LOCAL FOOD SYSTEMS & SUSTAINABLE DEVELOPMENT: ANALYZING A REGIME CHANGE IN KANE COUNTY, ILLINOIS, USA, THROUGH A TRANSITION THEORY PERSPECTIVE

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ABSTRACT

The current agricultural system in the United States faces severe structural problems on three prominent pillars of sustainability – *economy*, *society*, and *environment* – including price instability, climate change, and consumer disconnect from the food system. These *persistent problems*, characterized as complex, ill-structured, involving many stakeholders, and surrounded by structural uncertainty, can be both attributed to and seen as a vulnerability of a global food system. A rising alternative debated to contribute to greater sustainable development in society and in literature is local food systems. Revitalizing local food systems in former agro-industrial regions can be particularly challenging, however, as it takes more than incremental changes or a linear approach to address these persistent problems. This thesis proposes a hypothetical solution in which a structural breakthrough is needed to occur through a new steering paradigm, a transition process. By applying "transition theory" to explore societal change as a non-linear pattern of alternating phases, from one dynamic state of equilibrium to another, several prominent drivers and barriers affecting a local food system transition process toward a greater level of sustainable development are determined. An analysis of local food systems' relevancy to sustainable development is also made. Kane County, an agriculturally rich region located in northeast Illinois, USA, served as a microcosm for a single case study.

Keywords: food system, local food system, sustainable development, transition theory, persistent problem, foodshed, civic agriculture, values-based value chain, rights-based food system

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~ It is not from ourselves that we learn to be better than we are. ~ Wendell Berry

TABLE OF CONTENTS

ACRONYMS

AFT	American Farmland Trust	[www.farmland.org]
AMS	Agricultural Marketing Service	[www.ams.usda.gov]
CMAP	Chicago Metropolitan Agency for Planning	[www.cmap.illinois.gov]
CSA	Community Supported Agriculture	
EPA	United States Environmental Protection Agency	[www.epa.gov]
ERS	Economic Research Service	[www.ers.usda.gov]
FCS	Farm Credit Services	[www.farmcreditnetwork.com]
FDA	Food and Drug Administration	[www.fda.gov]
GHG	Greenhouse Gas	
IDOA	Illinois Department of Agriculture	[www.agr.state.il.us]
KCDD	Kane County Development Department	[www.co.kane.il.us/development]
KCHD	Kane County Health Department	[www.kanehealth.com
KCFB	Kane County Farm Bureau	[www.kanecfb.com]
KYF	Know Your Farmer, Know Your Food Initiative	[www.usda.gov/knowyourfarmer]
LFF	Lumpkin Family Foundation	[www.lumpkinfoundation.org]
LRMP	Land Resource Management Plan	
NASS	National Agricultural Statistical Service	[www.usda.gov/nass]
NSAC	National Sustainable Agriculture Coalition	[www.sustainableagriculture.net]
RWJF	Robert Wood Johnson Foundation	[www.rwjf.org]
U.S.	United States of America	
USDA	United States Department of Agriculture	[www.usda.gov]

FIGURES & TABLES

1 INTRODUCTION

Agricultural practices and process have changed dramatically in the United States (U.S.) over the past century to provide vast quantities of food at cheap prices. It may seem trivial as farmers account for less than 1% of the U.S. population and agriculture accounts for a mere 1.2% of GDP (CIA World Factbook, 2010), but the agriculture industry created $98.6 billion in agricultural good exports in 2009 (ERS, 2010a) and has allowed the average American family to spend less than 10% of their disposable income on food (Clauson 2008: 5). As the past century progressed, the globalization* of agriculture needed to support large production and demand for cheap food resulted from a variety of reasons, including government policies, public research investments, trade restrictions, technological innovations, and changing social norms, allowing for easier consumption of processed foods while supporting a vital economic source and livelihood for many states and their inhabitants (Morrison et al. 2010: 17). However, as the agricultural sector and those whose livelihood depends on its success have experienced the world over, the food system – whether it be supporting food, fiber, feed, or forage – is significantly susceptible to shocks and perturbations in economic, social, and environmental systems. These tribulations have been described as *persistent problems* (Rotmans 2006: 36).

*The terms global, globalizing, globalized, globalization, when used in reference to the food system, will be used interchangeably to refer to the industrialization process of agriculture. (See *Appendix A – Glossary* for definitions of terms such as *food system).*

1.1 A Persistent Problem

Persistent problems are characterized as complex, ill-structured, involving many stakeholders, surrounded by structural uncertainty, and, accordingly, are hard to manage (ibid.). For the agricultural system these can include price instability, food insecurity, obesity and other diet related illnesses, climate change, consumer disconnect from the food system, etc. These problems are being both attributed to and seen as a vulnerability of an increasingly globalized food system, where foods are transported thousands of miles, injected with food additives to preserve freshness and taste, and grown on monoculture crop acreages owned by large-scale producers that have driven out the small-scale local farmer. For the county of Kane, located in northeast Illinois, the globalized food system has encouraged commodity crop production (primarily corn and soybeans) to become the status quo in the region, "locked-in" by regulation and standards (i.e. subsidies), high investment costs, infrastructure, modern agricultural technologies, and cognitive routines.

The global food system in the U.S. isn't new. It has been an increasingly emergent process over the last few centuries that began in the mercantilist and colonial food regimes (Koc and Dahlberg 1999: 112). The process was significantly exacerbated within the last 60 years as the post-WWII era saw the spread of the *green revolution*, the growth of transnational corporations, the expansion of global financial capital, and the expansion of international organizations and agreements (ibid.). The development of international communication technologies, transportation systems, intellectual property rights, and genetic engineering have also contributed to the globalization of social, environmental, and economic interconnections and dependencies (ibid.)

The growing demand for a globalized food system necessitated efficiency and consolidation to reach economies of scale. By 2007 four U.S. companies controlled 83.5% of the beef-packing industry, 66% of pork packing, and 80% of soybean crushing in the nation; two companies sold 58% of U.S. seed corn, and four companies controlled 29% of the global commercial seed market (Hendrickson and Heffernan, 2007). The number and size of farms exemplify the repercussions of these trends: since 1900, the number of farms has fallen by 63%, while the average farm size increased by 67% (Dimitri et al. 2005: 2). Kane County saw similar patterns with a decrease in farm numbers by 63% and increase in average farm size by 72% since 1945

(KCFB, 2010a). As small-scale farms fell to the wayside of larger-scale, more consolidated farm systems, local infrastructure for selling, processing, and storing products deteriorated or disappeared (Anderson 2007: 2). Also, with the advent of the supermarket and convenience shopping after WWII, the presence of retail farmers markets began to decline (Hinrichs 2000: 298).

U.S. agriculture and rural life underwent obvious tremendous transformation in the 20th century causing recent concerns to mount regarding the sustainability and long-term viability of the current agricultural production system. In the midst of global expansion of commodity relations have been the destruction, transformation, and restructuring of previous forms of economic, social, and ecological systems. Numerous effects of and vulnerabilities to this globalizing food process have been discussed across this three-pillared indicator of sustainability, including the following: loss of prime farmland (Sorenson, 1997), increased food insecurity (Nord et al., 2008), high use of fuel energy (Pirog et al., 2001; Hora and Tick, 2001; Halweil, 2002), and destroyed domestic economies, rural life, local culture, communal structures, political power (national, state, and local), and natural environment (Koc and Dahlberg, 1999). A movement has thus been burgeoning that challenges the current agricultural paradigm by offering an alternative food system that is believed to be more sustainable and resilient to forthcoming changing dynamics – a more "localized" food system. Kane County, has been quick to join this movement with attempts to accelerate the already frontrunner established push for a local food system.

2 STUDY INTENT

As the current agricultural system in the U.S. is plagued by persistent problems, it will take more than incremental changes or a linear approach to address them and reach greater sustainability (Rotmans 2006: 36). This thesis proposes a hypothetic solution in which a structural breakthrough is needed to occur through a new steering paradigm, a transition process. *Transitions* are understood as processes of structural change in major societal subsystems that involve a shift in the dominant "rules of the game," a transformation of established technologies and societal practices, and movement from one dynamic equilibrium to another (Meadowcroft 2009: 324). Implementing a commitment to sustainable development entails a transition that not only creates a broader understanding and sets more ambitious goals, but also interrelates institutional structures and processes of planning, administration, markets, tradition and choice (Kemp et al. 2005: 17). However, as in all transition cases, there exist a myriad of barriers inhibiting the transition process as revitalizing local food systems in former agro-industrial regions is particularly challenging. By applying Rotmans et al.'s "transition theory" (2001) to explore societal change as a non-linear pattern of alternating phases, the drivers and barriers affecting a transition process toward local food systems can be analyzed, providing further systemic thought on the topic and allowing for conclusions to be drawn on how to accelerate the process toward a higher level of sustainability.

This thesis also attempts to establish a link between local food systems and sustainable development in order to make it relevant to analyze a transition process toward such systems. In an attempt to operationalize a local food system's relevancy to sustainable development, the triangular concept of sustainability is deployed. This three-pillared context will exemplify the economic, ecological, and social benefits of transitioning toward a local food system.

As this paper analyzes "local" food systems, it focuses on "where" food is produced, not "how" it is produced; although, as it will be made clearer later, the how can be altered as the where changes. Additionally, as the majority of Kane County's farmers produce commodity crops, focus will primarily be on drivers and barriers affecting these farmers' decision and ability to transition to specialty crop production for local supply. Therefore, although parts of this thesis may be generalizable to other types of farm

operations (ex. meat, dairy, and fiber production) focus will primarily be on commodity and specialty crop farms. Finally, the intent of this study is not to promote for a 100% transition from global to local food production and consumption as the author realizes the reality of this notion is irrational and potentially unsustainable. After all, it may be environmentally desirable to transport products at a greater distance than to degrade or utilize local resources unsuitable for use in food production. The intent is rather to realize the benefits of transitioning to a local food system in an area well suited with prime agricultural resources.

A summary of the research intent and questions framing this study are found in *2.2 Research Questions* (below).

3 METHODS

3.1 Single Case Study

In order to establish validity, reliability, and generalizability for this study, it is necessary to unveil the methods used and provide insight into the data collection process. Considering the complexity and particular nature surrounding the issue of local food systems it was decided that the research conducted would use Kane County, Illinois, as a microcosm single case study site as outlined by Bryman (2008: 52) and Yin (2002: 45) to narrow and refine the research. A case study investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin 2002: 13). A holistic design was also included in the single case study as the relevant theory underlying the case study itself was holistic in nature (Yin 2002: 45). As this paper embraces a wider vision of how scientific methods can be applied to current questions that involve environmental, social, and economic dimensions, its holistic thinking helps escape typical reductionist research thinking prevalent in contemporary models of discipline-bound science embedded in a dominant mechanistic paradigm described by Francis (2009: 4) as "hard science."

2.1 Research Questions

Purpose:

- To establish relevancy of ***local food systems*** to ***sustainable development*** by assessing issues prevalent on the three-tiers of sustainability – the ***economic***, ***social,*** and ***ecological***.
- To examine the ***drivers*** and ***barriers*** affecting a ***transition*** in Kane County, Illinois to a more ***local food system***.

Primary Research Questions

- What is the relevancy of the local food system to advancing sustainable development on the three tiers of sustainability – the social, economic, and ecological?
- What are the key drivers acting as incentives for transitioning farm production globally to locally?
- What are the key limiting barriers inhibiting a transition toward local food supply?

Sub-Research Questions

- How can social actors stimulate, slow down, or block a transition toward local food supply?
- What transition needs to occur to break path dependency in order to reach sustainable stability in a local food supply system?

The author was aware that single case studies warrant concern over the ability to extract relevant information that is generalizable; however, the intent of the research was to test and generalize upon the theory of societal transition toward local food systems, not enumerate frequencies that occur within transitions toward local food systems. Yin (2002: 10, 32) defines this as "analytic generalization" since a previously developed theory is used as a template with which to compare the empirical results of the case study, as opposed to "statistical generalization" where an inference is made about a population (or universe) on the basis of empirical data collected about a sample (often via quantitative formula methods). Quantitative data was only used to enhance understanding of current trends in the Illinois and Kane County agricultural sector.

The author was also aware that problems exist within a holistic design approach, primarily as the entire nature of a case study may shift, unbeknownst to the researcher, during the study itself (Yin 1994: 46). The initial research questions posed for this thesis paper did shift slight orientation as the case study proceeded with accumulating evidence addressing different questions. However, the attempt was made to institute an iterative research process where referral was frequently made to the initial research questions and intended research design, and adjustments were made as necessary to reflect new findings.

3.2 Qualitative Research

As this study took an exploratory approach (Yin 2002), it was decided a qualitative data collection process as outlined by Bryman (2008) would be appropriate. A qualitative study emphasizes understanding of the social world through an examination of the interpretation of that world by its participants (Bryman 2008: 366). The data analysis builds on interpretations and processing of data collected and constructed through *triangulation* (Bryman 2008: 379). Triangulation seeks to employ multiple methods including observations, interviews, and literature review, resulting in greater confidence in findings. This study incorporated all three methods during the data collection period from January to May, 2010, and the data was used to formulate an analysis of the transition process toward a local food system in Kane County, Illinois.

3.2.1 Archival Information

A thorough literature review was conducted for this study in order to understand the context of the issue at hand. By understanding the ongoing developments regarding transition theory, local food systems, and sustainable development, an appropriate interview guide was able to be created to help guide conversations with key informants. Local food systems relevancy to sustainable development was also constructed through literature review.

3.2.2 Interviews

Semi-structured and structured interviews were the primary methods used for the qualitative research process. These interview methods aid in understanding the themes of the lived daily world from subjects' own perspectives (Kvale and Brinkmann 2008: 24). In-depth interviews were conducted from March until April, 2010, and included in-person interviews, phone interviews, and email correspondence with key informants and stakeholders. These actors included government employees at the United States Department of Agriculture (USDA), non-governmental organization representatives working on national agricultural agendas, institution representatives and organization employees at the community and regional level involved in agriculture (including county planning department personnel), and individual farm producers and consumers (See *Appendix B – Interview Respondents*). A non-random sampling of interviewees was conducted as the methods undergone were convenience sampling and snowball sampling (Bryman 2008: 183-184, 458). After each interview recommendations were generated for new interviewees to be selected. There was a constant dynamic between sampling and data collection, and interviews were carried out until empirical saturation was reached (Bryman 2008: 462).

The semi-structured interviews provided an opportunity to have an interview guide to direct questions to the interviewee, but leave room for open discussion in their reply. This helped to make sure that central themes were covered while giving flexibility to follow up on questions considered particularly interesting. An important objective of semi-structured interviews is to give the respondent the possibility to provide his/her own view of a course of events, without being restricted to pre-arranged questions (Kvale 2008). As this study attempted an iterative process, the research questions were transformed during the duration of the research process. (See *Appendix D – Interview Guide* for sample interview questions).

3.2.3 Observations

To complete the triangulation method of research, non-participatory unstructured observations were performed. Aiming to develop a narrative account of the behavior being observed (Bryman 2008: 247), observations were conducted at several agricultural conferences in Washington, D.C., as well as during on-site interviews with farm producers in Kane County, Illinois (See *Appendix C – Observations*). The conference observations provided insight on relevant issues regarding local food systems in addition to gaining perspective of varying behaviors of the participants involved. The on-site observations allowed for visual understanding of how some local food producers operate their venture and interact with consumers, providing potential insight to better analyze and evaluate collected data.

4 Study Area

Kane County, Illinois, (See *Figure 1*) served as a microcosm in which to analyze the transition process to a local food system. Its composition of environmental resources including prime agriculture farmland and geographic proximity to a major city epicenter forms an exemplary model for analysis.

Figure 1: Location of Kane County, Illinois; Adapted from (Deniger 2003: 14)

4.1 Prime Agriculture Farmland

Kane County's prominent agricultural landscape is comprised of deep, high organic matter, nutrient-enriched surface soil, which occupies about 45% of Illinois' land area, most extensively in central and northern Illinois (NRCS, 2010). The soil is rich in protozoa, molds, and bacteria that encourage plants to grow, allowing for yields per acre to be 175 bushels for corn and 57 bushels for soybeans (Illinois State Museum, 2010). Kane County's temperate, humid continental climate has had an important overall influence on the characteristics of this soil (Deniger 2003: 188). These optimum combinations of physical and chemical characteristics have led much of Illinois land to be classified by the U.S. Department of Agriculture (USDA) as "prime farmland." Having some of the most fertile soil in the

world, Kane County's landscape is thereby conducive for producing food, feed, forage, fiber, and oilseed crops (ibid.: 96; NRCS, 2010).

