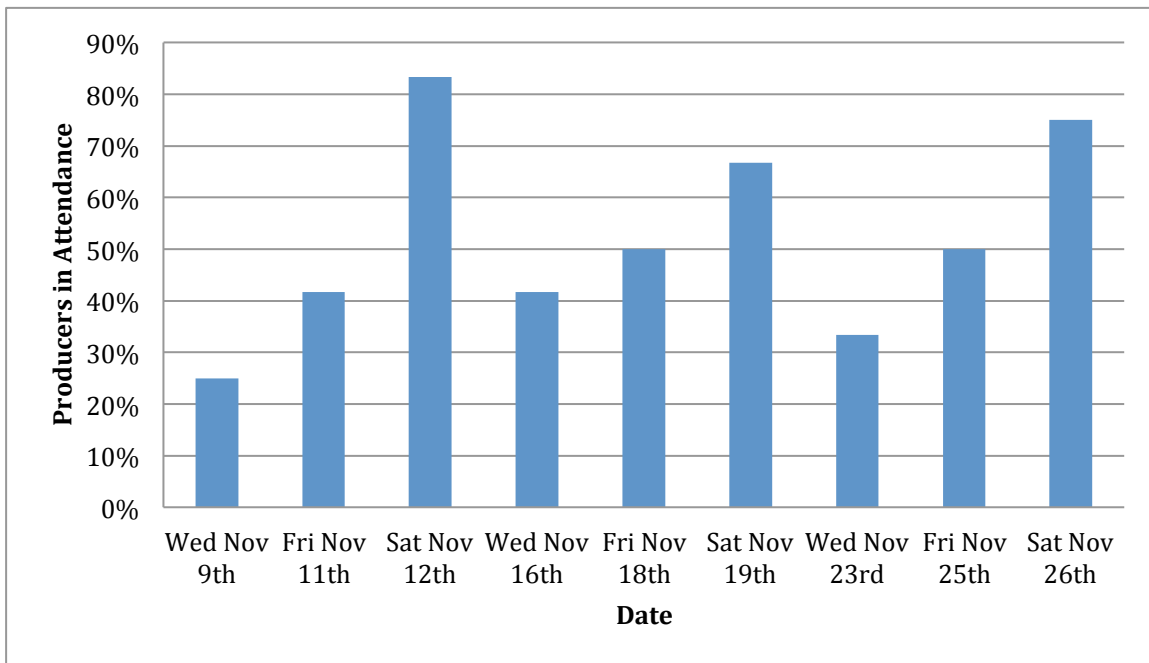


Figure 4: Producer Attendance on Market Days

As Figure 4 shows, attendance on behalf of the producers varied greatly depending on the day of the week. Multiple producers indicated that their limited participation is largely due to a decreased number of consumers attending the

Tianguis on days other than Saturday. For many producers, the costs of coming into town for slower market days reportedly outweighed the minimal benefits to be gained. As such, producer attendance was closely tied to daily earning potentials. The general lack of record keeping among producers made it difficult to gain a clear picture of daily earnings at the Tianguis, but those producers who were able to provide estimates unanimously recognized Saturday to be the best day to attend as it drew a larger crowd of consumers. Ranging from 735-815 pesos (56.54- 62.70 USD¹³), Saturday earnings are approximately double the 375-390 pesos (28.85- 30.00 USD) earned from the Wednesday and Friday markets. Market day observations confirmed these statements, as there was a noticeable difference in the number of consumers present depending on the day of the week. Whereas Saturdays were steadily busy save for the last hour or so, Fridays consisted largely of a smaller rushes, seemingly corresponding with the breaks of the professors and students, and Wednesdays were never attended by more than a handful of people at one time, often quite sporadically.

Earnings vary not only during the week but also through out the year. 80% of the crop producers indicated that earnings at the Tianguis varied during the year, which was largely attributed to the impacts of weather conditions upon the quantity of products available to sell. Excessive rain and frost were noted as the biggest offenders, followed by the occurrence of hail and conditions during the dry season.

¹³ Based on an exchange rate of 1 USD = 13 MXN

Each of these weather conditions can have devastating impacts on production levels and as an extension, the earnings of the producers.

The time of the year was also reported as causing variances. Few producers reported a rise in demand for their products during periods such as holidays or growing season. Additionally, one producer stated that because her products are not necessities but more so occasional treats, her earnings tend to vary greatly. Conversely, the producers who reported stable earnings throughout the year indicated that such conditions are achievable due to the fact that they grow a their crops according to the season, and therefore always have products available for sale.

The producers selling animal products also cited seasonal variations in total sales, as both stated that they are heavily impacted by holiday demand. In terms of the dairy products, it was once again stated that as an item that is not eaten regularly by everyone, demand tends to vary throughout the year.

4.4.1 Prices at the Tianguis

During interviews, half of the producers insisted that they received better prices for their products when selling at the Tianguis versus selling elsewhere. Two producers linked the resulting price difference to an unwillingness among consumers at the central market to pay higher prices. Divulging further, one producer linked the price differential to product knowledge, arguing, “a tomato is just a tomato to people who do not have information”. It was believed that once people are informed and aware of the conditions in which their food is produced, they would be more willing to pay the higher costs found at the Tianguis.

Item	Central Market (Price per item)	Tianguis (Price per item)	Price Difference (Percentage)
Vegetables			
-Green Beans	10 pesos	10 pesos	0%
-Onions	10 pesos	10 pesos	0%
-Potatoes	10 pesos	10 pesos	0%
-Lettuce	5 pesos	5 pesos	0%
-Spinach	5 pesos	5 pesos	0%
-Broccoli	8 pesos	10 pesos	25%
-Carrots	5 pesos	5 pesos	0%
-Radishes	1 peso	3 pesos	300%
Fruit			
-Bananas ¹⁴	0.71 pesos	1.25 pesos	76.06%
-Lemons ¹⁵	0.42 pesos	0.84 pesos	100%
Animal Products			
-Chicken ¹⁶ (per lb)	30 pesos	45.45–68.18 pesos	51.50 – 127.27%
-Eggs ¹⁷	1.2 pesos	3.33 pesos	177.50%
Prepared Foods			
-Tortillas ¹⁸	0.32 pesos	0.83 pesos	159.38%
-Tamales ¹⁹	3.33 pesos	5 pesos	50.15%
-Candied Figs	2 pesos	5 pesos	150%

Table 1: Price comparison of Tianguis and central market products (As of the week of November 20th- 26th, 2011)

¹⁴ At the central market, seven bananas are sold for five pesos, while at the Tianguis eight are sold for ten pesos.

¹⁵ At the central market, twelve lemons are sold for five pesos, while at the Tianguis six are sold for five pesos.

