THE IMPACTS OF BIOFUELS PRODUCTION IN RURAL KANSAS: LOCAL PERCEPTIONS

by

ALBERT IAROI

B.A., BABEŞ-BOLYAI UNIVERSITY, CLUJ NAPOCA, 1999
M.S., BABEŞ-BOLYAI UNIVERSITY, CLUJ NAPOCA, 2000

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Sociology, Anthropology, and Social Work
College of Arts and Sciences

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2013

Abstract

This dissertation examines the discourse of biofuels development in Kansas as promoted by rural growth machines. Corn-based ethanol production capacity and use in the United States has grown exponentially between 2000 and 2009, culminating with the 2007 Energy Independence and Security Act's 36 billion gallon Renewable Fuels Standard 2. At the national level, biofuels development is promoted by the media as important to national goals such as energy/national security, economic growth, and environmental improvement.

Examination of the biofuels discourse employed content analysis of newspaper articles as well as in-depth individual interviews and focus groups. The analysis revealed that rural growth machines created an ethanol discourse similar to the one promoted at national level, but with an almost exclusive emphasis on the economic development frame. The rural growth machine's ideological hegemony promoting ethanol development in the region was maintained through their power of creating and disseminating information. For the issue of biofuels development in Kansas, the analyzed newspapers played both conduit and contributor roles, as newspaper coverage strongly supported the interests of growth machines when the subject was local economic growth opportunities.

Members of the rural growth machines set an exclusive and one-sided discourse to legitimate their pro-growth activities and to portray the ethanol development projects as corresponding with the wider good of these communities. Because of dwindling demographic and economic bases as well as scarce natural resources, local political and economic elites approached the issue of growth form a standpoint of hegemony. They promoted growth to carry out their own political and economic agenda while there was a strong desire among the residents for almost any type of economic development. This might explain the weak opposition to the actions of the growth machine in these rural settings.

THE IMPACTS OF BIOFUELS PRODUCTION IN RURAL KANSAS: LOCAL PERCEPTIONS

by

ALBERT IAROI

B.A., BABEŞ-BOLYAI UNIVERSITY, CLUJ NAPOCA, 1999
M.S., BABEŞ-BOLYAI UNIVERSITY, CLUJ NAPOCA, 2000

A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Sociology, Anthropology, and Social Work
College of Arts and Sciences

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2013

Approved by:

Major Professor
LÁSZLÓ KULCSÁR

Copyright

Abstract

This dissertation examines the discourse of biofuels development in Kansas as promoted by rural growth machines. Corn-based ethanol production capacity and use in the United States has grown exponentially between 2000 and 2009, culminating with the 2007 Energy Independence and Security Act's 36 billion gallon Renewable Fuels Standard 2. At the national level, biofuels development is promoted by the media as important to national goals such as energy/national security, economic growth, and environmental improvement.

Examination of the biofuels discourse employed content analysis of newspaper articles as well as in-depth individual interviews and focus groups. The analysis revealed that rural growth machines created an ethanol discourse similar to the one promoted at national level, but with an almost exclusive emphasis on the economic development frame. The rural growth machine's ideological hegemony promoting biofuels development in the region was maintained through their power of creating and disseminating information. For the issue of biofuels development in Kansas, the analyzed newspapers played both conduit and contributor roles, as newspaper coverage strongly supported the interests of growth machines when the subject was local economic growth opportunities.

Members of the rural growth machines set an exclusive and one-sided discourse to legitimate their pro-growth activities and to portray the ethanol development projects as corresponding with the wider good of these communities. Because of dwindling demographic and economic bases as well as scarce natural resources, local political and economic elites approached the issue of growth form a standpoint of hegemony. They promoted growth to carry out their own political and economic agenda while there was a strong desire among the residents for almost any type of economic development. This might explain the weak opposition to the actions of the growth machine in these rural settings.

Table of Contents

List of Figures

List of Tables

List of Acronyms

BGY – Billion Gallons Per Year

EPA – Environmental Protection Agency

MGY – Million Gallons Per Year

MTBE – Methyl Tertiary Butyl Ether

RFA – Renewable Fuels Association

RIN – Renewable Identification Number

RFS – Renewable Fuel Standard

Acknowledgements

I would like to acknowledge and thank those who have been patient with me while I worked on my dissertation.

I am grateful to my major professor, Dr. László Kulcsár, for the profound words of advice, his work, support, and patience; the rest of my committee, Dr. Theresa Selfa and Dr. Gerad Middendorf for their counsel and support; and to Dr. Jeffrey Peterson for all of his contributions.

I would also like to thank Dr. Gary Brase for serving as the outside committee chair.

Numerous others are due gratitude as well, including Dr. Terrie A. Becerra, Uma Sarmistha, Ana Luiza De Campos Paola, Dr. Maria Zavodszky, Dr. Peter Zavodszky, Dr. Anna Zolkiewska, Dr. Michal Zolkiewski, and Dr. Imre Attila.

Dedication

I would like to dedicate this work to my extraordinary wife, Maria, for her love, continued support and encouragement throughout graduate study, and patience with the writing process; and my parents and sister for their faith and optimism.