4.2 City Proximity

Kane County is situated just 35 miles due west of downtown Chicago, Illinois and houses a population of 511,892 residents (U.S. Census Bureau, 2010). Nestled on the fringe of suburban sprawl, the county has been able to keep 57.8% of its land area in agriculture, allowing the rest to be developed for residential and commercial purposes (KCFB, 2010b). Every year, however, the city is growing nearer as population increases and land is developed to support incoming residents. From 1970 to 2000, the county saw an addition of 153,000 residents. The Kane County Regional Planning Commission, in their 2030 Land Resource Management Plan (LRMP), estimates the population growth rate to double this trend by 2030, adding 300,000 new residents (KCDD 2004: 21). This extensive growth has resulted in the loss of 82,856 farmland acres from 1969 to 2007 (KCDD 2004: 40; NASS, 2007).

5 DEFINITIONAL BASE

Before examining the drivers and barriers affecting a local food system transition in Kane County, it is important to first define *local food systems* and *sustainable development* and explore the importance of the former in reaching the latter.

In the literature, local food systems are conceptualized, described, and analyzed within the framework of alternative food systems or networks and agri-food systems. They include a myriad of terms, practices, and concepts, including short supply food chains (Anderson, 2007), community food systems (Peters, 1997), community food enterprises (Shuman et al, 2009), rights-based food systems (Anderson, 2008), foodsheds (Kloppenburg et al. 1996), civic agriculture (Lyson, 2000), values-based value chains (Stevenson and Pirog, 2006; Hoshide, 2007), etc. These latter three were identified by Hamm (2004: 37) as the three primary schools of thought in the literature which can be integrated to help conceptualize a more sustainable network of community. Other scholars depict conceptual constructions of local alternative food systems which may overlap these terms; examples include Peters et al.'s (2008) geographical and political concepts and Giovannucci et al.'s (2010) "new local" political act concept. In order to determine how local food systems can contribute to a more sustainable network of community through sustainable development, it is important to examine each concept more in depth to try and minimize any ambiguity and argument that may exist surrounding their meaning.

5.1 Defining Local Food Systems

5.1.1 Foodsheds and Geographical Constructs

A problem exists with trying to establish relevancy of local food systems to sustainable development as there is no universally accepted definition of "local food." Early antecedents attempting to bring clarity to the equivocal notion suggested possibilities for bioregionalism, for "local food systems" that foster community development, and for "foodsheds" characterized by proximity, locality, and regionality. They were viewed as primarily coalescing around geographical constructs (Kloppenberg et al.,1996; Sale, 1996; Feenstra, 1997). This categorization is still relevant today; Peters et al. (2008: 2) explore foodsheds and their relevance to sustainability, understanding it as analogous to watersheds and defining it as the geographic area from which a population derives its food supply.

There is some evidence that a popular understanding of local food is, at least in some places, identifiable by mileage or distance a producer or consumer is from a direct market source. Alisa Smith and J.B. Mackinnon, authors of *The 100-Mile Diet*, decided a mileage boundary for their one-year experiment in eating locally because "a 100-mile radius is large enough to reach beyond a big city and small enough to feel truly local." Two-thirds of respondents in a 2008 Leopold Institute study

indicated that food which traveled 100 miles or less from the farm to point of purchase were considered local (Pirog and Rasmussen 2008: 3). A wider geographical area not limited by mileage or distance has also been used by individuals attempting to answer the question: "What is local?" The remaining one-third of respondents to Pirog and Rasmussen's 2008 study viewed local food as "grown in their state or region" (ibid.). Inwood et al. (2009: 183), while examining the characteristics of chefs and restaurants that have adopted local foods, defined local as "any produce, dairy, or meat products grown or raised in the State of Ohio." Even the Food, Conservation, and Energy Act of 2008, otherwise known as the "Farm Bill," defines in Section 6015 a "locally or regionally produced agricultural food product" as one that is raised, produced, and distributed within a locality or region and is transported less than 400 miles from its origin, or within the State in which the product was produced (U.S. Congress 2008: 284).

Selfa and Qazi (2005) find there is great variability in what constitutes "local" food systems, however, dependant on if you are a producer or consumer. In their analysis of three counties in Washington State, they found on average across all three counties that 41.5% of producers identified with "within county or adjacent county," 18% with "Washington State or northwest region," and 5.4% with "proximity (mileage or distance)" when indicating what is "local." Consumers on the other hand responded 31.3%, 14.9%, and 23.5%, to these same criteria, respectively (Selfa and Qazi 2005: 462). These differing results were concluded to be from conflating positive social and environmental relations with proximate spatial relations. Hinrichs (2000) came to similar conclusions in her analysis of social embeddedness in local food systems.

5.1.2 Civic Agriculture and Political Constructs

Other scholars have attempted to bundle the emerging local food movements and markets together into the concept of "civic agriculture," a "locally-based agricultural and food production system that is tightly linked to a community's social and economic development" (Lyson 2000: 42). Feenstra (1997: 28) sets a similar trend stating that local food "provides not only economic gains for a community but fosters civic involvement, cooperation, and healthy social relations." Local food systems contribute to ecologically sound production and distribution practices and enhance social equity and democracy for all members of the community by creating alternative social spaces at direct market arrangements (ibid.). Market arrangements can include farmers markets, community-supported agriculture, farm/roadside stands, U-Pick operations, farm-to-school programs, and community gardens (Allen 2008: 159; Feenstra 1997; 28). These concepts move away from a rigid emphasis on production and economic efficiency and toward food and farming systems that are responsive to socioeconomic and ecological contexts (Selfa and Qazi 2005: 452). As Hinrichs (2000: 297) points out, author Brewster Kneen, in his 2003 book *From Land to Mouth: Understanding the Food System*, finds that all these varying direct market opportunities still can be understood as "expressions of proximity."

As a political concept, "local food" can be defined as "a banner under which people attempt to counteract trends of economic concentration, social disempowerment, and environmental degradation in the food and agricultural landscape" (Peters et al. 2008: 2). Giovannucci et al. (2010: 99) identify this political construct as "the new local" in which local food is not only about food quality, economics, or culture, but also includes political acts advocating for "freshness, support for the local economy and traditions, reduced transportation and processing affecting climate change, lower cost, a relationship with farmers, food safety, improved nutrition, better flavor, and a backlash against feelings of alienation and disconnection from the land."

5.1.3 Values-Based Value Chains and Rights-Based Food Systems

Recent literature has warned of coalescing "local" and "community-based" due to their

important distinguishable differences. Anderson (2008: 602) defines "local" based on geographic scope and "community-based" as control over the food system by community residents. Worrying about the conflation and ambiguity in the literature toward these two concepts, and the fear that activists trying to help communities may lead their food system choices into less productive strategies, Anderson (2008) introduces a new concept: rights-based food systems (RBFS). RBFS have the following core criteria: democratic participation in food system choices affecting more than one sector; fair, transparent access by producers to all necessary resources for food production and marketing; multiple independent buyers; absence of human and resource exploitation; and no impingement on the ability of people in other locales to meet this set of criteria (ibid.: 593). Values-based value (supply) chains have a similar vision of food democracy by developing relationships between farmers, suppliers, processors, distributors, and retailers based on trust, transparency, and relationship building (Hoshide 2007: 4). When relationships are expressly based in an articulated set of values, then a values-based supply chain is created (Stevenson and Pirog 2006: 1).

5.1.4 Localizing, "More Local"

While it is evident that there lacks certain continuity in defining "local" in the literature, Peters et al. (2008: 2) identify that terms like "local food," "local food system," and "(re)localization" are used almost interchangeably to refer to the concept of decreasing reliance on foods produced in the modern food system in favor of consuming foods produced near their point of origin. This thesis builds off this connection and opts for a flexible framework of analysis, rather than a rigid methodology, that refers to food systems in categories of "less local/more global" and "more local/less global" since food systems do not operate as separate units. As Bellows and Hamm (2000: 272) state, "'Localizing a food system or making it 'more local'…addresses a change toward concentrating a food system locally that can be applied in diverse situations." A "system" in this sense can be described as a conglomeration of people, structures, and processes that work together in an integrated set of various inputs, which together can accomplish an overall goal (McNamara 2010). More specifically, a "food system" includes agricultural production and all activities supporting or utilizing that production, including growing, harvesting, processing and manufacturing, packaging, transporting, consuming, and disposing of food, linked together by distribution and markets (CRS 2005: 113; The Chicago Community Trust 2009: 61). Therefore this thesis uses a *local food system* to define the concept of "local" and *global food system* for the concept of "global" as they exhibit a systems-wide perspective. The goal to be reached is to become "more local" or "localized" based on the various inputs described in the literature, including foodsheds and geographic constructs, civic agriculture and political constructs, and values-based value chains and rights-based food systems. Therefore, "more local" is achieved if interactions occur in a space, context, or socio-cultural process that is closer in proximity to a global food system and where civic engagement and values-based decisions can flourish amidst interactions between societal actors all along the food system chain. As the compartmentalized global food system has separated all social actors and agencies along the food chain spatially and temporally (Koc and Dahlberg 1999: 112), it should be noted that civic agriculture, political constructs, and values-based/rights-based value chains are easier to obtain in a locally integrated food system.

5.2 Defining Sustainable Development

Before we link the concept of local food systems to sustainable development, let us take a closer look at the latter. The idea of sustainable development or sustainability represents an attempt to link economy, society, and the environment with development and arose from two main sources: increasingly worrisome evidence of ecological degradation and other biophysical damages (Kemp and Parto 2005: 13; Kemp and Martens 2007: 5). The World Commission on Environment and Development

(WCED) was created to address these sources jointly. The Commission concluded that the ecological and social failures had common causes and demanded a common response. This was illustrated through the report *Our Common Future* by the WCED (the Brundtland Report), which stated that critical global environmental problems resulted from both the "South's" enormous poverty and the "North's" unsustainable consumption and production. Calling for a common response strategy that would unite development with economy, society, and environment, the report developed the now common term *sustainable development*, defined as "development that meets the needs of current generations without compromising the ability of future generations to meet their own needs'' (ibid; WCED, 1987).

Even though more than two decades have passed since publication of *Our Common Future*, there is still significant dispute about the meaning and implications of sustainable development (Kemp and Parto 2005: 14). Kemp and Parto (2005) identifies several "basics" that have become clear on the debate, however, including the following: current paths of development are not sustainable, sustainability is about protection and creation, requirements of sustainability are multiple and interconnected, pursuit of sustainability hinges on integration, and diversity is necessary. Martens and Rotmans (2005: 1134) suggest that sustainable development is complex, inherently normative, and subjective due to its estimation of what the needs of the present and future generations are and how they can be fulfilled. Ambiguity of the concept is also discussed because it requires trade-offs between economic, ecological, and social-cultural developments which can be weighed differently (ibid.). However, the authors do not disregard the ability to operationalize sustainable development.

6 Local Food Systems Relevancy to Sustainable Development

To operationalize a local food system's relevancy to sustainable development, this thesis deploys the triangular concept, as suggested by Martens and Rotmans (2005) and Kemp and Martens (2007), which includes three pillars of analysis: "economy" (economic), "environment" (ecological), and "society" (social) (see *Figure 2*); this concept also relates in other contexts as the P3 concept: "people," "planet," "profits" (Kemp & Martens 2007: 6). Economic aspects relate to production and consumption for economic sectors such as agriculture, energy, industry and services, and creation of wealth and jobs. Ecological aspects can relate to the structure and functions of the ecosystem including biodiversity, environmental quality, climate change, and physical, chemical, and biological processes. Social aspects include social behavior of various "actors" (individuals, institutes, or communities), concepts of human capital (health and skills), and opportunities for self-development attributable to freedom and education (ibid; Martens and Rotmans 2005: 1135).

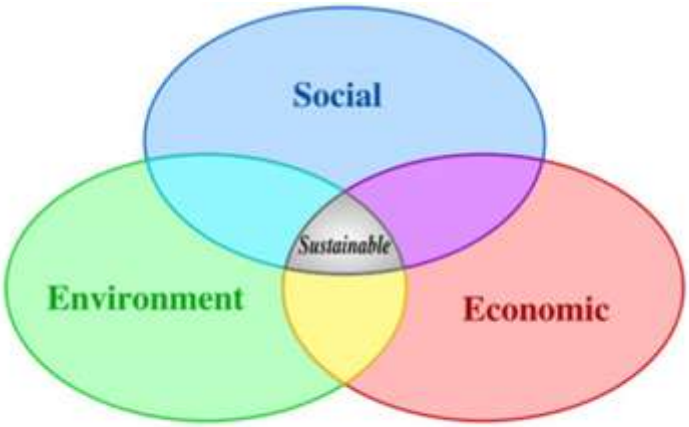

Figure 2: Three Pillars of Sustainability; Adapted from (Adams 2006: 2)

The burgeoning movement toward local food systems is now being promoted as a more sustainable alternative to the globalized system that can reverse negative trends, sparking significant recent debate. Francis (2009: 3) argues that scarce research would be better spent on improving the development of alternative agroecosystems, rather than invest resources into "futile comparisons that are unlikely to convince the skeptics." However, in order to bring forth validity in this thesis' dedication to analyzing a local food transition, it is imperative that some time be taken to compare the two ends of the

food system spectrum and establish why local food systems are potentially a better path to sustainability. By operationalizing the relevancy of local food systems to sustainable development using the three-pillar approach of sustainability, the debate between local vs. global is brought into clearer focus.*

*Note: An all-inclusive comparative depiction is not intended in an attempt to establish local food system relevancy to sustainable development; rather, its intent is to focus on primary issues being discussed surrounding the local vs. global food system debate.

6.1 Economic Pillar

6.1.1 Economic Development

Advocates of local food systems see the transition toward localizing food production and consumption as a path to sustainable economic development. A common argument supporting their claims involves the multiplier effect of re-circulating food dollars within a community. Ten Eyck (2008: 5), in the spring issue of *American Farmland*, the magazine of American Farmland Trust, states that re-circulating food dollars helps "strengthen local economies as well as wean people off an industrialized system." Anderson (2007) agrees that more wealth is retained in communities when you buy locally. A 2001 regional study of southeastern Minnesota found that the existing economic structures through which food products are bought and sold extract about $800 million from the region's economy each year (Meter and Rosales 2001: 3). In Meter's 2005 review of his and Rosales' "Finding Food in Farm Country" report, he states that if the region's consumers were to buy 15% of their food from local sources, however, it would generate as much income for the region as two-thirds of farm subsidies (Meter 2005: 2). Although not focusing on local food economies, a similar 2002 study found promising evidence of the benefits of buying locally. The study discovered that for every $100 in consumer spending at Borders (a national book retailer), the total local economic impact was $13; the same amount spent with a local book merchant yielded $45 (CivEc 2002: 3). When concentrating on farmers markets Otto and Varner (2005: 2) found that every dollar spent at an Iowa farmers market generated $1.58 in additional sales, and every dollar earned by vendors translated into $1.47 in income for others. This economic multiplier effect can also be beneficial at the state level. The Illinois Local and Organic Food and Farm Task Force (Illinois Food Task Force), in their 2009 report to the Illinois General Assembly, estimated that a 20% increase in local production, processing, and purchasing will generate $20 to $30 billion of new economic activity within the state (Illinois Food Task Force 2009: 11-12).

6.1.2 Producer Income Stability

Literature has also attested that shorter supply chains delivering produce locally can offer better and more stable incomes that keep existing farms in business and attract new farmers (Anderson, 2007). As the food system in the U.S. became more interconnected and globalized, from food production to consumption, the farmer began receiving less gross return. The USDA estimated that in 1975 a farmer's gross return on a consumer's spent food dollar was 40 cents (Elitzak, 1999b); by 1998 it had fallen to 20 cents (Elitzak, 1999a). It has been estimated that today, only 7 cents of every retail food dollar reaches the farmer, rancher, or grower, while 73 cents goes toward distribution (Shuman et al. 2009, 10). These pricing changes reflect the changing dynamics of the global food system as companies integrated in the supply chain formed alliances to create global value chains that could be mandated each step of the way. By keeping produce closer to the origin and interacting directly with consumers to minimize the number of exchanges, local and regional food systems significantly enhance the producer's share of the final retail price (Anderson 2007: 2). The source of income producers receive from direct access to consumers at farmers markets has proven to be a vital supplemental source. According to USDA's latest National Farmers Market Survey, more than 25% of market vendors in 2005 derived their sole source of income from farmers markets (AMS, 2010a). Compare this to the mere 8% of farmers with large farms (those with

sales of $250,000 or more per year) that can live on farm income alone, or the 27% of small farm operators (those with sales between $100,000 and $249,000 per year) that only receive 13% of household income from farming (Anderson 2008: 597). The positive economic benefits of direct marketing at farmers markets has led to an influx in the number of operating farmers markets in recent years (AMS, 2010b) (See *Figure 3*).