¹⁶ At the central market, chicken is sold for 30 pesos per pound, while at the Tianguis a whole chicken is sold for 150 pesos (approximately 1 - 1½ kilograms)

¹⁷ At the central market, fifteen eggs are sold for eighteen pesos, while at the Tianguis twelve eggs are sold for forty pesos.

¹⁸ At a Maseca Tortilleria, thirty-one tortillas are sold for ten pesos, while at the Tianguis twelve are sold for ten pesos.

¹⁹ At the central market, three tamales are sold for ten pesos, while at the Tianguis they are sold for five pesos each.

To better understand the difference in prices of products sold at the Tianguis versus the central market, a price comparison was conducted, in which a variety of products currently for sale at both locations were selected for assessment.

The results are displayed in Table 1, and indicate an interesting distinction between the items that cost more at the Tianguis and those at that are roughly equal in price. Aside from vegetables, all other products included in the survey are priced much higher, often times significantly so, at the Tianguis than at the central market²⁰. During interviews two producers – one selling processed goods and the other prepared foods – felt that the nature of their products allows them to receive better returns for their goods. The former producer stated that if she were to simply sell mangoes, she would receive much lower prices because “people could buy mangoes by the truckload”. However by processing the mangoes and selling them as sauces or jams, she is able to charge higher prices for her products and capture the value added by her labour. Similarly, the latter producer, who previously sold maize, made the switch to producing tortillas because she felt by doing so that she could earn more income by selling a prepared item versus the grain; once again increasing her earnings by adding value. Furthermore, the higher price of her tortillas was justified by the fact that she is “spending” her life making them by hand. Unlike at the tortillerias where machines do much of the work and can easily be repaired or replaced, she makes the tortillas manually. In both situations, the producers felt

²⁰ It is important to note, however, that the production methods of the items sold in the central market are unknown and therefore this comparison only serves to explore the impact that association with the Tianguis can have on the prices of goods.

strongly that the effort they expend greatly adds value to the products they offer and that in this way they earn a higher income than if they were to simply sell unprocessed or unprepared goods. In terms of animal products, a similar opinion was expressed, as one producer alluded to the extensive care and effort that goes into raising the household's livestock. In all three cases, prices were set to reflect the additional labour that their products required.

As illustrated however, the same cannot be said for vegetables, which are generally sold at the same price regardless of the location. In fact, when first approached at the beginning of the price comparison, one of the vegetable producers was confident that the same prices would be found at both locations, even though in an early interview she stated that she receives better prices for her products at the Tianguis. In order to understand this apparent contradiction, it is important to acknowledge the situations in which the producers sold their products prior to the Tianguis.

The majority of producers stated that they sold in either the central market (33.34%), to superstores (16.67%) or, in the streets, door-to-door or to a middleman (25%). Of the two latter categories, all but one producer felt that the Tianguis offered them better selling conditions than their prior arrangements. Those who previously sold to supermarkets spoke of high advertising costs and unfavourable conditions for their products²¹, as well as the application of

²¹ Such was the experience of one producer whose household formerly sold their products to a superstore in Tuxtla Gutiérrez. The household was required to pay for

unwarranted penalties²², all of which placed losses squarely on the shoulders of the producers. Regarding the third category, one producer felt that the predetermined and fixed days of the Tianguis now provides her with a sense of stability unrealized while selling to a middleman, while a further producer cited that though she continues to perform the same manner of work, it is less fatiguing because instead of rising at two o'clock in the morning and selling in the streets, she can sleep longer and sell in the shade and among friends at the Tianguis. It is therefore possible for producers to face less uncertainty regarding the price that they will receive and the quantity that they will sell at the Tianguis.

Additionally one producer disclosed that variations in productivity and subsequently the availability of products brought on by weather patterns can have an impact on the prices of goods at the central market but not at the Tianguis, where prices generally remain constant despite various factors. This can work both ways, however, as prices at the central market could be found to be lower or sometimes higher than those charged at the Tianguis.

any in-store advertising and only received compensation for the products purchased by consumers. Moreover, their items were never included in store sales and felt strongly that consumers generally overlooked them, as a consequence. The producer felt that though her household continues to sell the same quantity of products as before, they are now fairly compensated.

²² Another producer spoke of his experiences selling to various companies who would fine him with a variety of unwarranted penalties or occasionally pay him less than what he was owed because they claimed that his products were of poor quality.

4.5 Production and Consumption Patterns

Just as producers diversify their livelihood strategies, they also tend to cultivate and produce a variety of products. Such diversity is easily noticeable at the tables of those producers who sell a wide variety of produce at the Tianguis, however even those with a more specialized selection for sale tend to grow a wider variety for household consumption. Such circumstances were first revealed during a field visit, in which a producer guided researchers through her plot, pointing out the crops that she grows for sale at the Tianguis, those that she sells at the central market and those that are generally for household consumption. It soon became clear that items she sells at the Tianguis only represent a very small portion of crops she grows. The reason for this, she explained is due to a collective decision among the Tianguis members to minimize internal competition. Six of the eight producers who sell a more select assortment of products at the Tianguis grow additional varieties that they do not sell at this locale. Once again, two producers explained that this arrangement is largely due to concerns over the possible creation of internal competition. One producer in particular found this arrangement to have a motivating effect, in which she argued that it challenges each of them to be creative with the products that they offer and encourages the advancement of diversity. For her part, she cited the desire to make jams and marmalades, as well as add cinnamon, pepper and other fruits to her already expended inventory of produce.

Comparable conditions were found to be true in regard to the raising of livestock. Though only two producers specialize in the sale of animal products at the Tianguis, a total of ten of the twelve interviewed raise animals. The top five animals

cited, in order of popularity, include were chickens, rabbits, ducks, sheep and turkey, though the list is much more extensive for the two who specialize in this area. For eight producers, animals are raised strictly for household consumption, though they all have sold – and at times continue to sell – eggs when specifically requested by a neighbour or consumer. However such transactions only take place after household consumption has been covered (i.e. only “surplus” products are sold). Again the concern of competition was raised as one producer who previously sold meat has since stopped doing so since the entry of other producers into the Tianguis.

While all producers cultivated crops or raised animals for household consumption, the extent to which they did so varied among the sample. In terms of the proportion of production consumed within the household, nearly 60% of the producers maintain that they consume 25 percent or less of their product; 17% consume half of their production. The variation among households was largely attributed to either the scale of production or the nature of the products sold.

The remaining quarter of respondents stated that the majority of their produce is consumed intra-household, selling no more than 25% of their output. In two cases this was due to the fact that while they grow such a wide variety of crops overall, they sell only a specific item at the Tianguis. The additional producer cultivates primarily for household consumption and only comes to market if additional quantities are remaining.