Chapter 1 - Introduction

First generation biofuels, and grain-based ethanol in particular, are promoted in the United States as renewable domestic transportation fuels that help to alleviate environmental issues caused by green house gas (GHG) emissions, to economically develop rural communities, and to reduce the nation's dependence on foreign oil (Mol 2007, 2010; Carolan 2009; McMichael 2009, 2010; Jaeger and Egelkraut).

First generation biofuels are promoted in the United States for environmental, economic, and national security reasons. In particular, grain-based ethanol is promoted as a domestic transportation fuel to help alleviate green house gas (GHG) emissions, to provide economic development to rural communities, and to reduce dependence on foreign oil (Mol 2007, 2010; Carolan 2009; McMichael 2009, 2010; Jaeger and Egelkraut). The construction and expansion of ethanol plants (biorefineries1) in the past several years has generated a wave of economic growth in rural communities across the Midwest (Swenson and Eathington 2006; Urbanchuck 2010; KSDOL 2010, Peters et al. 2010). However, the economic benefits provided by biofuels production does not always outweigh the potential downfalls (Pimentel 2005; Ferrett 2007; Fargione 2008; Searchinger 2008; Clancy and Lowet 2013). In addition, the benefits of tax revenues and job growth promised by the biofuels industry must be balanced against the safety risks, increased pollution, and diminishing water supplies that small rural communities and farmers face in parts of the Midwest (Domingues-Faus 2009).

In Kansas, jobs in agriculture, which are traditionally the most important employment sector, are declining (Hall 2010). State and local governments pursue economic development policies designed to stimulate local economic activity through employment growth. Policy makers must anticipate the costs and benefits of economic development policies in their community. The number of jobs created measures the success of these policies. Local policies therefore encourage or discourage the opening of new businesses and plants in a community.

Local officials in small rural communities across the Midwest invested considerable local resources with the expectation that economic growth and tax revenues would accumulate and benefit their communities (Low and Isserman 2009; Pender, Marre and Reeder 2012). In this

[1] In this study I use ethanol *plant/ethanol facility* and *biorefinery* as interchangeable terms.

light, ethanol plants complement the needs of rural communities by creating jobs, additional markets for grain farmers, and nutrition-rich distiller's grain for the feedlots in the area. Rural communities often compete with each other to attract these facilities. Although representatives of the biofuels industry, politicians, and local boosters portray ethanol production in Kansas as the key to invigorating the economies of small communities and to help retain or attract population, who exactly reaps the benefits of having a biorefinery in the neighborhood remains unclear. Little is known about the actual social, economic, and environmental impacts of this industry on small rural communities.

The processes for attracting ethanol plants into rural communities are not well understood and remain generally unstudied (Ribeiro 2013). Thus, understanding who promotes ethanol development in rural Kansas, the role of local and regional media surrounding this development, and how community members perceive the effects of biofuels development in their communities is of increasing importance. Media discourse becomes an important outlet (Bolsen and Cook 2008) for understanding the social processes at work underlying perceptions of biofuels production in local communities (Rossi and Hinrichs 2011; Selfa et al. 2011; Hitchner and Schelhas 2012). Cacciatore et al. (2012) for example explored the direct effects of biofuels knowledge and the moderating effect of partisanship on the relationship between media use and benefit versus risk perceptions related to environmental impacts, economic consequences, ethical/social implications, and political ramifications. Their results suggest that more knowledgeable respondents see fewer benefits of biofuels relative to risks, and that Democrats and Republicans are affected differently by media use when forming opinions about biofuels.

I examine the structure, process, and outcomes of local biofuels development discourse as promoted by members of growth coalitions by asking: *In what ways did local leaders influence biofuels development in small rural communities? How did local/regional newspapers available in the case study communities' present/frame the discourse regarding local biofuel development? How did these frames resonate with the public? How did host community members perceive the effects of local ethanol refineries?*

Central Kansas incorporates many characteristics that make it an ideal place to study local attitudes and perceptions on biofuels development. The ownership of regional newspapers covering the study area is quite concentrated, and represents the major source of information for local residents regarding biofuels development in their communities. Agriculture is still a vital

component of the regional economy and agro-economic interests remain politically strong. Farming along with groundwater use is perceived as part of these rural communities' cultural heritage (Solis 2005), while conflict over scarce water resources and its proper use can often ensue (Sherow 2002).

The ethanol refineries were built in small communities facing economic, demographic, and water availability issues. Local governments were pressured into constantly looking to attract new businesses, while existing ones often failed. Ethanol production is a good fit for the region in many ways. First, there is an abundance of corn as its primary feedstock. Second, ethanol plants have a relative advantage because of their proximity to major cattle feeding operations. Third, they can sell a large proportion of their distiller's grain without drying expenses, and fourth because they can transport a significant portion of their ethanol by truck instead of by rail transportation to the blending facilities in Wichita in South Central Kansas.