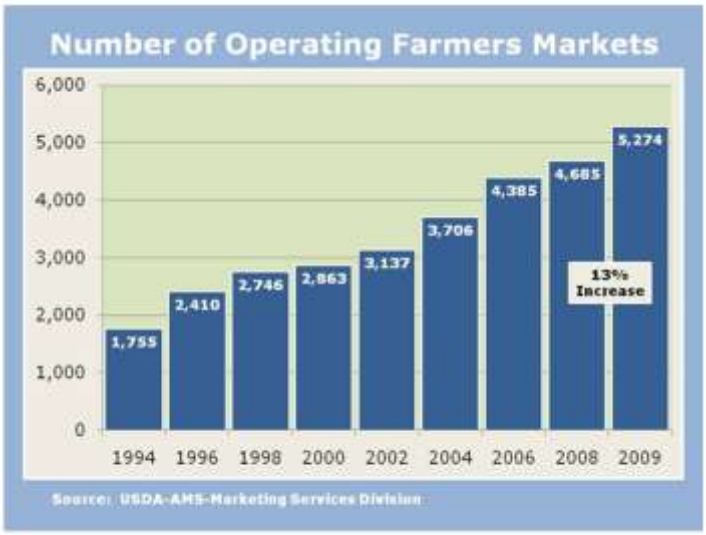

Figure 3: Number of Operating Farmers Markets, 1994-2009; Source (AMS, 2010b)

6.1.3 Prime Farmland

An economic deficiency in the food system resulting primarily from population growth is the disproportional loss of high quality prime farmland. From 1982 to 1992 it has been estimated that the U.S. conversion of prime farmland to urban or built-up land was 18.5 hectares every hour, or 400,400 acres annually (Serenson et al., 1997). Today the American Farmland Trust (AFT), a non-profit organization dedicated to protecting farmland, estimates that 1.2 million acres of farmland is lost annually, the majority being productive prime farmland. Although the loss of farmland may not be directly correlated to a global food system, the AFT pinpoints eating locally as one of their "7 Ways to Save Farmland" (AFT, 2010a). The economic importance of local farmland to local communities should not be underestimated; after all, the food and fiber industry employed 24% of Illinois' employment in 2007 and sold over $13 billion in market value of agricultural products (KCFB, 2010a; U.S. Census of Agriculture, 2007b). Anderson (2007: 6) suggests that local food systems can help keep farmland in a community and would be fiscally beneficial for municipalities "since farmlands generate more public revenues than they receive back in public services." Local direct market ventures such as Farm-to-School programs that attempt to connect local farmers to schools are seen as an opportunity to preserve farmland while maintaining livelihoods for farming families (Bagdonis et al. 2009: 108).

6.2 Social Pillar

6.2.1 Food Security, "Food Deserts", Health, and Nutrition

There have been very few studies conducted to illustrate the social benefits and externalities derived from local and global food systems. However, there are numerous issues frequently discussed in literature that can be inherently connected to this critical pillar of sustainability. Food security, brought about when sufficient income and other resources allow for access to fresh and nutritious foods, is one important issue capturing the attention of many. Nord et al. (2009: 4) determined there were 14.6% of households in the U.S. that were considered food insecure at some point during 2008, while 5.7% of households were classified as having "very low food security." Access to high-quality nutrient-dense food varies widely across the U.S. and by income level; poor people typically have less resources to access healthy food due to low incomes, lack of transportation, or being distant from an adequate source (Anderson 2007:3).

Some areas in the U.S., both inner-city and rural, have been dubbed "food deserts" as a result of this access inequality (Ver Ploeg 2010: 21). A 2009 USDA report to the United States Congress examined food deserts and found that 2.4 million (2.3%) of households live more than a mile from a supermarket and do not have

access to a vehicle. An additional 3.4 million (3.2%) live between one-half to 1 mile away while not having vehicle access (Ver Ploeg et al. 2009: 20). Smith and Morton (2009: 176) point to the globalization of the American food system and the consolidation of the retail food industry as the culprits to this phenomenon.

Health and nutrition are also important to consider when discussing food systems and food access. In 2007-2008, the prevalence of obesity was 32.2% among adult men and 35.5% among adult women (Flegal et al. 2010: 235). Kane County had between 27.8-29.1% obesity in 2007 in adults older than 20 (CDC, 2009). Studies have linked the problem of limited access to supermarkets and easier access to fast food restaurants and convenience stores to these high obesity rates and other diet-related diseases (Laraia et al, 2007; Larson et al., 2009). Ver Ploeg et al. (2009: 39) warn, however, that such studies use of data and methods may not form a sufficiently robust outlook to make a causal connection between food access and nutritional outcomes.

Ver Ploeg et al.'s study does suggest, however, that limited access may cause people to be more prone to poor diets and have poor health outcomes (ibid.: 6). Although there is lack of supporting research, local food systems are considered one option to counter food desert disparities by increasing access to fresh, nutritious and affordable food, thus allowing for healthier diets. A recent study did find that supportive attitudes about alternative food production practices, including locally grown food, correlated to a more healthful diet quality among adolescents (Robinson-O'Brien et al. 2009: 14). A USDA congressional report cited projects such as farmers markets and local food production and promotion as successful tools for community development to help alleviate the "access to food" problem. It also recognized the USDA's Community Food Projects Competitive Grant Program (CFPCGP) as an appropriate funding program to help alleviate the stress of food deserts by engaging participation of local communities in developing innovative approaches that foster local solutions for feeding low-income families (Ver Ploeg et al. 2009: 91). (See *Appendix E* for more information on local food initiatives focusing on health and nutrition).

6.2.2 Social Connectedness and Civic Engagement

There are other intrinsic benefits of local food systems that are not related to health or food security issues. A prevalent topic often discussed is that direct marketing ventures like farmers markets and Community Supported Agriculture (CSA) allow consumers access to locally produced food while giving them an opportunity to interact personally with farm producers, a benefit argued to be significantly decrepit in the global food system. Based on specialization, Koc and Dahlberg (1999: 112) argue that the current food system has compartmentalized the food chain into diverse sectors, processes and structures, and standards that have separated all social actors and agencies, from farmers to consumers, spatially and temporally. This has caused them to be "typically unaware of their common interests in the larger agri-food system" (ibid.).

Ten Eyck (2008: 4) puts the notion of societal benefit from local food systems simply, stating "When a high quality product is backed up by a farmer's direct relationship with the consumer, a bond is created that is hard to break." These interactive relationships are believed to create a sense of personal connectedness and respect between the two parties, allowing for a more integrated community (Ikerd 2008: 4; Hinrichs 2000: 300). They can also lead to civic discussions on the values and ideals of quality, locality, environment, justice, equality, and democracy (Feenstra, 1997; Allen, 2008). Born and Purcell (2006: 203) argue, however, that there is no reason why more distant producers cannot abide by more just social relations or be just as sustainable than those with whom consumers personally interact with. They go on to aver that greater face-to-face interaction can lead to more trust and regard between producers and consumers, but better information for the customer or a more sustainable or just food system does not necessarily arise (ibid.). Hinrichs (2000: 301) goes on to warn that although there is a certain social embeddedness

in direct agricultural markets there is also a connection to marketness and instrumentalism and social inequalities can exist as many markets involve social relations where the balance of power and privilege rests ultimately with the well-to-do consumers, not the producers. It has been asserted, however, that local farmers build relationships rather than exploit short run market opportunities as they have a vested interest in their customers and understand the needs and preferences of their particular customers (Ikerd 2008: 4).

This unique set of relationships can also cause greater food system diversity as producers plant multiple crops to meet their customers' needs (Anderson 2008: 603). If producers were to diversify crop plantings, although more labor intensive, they would be able to spread out their production and marketing risks (Anderson 2007: 5). Local food systems can also renew ties strictly between producers by decoupling political relations and through the embeddedness of sales activity in technical and friendship relations that favor cooperative innovation (Chiffoleau, 2009).

6.2.3 Farm Size and Community Development

The social demographics of U.S. farms have changed significantly over the past half century as agriculture tended toward larger, more mechanized farms (Heller and Keoleian 2003: 1016; Horrigan et al. 2002: 456). In 1950, there were 5,388,000 farms averaging 216 acres; in 1998 there were 2,192,000 farms averaging 435 acres (Heller and Keoleian 2003: 1017). From 1998 to 2002, the number of farms with more than 1,000 acres increased by 14 percent, while farms with 50-1,000 acres declined roughly 17% (Key and Roberts 2007: 36). Large farms (those with more than 1,000 acres) operated two-thirds of all farmland; small farms with fewer than 50 acres operated less than 2% (ibid.). Similar trends have been recorded for Kane County. As of 2007 there were 759 farms averaging 253 acres compared to the 2,020 farms in 1945 averaging 145 acres (NASS, 2007; KCFB, 2010a). Dean MacCannell, an anthropologist at the University of California, attests that carefully conducted research on farm size, residency of agricultural land owners, and social conditions in rural communities find a similar relationship: social conditions in the local community deteriorate as farm size and absentee ownership increases (Hassebrook, 1999). MacCannel affirms this in a study that associates depressed median family incomes, high levels of poverty, low education levels, and social and economic inequality between ethnic groups with land and capital concentration in agriculture (Horrigan et al. 2002: 456). Small and mid-size owner-operated family farms thus need to be revived to enhance community and rural development and promote equality (Hassebrook, 1999). As a pivotal part of communities, these farms help create bonds between individuals that form social capital, as explained above. Maintaining diversity in farm size and preventing total domination by large farms can also enhance American agriculture resilience to potential unforeseen shocks and perturbations (ibid.). In order to preserve these farms, it is necessary to also preserve farmland as mentioned earlier.

6.3 Environmental Pillar

6.3.1 Farm Diversity

A primary environmental benefit that is argued to arise in local food systems relates to farm diversification through personal interaction with consumers. As discussed earlier in *6.2.3 Social Connectedness and Civic Engagement*, farmers who sell directly to consumers can get immediate feedback about the types of products their customers want to buy. These personal interactions can encourage civic engagement that allows for customers to not only express which foods they desire, but also concerns about food quality, food safety, and production practices (Anderson 2007: 4). Farmers will diversify their crop plantings to meet consumer demand, thus escaping the monoculture trends of commodity agriculture and promoting crop diversity. Enhanced soil quality by incorporating crops with various nutrient needs, rooting depths, and nitrogen-fixing capacities is one potential ecological benefit (Anderson 2007: 5). If nitrogen levels were increased by nitrogen

fixating leguminous crops, there would be less need for synthetic nitrogen fertilizer application. Also, these intercropping practices may reduce pest pressure, allowing for less need of synthetic chemicals (ibid.). Chemical input synthetics such as pesticides, herbicides, and fertilizers are known to pollute surface water and groundwater supplies, calling into question the safety of current food supply (Born and Purcell 2006: 200).

6.3.2 Energy Use

Perhaps one of the most heated debates circulating literature on sustainability of local food systems is energy use. The globalized food system is berated for its tremendous use of energy to grow, package, and distribute food to travel excessive distances (Pirog et al, 2001; Hora and Tick, 2001; Heller and Keoleian, 2003). Pirog et al.'s (2001) study on food miles is one of the most frequently cited in the U.S. on the issue. The "food miles" approach compares the distance food travels from where it is grown to where it is ultimately purchased or consumed. The study found that a conventional transport system, represented as an integrated retail/wholesale buying system using large semitrailer trucks, used 4 to 17 times more fuel than a regional or local system and traveled on average 1,518 miles, drastically greater than locally sourced food which traveled just 44.6 miles (ibid.: 1-2). This mileage was found to be a 22% increase over the 1,245 miles traveled in 1981 (ibid.: 13). A similar study found that the average pound of fresh produce arriving at the Jessup, Maryland terminal market in 1997 traveled 1685 miles (Hora and Tick, 2001). Mariola (2008) and Edwards-Jones et al. (2008) argue that the food miles approach is just a conceptual tool, however, and not a holistic measure of energy use that can validate the assertion that local food systems are more energy efficient. If you take into the full life cycle assessment, including the energy embodied in vehicles used for transport, expended to maintain highway infrastructure, exhausted in refrigeration, consumed by human beings laboring along the food supply chain, etc., the end result may depict a global food system as more sustainable. However, this type of analysis is currently lacking for nearly all food chains (Edwards-Jones et al., 2008). Economies of scale have also been an argument against the food miles approach. Mariola (2008: 194) presents an interesting thought experiment by suggesting that a fully-loaded semi trailer carrying 38,000 food items traveling 100 miles would account for roughly .003% energy used per item, while a local farmer carrying 1000 items traveling 50 miles would use .05% energy per item. Worse yet, energy use per item can be greater if consumers need to travel farther distances to reach a direct market venue vs. a supermarket. As distances expand for transportation, however, refrigeration is needed to keep food items from perishing and the rising cost of refrigeration may tip the energy balance back in favor of local foods (ibid.: 196). Heller and Keoleian (2003: 1027) estimate that more than half of the energy consumption in food retail is used in refrigeration during storage and transportation. This is important to consider as local food systems require less refrigeration need since they are traveling shorter distances to a market. Another big culprit of fossil fuel use is chemicals. Approximately 40% of energy used in the food system goes toward the production of artificial fertilizers and pesticides (ibid.: 1032). So, while definite answers on energy use in global vs. local food systems are still at large, a significant energy cost and use of a non-renewable resource can at least be avoided if social interaction with consumers can cause local producers to utilize fewer chemicals by diversifying their production systems to meet consumers' demands, as explained previously.

6.3.3 Greenhouse Gas Emissions

A final ecological benefit debate stems along a similar topic: greenhouse gas (GHG) emissions, a leading cause of climate change. In 2008, agricultural emission sources were responsible for 6.1% of total U.S. GHG emissions (EPA 2010: 36). Burning fossil fuels as well as other agricultural activities contribute directly to these emissions, including enteric fermentation in domestic livestock, livestock manure management, rice cultivation, field burning of agricultural residues, and agricultural soil management. The contributions from fossil fuel

burning and agricultural soil management, however, are most related to the global vs. local food system debate. Much like in the "food miles" debate, there are criticisms against the argument that local food systems emit less greenhouse gas emissions due to too few life cycle assessments that holistically analyze the issue (Edwards-Jones et al., 2008). A 2008 life-cycle study did find, however, that although food was transported long distances, the GHG emissions associated with the long transport only amounted to 11%, and final delivery from producer to retail a mere 4% (Weber and Matthews 2008: 3508). In fact, 83% of GHG emissions were associated with the production phase of agriculture. Unlike most economic sectors, agricultural sector emissions are largely dominated by nitrous oxide (N_2O) from agricultural soil management during production (43%) rather than carbon dioxide (CO_2) from fossil fuel combustion (9%) (EPA 2010: 2-17). So while evidence remains largely inconclusive on weather global or local transportation chains reduce greenhouse gases, it may be better to focus on management practices. Carbon sequestration is being considered as a possibility to mitigate impending climate change through practice methods that include conservation/reduced tillage, cover cropping, crop rotations, and elimination of summer fallow. Through these practices, carbon dioxide can be removed from the atmosphere and converted into organic carbon in the soil by 0.5-1.1 Metric ton (Mt) CO_2 equivalent (Johnson et al. 2005: 5), improving soil quality and reducing a harmful atmospheric pollutant (Lewandrowski et al., 2004; Schahczenski and Hill, 2009). It can be argued that social interactions between producers and consumers can allow for a social arena in which consumers can value their purchases depending on alternative management practices that are more ecologically just, making a value demand statement that may cause producers to shift practices.

6.4 Summary of Local Food System Relevancy to Sustainable Development

There are yet other economic, social, and ecological concerns related in the global vs. local food debate, including the following: foodborn illness outbreaks and contamination, agroterrorism, social justice such as the health and safety of farm workers, and job growth potential. These particular issues are examined more in depth in *Appendix F*.

Table 1 (pg. 16) provides an aggregated account of *6 Local Food Systems Relevancy to Sustainable Development* for easy reference. Rip and Kemp's (1998) and Rotmans et al.'s (2001) multi-level concept in transition theory is deployed in *Table 1* so it is clear where certain benefits are received and drivers exist, at the macro-, meso-, or micro-level. *Figure 4* below illustrates the three different levels in terms of social organization and should be used in reference to *Table 1*.