Household Food Availability

A quarter of producers interviewed stated that there were periods during the year that their household lacked a sufficient quantity of food. Though the reasons for this deficiency and the time of year in which it took place differed for each producer, they all tied back to difficulties posed by decreases in their level of either production or sales. The majority of those who stated that their household faced no such periods of uncertainty linked their situation to the fact that they continue to grow a portion of their products strictly to satisfy household consumption and therefore argued that they always have access to what they grow themselves. It is also interesting to note that two of the eight producers who insisted that their household faced no such periods justified their response with an explanation of their family' ingenuity. It was argued that during difficult periods in the past, individuals developed strategies and learned to make the most with what they had available to them at the time. Such skills are nevertheless relied upon in more recent periods of difficulty as well. In this way, it was indicated that though households continue to face uncertainty and episodes of insufficiency, the majority have developed tactics, such as the act of growing for consumption or learned resourcefulness, to lessen their risk.

4.5.1 Changes in Production

A quick walk through both the Tianguis and the central market would reveal differences in the types of produce available. Though many common items can be found at both locations, certain items are distinctly found at one or the other. When

asked if there were any crops that they had stopped growing since joining the Tianguis, the unanimous answer was “no”; however, 40% of producers did acknowledge that there are certain crops that they have begun to grow less of due to lack of demand at the Tianguis. Such crops include mustard greens, turnip greens and certain varieties of lettuces; as it was claimed that these items either do not appeal to Tianguis consumers or that consumers desire more diversity than the one or two types of lettuces previously produced.

In contrast, seven producers stated that they have started growing new crops since joining the Tianguis. On average, each of these producers has acquired approximately three new crops, with some producers adding as many as ten. The most widely added crops include new varieties of lettuce (57.14% of producers), arugula (28.57%), tatsoi (28.57%) and red chard (28.57%). However the total list is quite extensive, as each of the following items were each cited by one producer respectively: red mustard greens, Japanese turnip, yellow squash, Chinese parsley, long spinach, berries, kale, bunching onion, carrots, beets, artichoke, potatoes and celery. The most widely cited reason for producer’s adoption of the aforementioned vegetables was entirely based on consumer demands at the Tianguis, which caused many producers to seek out the new crops or, in some cases, they were actually given the required seeds by interested consumers or an employer. Three producers stated that they did not grow these crops prior to the Tianguis because they were not familiar with them. In addition to commencing cultivation of various vegetables, one producer also began producing chocolate due to consumer demand. In fact there was only one case in which a producer declined to add another item to their

selling inventory, despite expressed demand. Her reason for not doing so was in response to the additional work that would be required.

An interesting remark offered during one interview was that selling at the Tianguis requires the cultivation of smaller quantities of a diverse range of items. It was argued that it is only worth selling at the central market if the producer grows multiple beds of the same, or very few, crops. Conversely consumers of the Tianguis are often in search of an array of choices and therefore it is best to grow a smaller amount of more items. In this way, participation within the Tianguis has largely impacted both the varieties and quantities of items produced.

In terms of animal products, two producers have since begun to raise new animal species since joining the Tianguis: rabbits and goats. The decision to raise these animals was partly for direct household consumption, as well as the possibility to sell meat and other animal products at the Tianguis. One producer in particular has diversified her animal products further and has introduced packages of prepared meats and sauces into her selection of available items.

Though the large majority of these products were started in response to consumer demand, the producers stated that they have also integrated the majority of the products into their diets. In fact only three producers identified vegetables that they grow but do not eat. Among the products that are not consumed within the households, producers do not eat garlic, arugula and red mustard greens, due to their strong, unfamiliar taste; one producer also noted that she does not consume the spinach that she grows because she is unsure how to prepare it.

4.5.2 Additional Purchasing Power

Fifty percent of producers stated that by selling at the Tianguis, they have since been able to purchase items that they could not afford previously. The items now purchased varied from producer to producer but included household items such as refrigerators and blenders, as well as food items, oftentimes meat or dairy products. In other households, the additional income was used to cover various child-related needs or university tuition.

Two producers noted that they have not increased their purchasing power because they do not sell at the Tianguis year round. In one instance this is due to the growing season of the specific crop that they sell at the Tianguis, though the other producer is greatly limited by lack of access to water and therefore only sells during the rainy season, when she is more likely to have a surplus of products.

4.5.3 Purchased Food Items

The percentage of food purchased varied among the twelve households interviewed. In the case of five households, a “quarter or less” of items consumed within the household were purchased, a further four households purchased “half” of their food items, while the remaining three stated that they purchased “most” of the items consumed within the household. It is interesting to note that the producers who purchase “most” of their food items shared a common characteristic; in so much that they each sold what is considered to be a specialty item. Unlike other producers who sold vegetables, fruit, meat or tortillas, these producers sold items such as chocolate, candied fruit and cheese; each of which were stated to be highly

susceptible to unstable demand, and of which the household itself could only consume so much. Conversely, the households that purchased a smaller proportion of their food generally bought only what they did not produce themselves and, as previously noted, many households grew products in addition to those that they sell.

Such circumstances were widely the same prior to participation within the Tianguis, with only three households indicating changes in purchasing levels. Two such households purchase less than they did before due to an increase in the varieties of crops the household grows, while the additional household now purchases more than they once did, due to an increase in available resources and purchasing power.



Figure 5: The Ten Most Commonly Purchased Items

Figure 5 illustrates the ten food items most commonly purchased by the households interviewed. As shown, most producers purchase the majority of their

items from the market, whereas the Tianguis is largely unrepresented, except in regard to the purchase of vegetables. It is important to note, however, that this figure does not account for food that is acquired outside of the market, including self-production and non-market exchanges among Tianguis members.

Of the twelve households, one quarter stated that there were times during a typical year in which the household had difficulty purchasing food items. Once again this was primarily attributed to limited income from sales. Conversely, those who never had difficulty with purchases generally stated either that they always had access to sufficient funds to purchase needed items, or that the household itself bought very little and relied more so on self-provisioning. However, though they initially stated that their households faced no such periods of uncertainty, two households indicated that their ability to purchase food items that they do not grow is sometimes impacted by slow periods in both production and selling.

To better understand the consumption patterns of the producers, each were asked to list the food items that they typically eat as well as to participate in a food recall, both as part of the initial interviews as well as subsequent follow-ups, depending on availability. The reason for doing so was to evaluate a possible difference between the producer's perceptions of what they consume in comparison with actual circumstances. The only item to be mentioned by all producers was vegetables, and often times it was quantified as "a lot", though very few elaborated on the varieties that they consume. Aside from vegetables, beans, chicken and beef

were listed during the majority of interviews and rabbit meat, rice and eggs were all listed by a quarter of producers.