When studying local attitudes and perceptions [regarding biofuels development] it is essential to consider the local social and cultural context. Such context greatly influences rural responses and receptivity to the development of biofuels (Rossi and Hinricks 2011). A major threat to agriculture and local communities in West Kansas is the declining water resources (Mintert and al. 2006, Krider et al. 2006). Current Kansas water policy calls for slowing the decline rate~~s~~ of the Ogallala/High Plains Aquifer. Thus, the establishment of biorefineries in the south and west central part of the state raised questions regarding how best to balance the need for economic development in rural communities with the diminishing availability of water resources. This study researched how growth machines in four rural Kansas communities pursued biofuel development. The research questions posed in this study are:

Q_1: How do relatively small groups of local political and business elites promote biofuels development in small rural communities in Kansas?

Q_2: How do local and regional newspapers influence the public perception of biofuels development in small rural communities?

Q_3: How do members of rural communities with ethanol refineries perceive community benefits from biofuels development?

The purpose of this research is to begin to answer these questions and others that are raised by the establishment of biorefineries and the increased ethanol production in Central Kansas. My aim was to bring a new approach to the work on the growth machine coalitions (considered mostly as an inherently urban phenomenon) by drawing on newspaper article analysis, on field research, and on community survey data to explore the dynamics of attracting and establishing biorefineries in the small rural communities of Kansas.

1.1 Overview of Chapters

This dissertation is organized with an introductory chapter followed by a background chapter (Chapter 2). The background chapter presents the historical, economic, and legislative context of biofuels development in the United States and Kansas as well as a brief description of the Ogallala Aquifer that sustains agriculture, ethanol production, and municipalities in the western part of the state. The literature review is in Chapter 3, while the description of the case study communities and methods follow in Chapter 4. Chapter 5 contains the findings of this study. Chapter 6 presents the discussion, and conclusions.

Chapter 2, the background chapter, provides information regarding the emergence of corn based ethanol production in the United States as well as historical data regarding ethanol industry. This is followed by a brief description of the biorefinery activity in Kansas. The chapter also offers a summary of federal and state laws and incentives that stimulate biofuels development in the country and the state of Kansas.

Most of the semi-arid western part of the Kansas sits over the Ogallala Aquifer. The diminishing ground water supply is used intensively to achieve very high corn yields. For context, this chapter provides a short historical description of both the development of irrigated farming as well as the legislative initiatives that were enacted to slow dropping groundwater levels.

The literature review (Chapter 3) starts with a discussion of the ecological modernization theory, which is useful in providing an overall framework for the research. I draw on this theory for explanatory context of the revival of biofuels in the United States. An ecological modernization framework holds the concept that environmental problems can be solved by developing and adapting new technologies as well as through restructuring the process of production and consumption through governments, businesses, moderate environmentalists, and

scientists working together for economic efficiency and environmental conservation (Spaargaren and Mol 1992; Dryzek 1997).

A second area of literature is the "growth machine" theory, which provides an overall framework for the research. Growth machine theory helps identify the actors and mechanisms promoting biofuels development in rural Kansas. This theoretical framework suggests that promoters of growth encourage development as a universal good (Moloch 1976) and that growth increases socio-economic opportunities for the whole community; however, only select residents enjoy these socio-economic benefits (Logan 1997). The core components of the growth machine theory are the elite coalition, the self-interested promotion of urban growth, and the unequal benefits of this growth (Kulcsar and Domokos 2005).

The methods chapter (Chapter 4) explains the procedures for community and sample selection, instrument development and measures, data collection procedures, and means of data analysis. In order the uncover the ways members of local growth coalitions promote the establishment of ethanol plants in the case study communities, qualitative research methods included content analysis of eight newspapers; interview and survey data were drawn upon to substantiate the findings.

Chapter 5 describes the findings of this research. The chapter begins with a discussion of biofuels development as a public issue, and then presents an analysis of the frames and sub-frames of the biofuels discourse found in the relevant articles of one state-level and six regional newspapers. The presentation of media frames is complemented by the description of the audience frames emerging from the interviews and survey data.

The last chapter (Chapter 6) summarizes the findings of this study related to the manifestations of the rural growth machine while promoting ethanol production.

The next chapter introduces understanding of why the establishment of ethanol plants was pursued by small rural communities of Kansas in the early and mid- 2000s, by presenting the general context of biofuels development in the United States and in Kansas.

Chapter 2 - Background

Within industrially developed countries economic development strategies for rural areas are concerned with reshaping rural economies in the context of agricultural restructuring and associated economic and social change Storey (2009). He noted a recognizable shift from the imposition of top-down development strategies to the promotion of local and community involvement. In his view the current development philosophy emphasizes the importance of participation and is underpinned by an espousal of the centrality of community involvement, empowerment, and capacity building.

In their work on search of rural communities across the country for development strategies that create jobs, businesses, and community wealth, Brown-Graham and Lambe (2008) offer new principles for rethinking methods and measures that promote effective economic development in the twenty-first century. They propose four tenets to achieve these goals: innovation, as key to driving growth and prosperity; capital investments to put innovations to use; measures to protect valuable natural assets; and well-developed personal networks of personal contacts to attract new businesses.