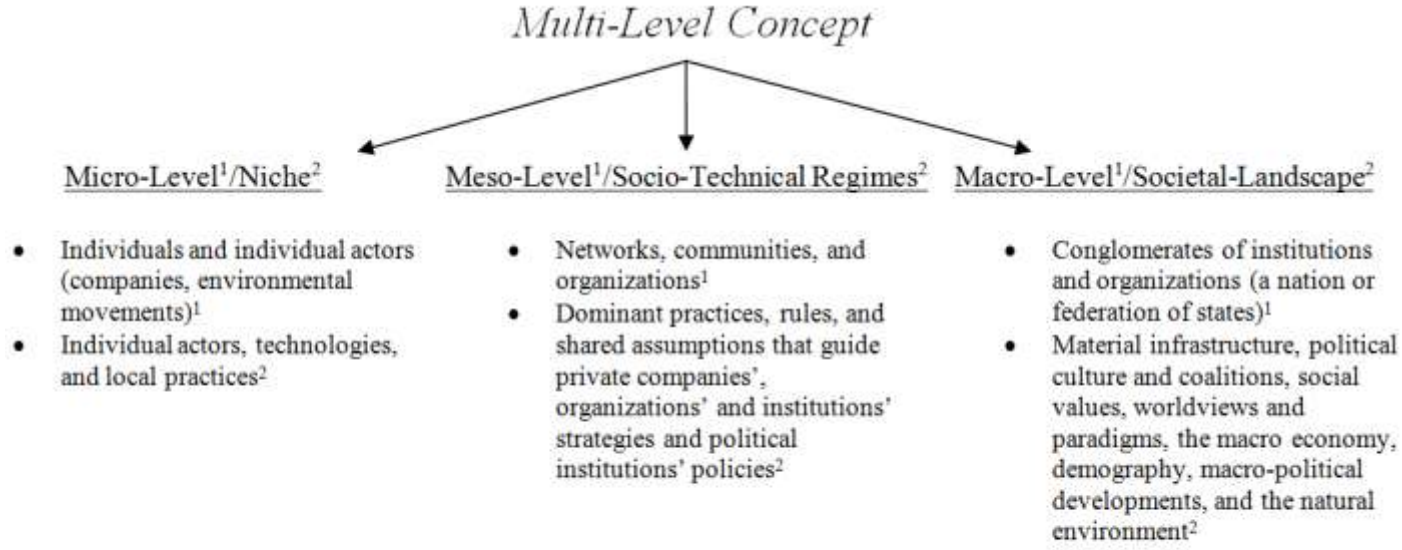

Figure 4: The Multiple Levels of Transition Theory; Adapted from (Rotmans et al., 2001)[1] and (Rip and Kemp, 1998)[2]

Table 1: Economic, Social, and Ecological Benefits of Local Food Systems

	Micro/Niche-Innovation		Meso/Socio-Technical Regimes		Macro/Societal Landscape	
Economic	↑	Income stability for producers[1]	↑	Local economies and strengthen wealth by re-circulating food dollars[6]	↑	GDP growth that can lower the impact of a recession
	↑	Income source for producers[2]	↓	Prime farmland loss (keeps agriculture as viable economic sector)[7]	↑	Market demand for other local goods and services by increasing awareness of positive aspects
	↓	Prime farmland loss (maintain economic livelihood of farm families)[3]	↓	Healthcare costs for national government[8]		
	↓	Healthcare costs for individuals[4]	↓	Employee costs[9]		
	↓	Production and marketing risks by diversifying production system to meet consumer needs established through direct interactions[5]	↓	Consolidation of farms that leads to depressed median family incomes and economic inequality[10]		
			↑	Community wealth through job growth[11]		
Social	↑	Food security[12]	↓	Food deserts in communities[18]	↑	Common interest in the agri-food system by connecting social actors and agencies[25]
	↓	Obesity and diet-related illnesses[13]	↑	Job performance quality[19]	↑	Civic engagement and activism that can affect individuals consciousness and worldview on topics such as food quality, locality, environment, justice, equity, democracy, etc.[26]
	↑	Personal connectedness, respect, and trust between producer and consumer[14]	↑	Community integration through producer and consumer interactions[20]	↑	Ability to influence political culture and macro-political developments via civic engagement and activism
	↑	Understanding of food systems through direct market interactions[15]	↓	Consolidation of farms that leads to high levels of poverty, low education levels, social inequality, and deteriorated communities[21]		
	↑	Social justice related to individual actors (ex. health and safety of farm workers, food security, etc.)[16]	↑	Democratic participation[22]		
			↓	Foodborn illness outbreak and contamination[23]		
	↑	Job employment[17]	↓	Spread of contamination in event of act of agro-terrorism[24]		
Ecological	↑	Soil quality in fields by potentially* diversifying food crops, rotating crops, using reduced/conservation tillage, etc. to meet consumers needs[27]	↓	Potential* energy use via decreased transportation and refrigeration use[29]	↓	Greenhouse gases, a leading cause of climate change, by potentially* limiting transport, chemical use, etc.
	↓	Potential* need for synthetic chemicals including fertilizers, pesticides, and herbicides that pollute surface water and groundwater[28]	↓	Energy use by utilizing less chemicals via consumer demand		

Table 1: Economic, Social, and Ecological Benefits of Local Food Systems at the Micro-, Meso-, and Macro-Level; This diagram was created to the best of the author's ability based on a literature review of the following authors and studies:
1: (Anderson, 2007); **2**: (AMS, 2010a; Anderson, 2007); **3**: (Bagdonis et al., 2009); **4**: (Finkelstein et al., 2009); **5**: (Anderson, 2007); **6**: (Anderson, 2007; CivEc, 2002; Meter, 2005; Meter and Rosales, 2001); Otto and Varner, 2005; Ten Eyck, 2008); **7**: (AFT, 2010; Anderson, 2007; Serenson et al., 1997); **8**: (Finkelstein et al., 2009); **9**: (Aronovich, 2006); **10**: (Hassebrook, 1999; Horrigan et al., 2002); **11**: (Shuman, 2010); **12**: (Ver Ploeg et al. 2009); **13**: (Bagdonis et al. 2009; Laraia et al., 2007; Larson et al., 2009; Ver Ploeg et al., 2009); **14**: (Hinrichs, 2000; Ikerd, 2008); **15**: (Bagdonis et al., 2009); **16**: (Allen, 2008); **17**: (Otto and Varner, 2005); **18**: (Smith and Morton, 2009; Ver Ploeg et al. 2009); **19**: (GSA, 2010); **20**: (Horrigan et al., 2002); **21**: (Hassebrook, 1999; Horrigan et al. 2002); **22**: (Anderson, 2002); **23** & **24**: (Anderson, 2007); **25**: (Koc and Dahlberg, 1999); **26**: (Feenstra, 1997); **27** & **28** (Anderson, 2007); **29**: (Heller and Keoleian, 2003; Hora and Tick, 2001; Pirog et al. 2001)

*The word "potential(ly)" is used due to varied interpretations that remain when considering the benefit of proximity in food systems.

7 DATA ANALYSIS AND DISCUSSION

It is clear there is validation in the emerging support for local food systems as a more sustainable alternative to the global food system. As the terminology of local food systems and sustainable development has been defined, and there is established relevancy of the formers ability to obtain the latter, data analysis of the local food system transition in Kane County can commence. It should be noted that aggregation of data came from the triangulation process: archival information, interviews, and observations. Qualitative interviews were the primary source of data as information was gathered from key informants/stakeholders within the agricultural system. Quantitative analysis was also conducted to represent empirical numbers characterizing the Kane County and Illinois agricultural sector. This quantitative data was synthesized from the 2007 U.S. Census of Agriculture. (See *Appendix G*).

7.1 Analysis Intent

It has become evident that for local food systems to advance in Kane County a transition process is needed. The issues at hand, identified as persistent problems due to complexity and ill-structured nature, require a method of analysis that will cover all occurring interactions in the transition process. Rotmans et al.'s (2001) transition theory provides a respectable framework in which to analyze data obtained. By monitoring the transition process, including the rate of progress (and motivating drivers contributing to that progress), the barriers, and the points to be improved, the process of social learning and acceleration can be stimulated (Rotmans and Loorbach 2009: 193). This data analysis and discussion focuses on the first two of these with an attempt to further systemic thought on how to improve the transition process. The ambition of this study is not to fully understand and evaluate all interactions that are creating motivating drivers and inhibiting barriers affecting a transition to a local food system, but to choose a limited number of topics that are considered critical and make a deeper analysis of these.

7.2 Theoretical Framework

7.2.1 Transition Theory

Transition theory describes broad, long-term, and structural society changes and explains their mutual interaction. Transitions, as defined by Rotmans et al. (2001: .015), are "transformation processes in which society changes in a fundamental way over a generation or more" and are brought about by a "structural change in a stepwise manner." The process of social change in transitions is non-linear as technological, economic, ecological, social-cultural, and institutional developments, policies, and initiatives influence and reinforce each other on multiple scale levels (ibid.: .016; Martens and Rotmans 2005: 1136). The transition of individuals, society, and governments involves sensitivity to existing dynamics and regular adjustment of goals to overcome conflict between intended long-term ambition and short-term concerns (Rotmans et al. 2001: .015). As a result of gradual changes over time, new bottlenecks will arise allowing for stimulation and development of new concepts, ideas, insight, methods, and techniques that will encourage a successful transition. Transitions are identifiable by two types: evolutionary transitions and goal-oriented transitions. The former describes a transition that does not have a pre-defined planned outcome while the latter incorporates goals or visions that guide public actors and orient the strategic decisions of private actors (Loorbach and Rotmans 2006: 190). It should be noted that the realization of a specific transition is not necessarily the absolute aim of transition theory; it could instead be a transitional improvement in an existing system that offers collective benefits in an open, exploratory manner (Rotmans et al. 2001: .022). A preliminary framework that uses two transition concepts – multi-phase and multi-level – are used to describe, understand, and explore transitions.

7.2.1.1 Multi-Phase Concept

The multi-phase conceptual level has four different transition phases which indicate that transition paths are non-linear with interactions

at the multi-level concept creating shifts from one dynamic equilibrium to another (see *Figure 5*) (Rotmans et al. 2001: .017; Loorbach and Rotmans 2006: 190). The four phases are as follows:

- A *predevelopment* phase; a dynamic equilibrium exists as there is a great deal of innovation at the individual level with no visible change to the status quo.
- A *take-off* phase; the process of change gets under way and the system begins to shift due to different reinforcing innovations or surprises.
- An *acceleration* phase; visible structural changes take place through an accumulation of socio-cultural, economic, ecological and institutional changes that react to each other. During this phase, there are collective learning processes, diffusion, and embedding processes as a result of the interactions.
- A *stabilization* phase; a new dynamic equilibrium is reached as the speed of societal change decreases.

The stabilization point is not set in advance since the direction, size, and speed of the transition process can be influenced through policy and specific circumstances (Martens and Rotmans 2005: 1136).

7.2.1.2 Multi-Level Concept

The concept of transition can also be used at three different aggregation levels in terms of social organization: the "micro-," "meso-," and "macro-level". The micro-level includes individuals or individual actors (companies, environmental movements). The meso-level comprises networks, communities, and organizations. Finally, the macro-level consists of conglomerates of institutions and organizations (e.g. a nation or federation of states) (Rotmans et al. 2001: .019). This multi-level perspective classification has been closely connected with classifications used by Rip and Kemp (1998) who distinguished three levels of heuristic, analytical concepts: niche-innovations (micro-level), socio-technical regimes (meso-level), and socio-technical landscape (macro-level) (Rotmans et al. 2001: .019). The higher the scale levels, the more aggregated the components and their relationships and the slower the dynamics of change that occur between their interactions. The niche-innovation

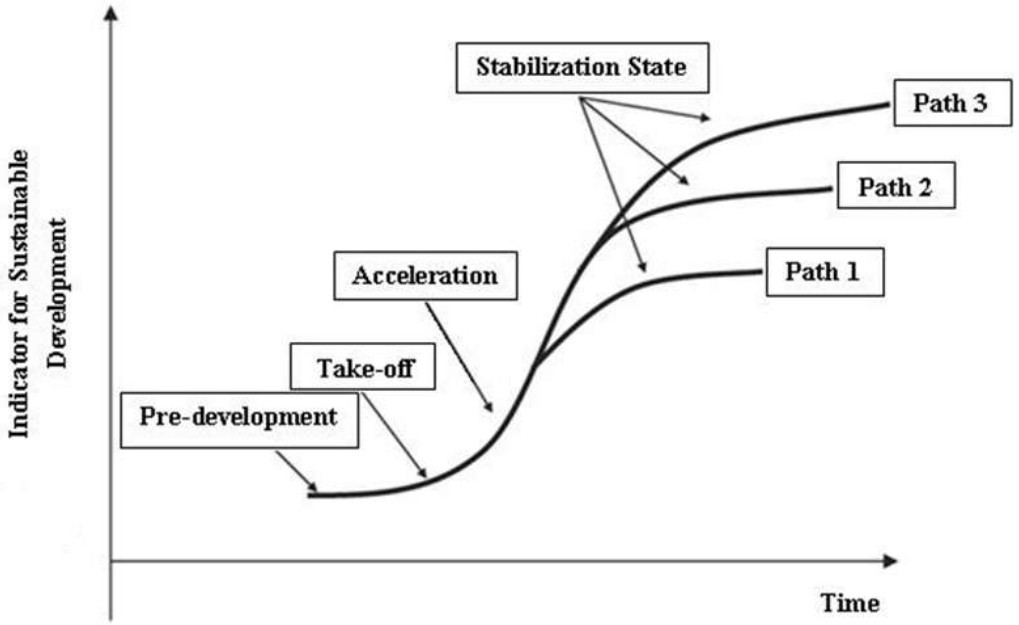

Figure 5: The Multi-Phase Concept of Transition Theory; Adapted from (Rotmans et al., 2001)

level is where radical novelties emerge, as carried out by individual actors acting outside the status quo, by developing or implementing alternative technologies and social practices (Geels and Schot 2007: 400; Rotmans et al. 2001: .019). The next concept level, the socio-technical regime, accommodates a wide community of social groups and their alignment of activities including scientists, policy makers, local communities, and organizations. This meso-level relates to dominant practices, rules, shared assumptions, and belief systems that guide private companies', organizations' and institutions' strategies and political institutions' policies (ibid). Lastly, the socio-technical landscape, or societal-landscape, forms an exogenous environment comprised of material and immaterial elements including macro-economics, deep cultural patterns, demography, worldviews and paradigms, and macro-political developments (ibid). Changes at the landscape level usually take place slowly over decades of time. See *Figure 6* for a diagrammatic account of the multi-level concept.

7.3 Establishment of a Dominant Food System Regime and Lock-in

Transition theory defines transitions as changes from one socio-technical regime to another. Therefore, this thesis focuses on the regime level and interactions with the other two levels. The globalization of agriculture has led to a socio-technical regime that has stabilized at a less than satisfactory sustainable trajectory in Kane County. Geels and Schot (2007: 400) point to several factors that can cause this: competencies, infrastructures, regulations and standards, adaption of lifestyles to technical systems, sunk investments, and cognitive routines that blind individuals to developments occurring outside their focus. A look into Kane County's history shows many of these factors that have contributed to the county's current agricultural dominance in few commodity crops and feeble supply of locally produced and consumed food products.

7.3.1 Competencies and Infrastructure

After immigrant settlers arrived in the northern Illinois region in the mid 1830's, they quickly took to farming as they found that small grains grew particularly well in the regions rich, black soil (Edwards and Edwards 2001: 18). The characteristics that defined the region as prime farmland established competence. The period following the 1830's defined Chicago and its surrounding vicinity as a leading agricultural city in the world, primarily due to technological,

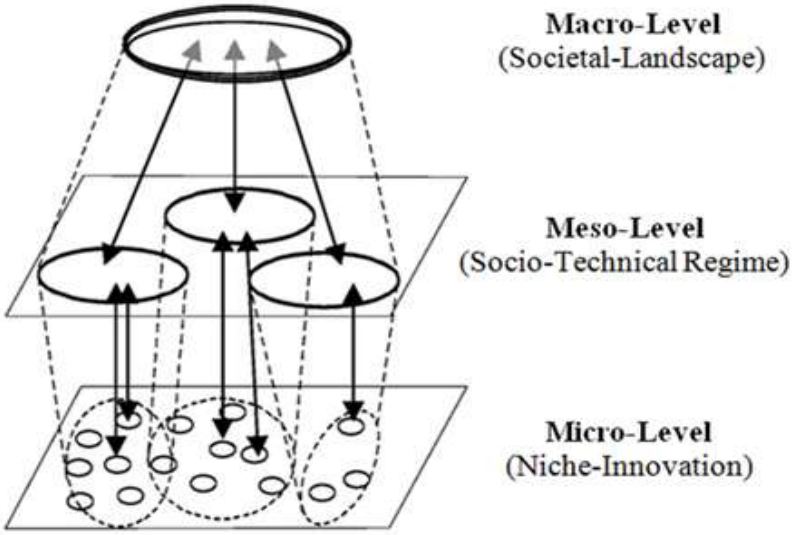

Figure 6: The Multi-Level Concept of Transition Theory; From the micro-level, niche innovations interact with and emerge within the regime level depending on the conditions of the current regime and societal-landscape; Adapted from (Geels and Kemp, 2000; Rotmans et al., 2001)

infrastructural, and societal innovations and developments that would continue to establish competence, including Cyrus McCormick's and Obed Hussey's competitive manufacturing of grain reapers and other implements (1832-1858), the opening of the Illinois & Michigan Canal (1848), the beginning of the Chicago Board of Trade (1848), the opening of the Union Stock Yard (1865), and the western expansion of railroads including the completion of the "Corn Belt Route" (1887) (Raleigh, 2005; The Electronic Encyclopedia of Chicago, 2010). A significant technological advancement that has helped revolutionize agriculture into its current practices was the use of synthetic chemicals in the 1930's which accelerated post-WWII (Vandermeer 1995: 203).