When asked if there are ever times in which it's difficult to acquire the foods items specified in the aforementioned question, approximately three-quarters of producers responded negatively, explaining that either they grow enough for own consumption (44.45%) or that there is always enough money (33.34%), with one additional producer citing household ingenuity. Interestingly, when probed for further information concerning the specific items which are difficult to acquire and the reasons why, the most cited response was dairy products, which in fact only factored into the diets of 20% of producers. Two additional items, each cited by producer respectively, were meat as well as beans and corn. Unanimously, the reasons for difficulties obtaining these items were due to the high costs of each, which producers could not afford in times when their own products were earning them a sufficient income.

Generally however, producers asserted that they were satisfied with the food items that they currently consume, with only three producers identifying food items that they would like to consume but do not currently. In each case, the food item in question varied. For one producer, the item in question was sardines, which her husband enjoys but they rarely purchase. Another cited granola and yoghurt as a favourite of her children, though the expensive nature of these products limited the frequency in which they could be purchased. The final item cited was the consumption of additional meat products. Interestingly, this producer stated that

her household's ability to consume meat products is limited by the growth rate of their livestock, making no mention of the possibility of purchasing such products.

4.5.4 Daily Eating Habits

The completion of the food recall study aided in the attempt to better understand the daily eating habits of producers. Subsequently, the overall results from the recall were compared to *El Plato del Buen Comer*, a food guide that was compiled by the Mexican government to reflect food items and portions that are culturally suitable as well as easily accessible to the general population. This guide illustrates a plate divided into thirds, reflecting both portion sizes as well as the elements required for a balanced diet: (1) fruits and vegetables, (2) cereals, and (3) legumes and animal products (Mexico, 2003: 14-16; Mexico, 2010a: 34).

Over the course of the food recall study, as well as a few mealtime observations, 353 food items were recorded. Of that total, 29.74% belonged to the category of fruits and vegetables, 28.05% were cereals and a further 26.06% were legumes and animal products. The remaining 16.15% of items recalled fell into the grouping of "Others", largely consisting of coffee, soda and snack items. It is, however, important to note that while fruits and vegetables accounted for almost a third of the total items recorded, the large majority of vegetables were not consumed as their own serving but rather as part of an omelette or quesadilla. Therefore, as illustrated by one example, though the producer indicated that as part of her lunch she ate both lettuce and tomato, they were merely slices on a sandwich.

Though the information gathered through the food recall cannot speak to portion sizes, it does shed light on the typical consumption patterns of the producers.

Breakfast: Only five items were consumed in at least 25% of recorded breakfasts. In descending order, these items were: tortillas, coffee, beans, eggs and tomato.

What is concealed however, is the fact that vegetables as a whole constituted 20% of the items recorded. Though once again, they generally were not consumed on their own, a wide variety of vegetables were recorded, including newly acquired items such as spinach and chards. Fruit was largely unrepresented, mentioned only six times within the twenty-eight meals, with the majority derived from the consumption of fruit juice. 60% of breakfasts included elements from the three categories outlined by *El Plato del Buen Comer*.

Lunch: The most consumed items at lunch were generally similar to those consumed earlier in the day: tortillas, fruit juice, beans, tomato and rice. Three-quarters of lunches included elements from the three food categories. Once again, an array of vegetables was consumed, accounting for almost a quarter of items recalled, whereas fruit was overwhelmingly consumed as juice; recorded in fifteen of sixteen meals. Meat and animal products accounted for just under a fifth of the items consumed, chicken, beef and eggs combining to account for the majority of such items.

Supper: While lunch is typically the largest meal of the day, supper was practically non-existent among the producers. In fact, half of the recorded meals consisted solely of coffee and bread, or a similar combination. Moreover, on four additional occasions, supper was not eaten on the day recorded. Only four items- coffee, bread, tortillas, and cheese- were consumed as part of 25% of meals. Of the other nine meals, only five of them included items from each of the three food categories. Fruit was excluded from all meals, beans included only once and coffee was consumed in twice as many meals as all the vegetables recalled. Overall, supper was the least diversified meal recorded.

Snacks: Throughout the day, snacks were generally a rarity, as they were only included in less than half of the recalls conducted. Fruit accounted for 50% of the items recorded, among which oranges and bananas were the most common. Cereals and items designated to the category of “other”, which included soda, coffee and sweets, each respectively accounted for approximately 20% of items consumed. The two remaining items were vegetables.

4.5.5 Dietary Changes

When asked to discuss any dietary changes since participating in the Tianguis, ten of twelve producers (83%) responded that their diets had improved. Though diets had changed in a variety of ways, 58% of respondents maintained that they now consume more vegetables. Accompanied by this change in consumption was a greater degree of general awareness, and in some cases concerns about

possible contaminates in conventionally grown products. Three producers stated that they now eat more agroecologically-produced food items, while two additional producers have changed the way in which they typically cook vegetables; one opting to eat more fresh vegetables as opposed to boiled ones, while the other has learned to make a variety of dishes through conversations with consumers and participation in workshops.

Additional income earned at by selling at the Tianguis has had impacts on the diets of two of the producers, as they stated that the additional purchasing power enables them to purchase and consume items that they do not grow themselves, therefore expanding their access to items that were previously out of reach.

For the two who cited no changes in their diets, in one case it was due to the household's pre-existing ability to eat what it wanted, while the other producer once again faces a variety of production limitations and stated that the household generally eats and grows what it always did.

Producers indicated that not only have they begun to eat more vegetables than before, but two-thirds have also begun to diversify and include new varieties into their diets. The most widely cited vegetables were new varieties of lettuce (50% of producers), chards (37.5%), arugula (37.5%), and tatsoi (25%), though spinach, broccoli, peas, green beans sprouts, mushrooms, red mustard greens, kale and mustard seeds were each cited by one producer respectively. The only two non-vegetable additions were whole wheat bread and prepared meats, both of which are

either purchased or exchanged²³ with other vendors at the Tianguis. The most common response as to why producers have begun to consume such items was attributed to the fact that they previously did not know about the items, or in one case, how to prepare them. Positive feedback from consumers purchasing the items and insistence by a friend regarding the health benefits were cited each by a producer.