Economic cycles of boom and bust in the 1900s have left deep marks on rural communities in the Midwest. During the 1980s agriculture and related manufacturing were especially hard hit (Conger et al. 1994), and the trend of economic decline and outmigration continued since the early 1990s (Johnson 2006).

Since the 1970s, the U.S. government has supported the growth and development of the corn-based ethanol industry. Advocates have seen the development of a robust ethanol industry as a way for the United States to reduce its dependence on foreign oil, to reduce green house gas emissions, and as a way to help the economies in rural communities. Many state and local municipal governments in the Midwest promoted the rural economic development potential of the industry in spite of few evidence that the ethanol industry was creating jobs and economic development in rural areas was limited (Pimentel 2003).

In Kansas, the state with the third highest number of acres in agriculture (NASS 2011), state and local politicians, investors and other stakeholders promoted the ethanol industry as the best fit for grain farmers and for the economic development of the state. Members of local

growth coalitions emphasized both economic and energy independence benefits of ethanol in order to facilitate the establishment of biorefineries in rural communities.

Gillon (2010) suggests that the development of the biofuel industry in the Midwest can be understood with insights from agrarian political economy, and describers how biofuel development strategies connect to rural landscapes and livelihoods through agro-industrial political economic processes. His research shows that "federal biofuel policy, volatile markets, and circuits of agro-industrial capital exchange and investment offer a limited number of lasting rural economic opportunities and reproduce the same political economic marginalization and negative ecological consequences characteristic of intensive agricultural production in the Midwest" (p. 729). Gillon describes how the cost of refinery construction is often paid with funds both internal and external to the refinery's location and how local residents are often asked to support local refinery construction with capital investments of varying magnitudes.

2.1 Ethanol Production in the United States

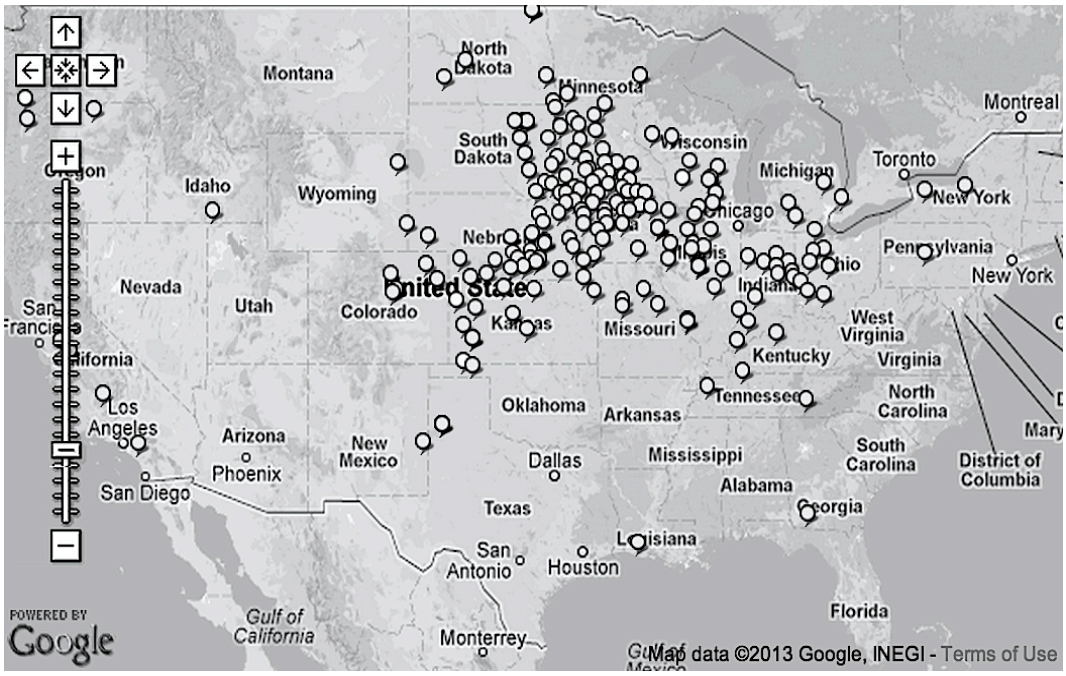
Ethyl alcohol (or ethanol) is a clear, colorless chemical compound made through fermentation from the sugars found in crops such as corn, sugar beets, and sugar cane. It has long been used as an automotive fuel by replacing gasoline in a slightly modified internal combustion engine and, when mixed with gasoline in blends of 10 to 15 percent, it is an effective "octane booster" in engines not modified.

Alternative fuels (especially ethanol) in the cultural and political context, have held a symbolic and politically strategic significance among advocates and opponents alike that have implications far beyond the simple substitution of one product for another (Kovarik 1982, 2001). Kovarik noted that from the beginning advocates touted fuel ethanol's potential for revolutionizing agricultural economics, for dissipating city smog, and for curbing the power the oil industry held over the economy. Meanwhile, opponents saw ethanol fuel as "a scheme for robbing taxpayers to enrich farmers, as turning food for the poor into fuel for the rich, as compounding soil erosion problems, and as a marginally useful enhancement or replacement fuel for a transportation system that is poorly designed in the first place" (Kovarik 1982:9).