7.3.2 Regulations and Standards

Certain regulations and standards have also contributed to the socio-technical food regimes current dominant state including the Agricultural Adjustment Act of 1938 which was the first to make price support mandatory for corn, cotton, and wheat to help maintain sufficient supply in low production periods (ERS, 2009). The Food, Conservation, and Energy Act of 2008 still upholds previous legislation that established direct payments to producers with eligible historic acreage of major limited commodities, including wheat, soybeans, and corn (ERS, 2010b). From 1995-2008, Kane County farmers received a combined total of $122,764,822 in corn, soybean, and wheat subsidy payments (EWG, 2010). The Energy Policy Act of 2005 also provides some insurance for corn producers as it established a national renewable fuel standard which mandated that gasoline sold in the U.S. contain a specified volume of biofuels (mostly corn ethanol) (Neff 2005: 2).

7.3.3 Lifestyle Adaptation

These technological, infrastructural, and societal innovations, as well as standards and regulations, have allowed for an adaption of lifestyle to these technical systems and the creation of a dominant globalized food system regime that can produce vast quantities of commodity grains for fast, cheap, and efficient distribution. Today, Illinois' agricultural industry supports the livelihood of 24% of employed residents and ranks second nationally in the export of agricultural commodities at 44% (KCFB, 2010a; IDOA, 2010a).

However, the close integration of incumbent technical standards and practices supported by competencies, infrastructure, and regulatory approaches provide strong structuration, allowing regime actors to align activities and stabilize dominant practices (Geels and Schot 2007: 403). This can make attempts by niche-innovators to overturn this dominant socio-technical regime difficult. Meadowcroft (2009: 329) refers to this as "socio-technical 'lock-in'" that results in a sub-optimal state of stabilization (ex. "Path 1" in *Figure 7* (pg. 21)). Sunk investment costs and cognitive routines have also led to this "lock-in" state.

7.3.4 Sunk Investments

As farmers adapted their lifestyles to the dominant regime, they made significant investments toward particular technologies and practices that have created a hindering effect for them to attempt alternative methods. On average, farmers in Kane County invest $175,643 in machinery and equipment for farm operations, with an additional $13,589 in supplies, repairs, and maintenance (U.S. Census of Agriculture, 2007a). Commodity producers' dependence on synthetic fertilizers and chemicals to average high yields also presents a financial strain. The purchasing of fertilizers, lime, soil conditioners, and chemicals equates to 23.7% of Kane County farmers production expenses (ibid.).

7.3.5 Cognitive Routines

Commodity producers' cognitive routines are also creating a lock-in as they are blinding them to the developing market opportunities surrounding local food systems. The Illinois Food Task Force derived that annual direct market farms sales grew from $12 million in 1997 to $25.9 million in 2007 while farmers markets increased from 97 to 270 between 1999 and 2008 and CSA's grew from 14 to 68

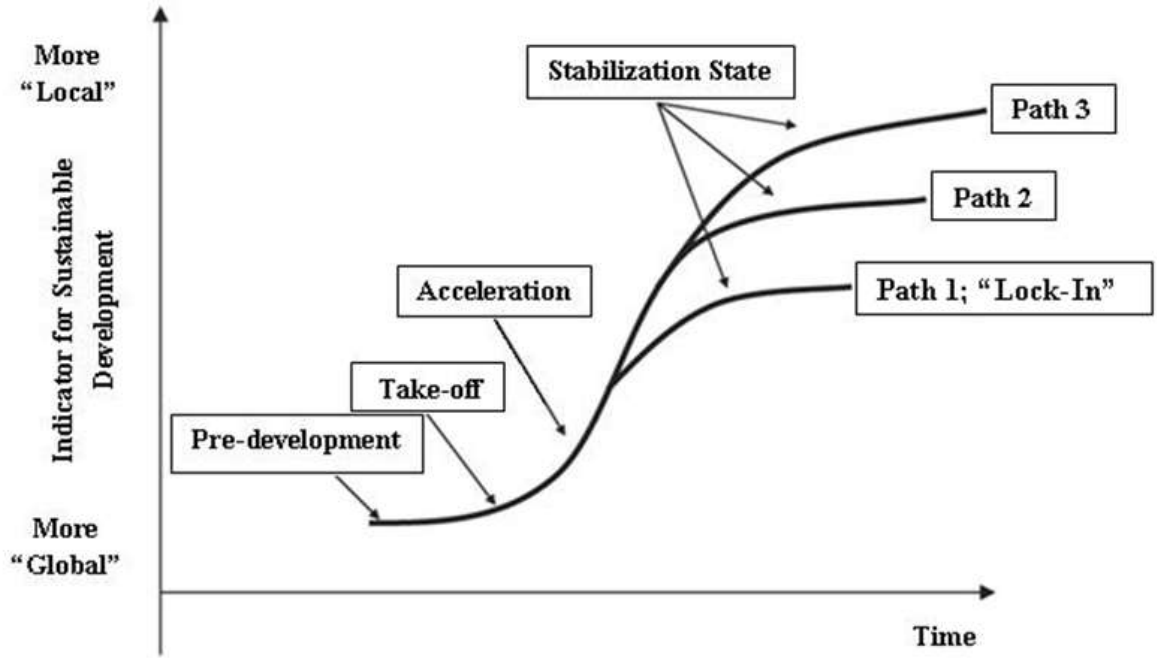

Figure 7: Path 1; "Lock-in". *As indicated previously, "more local" is achieved if interactions occur in a space, context, or socio-cultural process that is closer in proximity to an alternative food system and where civic engagement and values-based decisions can flourish amidst interactions between societal actors all along the food system chain (pg. 10). The conceptual indicator of sustainable development as "more local" can be analyzed empirically, for example, by examining growth in direct market ventures within the State of Illinois or Kane County, or by examining the shift in acreage use dedicated for vegetable, melon and potato harvesting; Adapted from (Rotmans et al. 2001)

between 2000 and 2008 (Illinois Food Task Force 2009: 7). The average value of sales by commodity group per acre in Kane County is approximately $2,707/acre for vegetables, melons, and potatoes, while only $590/acre for corn, $403/acre for soybeans, and $409/acre for wheat (U.S. Census of Agriculture, 2007a). However, despite market growth and greater price return, only 0.6% of land in farms in Kane County is dedicated to growing vegetables, melons, and potatoes, while 86.6% of arable farmland supports corn, soybean, and wheat commodities.

A structural breakthrough to this "locked-in" dominant regime has been emerging, however, as "system improvements" (incremental adjustments to existing practices to address perceived problems) and "system innovations" (experiments with fundamental adjustments to "dominant designs") (ibid.) have been accruing in Kane County and the surrounding region at the micro-level. Coupled with pressure from the macro-level, the dominant regime is deteriorating allowing for an emerging transition to commence.

7.4 The Local Food System Transition - Drivers

The multi-level perspective argues that transitions occur through interactions between three levels: (1) niche-innovations (micro-level) build internal momentum through learning processes, price/performance improvements, and support from frontrunner* individual actors and powerful groups; (2) changes at the landscape level (macro-level) create pressure on the regime; and, (3) socio-technical regime (meso-level) destabilization creates windows of opportunity for niche-innovations (Geels and Schot 2007: 400). It should be noted that the broader regime and landscape developments can influence the perception of niche actors and the size of support networks (ibid). The alignment between the three levels enables a breakthrough

of societal change through the creation of new novelties in mainstream markets that effectively compete with the existing socio-technical regime. The multi-level alignments, through a look at the current rate of progress and motivating drivers across all three levels, can provide a good analysis of how the local food transition has been causing a societal change away from the dominant regime.

*Frontrunners are key to a transition process as they are agents characterized as creative minds, strategists, and visionaries, who have the capacity to generate emergent structures and operate within these deviant structures without depending directly on the structure, culture, and practices of the regime (Rotmans and Loorbach 2009: 189).

7.4.1 Micro-Level/Niche-Innovation

Since the 1960's and 1970's there has been a growing movement that challenged the globalization of agricultural, initiating a re-localization of the food system. Termed the "back-to-the-landers," a new generation of farmers embraced the concept of organic agriculture developed by J. I. Rodale and increased the number of small farms selling a variety of products to local communities (The Chicago Community Trust 2009: 19). A 1996 survey found that the back-to-the-landers held progressive views on environmental and social issues (Jacob, 1996). The 1970's also saw a growing movement in the environmental concept "think globally, act locally," supporting an alternative ideology which contested the traditional American agricultural system paradigm. Rising interest in environmental, social, and economic issues as discussed in *6 Local Food Systems Relevancy to Sustainable Development* created additional incentive to transform the current dominant agricultural regime toward a more local food system. By the 1980's, demand for fresh, local food led to the appearance of farmers markets in Chicago (Kraig, 2010). By 1999 there were 97 farmers markets in Illinois, and 270 by 2008. This growing trend suggests that a certain learning process has been developed to continue advancing direct market niche innovations that support local food. Price/performance improvements have also been strengthened as indicated by an annual Illinois direct farm sales growth of 116% from 1997 to 2007 (Illinois Food Task Force 2009: 7), the fact that more than 25% of market vendors were able to derive their sole income from farmers markets in 2005 (AMS, 2010a), and the awarding of more than $435,000 to the State of Illinois in 2009 through the U.S. Department of Agriculture's Specialty Crop Block Grant Program to support and expand the availability of fresh, locally-grown produce (IDOA, 2009). The Geneva Green Market in Kane County received $11,000 of this grant. Kane County was also one of 41 national sites awarded a $360,000 grant from the Robert Wood Johnson Foundation (RWJF) to help fight child obesity by funding physical activity projects and developments such as a community supported garden that will increase access to fresh fruits and vegetables (KCHD, 2010).

Now, key frontrunner actors and powerful groups are supporting the local food system transition. In Kane County, Heritage Prairie Farm is an example of an emerging frontrunner. In 2007, the farm transitioned to hoop-houses (mobile structures that modify the growing climate) to support local food marketing year-round. The farm is not just a production operation as it also has educational programs (the Liberty Garden Classes) that teach how to plant vegetable and herb gardens and frequently hosts themed farm dinners that provide an arena for social engagement. Esther's Place Fibers, a family run business, is another established frontrunner which sells wool fiber from locally raised Illinois sheep flocks, participates in farmers market (since 2002), and is one of two known operating CSA's in the county (KCFB, 2010c). Esther's Place Fibers also holds retreats to the fiber store which doubles as a bed-and-breakfast, has frequent events including a "Farm Day" where people can visit the farm and sample locally grown food, and maintains a fiber arts studio that teaches hands-on classes on weaving, felting, and knitting. Donna Lehrer, part-owner of Esther's Place Fibers, described the social importance of Esther's stating it "creates a sense of place for the community, and it's the personal connection with individuals that keeps them coming back" (Lehrer, 2010).

A front-running local practice also emerged in Kane County as suburban development threatened environmental and agricultural resources while presenting a serious issue for spatial planning. Inadvertently, Kane County's Development Department, along with key agricultural groups and actors in the region including Kane County Farm Bureau, has protected the potential for local food systems to develop within the county by becoming the first county in Illinois to adopt a Farmland Preservation Policy in 1991 to minimize conflicts between farming and other land uses. In 2001 the county adopted the federal Agricultural Conservation Easement and Farmland Protection Program which protects farmland through purchase or donation of development rights and now includes 38 farms representing 5,156 protected acres (Hill, 2010).

7.4.2 Macro-Level/Societal-Landscape

7.4.2.1 Natural Environment

Exogenous developments at the macro-level have also exerted pressure on the existing dominant regime. In 1987, *Our Common Future* established a common response strategy to unite development and the environment. Developing the term "sustainable development" shaped the world views of generations to come as it brought economy, society, and environment together with development from a local to a global perspective (WCED, 1987). Now, one of the foremost exogenous pressures threatening future generations is climate change. This driver has provided reason for the occurrence of several additional landscape factors, including the development of the Kyoto Protocol, a transnational cooperative effort to reduce greenhouse gas emissions in order to curb climate change to 2°C (UNFCCC, 2010). The Kyoto Protocol, backed by the world community, has put pressure on the U.S. to develop action plans to help mitigate anthropogenic emissions.

7.4.2.2 Macro-Political Developments

As 6.1% of total U.S. GHG emissions in 2008 were attributed to agriculture (EPA 2010: 36), the agricultural sector has been targeted as a significant contributor to climate change. However, it is also regarded as a potential sink of carbon dioxide emissions through carbon sequestration practices. Internal national pressure in the U.S. shaped by political culture has thus lead to macro-political developments attempting to address GHG emissions in agriculture. Political advocacy groups and coalitions aim to protect the agricultural sector from climate change by pressuring political elitists to develop long-term climate policies. One example is the National Sustainable Agriculture Coalition (NSAC), an institutional conglomeration of nearly a hundred agricultural organizations dedicated to the advancement of sustainable agriculture. In a 2009 policy position paper on agriculture and climate change, the NSAC stated that they seek to promote regional and local food systems as they "play an important role in reducing GHG emissions…while also conserving energy, improving the nation's health, and increasing the overall resilience of the U.S. farming and food system" (NSAC 2009: 2).

7.4.2.3 Macro-Economic Developments

Recent macro-economic developments have added pressure to the globalized food system. As the world was in a recession in 2009, net farm incomes in the U.S. decreased to $56.3 billion, a 35.4% decrease from the 2008 record high of $87.1 billion (ERS, 2010c). The steep drop in farm income was attributed to deteriorating economic conditions worldwide that caused decreased demand for agricultural products (ibid.). Consequently, many commodity farmers became worried about their bottom line that was significantly dependant on the global market. Volatile fuel and commodity prices have also played into the deterioration of the present socio-technical regime, thanks in part to government subsidies and mandates for ethanol production and use that have linked commodity prices to crude oil price (Cox and Hug 2009: 2).

7.4.2.4 Demography and Social Values

Demography issues, more specifically, demographic trends in agriculture and in

population (including health), have supported initiatives at the regime level to address unwanted emerging trends which have been credited to the faults of the dominant global agriculture regime. These demographic trends primarily include the consolidation of farms operating on more acres and high obesity rates as discussed earlier in *6 Local Food Systems Relevancy to Sustainable Development*. Coupled with other economic, social, and environmental issues mentioned, demographic trends have shifted many consumers' social values regarding the current dominant global food regime to support emerging local food niche-innovations. Other exogenous demographic issues that are affecting agriculture's capacity to remain vitally important to livelihoods include population growth and aging farm operators. Kane County's particular rapid growth pressure has resulted in the county losing 77,001 acres of farmland from 1969 to 2002, and an additional 5,855 acres from 2002 to 2007 (ibid.: 40; NASS, 2007). On the topic of aging farmer demographics, Secretary of Agriculture Tom Vilsack expressed his concern at the 2010 USDA Agricultural Outlook Forum stating "Today's average farmer/rancher is 57 years of age…, [and] we have a 20% decline of farmers under the age of 25 and a 30% increase in the number of farmers over the age [of] 75" (Vilsack, 2010). This demographic is very similar in Illinois and Kane County where the average farmer's age is 56.2 and 56.1 respectively (NASS, 2007).

7.4.3 Meso-Level/Socio-Technical Regime

The (1) niche-innovations that have built internal momentum through learning processes, price/performance improvements, and support from frontrunner individual actors and powerful groups, and the (2) changes at the landscape level that have put pressure on the regime, have resulted in (3) a beginning of a global food system regime destabilization that is creating windows of opportunity for micro-level local food system innovations, as is evident for example by the growing rate of farmers markets. At the national level, this has led to a goal-oriented transition process (goals or visions that guide public actors and orient the strategies of private actors) within the USDA. At the 2010 USDA Agricultural Outlook Conference, greater emphasis was placed on local food systems, rural development, and food access – a significant shift from past conferences that concentrated on global production agriculture. A premise to the conference's new focus was the launch of the "Know Your Farmer, Know Your Food" initiative (KYF Initiative) on September 15, 2009. The initiative is a USDA-wide effort with a mission to spur economic opportunities by beginning a national level conversation to help develop local and regional food systems. The USDA began this mission due to the fact that "there is too much distance between the average American and their farmer" (USDA, 2010s). Strategic developments at the USDA such as the KYF Initiative guide much of agriculture in the country and have major impacts on the food system. An example are the numerous programs instituted by the USDA that support local and regional food systems and rural development, including the Community Facilities Program, the Business and Industry Guaranteed Loan Program, and the Value-Added Producer Grant Program (Merrigan, 2009).