Though one producer indicated that his household has begun to eat more vegetables since joining the Tianguis, he also stated that they do not eat as well as they once did. While the change that brought on such circumstances is not related to his participation at the Tianguis, it does however provide some interesting insight. Approximately fifteen years ago, the household grew a large variety of agricultural products; however with few nearby roads, they had limited market opportunities and their products were primarily destined for household consumption. In so doing they had plenty of food available but little money to purchase additional items. With time, however, a highway was constructed nearby and the family decided to raise cattle; the products of which are now being sold at the Tianguis. The producer is adamant that they ate much better before, when they had very little money but provided for themselves, firmly stating that “Money and a highway do not mean

²³ In terms of product exchanges between Tianguis members, accounts of such happenings were rare, and only reported twice. In one instance, which as both discussed during an interview and witnessed through market day observations, the producer regularly exchanges some of her remaining vegetables for a few loaves of bread. In the latter occurrence, a producer discussed how his participation at the Tianguis led him to become acquainted with another producer who resides in the same town. Their close proximity to one another has enabled them to exchange products outside of market day gatherings.

progress". Due to economic specialisation, the household must now purchase all the items that they once grew for themselves. Though money is not currently an issue for the household, the producer still felt very strongly that the quality of household consumption has been negatively impacted by specialization of production.

4.6 Overall Impact of Participation in the Tianguis

When asked to describe the overall impacts that participation in the Tianguis has had on the producer's household, the responses were understandably varied. However, somewhat surprisingly, economic circumstances were factors in very few descriptions. The general economic impact was largely contingent upon the duration and extent of participation. Those that saw little to no economic improvement due participation in the Tianguis were generally the producers who had most recently joined; participated on a seasonal basis; or in one case, were more reliant on sales elsewhere. One-third of the producers noted that participation has increased their household income, albeit generally not in a significant way. Mentioned once again, by a couple of producers respectively, were improved eating habits and environmental practices. However, the vast majority of responses were greatly linked to emotional and social aspects of participation within the Tianguis.

Friendship was viewed by one producer as the most important impact of participation within the Tianguis, and is a sentiment that was shared by others as well. The Tianguis is viewed as a space where the producers can not only sell their products but also engage in conversations with other producers and consumers

alike. For many, the environment and company makes the work far more enjoyable and as aforementioned, was one of the reasons why producers cited improved conditions at the Tianguis versus elsewhere. Chatting and laughter among producers was often observed during market hours and in the words of one producer, "What is it worth to have money but no friends?" As noted by the EP member, the producers selling at the Tianguis come from a variety of backgrounds, lending to a diversified environment where each has different ideas and ways of being.

The Tianguis is also viewed to be a motivating and empowering place as producers felt that their work was important and valued by others. The meat producer stated that through her participation in the Tianguis, people have gotten to know her and her husband better. They have furthermore gained the trust and loyalty of consumers who have come to recognize the quality of their products. Consumer trust and input is immensely important to this producer as the care and passion with which she engaged with customers was often observed.

The most widely cited impact of participation in the Tianguis was increased knowledge and awareness. Many felt that as participants in the Tianguis, they have become more informed and have experienced an increase in consciousness regarding their responsibilities to the land that they work. As one producer stated, many learning opportunities have arose out of participation in the Tianguis. The occasions to visit each other's plots and exchange information were highly prized, as were workshops. Moreover, not only do they learn from each other but also through conversations with consumers on market day. The information gathered through

Tianguis related experiences has impacted the households in a variety of ways, including consumption choices as well as production methods.

Moreover, in conjunction with their participation in the Tianguis, three producers spoke of their involvement in similar events or organisation. One producer has accepted multiple initiations by communities to conduct workshops and presentations demonstrating the potential of agroecological techniques, while another producer, along with a group of women, recently opened a small restaurant in the city, focusing on agroecologically produced items. An additional producer spoke of her association with another organisation, which has provided her and her husband opportunities to travel abroad to learn about various movements and techniques. She felt that the opportunity to travel to other countries and experience life first hand in other cultures has positively impacted how she and her husband interact and make decisions. Similarly, when discussing how decisions are made, another producer felt that participation in the Tianguis has created an environment of increased communication and sharing within his household, leading to shared participation in the decision making process. In fact when asked about the decision-making process within the producer's households, the general response was that decisions are made collectively, and in three cases the children were also incorporated into the process.

The political significance of the Tianguis varied greatly among the producers. In conversation, the EP member confirmed that certain producers were more politically motivated to participate than others. She herself strongly felt this connection, stating that that choice of where to purchase goods is a political decision²⁴.

²⁴ “Donde se compra es una decisión politica”

Chapter Five

Discussion

5.1 Local Food Markets

The bulk of the literature written regarding local food markets is focused on the many benefits accrued by consumers, with relatively little insight into the impacts on producers beyond the potential for retaining a higher portion of their earnings. As the case study of producers at the Tianguis in San Cristóbal de Las Casas illustrated, selling at their local food market had other, and in some case more meaningful, benefits and impacts.

5.1.1 Improved Selling Conditions

Though it has been strongly argued that local food markets can serve as a mechanism to ensure that small-scale producers receive better compensation for the methods they employ, the price comparison indicated that when compared with prices at the central market, only certain items earn higher returns.

For those who did benefit from higher earnings, and chose to elaborate on the situation, some felt that consumer awareness concerning the quality of their products enabled them to charge higher prices, while others felt that the added effort that they put into processing their products or rearing their animals warranted a higher return.

Vegetables however, which account for a large portion of the items sold at the Tianguis, were generally found to cost the same in both locations. This is an interesting point, especially as half of the producers interviewed, including multiple vegetable producers, insisted that they received higher prices for their products at the Tianguis. Since many Tianguis producers either began or continue to sell their products at the central market, there is a possibility that some of the items priced in the comparison were produced agroecologically as well, however it is certain that though selling under the banner and criteria of the Tianguis, vegetable producers generally charge no more than their central market counterparts.

Additionally, concerns over internal competition at the Tianguis limited the extent to which some producers could benefit monetarily from their agroecological practices. This meant that some producers sold only specific items at the Tianguis, though they grew a great many more; most of which were destined for household consumption or sale in locations such as the central market, undistinguishable from all other products.

Besides prices, two additional factors could be contributing to producer's receiving higher incomes for their products. One, which will be discussed at greater length in a subsequent section, is directly related to the nature of the agroecological methods used by producers, which they rely little on purchased inputs, therefore enabling them to keep their costs down; while the other is a consequence of the improved selling conditions which the Tianguis provides them. Half of the producers interviewed stated that they used to sell their products to superstores,

other vendors or door-to-door. Coming from such circumstances, all but one producer provided detailed descriptions of their improved selling conditions at the Tianguis. For some the Tianguis provides a locale in which they are not assaulted by unfair penalties or exorbitant advertising costs. For others, the Tianguis provides a previously unknown sense of stability or simply a more enjoyable selling environment. Therefore, while some producers clearly receive higher prices for their goods at the Tianguis, others earn higher incomes because of the stable and fair environment of the Tianguis.