Ethanol production in the United States is concentrated in corn-belt states of the upper Midwest. The construction of ethanol refineries started several decades ago by farmers' cooperatives as a way to diversify product markets, increase self-reliance, and to add value to

their grains (Solomon et al 2007, Bernton 2010, Gillon 2010). By the end of the millennium the ethanol industry consolidated. Archer Daniels Midland (ADM) dominated the ethanol market, accounting for 75 percent of the ethanol output from the industry's 56 biorefineries' (Morris 2005). Between the years 2000 and 2010 ethanol production witnessed a rapid expansion of new, increasingly larger-volume, farmer-owned ethanol plants. The expansion was due to the increased demand for ethanol, which was caused by the gradual termination by early 2006 of the transportation fuel additive methyl tertiary butyl ether (MTBE)[2], rising crude oil prices, as well as federal and state mandates and tax incentives.

Figure 2.1 Location of ethanol plants in the United States



Source: Renewable Fuels Association http://www.ethanolrfa.org/bio-refinery-locations

The U.S. ethanol industry underwent a substantial restructuring in 2009 due to the difficult economic conditions that gripped the national economy in 2008. The price of corn rose in 2008 following the early floods the Midwest. Corn growers and brokers expected a small harvest due to the flood damage and supplies were locked in at fairly high prices in an attempt to

[2] The Energy Policy Act of 2005 did not guarantee product liability protection for the manufacturers of MTBE.

hedge against a poor harvest. However, corn growers recovered from the flooding more strongly than expected, and the resulting collapse in corn prices forced many companies into bankruptcy protection. Several firms were subsequently liquidated, others consolidated. Further, several major oil refineries acquired ethanol production capacity for less than replacement cost (USEIA 2010).

As a result the ownership structure of ethanol plants changed dramatically and the industry became more concentrated (FTC 2012). The number of farmer-owned ethanol facilities decreased from 40 in 2005 to 38 in 2009 while the number of non-farmer owned facilities rose from 41 to 151 in the same period. Further, the ten largest ethanol producers accounted for less than 50 percent of total industry output while the largest three firms accounted for about 32 percent of total production (Urbanchuck 2010).

The U.S. ethanol industry grew exponentially as the number of biorefineries increased from 50 in 1999 to 211 in 2013, while the production capacity rose from 1.7 billion gallons per year to 14.7 billion gallons in the same period (Table 2.1).

Table 2.1 Ethanol industry output overview

Year	Nr. of eth. plants	Nr. of states with eth. plants	Eth. prod. capacity (MGY)	Nr. of plants under constr./ expanding	Capacity under constr./ expanding (MGY)
2000	54	17	1749	6	92
2001	56	18	1922	5	65
2002	61	19	2347	13	391
2003	68	20	2707	11	483
2004	72	19	3101	15	598
2005	81	18	3644	16	754
2006	95	20	4336	31	1778
2007	110	21	5493	76	5635
2008	139	21	7888	61	5536
2009	170	26	10569	24	2066
2010	189	26	11877	15	1432
2011	204	29	13508	10	522
2012	209	29	14907	2	140
2013	211	28	14712	4	158

Source: Renewable Fuels Association http://www.ethanolrfa.org/pages/statistics

The year 2012 was a good one for U.S. ethanol producers, although according to industry data total ethanol production in 2012 slightly decreased to 13.3 billion gallons from 13.9 billion gallons in 2011 (RFA 2013).