Other goal-oriented transitions are occurring at the state level, where niche-innovations and landscape dynamics encouraged the Illinois Food, Farm, and Jobs Act of 2007 to establish the Illinois Local and Organic Food and Farm Task Force. Their duty is to develop a plan containing policy and funding recommendations for expanding and supporting a State local and organic food system (IDOA, 2010b). Their 2009 report submitted to the Illinois General Assembly estimated that of the $48 billion food dollars consumers spend annually on fresh, prepared, and processed food from supermarkets, restaurants, and other sources, approximately $46 billion (96%) is exported out of state (Illinois Food Task Force 2009: 7). The report then estimated that a 20% increase in local production, processing, and purchasing will generate $20 to $30 billion of new economic activity within the state (ibid.: 11-12). This finding led to a key 2020 goal: to increase the purchase of Illinois local food products by Illinois consumers to 10% of total food dollar expenditures (ibid.: 18). Already the State of

Illinois is taking a goal-oriented transition process in an attempt to guide public actors and orient the strategic decisions of private actors.

Similar goals have been set on a regional basis in Illinois. "Go To 2040," the comprehensive regional planning campaign of the Chicago Metropolitan Agency for Planning (CMAP), has a vision stating that by 2040 the seven counties in Illinois comprising Chicago Metropolitan (including Kane County) will have a regional food system (supported by the seven counties, as well as extending to other nearby regions of Illinois, Iowa, Minnesota, Wisconsin, Michigan, and Indiana). In "Go To 2040's" vision, it specifically states that the food system will "support vibrant 'local food' cultures based on seasonality and availability," while also achieving economic vitality, preserving farmland and natural resources, and contributing to social justice, touching upon all three pillars of sustainability (The Chicago Community Trust 2009: 7). FamilyFarmed.org, which annually hosts the "FamilyFarmed Expo" in Chicago, Illinois, is another regional meso-level actor with a mission to "expand the production, marketing, and distribution of locally grown and responsibly produced food, in order to enhance the social, economic, and environmental health of…communities" (FamilyFarmed.org, 2010). The private Lumpkin Family Foundation (LFF), located in central Illinois, hired the Delta Institute, the Wallace Center of Winrock International, and Mari Coyne (the Delta Team) in 2007 to develop the LFF's Local Food Program which would assist their dedication to "supporting education, preserving and protecting the environment, and fostering opportunities for leadership" (LFF, 2008; LFF, 2010).

Locally in Kane County there have been several recent initiatives to combat demographic issues and support local food systems. The "Fit for Kids" initiative began in 2008 in response to the fact that 16% of all Kane children under 18 years of age are obese (KCHD, 2010). The Kane County Health Department (KCHD), which has a vision to be the "healthiest county in Illinois by 2030," applied for the $360,000 RWJF grant mentioned earlier which will support "Fit for Kids" partners. The 2030 Land Resource Management Plan (LRMP) of the Kane County Development Department is also fighting exogenous demographic pressures, primarily population growth, by engaging the community to help protect vital resources of the county, including prime farmland. The LRMP has developed a Conceptual Land Use Strategy Plan that seeks to keep 50% of the county's land in open space and agriculture (KCDD 2004, 27). Janice Hill, Executive Planner of the Kane County Development Department, cited concern that the 2030 LRMP had a chapter on agricultural preservation that did not focus on developing local food systems. However, the 2040 Land Use Plan, Hill ensures, will focus more on preserving land for local food developments as interest is burgeoning among smaller farmers that wish to sell or donate their development rights in exchange for agricultural preservation (Hill, 2010). This long-term precautionary strategy will help alleviate growing pressure on agricultural land and keep the option open for it to support a local food system transition. The 2030 LRMP also seeks to add an additional land use category "Protected Agriculture – Limited Development" to support development trends known as farming subdivisions. This development trend is gaining attention across Illinois and the country as it is a form of Conservation Design which provides for clustering of residential lots on a portion of a designated property while permanently protecting the remainder of the land for agriculture and open space (KCDD, 2008). A great regional example is Prairie Crossing located forty miles north of Chicago in Lake County where among the development's clustered homes and ecologically restored wetlands and prairie grasslands are 154 acres reserved for organic farming (see *Appendix H*). Prairie Crossing is an innovative example of civic agriculture that allows residents to participate in the farm work and buy local produce from the weekly farmers market (Cohen, 2007). Kane County's strategic foresight will help in developing more opportune local areas such as this to engage residents and consumers with local farming, further supporting niche-innovations.

7.5 Pre-Development to Take-Off to Acceleration

Analyzing this transition process from the multi-level perspective shows that initiatives and developments at the micro-level (ecological, economic, and social concerns; spatial planning issues; environmental movements; individual innovators) were being reinforced with pressures at the landscape level (natural environmental issues; macro-political and macro-economic developments; shifting demographics; changing social values), ultimately leading to the creation of a transition process that could be further influenced by innovators and innovations supported by goals, strategies, and policies. The social experimentation of the "back-to-the-land" movement in the 1960's and 1970's, the "think globally, act locally" slogan of the 1970's, and the re-emergence of the farmers market in Chicago in the 1980's represented individual niche-developments that created a breakthrough in the dominant socio-technical agriculture regime in Kane County, characterizing the pre-development stage of the transition process. Now, as a result of numerous processes of change and reinforcing innovations and pressures that are being built up at the micro-, meso-, and macro-level, the regime system has shifted into the take-off phase and is nearing acceleration. Implementation of local and regional food system goals and visions at the meso-level will assist the transition from take-off to acceleration in the upcoming years.

However, there are several formal and informal constraints that can continue supporting a "lock-in" of the dominant agriculture regime, as well as barriers slowing down niche-innovations/innovators and the accumulation and implementation of socio-cultural, economic, ecological, and institutional changes that characterize the acceleration phase. Barriers can arise from the micro- and macro-level as well as from exogenous pressures at the landscape level. All three levels' interrelations can impede the acceleration of the local food system regime and create incentive for dominant socio-technical regime actors to remain in their paradigm and maintain status quo. These barriers will inhibit developments that have already reached the take-off phase of transition, keeping local food systems as a primarily niche market.

7.6 The Local Food System Transition – Barriers

7.6.1 "Lock-in" Status Quo

Maintaining the status quo of the already "locked-in" dominant regime poses one of the most significant barriers to accelerating a transition process in Kane County. Cognitive routines are likely to remain if certain regulations and standards are not modified and infrastructures are not developed to support an alternative food system.

7.6.1.1 Regulations and Standards

Direct subsidy payments to commodity farmers allow them to keep producing, even if farm income is insufficient to cover household expenses. Furthermore, the 2008 Farm Bill restricts farmers from planting fruits and vegetables on their commodity program base acres, acreage designated in the 2002 Farm Act used to determine direct and counter-cyclical payments (Edwin, 2005; Motamed, 2010). These regulations and standards create strain on innovative farmers wanting to break path dependency and transition to an alternative local food system. A new 2008 Farm Bill Pilot Program allows planting flexibility, however, to produce specialty crops including vegetables and fruits for processing on 75,000 base acres in 7 Midwestern states (including Illinois) without undergoing permanent recalculation of base acres (Ratcliffe, 2008; U.S. Senate Committee on Agriculture, Nutrition, and Forestry, 2008). Nevertheless, Motamed et al. (2010) estimate that relaxing fruit and vegetable restrictions matters but is not likely to cause dramatic shifts in planting, primarily because of the high costs in transporting crops for processing.

7.6.1.2 Infrastructure

Lack of appropriate infrastructure that can support local food production and reduce costs

of transportation thus proves to be another constraint that can continue a socio-technical lock-in of the dominant regime. As small-scale farms fell to the wayside of larger-scale, more consolidated farm systems, local infrastructure for selling, processing, and storing products deteriorated or disappeared (Anderson 2007: 2). The result is that food now often exchanges hands over a dozen times as it moves along the supply chain from producers, packers, shippers, food manufacturers and processors, wholesale distributors, food retailers, and eventually to consumers (Kloppenburg et al. 1996: 34). In order to scale-up local food systems and bring it from the niche-innovation level to the new dominant regime will require local infrastructure, including combinations of aggregations, processing, storing, packaging, and distribution. In order to reduce energy costs and CO_2 emissions, aggregation will be a key factor. Warren King who served as Infrastructure Committee Co-Chair on the Illinois Local and Organic Food and Farm Task Force, believes there is a lost aggregation of food growers in Illinois, and proximity presents an issue for feasibility of processing and transporting (King, 2010). The more spread out local food system innovators are, the greater the energy used in collecting food products, an economic cost and environmental burden. An aggregated community of growers, however, could work cooperatively to build infrastructure (ibid.). Salinas Valley, California is a prime example where lettuce growers located within a close geographical construct were able to effectively monopolize the lettuce industry (Griffin and Langdon, 1955), receiving the nickname "The Salad Bowl of the World." Large scale aggregation can create questions of food safety, however, as witnessed in Salinas Valley (Associated Press, 2006; Western Farm Press, 2008).

7.6.1.3 Lifestyles

Adaptation of lifestyles to technical systems for generations imposes another constraint keeping the dominant regime locked-in and resistant to change. In addition to having sunk investment costs described in *7.3.4 Sunk Investments* (pg. 20), many commodity farmers do not want to transition to specialty crop farming because it is more labor intensive. A 2010 National Agricultural Statistical Service study found that on average farms classified under "field crops" (wheat, rice, corn, soybeans, or other such crops) employed 13% of field and livestock producers, while "other crops" (vegetables, melons, potatoes, fruits, etc.) represented 48% of farm workers (NASS 2010, 14). Moreover, corn and soybean production is automated and sporadically busy during planting, cultivation, and harvest, leaving much of the winter open; vegetable and fruit production, on the other hand, can require year-round physical labor and time due to year-round market demand. As the Kane County average principal operator is 56.1 years old, many of their eyes are set on retirement and maintaining their livelihood, not on diversifying their farming operation. Societal actors embedded in their lifestyle's who are not particularly enthusiastic about alternative pressures that may make their regime practices obsolete may even go so far as to attempt to "lock-out" nascent rivals by exerting political influence converted by economic strength (investment, income, exports, employment) (Meadowcroft 2009: 329). A recent example was the introduction of the FDA Food Safety Modernization Act of 2009 which was lobbied by some multinational agribusiness giants including Cargill and Monsanto and believed by local food advocates to be vastly detrimental to small-scale family farms and food processors as it would further concentrate the food system (Bottemiller, 2010; Hinyub, 2010; Johnson, 2010; NSAC, 2010). The Carolina Farm Stewardship Association recently issued a report outlining the consequences if this federal legislation passes. The report concludes that small business could incur costs equating to 150 hours in labor and $9,500 in consulting and testing expenses annually, resulting in small farms and food businesses likely abandoning value-added markets (McReynolds, 2010: 2).

If dynamic shifts do not occur regarding regulations and standards, infrastructure, and livelihood choices adapted to technical systems, it is likely that the cognitive routines of the dominant agricultural regime will remain the status quo.

7.6.2 Macro-Level/Societal-Landscape Barriers

7.6.2.1 Demographics

Certain demographic trends are also acting as barriers to a successful acceleration of local food systems in Kane County. A primary demographic trend is the aging of principal farm operators and the decline of total operators (See *7.4.2.4 Demography and Social Values*, pg. 23). As mentioned earlier, specialty crop farming requires on average 35% more labor. However, as farmers are aging and young people do not see farming as a desirable profession or lifestyle, the local food system will be hard strung to progress. For young and beginning farmers that are seeking to return to agriculture, acquiring and purchasing acreage presents a difficult issue. In Kane County, not only is the demographic trend of population growth developing prime agricultural farmland, but it is also causing land prices to rise significantly (Schnitkey, 2007), prohibiting niche-innovation developments.

7.6.2.2 Political Culture and Macro-Political Developments

The distinguishing beliefs, values, attitudes, habits, and behavior patterns that characterize a political community can vastly impact the local food system transition process. As mentioned previously, the USDA's KYF Initiative has exemplified a radical shift in the traditional U.S. agriculture global production outlook. This has brought forth vilifications from the political community, as represented by the recent view points of a few staunch political party members toward the new administrations "local" initiative. On April 27, 2010, three prominent U.S. Senators sent a letter to the Secretary of Agriculture expressing their concern that too many Rural Development funds were being spent to support "locavore" projects in urban areas (McCain et al, 2010). While the members were simply apprehensive about the intentions of the KYF Initiative, their statement that "the federal government cannot afford to spend precious Rural Development funds on feel-good measures which are completely detached from the realities of production agriculture" exemplifies the strains that political culture can have on forwarding a local food system transition.

Macro-political developments such as the FDA Food Safety Modernization Act of 2009 described earlier can also deter or even reverse niche-innovations.

7.6.2.3 Natural Environment/Social Values/Worldviews

Developments in scientific research continually shape individuals social values and worldviews. After the alleged "Climategate" scandal involving the East Anglia Climate Research Unit, global skepticism toward the realities of climate change has risen. An October 2009 Pew Research Center poll determined that there was a 14% decline from April 2008 in Americans believing there is solid evidence that the earth is warming (PRC, 2009). If social values and worldviews of individuals change as a result of shifting evidence regarding societal landscape pressures, it will present a significant barrier to accelerating a transition process.

7.6.3 Micro-Level/Niche-Innovation

7.6.3.1 Financing/Resources

Securing financing is a prominent barrier for niche-innovators. The price of land as mentioned before is increasing and capital investments are necessary to develop new local food production enterprises. In order to successfully enter the emerging regime, many producers seek funding through credit loans and grant financing. A 2010 survey conducted for The Drake Forum, a two-day national policy conference focusing on new and beginning farmers, found that of 120 attending respondents, 24.2% identified that "access to credit and financing" was the first most significant obstacle facing beginning farmers, and 25.0% identified it as the second most significant obstacle, just behind "available land to rent or purchase" (The Drake Forum, 2010). Farm Credit Services (FCS), the largest private agricultural lending institution, has provided more than $160 billion in loans, leases, and related services to over 55,000 member

borrowers, however (FCS, 2010). Gary Matteson, Vice President for Young, Beginning, and Small Farmer Programs at the Farm Credit Council, understands that credit is available but that many new and beginning farmers lack expertise in business planning that is necessary to secure FCS financing (Matteson, 2010). The Lumpkin Family Foundation's "Local Food Program" report also attested that a lack of business planning is hindering local food system developments (LFF 2008, 7).

The Kane County Development Department has, however, experienced declining income in 2009 to fund their Purchase of Development Rights (PDR) program, affecting some niche-innovators who were seeking the funding support (Hill, 2010). In 2008, Kane County attempted to pass Illinois House Bill 4462 which would allow the county to levy an annual tax at a rate of 0.05% for farmland preservation easement purposes. However, last action on the bill was *sine die* (indefinite adjournment) on January 13, 2009 (Illinois General Assembly, 2010).

7.6.3.2 Marketing/Awareness

Marketing and awareness create constraints on regime transitions as well. A common fear among niche-innovators and producers contemplating entering the local food market is a shift in demand away from local food products or lack of consumer awareness to buy local foods. The Illinois Food Task Force justifies this fear, stating that most Illinois consumers are unaware of the benefits of a local farm and food economy (Illinois Food Task Force 2009: 28). If the population is not adequately educated on the benefits of local food, there is concern that the population will not pay any kind of premium (LFF 2008: 6). One niche-innovator commented on this, saying "the consumer needs to stop thinking farming produce should be at a flea market price; they need to be willing to pay" (Lehrer, 2010). A 2009 survey of National Family Farm Coalition members determined a similar fear among producers: if everyone starts selling locally at the same time the market will be flooded, causing prices on return to fall (Hoffman 2009: 5). Until producers are convinced there is a market opportunity, accelerating the local food system transition will be challenging.

7.6.3.3 Separation

Finally, the micro-level may have difficulty encouraging more niche-innovators unless there is a formalized support network. Currently, developed and developing niche-innovators are separated from each other in Kane County and the surrounding region. Without a close connection of interactions through the formation of networks involving all stakeholders in the local food system – from producers, business owners, consumers, to local officials – the collective learning process, diffusion, and embedding process critical of the acceleration phase will not occur.

7.6.4 Meso-Level/Socio-Technical Regime

7.6.4.1 Regulatory Restrictions/Technical Support

Regulatory institutional policies guided by shared assumptions and rules can act as a barrier at the meso-level. Numerous processing rules and standards regulating direct market sales – including five state Acts, two state Codes, and seven federal Acts (IDOA, 1999; Schell 2003: 16) – keep dominant regime commodity producers in Illinois wanting to maintain their livelihood instead of forging into unchartered territory. Additionally, the Illinois Department of Public Health's guidelines that clarify regulations concerning farmers market products were written with the understanding that individual county personnel can interpret these guidelines at their own discretion. This has led to farmers already selling at direct markets to travel farther distances to reach counties with less strict interpreted guidelines (Illinois Food Task Force 2009: 32). Producers attempting to expand their production by adding on-farm processing or creating regional processing often encounter regulatory agencies ill-equipped to support non-commodity scale production (LFF 2008: 6). Sysco Corporation, a national company that works with "aggregators" that consolidate supplies from smaller farmers, is attempting to re-orient themselves, however, by

transitioning from a supply chain to a value chain that will concentrate on procurement and distribution of local foods, instead of the standard mantra of "fast, convenient, and cheap" (Cantrell 2009: 1). Still, if there are not more state-wide support groups and corporations aiding smaller diversified food production, large-scale commodity production for global use will likely remain the dominant regime.