5.1.2 The Importance of Community

Though the ability to charge higher prices might be seen as a benefit to selling at a farmer's market, economic benefits ranked low in importance for the producers. In fact, when asked to describe what the overall impact of the Tianguis has been in their life, very few mentioned any economic benefit and in the few cases that it was mentioned, the improvements to the household's economy was described as being small in scale. In fact, only half of the producers indicated that they are now able to purchase items that they couldn't before, which generally referred to household appliances, food items and child related needs. Instead, friendship was highly valued by the producers. The Tianguis is viewed as a space where the producers could not only sell their products but also engage in meaningful conversations and relationships with one another, as well as consumers. The development of consumer trust was of key importance to one producer; a

sentiment echoed by others when discussing how they felt more valued when selling at the Tianguis. Moreover, plot visits and workshops created opportunities for dialogue and knowledge sharing among producers; opportunities which are important in supporting and sustaining agroecological practices. It is therefore the sense of community, sharing and trust among both producers and consumers that made participation in the Tianguis meaningful for many of the producers, as opposed to any potential economic benefits.

5.1.3 The Impact of Consumer Demand

In accordance with Stagl (2002: 155), the wide variety of products available at the Tianguis demonstrated that eating locally does not necessarily result in limited options. In fact a wider diversity of products, specifically vegetables, was found at the Tianguis. Such circumstances are direct consequences of the impact that consumer demand has had on the Tianguis producers and the products that they sell.

As it was noted, consumer demand has been highly influential in determining what products are produced and subsequently sold at the Tianguis. It was argued that Tianguis consumers demand variety as opposed to large quantities of a few items and that it is therefore better to grow a little bit of a lot of items versus a lot of only a few. Such demand greatly impacted producers and their decisions as almost three-quarters of producers have begun to grow or produce new items to sell at the Tianguis, generating an extensive list of new products. It should also be noted that

the adoption of all of these new products were the direct result of consumer demand and were never reportedly initiated on the part of the producer's themselves.

However, though consumer demand has altered production, it has generally been quite contained. No producer completely stopped growing any specific crop or product or wholeheartedly embraced only those that consumers demanded. This is highlighted in the fact that while increases in variety have occurred, no products or crops have been discontinued but merely decreased in quantity. Moreover, the majority of producers stated that they have integrated the newly produced products into household consumption. Though rare occurrences, such products were noted during the food recall survey.

Overall, the Tianguis provided a stable and fair environment where producers could sell their products directly to consumers. While the literature surrounding local food markets generally focuses on the economic benefits, producers of the Tianguis placed little importance on this aspect. Instead immense value was seen in their ability to interact with and learn from fellow producers and consumers alike. Consumer demand clearly had a hand in not only determining the products sold at the Tianguis but also had an impact on the consumption patterns of the producers themselves, as many cited having improved their eating habits as a result.

5.2 Agroecology

5.2.1 Productivity

As previously discussed, many who feel it to be incapable of matching the yields of conventional agriculture have called the productivity of agroecology into question. However producers generally vocalized no such concerns and instead, their agroecological practices enabled many to harvest yields that satisfied not only the needs of their household, but those of consumers as well²⁵. With regard to pests, though a constant nuisance, producers have been able to employ techniques that have reduced their susceptibility. In fact, only one producer cited having experienced widespread losses due to pests; a new phenomenon for which she is implementing management techniques. Extreme weather conditions were perhaps the most worrisome for producers, as crops and livestock are negatively affected. Overall however, producers voiced no dissatisfaction with the level of productivity that their agroecological practices reaped. Moreover, as it will be discussed further, many producers indicated that their households faced no period of uncertainty or want due to the fact that their practices provided them with a consistent harvest of diverse crops, which covered both the needs of the household and consumer demand.

²⁵ Perhaps the only exception to this trend would be the producer who relied heavily on rainwater and therefore had reduced harvest during the dry season. Such circumstances are however due to her limited access to water and not her agroecological techniques.

5.2.2 Minimal Dependence on Purchased Inputs

Though it is not an approach completely devoid of inputs, agroecology relies on more locally and accessible elements, supporting the argument that such methods can ease and eliminate producers' dependence on costly inputs. Though producers were unable to provide an account of how much they spent on inputs yearly, the list was quite minimal, in which only labour and occasional seed purchases were widely reported. Instead of relying on expensive fertilizers and pesticides, producers generally employed beneficial polycropping techniques and also applied compost or manure, as well as household pest management remedies. In this way, producers had minimal reliance on, or need for, purchased inputs, as much of what they required or employed were either locally available or derived directly from the household itself. Such circumstances may also explain why producers cited higher profits, despite at times, charging similar prices to those found at the central market. What is left unanswered however, is whether Tianguis vegetable producers could in fact, demand higher prices for their products. The literature suggests that consumers are willing to pay for their products when they have direct interaction with the producer; enabling them to ask questions and become acquainted with the production methods. Such a notion is reminiscent of the statement made by one of the producers, in which "a tomato is just a tomato to people who do not have information". It is therefore arguable that by creating conditions of greater knowledge and awareness concerning agroecological production methods among consumers, producers would find that they could charge higher prices for their products.

5.2.3 Improvements to Land Holdings

As McAfee (2006: 5) argued, it would be shortsighted to focus merely on production levels and that emphasis should also be placed on the long-term conditions of the land being used. Producers often reported a deep connection with the land, which for many had been developed or enhanced since adopting agroecological practices. It was also strongly felt by many that the techniques they employ have greatly benefited and improved the quality of their land holdings. Mirroring the findings of Holt-Giménez (2006: 192), one producer discussed how her land, though it did decline somewhat in quality, fared far better than neighbouring plots in the wake of Hurricane Mitch; the result of which she attributed to her practice of agroecology.

5.2.4 The Importance of Knowledge

As it has been noted, agroecology is knowledge intensive and its practices must be adapted to suit varying circumstances. For the majority of producers, agroecology, though previously known by other names, has been a family tradition, in which practices have been passed down and refined through generations. In the case of pest management, while responses often varied, producers have each developed their own successful recipes or practices. Over time producers have developed and retained techniques that are tailored to their individual situations.

However as one producer noted, knowledge is not acquired instantly and the subsequent practices are only perfected after a period of experimentation. In her

opinion, her household was less prepared and therefore more susceptible to pests because compared to other households participating in the Tianguis, hers was relatively new to agroecological practices and had yet to develop consistent pest management techniques.