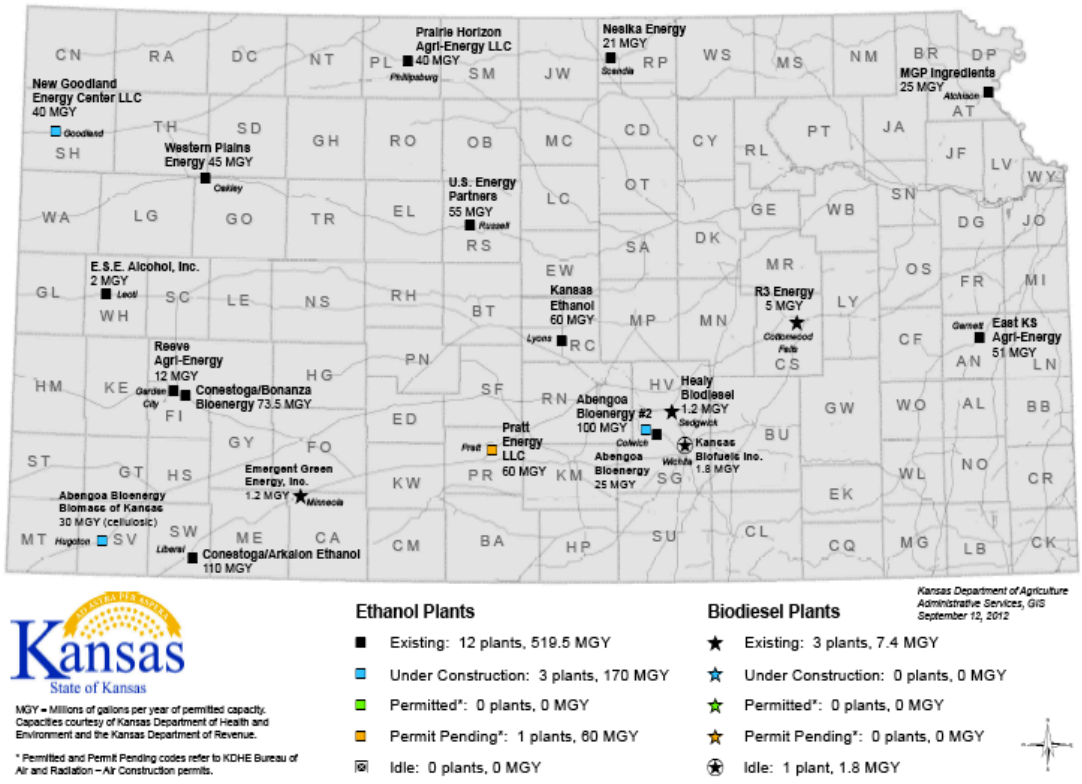
2.2 Ethanol Production in Kansas

Within Kansas, most of the biofuels plants (ethanol and biodiesel) are located in west Central Kansas. One of the peculiarities of Kansas' biorefineries is that grain sorghum is often utilized in ethanol production. Although corn and grain sorghum have very similar starch and protein structures, allowing them to be substitutes in ethanol production, grain sorghum is much more drought tolerant than corn and is well adapted to the dry climate of west Central Kansas.

Among the relative advantages of ethanol plants in the state is their proximity to major cattle feeding operations. They can sell a large proportion of their distiller's grain without drying expenses, and they are able to transport about half of their ethanol by truck instead of by rail transportation to the blending facilities in Wichita, Kansas. Approximately 40 percent of fuel ethanol is produced by wet-mills. These plants produce wet or dried corn gluten feed, corn gluten meal and corn germ meal as the primary by-products. Dry-grind ethanol plants represent the fastest growing segment of the fuel ethanol industry in the United States, and produce the majority (60%) of fuel ethanol. By-products from dry-grind ethanol plants include wet and dried distillers grains, wet and dried distillers grains with solubles, modified "wet cake", and condensed distillers solubles. Of these dry-grind ethanol plant by-products, distiller's grain with solubles (DDGS) is the predominant by-product being marketed domestically (UM 2012).

Kansas has the ninth largest ethanol nameplate capacity (the full-load continuous rating of a plant under specified conditions as designated by the manufacturer) and the eight largest ethanol operating production in the country, based on May 2013 industry figures. The 11 operating and one idled ethanol plant have the nameplate capacity to produce 478.5 millions of gallons of ethanol, which is 3.3 percent of the nation's capacity of 14.7 billion gallons Further, there are two planned plants with a total production capacity of 20MGY, and a 16 million gallons per year (MGY) cellulosic ethanol plant is under construction (RFA 2013).

Figure 2.2 Location of ethanol plants in Kansas



Source: Kansas Department of Agriculture Administrative Services, GIS

Table 2.2 Fuel ethanol facilities capacity of Kansas and the U.S. as of May 2013 (MGY)

State	Nameplate Capacity	Operating Production	Expansion Capacity
Kansas	478	436	20
United States	14712	13315	183

Sources: Renewable Fuels Association http://www.ethanolrfa.org/bio-refinery-locations

Biofuels production levels are inscribed in a number of federal policies, the two consecutive Renewable Fuels Standards (RFS) being the most prominent. The RFS2 mandates an increase in biofuels production to 36 billion gallons per year (BGY) by 2022 of which 16

BGY – 40 percent of the total – being allocated for corn ethanol and the rest for second and third generation biofuels.

2.3 Federal Laws and Incentives Promoting Biofuels Development

Ethanol and biodiesel are the two most widely used biofuels, and in the past three decades both have received significant government support under federal law in the form of mandated fuel use, tax incentives, loan and grant programs, and regulatory requirements (Yacobucci 2012). Although some have already expired, the 22 programs and provisions administered by five separate agencies and departments targeted a variety of beneficiaries such as farmers and rural small businesses, biofuel producers, petroleum suppliers, and fuel marketers. Perhaps the most significant federal programs for biofuels had been tax credits for the production or sale of ethanol and biodiesel. Congress however, has mandated biofuels use with the establishment of the renewable fuel standard (RFS) under the Energy Policy Act of 2005, , and significantly expanded that mandate by the Energy Independence and Security Act (EISA) of 2007.