7.6.4.2 Micro-Level and Macro-Level Pressures

Just as niche-innovation drivers and exogenous developments at the societal landscape can influence the goals, strategies, and policies of the socio-technical regime actors (private companies, organizations, institutions), barriers existing at these levels can have the same effect. The aggregation of these constraints through interactions between the levels creates incentive for dominant socio-technical regime actors to maintain the status quo while shutting out windows of further opportunity for niche-innovations.

8 CONCLUSION

The data analysis conducted for this thesis shows that the current food system is heavily entrenched in a dominant global agricultural socio-technical regime to the extent that transitioning to a local food system in Kane County, Illinois is challenging. However, there are significant advantages of doing so. Across the three pillars of sustainability – economy, society, and environment – local food systems stand to be a potentially better alternative in reaching a greater level of sustainable development, including greater economic development, price stability, social cohesion, health and nutrition, farm diversity, and natural environment protection. As micro-level developments (ecological, economic, and social concerns; individual innovators; spatial planning issues; environmental movements) and exogenous developments from the macro-level (growing awareness of natural environmental issues; volatile fuel and commodity prices; economic recession; population growth; loss of prime farmland; high obesity rates; aging farmers) continue to pressure the existing dominant regime, Kane County will begin to take-off and accelerate to a greater stabilization state of sustainable development supported by goal-oriented transition goals, strategies, visions, and policies. However, constraints to the acceleration phase of the transition process yielded from the aggregation of the barriers existing at the micro-, meso-, and macro-level can slow down or even shift the transition process into a sub-optimal state of sustainability. Prominent barriers to transition toward a local food system identified in this study included standards and regulations that support the dominant regime, a lack of appropriate infrastructure, cognitive routines and adapted lifestyles to dominant regime technical systems, demanding labor requirements and lack of labor supply, political culture and policies, reduced financing and available resources, shifting worldviews, fear of low marketing potential and consumer awareness, lack of a support network, and restrictive regulations and policies. In order to ensure against this and provide transitional support, it is imperative to have continued systemic thought and open dialogue on the issue of local food systems and sustainable development and how to address these barriers.

8.1 Limitations and Further Research

In this paper's attempt to explore the transition process in Kane County, Illinois, toward a local food system, it brought understanding to the drivers and barriers affecting the process with significant focus on commodity and specialty crop producers. However, this is only one small element of the wider supply value chain supporting agriculture. In order to accelerate a transition process, challenges impeding other supply chain operators from supporting local food systems must also be examined, including packers, shippers, food manufacturers and processors, wholesale distributors, food retailers, and consumers. Further holistic analyses of local food systems relevancy to sustainable development also need to be conducted. As was shown, many unsettled debates remain that need to be examined or re-examined, including debates on health and nutrition, energy use, and

greenhouse gas emissions. Additional research should continue systemic thought on the issue at hand with attempts to forward the production of knowledge and understanding. After all, local food systems are not a panacea to the persistent problems facing the current agricultural system, nor is it completely rational or sustainable to promote a 100% (re)localization of the food system. The global food system will continue to play an integral part in the lives and livelihoods of many people for generations to come. We should, however, look to diversify our food system portfolio and look to alternatives such as local food systems that may provide chance for greater sustainable development.

"No matter how intently one studies the hundred little dramas of the woods and meadows, one can never learn all the salient facts about any one of them."

— Aldo Leopold (A Sand County Almanac)

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APPENDICES

Appendix A – Glossary

Note – The following definitions were taken from prominent agricultural resources, including the National Agricultural Library, and a 2005 Congressional Research Service report defining agricultural terms. Often, full-text is used verbatim as it is a widely accepted definition of the term. References are given accordingly.

Arable Land

An agricultural term used to describe land that is capable for growing crops, suitable for farming, or able to be plowed or tilled (The Chicago Community Trust 2009: 60).

Base Acres

For purposes of Direct and Counter-cyclical Program (DCP) payments under the 2002 farm bill (P.L. 107-171, Sec. 1101), a farm's average planted acreage of specific crops (covered commodities and peanuts) over the four years 1998-2001, plus land cropland prevented by disaster from being planted, or 2002 contract acreage under the 1996 farm bill (P.L. 104-127) (CRS 2005: 25).

Census of Agriculture

A comprehensive set of quantitative information on the agricultural sector of the U.S. economy, broken down to the state and county levels (i.e., number of farms, land in farms, crop acreage and production, livestock numbers and production, production expenses, farm facilities and equipment, farm tenure, value of farm products sold, farm size, type of farm, among other data). Special reports are issued on such subjects as irrigation, land ownership, economics, and an atlas of agriculture (CRS 2005: 41).

Civic Agriculture
A locally-based agricultural and food production system that is tightly linked to a community's social and economic development that can foster civic involvement, cooperation, and healthy social relations (Lyson 2000: 42; Feenstra 1997: 28).

Commodity Crops
Standardized crops produced by many farmers and consolidated for processing and eventual use in other products. Common commodity crops include corn, soy, and wheat; end uses include both food (i.e. corn syrup) and non-food (i.e. ethanol) products (The Chicago Community Trust 2009: 60).

Community Garden

Plots of land, usually in urban areas, that are rented by individuals for private gardens or are for the benefit of the people caring for the garden (NAL, 2010).

Community Supported Agriculture

A form of direct marketing whereby a farmer supports his (usually small) operation by selling shares in the farm's annual production. Share-holders pay a certain amount of money at the beginning of the growing season and are entitled to a portion of each week's harvest until the end of the season. Share-holders are not refunded their money if some or all of the crops fail. Also known as subscription farming (CRS 2005: 53).

Crop Rotation

The growing of different crops, in recurring succession, on the same land in contrast to monoculture cropping. Rotation usually is done to replenish soil fertility and reduce pest populations in order to increase the potential for high levels of production in future years (CRS 2005: 68).

Direct Marketing

Any arrangement where the producer (or representative) is selling products directly to the end user. Typical forms of direct marketing are farmers' markets, farm/roadside stands, and U-Pick operations. Other examples include subscription farming or community supported agriculture and regular delivery of fresh farm produce by farmers to homes, restaurants, or institutions (CRS 2005: 77).

Direct Payments

Generally, payments (usually in cash but sometimes in commodity certificates) made directly to producers in conjunction with participation in commodity support programs, conservation programs, and disaster assistance programs. A direct payment is equal to the product of the payment rate for the specific crop, the historical payment acres (85 percent of base acres in crop years (CY) 2008 and 2012 and 83.3 percent in CYs 2009-11), and the historical payment yield for the farm (CRS 2005: 77; ERS, 2009).

For example, the payment for corn base is:

DP_{corn} = (Payment rate)$_{corn}$ x (Payment yield)$_{corn}$ x (Payment acres)$_{corn}$

Where (Payment acres)$_{corn}$ = (Base acres)$_{corn}$ x (85% in CY 2008 and CY 2012 and 83.3% in CY 2009-11)

Base acres planted to corn	100 acres
	x 85%
Payment acres	85 acres
Direct payment yield	x 110 bushels
Direct payment rate	x $0.28 per bushel
Direct payment	*$2,618.00*

Economies of Scale

The concept that the average cost of production per unit declines as the size of the operation grows. One reason farms have been growing in size is to make more economical use of machines capable of covering more ground with less labor, to capture economies of size. Larger sized farms can typically get volume discounts on such inputs as chemicals and seed. They also are more likely to be more vertically coordinated with buyers and processors (CRS 2005: 82).

Easement

A landowner sells or donates a right to a portion of the property for some purpose, usually in return for a payment or some other benefit. In agriculture, conservation easements receive the most attention, but easements are more common for other purposes, including access and utility strips. Easements may be permanent or temporary (for some specified period of time). Easements are registered as part of the deed for the property. Some local and state governments, and land trusts and other non-governmental

organizations, have programs to acquire development easements from landowners to prevent conversion of farmland to other uses (CRS 2005: 81).

Family Farm

A "family farm" is any farm organized as a sole proprietorship, partnership, or family corporation. Family farms exclude farms organized as nonfamily corporations or cooperatives, as well as farms with hired managers. Family farms are closely held (legally controlled) by their operator and the operator's household (ERS, 2005).

Farm

A farm is currently defined, for statistical purposes, as any place from which $1,000 or more of agricultural products (crops and livestock) were sold or normally would have been sold during the year under consideration. This definition has been in place since August 1975—by joint agreement among USDA, the Office of Management and Budget, and the Bureau of the Census (ERS, 2005).

Farm Operator

The person who runs the farm, making the day-to-day decisions. In the Census of Agriculture and in the Agricultural Resource Management Survey (ARMS), information is collected for only one operator per farm. For farms with more than one operator, data are collected only for the primary operator, referred to as "principal operator" (ERS, 2005).

Farm Stand/Roadside Stand

A direct market activity where the farmer sells agricultural and value added products from his farm directly to consumers at a stand or kiosk located on or near his farm or along a roadside (Lobo, 2010).

Farm-To-School Program

A farm to school program exists when a K-12 school district or school purchases fruit, vegetables and other fresh products from local farms to serve as part of school meals and/or snacks. There is often an education component in which students learn about nutrition and the food supply (Dillon 2007: 9).

Farmers Market

A venue where agricultural and food producers sell directly to consumers. There is variation among farmers markets: (1) producers-only markets where vendors sell only produce grown on their own farms; (2) markets where producers sell their own produce along with produce from other local farms; and (3) vendors who sell produce they purchase, locally or not. Some markets have only a few vendors, but the more successful farmers markets may have a large number of venders offering locally and regionally grown produce, meat and poultry, fruits, and value-added agricultural products, e.g., cheese, maple sugar, cut-flowers, breads and pastries, meat and dairy products (CRS 2005: 102).

Food System

A sector of the U.S. economy that includes agricultural production and all economic activities supporting or utilizing that production, including growing, harvesting, processing and manufacturing, transporting, marketing, retailing, consuming, and disposing of food and food related items (CRS 2005: 113; The Chicago Community Trust 2009: 61).

Food Miles

The distance a food item travels from harvest to consumption. A popular, but often contested measure of the environmental impact of a food item (The Chicago Community Trust 2009: 61).

Foodshed

Analogous to "watershed," "foodshed" denotes a geographic area from which a population derives its food supply. Measures of foodsheds vary, ranging from strictly defined radiuses to much larger areas defined by transportation networks or cultural affinities (Peters et al. 2008: 2; The Chicago Community Trust 2009: 62).

Global Food System

A food system supported by the industrialization of farms through consolidation, intensification, and commoditization in order to meet demand for goods, services, and capital generated by world-wide integration of markets (CRS 2005: 114; NAL, 2010).

Globalization

The world-wide integration of markets for goods, services and capital (NAL, 2010).

Know Your Farmer, Know Your Food Initiative
A USDA-wide effort launched September 15, 2009 to create new economic opportunities by better connecting consumers with local producers. It is also the start of a national conversation about the importance of understanding where your food comes from and how it gets to your plate (USDA, 2010s).

Local Food System

For the purposes of this study, a food system that is defined by a space, context, or socio-cultural process that is closer in proximity to a global food system and where civic engagement and values-based decisions can flourish amidst interactions between societal actors all along the food system chain. Local food systems tend to include direct market arrangements that require minimum transportation and handling of produce.

Monoculture

A pattern of crop or tree production that relies on a single plant variety (CRS 2005: 167).

National Agricultural Statistics Service

A USDA agency that collects and publishes statistics on the U.S. food and fiber system, with offices located in each state's department of agriculture (CRS 2005: 172).

Prime Farmland

Land that is best suited to and available for the production of food, feed, forage, fiber, and oilseed crops. It can be cropland, pastureland, rangeland, forestland, or other land. It has the soil quality, growing season, and moisture needed to produce high yields of crops each year economically, if managed according to acceptable farm practices. Prime farmland produces the highest yields with minimal expenditure of energy and economic resources and does so with the least damage to the environment (CRS 2005: 208).

Rights-Based Food System

A set of core criteria based on the following; democratic participation in food system choices affecting more than one sector; fair, transparent access by producers to all necessary resources for food production and marketing; multiple independent buyers; absence of human exploitation; absence of resource exploitation; and no impingement on the ability of people in other locales to meet this set of criteria (Anderson 2008: 593).

Specialty Crops

All farm commodities other than livestock and field crops (wheat, corn, rice, cotton). This definition would include "fruits and vegetables, tree nuts, dried fruits, horticulture, and nursery crops (including floriculture)" as defined by the Specialty Crop Competitiveness Act of 2004 and the Food, Conservation, and Energy Act of 2008 (AMS, 2010; CRS 2005: 241).

Sustainable Development

A system encompassing a broad range of practices that, according to the World Council on Economic Development, "meets the needs of current generations without compromising the ability of future generation to meet their own needs'' (WCED, 1987). A balance model of sustainable development takes into account the triangular concept of sustainability which includes the economic, social, and ecological impacts of a given practice or process (Martens and Rotmans, 2005; Kemp and Martens, 2007). A sustainable food system would be one whose components (production, processing, transportation, etc.) are assessed and regulated according the needs of these three pillars.

U-Pick Operation

These are fruits and farms or orchards where the customers themselves harvest the fruits or products. The prices they pay for the volume harvested will be usually higher than what the grower would get from a broker. They are also known as Pick-Your-Own (PYO) Operations (Lobo, 2010).

Value-Added Agriculture

Value-added refers to manufacturing or production processes that increase the value of primary agricultural commodities. This concept has allowed for some direct market producers to capture a larger share of the food dollar in response to the concern that the farm value of the consumer food dollar continues to decrease. Examples of value-added agriculture include direct marketing, farmer ownership of processing facilities, and producing farm products with a higher intrinsic value (CRS 2005: 272).

Value Supply Chain

The network of firms that bring products to market, from companies that produce raw materials to retailers and others that deliver finished products to consumers. Economic value is added through the coordinated management of the flow of physical goods and associated information at each stage of the chain (NAL, 2010).

Values-Based Supply Chain

A value supply chain between farmers, suppliers, processors, distributors, and retailers based on trust, transparency, and relationship building (Hoshide 2007: 4).

Appendix B – Interview Respondents

Interviews In-Person

Brayboy, Stacey. 2010. Director of Economic and Community Development, Rural Development, United States Department of Agriculture. Interviewed on March 24, 2010.

Fallenbaum, Nina. 2010. Special Assistant, Office of the Executive Secretariat, United States Department of Agriculture. Interviewed on March 24, 2010.

Hill, Janice. 2010. Executive Planner and Farmland Protection Program Manager, Kane County Development Department. Interviewed on April 15, 2010.

King, Warren. 2010. Infrastructure Committee Co-Chair, The Illinois Local and Organic Food and Farm Task Force; Co-Founder, WellSpring Management. Interviewed on April 13, 2010.

Kurlanski, Matthew. 2010. Senior Program Associate, Wallace Center at Winrock International. Interviewed on March 24, 2010.

Lehrer, Donna. 2010. Part-owner, Esther's Place Fibers; Manager, Illinois Green Pastures Fiber Cooperative; Secretary/Treasurer, Kane County Farm Bureau; Member, The Illinois Local and Organic Food and Farm Task Force. Interviewed on April 9th, 2010.

Matteson, Gary. 2010. Vice President for Young, Beginning, and Small Farmer Programs, Farm Credit Council. Interviewed on March 24, 2010.

Montoya-Tansey, Jenny. 2010. Special Assistant, Rural Housing, Rural Development, United States Department of Agriculture. Interviewed on March 24, 2010.

Scholl, Jon. 2010. President, American Farmland Trust. Interviewed on March 26, 2010.

Interviews via Phone

Freedgood, Julia. 2010. Managing Director, Farmland & Communities Initiatives, American Farmland Trust. Interviewed on April 7, 2010.

Heuer, Bob. 2010. Public Policy and Marketing Consultant. Interviewed on April 18, 2010.

Zurbrugg, Anita. 2010. Assistant Director, Center for Agriculture in the Environment, American Farmland Trust. Interviewed on April 7, 2010.

Interviews via Email

Cambell, Dave. 2010. Principal Operator, Lily Lake Organic Farms; member, North Central Region – Sustainable Agriculture Research & Education; member, Midwest Cover Crops Council. Interview comments received May 14, 2010.

Murphy, Robert. 2010. Owner, Curds & Whey Cheese Company. Interview comments received May 2, 2010.

Pike, John. 2010. Extension Educator, Community & Economic Development, University of Illinois Extension. Interview comments received May 3, 2010.