Additionally, many producers discussed their experiences with conventional methods and the subsequent reasons for their return or commencement of agroecological practices. Often, the decisive moment in which producers chose to convert their practices was linked to degrading soil conditions and declining yields, which are attributed to the conventional methods that they were employing. However, as one producer highlighted, the choice to completely overhaul agricultural production is not one that should be made lightly, nor without acknowledgment of the potential risks. Though his father has expressed interest in the potential of agroecology, he has yet to fully commit, as his livelihood is greatly dependant on his agricultural productivity.

Scialabba (2007: 6) argued that social organizations could play a large role in educating and transmitting knowledge among producers, a position that is supported by experiences at the Tianguis. The sense of community and ability to share knowledge was of great importance to the producers. Workshops and plot visits enabled them to engage with one another, sharing techniques and knowledge; while market days provided them the opportunity to interact with consumers, as well as one another.

Such experiences have also had impacts on communication within the household. Many producers described a shared method of decision-making within their household, however two in particular attributed an environment of increased dialogue directly to their participation in the Tianguis or experiences abroad. A few producers are also active outside of the Tianguis, using various opportunities to both learn and share their own knowledge with other.

5.3 Food Security

5.3.1 The Importance of Producing for Household Consumption

When describing the idea of entitlements, Sen (1981) notes that the endowments required to ensure one's entitlement to food are often derived in two ways: through one's ability to work for a wage; or the possession of capital, such as land. To some degree, the producers at the Tianguis crafted their food entitlements through both means, as they all grow or produce their products for both sale and household consumption. However the experiences of the majority of producers indicated the importance that the latter consideration has in assuring food security.

Only a quarter of producers interviewed stated that there were times during the year in which their households lacked sufficient quantities of food; the reason for which was always attributed to limited financial means due to slow periods in either production or sales. The remaining majority indicated that their household faced no such period because they grow a portion of their products strictly to satisfy household consumption and in so doing, ensured that they always had access to

sufficient food quantities. Therefore it seems that the households that relied to a lesser extent on the sale of their product were perhaps more self-sufficient and were able to generate more stable conditions of food security.

A similar situation as found to be true when producers were asked for details specifically regarding the food items they purchase. Though the extent to which each household consumed purchased items varied, responses were unified in stating that the times of difficulty are directly related to slow periods in sales. Conversely, producers who reported no such periods of difficulty generally attributed it to the fact that they purchased very little and relied more so on items that they themselves grow. Though two such households did admit that slow periods in sales can hinder their ability to purchase other items, the fact that they too generally consume what they grew means that while their purchases might be limited at times, extreme periods of difficulty are not encountered.

It is also important to note that producers generally found a balance between addressing consumer demands and providing for the needs of their households. Once again, though many producers have adopted new products to satisfy consumers, no products have been fully discontinued, nor have entire yields been set aside for sale at the market. A prime example of this balance is production of eggs among households. While a few households produce eggs, only one sells them at the Tianguis on a regular basis. The remaining households consume these products within their households and generally only sell the leftovers to neighbours, though sometimes consumers as well. In this way, though demand exists, producers

have decided to satisfy the needs of their respected households, instead of the potential market demands.

5.3.2 Improved Household Nutrition

Pretty (2009: 6) argued that crop diversity can lead to diversity on the plate and subsequently, improved household nutrition. The majority of producers cited dietary improvements, largely by way of increased consumption of vegetables. Moreover, though producers previously grew an array of products, consumer demand has in fact created even more diverse conditions. For producers, the introduction to new products and ability to converse with consumers has generally led to a more diverse plate. Though all new products were acquired to address consumer demand, producers reported that they too have begun to introduce such items into their own diets, save for the few that have been excluded due to unfamiliar tastes. Such circumstances were verified by the food recall survey, which recorded the consumption of items such as chards and spinach.

Perhaps one of the most illuminating experiences regarding the potential of agroecology to improve nutrition and subsequently household food security is that of the producer whose household has ceased to grow an array of crops for household consumption and now focuses primarily on the sale of specialized products. This producer felt strongly that his family no longer eats as well as they used to now that they don't grow for household consumption. His statement that "Money and a highway do not mean progress" spoke volumes about his

circumstances and demonstrated how specialization of production and increased dependence on purchased food have negatively impacted his household's food security. Whereas other producers have continued to diversify their products, his household did otherwise; the consequences of which were reflected in his account.

Chapter Six

Conclusion

Though diverse in amongst themselves, the experiences of the producers at the Tianguis demonstrated the impact that the practice of agroecology can have on household food security as well as the benefits of participating in a local food market. Although much of the literature pointed to increased incomes as a benefit for selling at local food markets, such advantage rated fairly low among producers of the Tianguis. While many did feel that they receive better prices, the monetary benefit of their actions was minimal. It was instead the improved conditions, social environment and sense of community that producer's found to be the greatest remunerations.

In fact, such an atmosphere served to greatly enhance both the producers' agroecological practices and subsequently their household food security, as knowledge was shared among producers as well as consumers. Through such exchanges producers were able to learn improved techniques from their peers as well as build trust among consumers. Interaction with consumers also lead to dietary changes, as producers sought to satisfy consumer demand and subsequently incorporated such requests into their own diets.

The experiences of producers illustrated the immense importance of agroecology in insuring that the household had access to sufficient and nutritious food items. The various agroecological techniques employed ensured that producers

reaped harvests that fulfilled both household and consumer needs, without the use of costly inputs and all the while improving the quality their landholdings and sustaining their livelihoods.

Of the utmost importance is the diversity and stability embodied in agroecology, which enabled producers to ensure the food security of their household. By growing a diverse array of crops, producers were able to achieve a level of self-sufficiency, which was reflected in the fact that the majority of households did not face periods of food insecurity due to their action of cultivating for their own consumption. One experience in particular illustrated in detail how specialization and decreased diversity can negatively impact household food security.

Additionally it can be argued that the agroecological production of many producers enabled them to achieve significant conditions of food sovereignty within their households. Unhindered by a dependence on costly inputs, market prices or concerns over degrading landholdings, producers were able to ensure that the dietary needs of their households were being met. While consumer demand was shown to have noteworthy influence over the adoption of specific crops, producers tempered consumer influence and ultimately maintained control over their practices.

As it has been discussed, the current practice of conventional agriculture has generated a multitude of devastating environmental and social consequences and has moreover been unable to address the root causes of food insecurity worldwide.

Even though there is an overabundance of food globally, much of the population continues to face hunger and malnutrition. As it has been stated, a vast percentage, approximately half, belongs to the households of small-scale producers. In light of this global paradox, focus needs to shift from the mere abundance of food to ensuring that what is produced, is accessible by all. The experiences of the producers at the Tianguis illustrated how the practice of agroecology has the potential to drastically reshape the conditions of food security within these households.