Table 2.3 Mandated use of renewable fuels from the EISA of 2007

Year	Renewable Biofuel (MGY)	Advanced Biofuel (MGY)	Cellulosic Biofuel (MGY)	Total (MGY)
2008	9			9
2009	10.5	0.6		11.1
2010	12	0.95	0.1	12.95
2011	12.6	1.35	0.25	13.95
2012	13.2	2	0.5	15.2
2013	13.8	2.75	1	16.55
2014	14.4	3.75	1.75	18.15
2015	15	5.5	3	20.5
2016	15	7.25	4.25	22.25
2017	15	9	5.5	24
2018	15	11	7	26
2019	15	13	8.5	28
2020	15	15	10.5	30
2021	15	18	13.5	33
20	15	21	16	36

Source: USEPA http://www.epa.gov/otaq/fuels/renewablefuels/index.htm

Further, the 2008 Farm Bill (The Food, Conservation, and Energy Act of 2008) adjusted or created several biofuels incentives, including lowering the value of the ethanol excise tax credit, establishing a tax credit for cellulosic biofuel production, extending import duties on fuel ethanol, and establishing several new grant and loan programs (Yacobucci 2012).

The second RFS requires the use of renewable fuels (including ethanol and biodiesel) in transportation fuel. Fuel suppliers are required to include 36 billion gallons of renewable fuel in the national transportation fuel supply by 2022 for 2013 the mandate was set for 13.8 billion gallons). The Energy Independence and Security Act of 2007 specifically mandates the use of "advanced biofuels" (fuels produced from non-corn feedstocks and with 50 percent lower lifecycle greenhouse gas emissions than petroleum fuel) starting in 2009. The law stipulates that of the 36 billion gallons required in 2022, at least 21 billion gallons must be advanced biofuel (including quotas for cellulosic biofuels and for biomass-based diesel fuel).

The United States Environmental Protection Agency (USEPA) created the Renewable Identification Number (RIN) system was to facilitate compliance with the RFS. Therefore, RINs track whether refineries have met the governmental mandates for renewable fuels use (USDA ERS 2012). Between 2007 and 2012 gasoline demand declined by 6 percent (based on Energy Information Agency data and news reports) and by 16 percent between December 2011 and March 2013 (as suggested by Bloomberg Financial News and Energy Information Agency data); however, the ethanol production mandate continued to increase. Thus RIN numbers became a short supply as refineries hit the 10 percent blending wall (the maximum amount of gasoline blended with ethanol as required by RFS 2) due to decreased demand for gasoline and increased fuel efficiency, high corn prices, reduction in ethanol production. The oil industry (American Petroleum Industry) had the EPA mandate of blending cellulosic ethanol for 2012 repealed by a federal court on the ground that cellulosic ethanol is not commercially available yet (Snow 2013). On the other hand the ethanol industry keeps lobbying for E15 blend and accuses oil industry of monopoly and obstructionism (RFA 2012).

Many incentives for biofuels production and use (for example a tariff on ethanol imported from most countries, as well as tax credits for biodiesel, renewable diesel, and ethanol) expired at the end of 2011 and the ongoing congressional debate over budget deficits and the national debt make the prospect of extending these incentives less likely.

2.4 Laws and incentives promoting biofuels development in Kansas

In 1987, House Bill (HB) 2491 repealed the provisions which granted a lower motor fuel tax rate to gasohol and replaced that form of incentive with a direct subsidy of $.20 per gallon of agricultural ethyl alcohol to Kansas ethanol producers who sell ethanol to fuel blenders for use as motor fuel. The payments, pursuant to this program, administered by the Secretary of Revenue, are made from the new Kansas Qualified Agricultural Ethyl Alcohol Producer Incentive Fund. The fund is replenished from motor fuel tax receipts at the rate of $625,000 in each quarter beginning October 1, 1987, and ending July 1, 1990.

HB 2585 of 1990 extended the expiration date of the Agricultural Ethyl Alcohol Incentive Program from July 1990 to July 1, 1993. SB 59 extended the expiration date of the Agricultural Ethyl Alcohol Incentive Program from July 1993, to July 1, 1997; then, SB 2 extended the expiration date of the Agricultural Ethyl Alcohol Incentive Program from July 1, 1997, to July 1, 2001.

In 2001 HB 2011 modified the section of law dealing with incentives for the production of ethyl alcohol. The bill provided for an incentive of $.05 for each gallon of agricultural ethyl alcohol sold by the producer to an alcohol blender with an annual cap of $2 million. This incentive was only for current producers, and the provisions of the agricultural ethyl alcohol incentive were to expire on July 1, 2012 (KLDR 2007).

Other state incentives include the Biofuel Blending Equipment Tax Exemption (Kansas Statutes 79-232 and 79-32,251 from 2007) and the Biofuel Production Facility Tax Exemption (Kansas Statutes 79-229 and 79-32,233), both from 2007. The first one states that qualified equipment used for storing and blending petroleum-based fuel with biodiesel, ethanol, or other biofuel is exempt from state property taxes for 10 taxable years. The second one stipulates that any newly constructed or expanded biomass-to-energy facility is exempt from state property taxes for up to 10 taxable years immediately following the taxable year in which construction or installation is completed (AFDC 2013).