Appendix C – Observations

Conference Observations

The Farm Credit Council Annual Meeting. January 24-26, 2010, Washington, D.C. Information available at http://www.fccouncil.com/Default.aspx?pageid=20

Community Food Enterprise Event. "Examining the Role of CFEs in Local Economic Development." Hosted by Wallace Center at Winrock International and the Business Alliance for Local Living Economies (BALLE). January 28, 2010, Washington, D.C. Information available at http://beginningfarmers.org/community-food-enterprise-cfe-event-examining-the-role-of-cfes-in-local-economic-development/

USDA Agricultural Outlook Forum 2010. "Sustainable Agriculture: The Key to Health & Prosperity." February 18-19, 2010, Washington, D.C. Information available at http://www.usda.gov/oce/forum/

The Drake Forum. "America's New Farmers: Policy Innovations & Opportunities." Hosted by Drake University Agricultural Law Center. March 4-5, 2010, Washington, D.C. Information available at http://www.law.drake.edu/centers/agLaw/?pageID=beginningFarmers

On-Farm Observations

Heritage Prairie Farm. Kane County, Illinois. Information available at http://www.hpmfarm.com/

Esther's Place Fibers. Kane County, Illinois. Information available at http://www.esthersplacefibers.com/

Appendix D – Interview Guide

1. Do you believe there is a primary driver for needing to transition to local food systems (i.e., food security, health issues, economic viability, climate change, etc.)?
    a. Why?
    b. Why not?
2. What other primary indicators do you believe have led to the local food initiative/movement?
3. Where do you feel most pressure is coming from for a local food transition?
    a. Top-down approach,
    b. Bottom-up grassroots approach?
4. Do you see a local food transition as a positive trend toward sustainable development?
    a. Why?
    b. Why not?
5. What key values do you see gained as a result of having food produced and supplied locally?
6. Do you believe local food meets right goals of sustainability (socially, economically, and ecologically)?
    a. Is any goal more important than another?
7. What do you believe is more sustainable: a local food system or global food system in respect to environment, society, and economy?
    a. How might pressing issues of sustainability force the food system to become more local?
8. What is your vision – the institute's vision – of a local food system (i.e., what percent for local supply vs. global supply)?
    a. Is there an established long-term target/goal?
    b. If no, why not?
9. Do you believe the vision of "local food" is often still in question (i.e., its practicality and relevance to sustainability) or is it generally accepted?
10. Do you feel there is a sense in urgency in transitioning toward local food systems?
    a. Is this occurring at all three scales – macro, meso, and micro?
    b. Do you feel there particular urgency in accelerating the transition process?
    c. Is there a political sense of urgency to having local systems?
11. To what extent do you believe policy is aiding/accelerating the transition process?
12. Do you view local food as a niche market potential or as a completely alternative market that can support a community of growers and consumers?
13. Who do you believe were the key frontrunners of the transition movement?
14. Which farmers are being targeted to transition and how are they encouraged to transition toward local food production supply?
15. In transitioning to a local system, how do you see farms changing (i.e., do you see a needed shift in which food commodities farms are producing)?
16. What is being done to address commodity crop farmers' current "lock-in" situation of producing for national distribution as opposed to local supply?
    * "Lock-in" situation as described by high technological inputs, low labor supply, high investment costs to shift current practices, etc.
17. What do you feel is the effect of farm policy on production strategies for commodity farmers, primarily those in conventional row crop corn and soybean production?
18. How do you define "local/regional?"
19. How do you define "sustainable?"
20. Do you feel the current agriculture policy process is being dominated by vested interests?
21. What policies do you know of that are changing/adapting to aid transition to local food systems?

Appendix E

Health and Nutrition

While rising obesity rates have been observed across the U.S., increasing obesity rates in children have prompted particular concern. This, coupled with the concern that an increasing globalized food system causes social distances between food production and consumption, have lead many school districts to develop Farm-to-School programs where local food is brought in from local farms to create fresher, more nutritional lunch menus and educate students of where their food comes from (Bagdonis et al. 2009: 107). Inadvertently, if obesity and other diet-related costs were decreased by increasing access to healthy food, healthcare costs could be lowered, an inarguable economic benefit (Finkelstein et al., 2009).

Private and public sector organizations are also beginning local food programs to decrease health related issues of their employees. Since healthy employees take fewer sick days, need less medical care, and are less distracted with physical ailments, their performance and productivity levels increase allowing for companies to reduce employee costs (Aronovich 2006: 160; AFT 2008: 6; Wu, 2006; GSA 2010). Internet giant Google is leading the corporate path in incorporating local foods in the diet of its employees. Café 150 is situated on the high-tech Google campus serving food ingredients from a 150-mile radius, hence its name (Wu, 2006). As part of President Obama's commitment to improve wellness among federal employees, the U.S. General Services Administration has developed a food service contract to deliver healthier food choices and more sustainable, green cafeterias. The U.S. State Department headquarters building will have one of the first renovated dining facilities that will integrate a farmers market to provide locally grown produce and market baskets (GSA, 2010).

Appendix F

Additional Economic, Social, and Ecological Benefits

Foodborn Illness and Agroterrorism

Another health related and security issue is related to foodborn illness and agroterrorism. Security in this sense is in regard to national security, however. When distribution and processing are highly centralized, microbial contamination in foods can spread relatively easily while tracing and removing the contaminated goods can be quite difficult. There have been numerous accounts of foodborn illness outbreaks and contaminations within the last several years: 2006 outbreak of *Escherichia coli* (E. coli) O157:H7 in spinach and outbreak of *Salmonella typhimurium* in tomatoes, 2007 outbreak of E. coli in ground beef patties, 2008 outbreak strain of *Salmonella agona* in cereal, and 2009 outbreak of E. coli O157:H7 in beef (CDC, 2010). After the September 11, 2001 attacks on the United States, the Congressional Research Service and Government Accounting Office released reports warning that concentration in production and processing makes the U.S. more vulnerable to agro-terrorism (Monke, 2004). Anderson (2007: 4) argues that since local and regional food production is on a smaller scale, in the event of a contamination outbreak it is easier to contain and handle. If it does reach the shorter distribution networks supply chain, it can most likely be traced more easily.

Social Justice

Despite the prevalence of inadequate food access and health related issues connected to the current agri-food system, Allen (2008: 157) argues that there remains a lack of social justice in the American food system. Included in this is the exploitation of farm workers. One prominent example often cited is the health, safety, and labor standards violations that have plagued the largest meat packing plant in the world: Smithfield Packing Company. Farm Sanctuary, an advocacy organization for the ethical treatment of farm labor workers, aggregates numerous accounts of Smithfield's violations and found that the Occupational Health & Safety Administration (OSHA) of the U.S. Department of Labor issued more than 100 violations and fines between 2001 and 2006 for failing to provide employees with a safe work environment (Farm Sanctuary, 2006). Social justice through civic participation is believed to be reachable through participation at direct market local food systems. Institutions like CSA's, farmers markets, and community gardens form alternative social spaces that can create conditions for civic involvement and activism leading to social equity and democracy for all members of a community (Allen 2008: 157; Feenstra 1997; 28). Born and Purcell (2006: 202) argue that localizing the food system will not bring about social justice and may even exacerbate injustice if economic gains are achieved due to existing inequalities within the local community. Anderson (2008: 593) is also hesitant about the conflation between local food and human rights as activists trying to help communities regain control of their food system choices may actually lead the communities into less productive strategies. However she is convinced that through localization and a strong community base, a rights-based food system can be achieved that allows for democratic participation across more than one sector of the food system, transparent access by producers, and absence of human and resource exploitation (ibid.) Participation in everyday forms of resistance such as local food systems and ethical consumerism can effect an individual's consciousness and that of the people around them (Allen 2008: 159).

Job Growth

A final imperative benefit to be included in the pillars of sustainability is the potential for job growth in local food systems. Farm jobs fell from 12.4% of nonmetro jobs in 1976 to 6.2% in 2004 (Kusmin and Parker, 2006); causes have been attributed to public policy and technology

that have favored the replacement of human labor (chemicals and machinery), and federal subsidies that have gone mainly to less labor-intensive crops suitable for export (Anderson 2008: 598). There is untapped development potential for creating jobs if focus is shifted to local production. Otto and Varner (2005: 14) found that for every 100 farmer's market jobs, 145 additional jobs were created elsewhere in the state of Iowa. Another study estimated that 5,000 jobs would be created in Detroit, Michigan if there was a 20% shift in Detroit retail food spending to locally grown food (Shuman, 2010). A similar shift to Detroit-grown food by residents in the surrounding five counties would create 35,000 jobs. This is both a social benefit as more individuals are obviously employed, but also an economic benefit as more wealth is being created.

Appendix G

Kane County Agricultural Profile and Statistics

Table 2: Kane County Agricultural Profile and Statistics

COUNTY AGRICULTURAL PROFILE		
Number of Farms	759	
Land in Farms (acres)	192,372	
Average Size of Farm (acres)	253	
Average Age of Principal Operator (years)	56.1	
MARKET VALUE OF AGRICULTURAL PRODUCTS SOLD		**Net Profit** (Agricultural Products Sold – Production Expenses)
Total Value of Agricultural Products Sold	$43,050,000	$43,050,000
Average Per Farm	$56,718	$56,718
FARM PRODUCTION EXPENSES		
Total Farm Production Expenses	$155,058,000	**Percentage of Average Farm Production Expenses (%)** (Includes categories Fertilizer etc., Chemicals, and Supplies etc.; excludes Gasoline etc.)
Average Per Farm	$204,293	
Fertilizer, lime, and soil conditioners purchased (434 farm average)	$32,366	15.8
Chemicals purchased (383 farm average)	$16,135	7.9
Supplies, repairs, and maintenance (706 farm average)	$13,589	6.7
Gasoline, fuels, and oils (740 farm average)	$10,870	5.3
VALUE OF MACHINERY AND EQUIPMENT		
Average Per Farm	$175,643	
VALUE OF SALES BY COMMODITY GROUP		**Percentage of Total Value of Agricultural Products Sold (%)**
Grains, oilseeds, dry beans, and dry peas	$88,718,000	44.8
Corn	*$67,785,000*	
Soybeans	*$18,745,000*	
Wheat	*$2,154,000*	
Vegetables, melons, potatoes, and sweet potatoes	$3,194,000	1.6
Fruits, tree nuts, and berries	(D)	(D)
TOP COMMODITY GROUPS (ACRES)		**Percentage of Total Land in Farms (%)**
Corn for grain	114,809	59.7
Soybeans for beans	46,546	24.2
Forage-land used for all hay and haylage, grass silage, and greenchop	7,180	3.7
Wheat for grain, all	5,269	2.7
Top commodity groups, all	173,804	90.3
Vegetables, Potatoes, and Melons, harvested	1,180	0.6

Source: U.S. Census of Agriculture (2007a); (D) Cannot be disclosed.

Illinois State Agricultural Profile and Statistics

Table 3: Illinois State Agricultural Profile and Statistics

STATE AGRICULTURAL PROFILE		
Number of Farms	76,860	
Land in Farms (acres)	26,775,100	
Average Size of Farm (acres)	348	
Average Age of Principal Operator (years)	56.2	
MARKET VALUE OF AGRICULTURAL PRODUCTS SOLD ($1,000)		**Net Profit** (Agricultural Products Sold – Production Expenses)
Total Value of Agricultural Products Sold	$13,329,107,000	$4,284,027,000
Average Per Farm	$173,421	$55,738
FARM PRODUCTION EXPENSES		
Total Farm Production Expenses ($1,000)	$9,045,080,000	**Percentage of Average Farm Production Expenses (%)** (Includes categories Fertilizer etc., Chemicals, and Supplies etc.; excludes Gasoline etc.)
Average Per Farm (dollars)	$117,683	
Fertilizer, lime, and soil conditioners purchased (49,671 farm average)	$29,804	25.3
Chemicals purchased (43,618 farm average)	$16,781	14.3
Supplies, repairs, and maintenance (68,871 farm average)	$8,592	7.3
Gasoline, fuels, and oils (74,841 farm average)	$7,514	6.4
VALUE OF MACHINERY AND EQUIPMENT		
Average Per Farm	$136,609	
VALUE OF SALES BY COMMODITY GROUP		**Percentage of Total Value of Agricultural Products Sold (%)**
Grains, oilseeds, dry beans, and dry peas	$10,257,765,000	77.0
Corn	*$7,073,343,000*	
Soybeans	*$2,914,745,000*	
Wheat	*$229,850,000*	
Vegetables, melons, potatoes, and sweet potatoes	$103,914,000	0.8
Fruits, tree nuts, and berries	$10,246,000	0.1
TOP COMMODITY GROUPS (ACRES)		**Percentage of Total Land in Farms (%)**
Corn for grain	13,096,231	48.9
Soybeans for beans	8,293,711	31.0
Forage-land used for all hay and haylage, grass silage, and greenchop	593,186	2.2
Wheat for grain, all	891,567	3.3
Top commodity groups, all	22,874,695	85.4
Vegetables, Potatoes, and Melons, harvested	71,371	0.3

Source: U.S. Census of Agriculture (2007b)

Appendix H

Prairie Crossing Conceptual Map

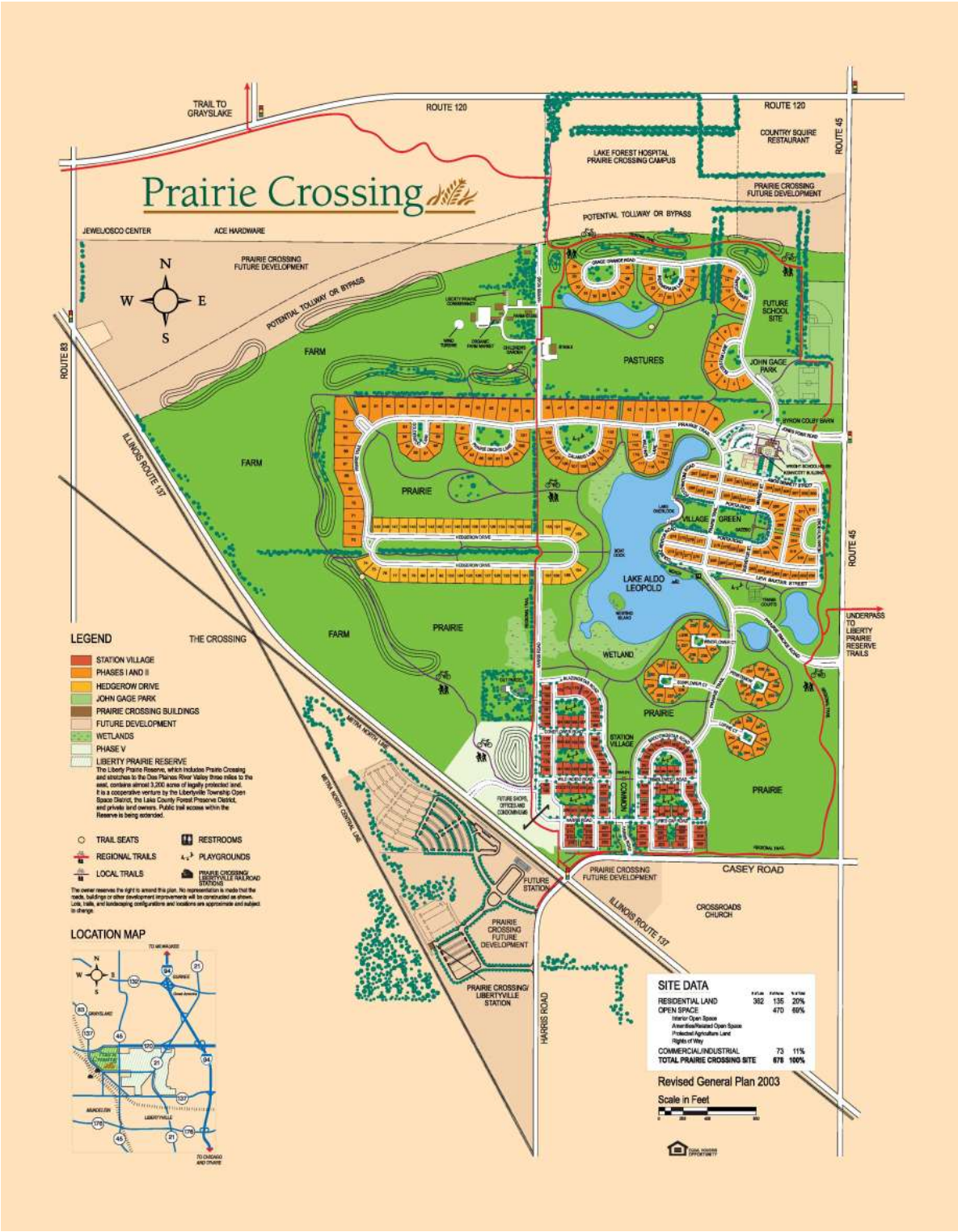

Figure 8: Map of Prairie Crossing, Grayslake, IL; Source (Prairie Crossing, 2010)