For its part, the Tianguis provides an environment where producers can sell their products, as well as learn from and engage with both their peers and consumers. This dynamic was shown to have far-reaching consequences on the household food security of producers. The experiences of the Tianguis also demonstrate the potential of social organisations in aiding producers to overcome the obstacles that limited information can pose in the attempt to convert or improve their agricultural practices.

Moreover, the minimal costs and transitional process associated with the impending PGS ensures that participation and certification are easily accessible to small-scale producers. In her work, Reynolds questioned whether organic certification was capable of addressing social issues due to its strong environmental focus. The Tianguis producers have identified conditions of social justice to be of high importance, and as such, have included certain requirements in their certification criteria. Being in the implementation stage, it is too early to suggest any

far-reaching social change however there is the potential, should the participants continue to adhere to these criteria.

While local food markets and certification processes, such as the Tianguis, can greatly benefit small-scale producers, they are not without limitations. For an endeavour such as the Tianguis to succeed, and expand, engagement with both producers and consumers is required. However, as discussed in both the literature and case study, the limited availability of funding, and subsequent dependence on voluntary labour, can greatly impeded the progress of such markets, not only in terms of educational endeavours but also their very existence.

Moreover, as Guthman (2007) noted, for a labelling system to have merit, a mandatory condition is that all producers cannot meet the requirements. Arguably such circumstances form a barrier for producers who may wish to achieve certification, but lack access to necessary resources, such as clean water. Although the certification system being implemented at the Tianguis includes the achievement of transitional status, many producers will continue to be effectively prohibited in the absence of a greater focus on the distribution of access to resources.

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Appendix A: Interview Guide

Name:

Date:

Location:

1. a) How many people live in your household?
b) How many children?

2. a) How many years have you been farming under organic, agroecological or clean methods?
 <1 1-5 6-10 11-15 20 +
b) How long have you been selling at the Tianguis?
c) How many hours a day/week do you work?
d) Has this changed since joining the Tianguis?
e) If yes, why?
f) How many hours do you sleep each night?

3. a) Are your crops sold, consumed in the household or both?
Before
 Sold Consumed in the household Both

After
 Sold Consumed in the household Both

b) How much is consumed or sold?
Before

	All	Nearly all	Half	Quarter	None
Sold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consumed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

After

	All	Nearly all	Half	Quarter	None
Sold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consumed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

c) If changed, why?

d) If crops are sold, how much do you earn from the crop sales in a given week?	
e) Does this vary from season to season?	
f) By how much?	
g) Why?	
h) What is the best season/time?	
i) What do you do with the revenue from your agricultural sales?	

4. a) Are there any crops that you've stopped growing since belonging to Tianguis?
- b) What?
- c) Why?
- d) Are there any crops that you've started growing since belonging to Tianguis?
- e) What?
- f) Why?
- g) Grow anything that you don't eat?

h) What?

i) Why don't you eat them?

5. a) Do you raise any livestock (ie. Chickens, turkeys, pigs, cows, goats)?

Before:

After:

b) If yes, what types of animals and how many do you have?

Before		After	
Type of Animal	Number	Type of Animal	Number

c) If changed, why?

d) Is your livestock, or the products of your livestock (e.g. eggs, wool) sold, consumed within the household or both?

Before

- Animal 1 Sold Consumed within the household Both
Animal 2 Sold Consumed within the household Both
Animal 3 Sold Consumed within the household Both
Animal 4 Sold Consumed within the household Both
Animal 5 Sold Consumed within the household Both

After

- Animal 1 Sold Consumed within the household Both
Animal 2 Sold Consumed within the household Both
Animal 3 Sold Consumed within the household Both
Animal 4 Sold Consumed within the household Both
Animal 5 Sold Consumed within the household Both

e) Approximately how much is consumed or sold?

Before

	All	Nearly all	Half	Quarter	None
Sold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consumed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

After

	All	Nearly all	Half	Quarter	None
Sold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consumed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

f) If changed, why?

g) If sold, how much do you earn from the sales in a week?	
h) Does this vary from season to season?	
i) By how much?	
j) Why?	
k) What do you do with the revenue from your livestock sales?	

6.

a) Are there any times during the year in which the members of your households do not have a sufficient quantity of food?	
b) If yes, when?	
c) Why?	

7. a) What foods do you typically eat?
- b) Are there times when you have a difficult time acquiring these foods?
- c) If yes, which?
- d) When?
- e) Why?
- f) Are there other types of food that you would like to include in your diet but are unable to do so?
- g) If yes, what?
- h) Why?
- i) Why don't you eat them?
- j) Has your diet changed since belonging to the Tianguis?
- k) How?

l) Why?

m) Is there anything that you eat now that you didn't before?

n) What?

o) Why do you now eat it?

8. a) What percentage of food consumed by the household is purchased?

Before

All Nearly all Half Quarter None

After

All Nearly all Half Quarter None

b) If changed, why?

c) Please list food that your household typically purchases

d) Where do you purchase your food (ie. Other farmers, tianguis, Walmart)?

Before		After	
Food Item	Where purchased	Food Item	Where purchased

e) What did you eat yesterday for breakfast, lunch, dinner and snacks? What was from your farm, purchased or exchanged? (OF = own farm, P = purchased, E = exchanged)

Breakfast Item	OF	P	E	Lunch Item	OF	P	E
Dinner Item	OF	P	F	Snack Item	OF	P	E

f) Are there any times during the course of the typical year in which you are not able to purchase a sufficient quantity of food for your household?

g) If yes, when?

h) Why?

9. a) What inputs (ie. fertilizer, seeds, labour, etc) do you purchase each year?

Before		After	
Input 1		Input 1	
Input 2		Input 2	
Input 3		Input 3	
Input 4		Input 4	
Input 5		Input 5	

b) How much of each input do you purchase in a given year?

c) How much do you spend on each of these inputs in a given year?

Before			After		
	How much purchased	How much spent		How much purchased	How much spent
Input 1			Input 1		
Input 2			Input 2		
Input 3			Input 3		
Input 4			Input 4		
Input 5			Input 5		

10. a) Have you experienced any crop failures?

b) If yes, due to what?

c) How frequently?

11. a) Do you sell your crops or products at places other than the Tianguis?
b) If yes, where?
12. a) Do you receive additional support or income from sources other than your agricultural production (eg. Wage labour, remittances, sales of handicrafts, etc)? From who/what?
13. a) How much land do you work?
b) How much of this do you own?
c) How much of this do you rent?
d) Do you own land that you rent to other farmers?
e) Describe the quality of the land that you work
f) Has the quality of your land changed (ie. improved, worsened)?
g) Why?
14. Who would you identify as the key decision maker of the household?
15. Why is agroecology important?
16. In what ways has selling at the Tianguis impacted your household?