2.5 The Ogallala Aquifer - Groundwater Mining

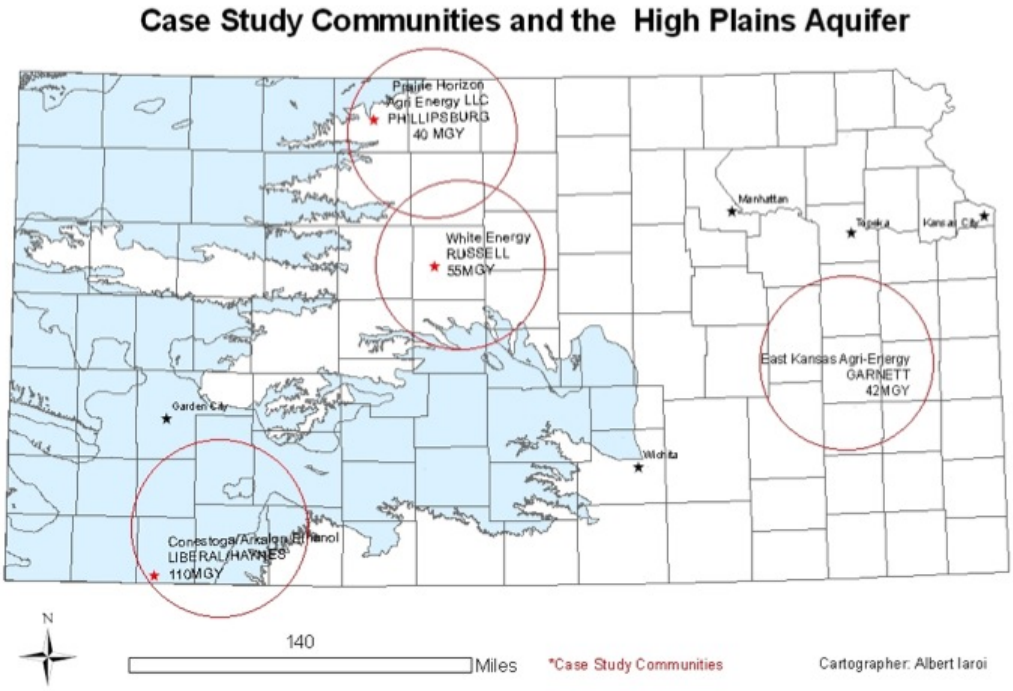
As illustrated by Figure 2.1, most of the semi-arid western part of the state sits over the Ogallala (or High Plains) Aquifer. The diminishing water supply of the aquifer is being systematically exploited and – consequently – depleted to achieve very high corn yields through

irrigation. The development of ethanol industry in this region in the last decade created additional markets for corn and sorghum producers to sell their grain at higher prices. It has also increased the need for more groundwater to irrigate the corn feeding the ethanol biorefineries and to assist the corn-to-ethanol process.

The Ogallala Aquifer is one of the largest freshwater aquifer systems in the world, covering large parts of Texas, Oklahoma, Kansas, and Nebraska, extending into New Mexico, Colorado and South Dakota. It provides 30 percent of the total withdrawals from all aquifers for irrigation in the United States and drinking water to 82 percent of the people who live within its boundaries (Sophocleous, 2010). As its sources were cut off long time ago, Ogallala groundwater is mostly irreplaceable "fossil water". Approximately 23 percent of the cropland overlying the High Plains aquifer is irrigated, accounting for 94 percent of the total groundwater use on the High Plains (USGS 2000).

The Ogallala Aquifer underlies approximately 46 counties in Kansas. The agricultural economy (crop, livestock, and meat processing sectors), the oil and gas production, and lately the ethanol industry in Western Kansas runs on water mined from the aquifer and together account for almost all water consumption in the region. Irrigation alone accounts for 87 percent of total water use in western Kansas (Peterson et al. 2003). Irrigation of millions of acres of dry cropland started in the 1930s; however, by the 1970s because of the very limited rainfall in the region the withdrawals from the aquifer for agricultural purposes exceeded the natural rate of recharge. The trend continues since, although at a slower pace and it is geography specific. The total cumulative groundwater depletion from 1950 through the end of 2000 was about 255 km^3. By the end of 2008, the total depletion was about 337 km^3 (Konikow 2013).

Figure 2.3 Map of Kansas with the case study communities and the Ogallala Aquifer



During the 1990s a fast increasing part of irrigated land has been planted to corn – the most water intensive crop alternative in most areas of western Kansas (Peterson et al. 2003). Since then, the number of irrigated corn acres in western Kansas has increased, implying elevated water use from the aquifer and consequently, high depletion rate of the aquifer. However, lately a modest reduction in the per acre water use for all irrigated crops has been observed, attributed to improved irrigation efficiency and other factors (Sophocleus 2010).

For some time Kansas followed the riparian doctrine for streams and the absolute ownership doctrine for groundwater. In 1945 the prior appropriation doctrine was adopted for both streams and groundwater (Irvin 1996). This act protected existing rights with "vested rights" for water already being used. The legislature amended the Water Appropriation Act in 1957 to state explicitly that water rights are "real property right[s], appurtenant to ... the land on or in connection with which the water is used" (Peck 2004).

As an additional policy tool, the Kansas Chief Engineer has statutory mandate to implement and oversee the provisions of the Water Appropriation Act and to initiate public proceedings designating Intensive Groundwater Use Control Areas (IGUCAs). This policy is the single most powerful tool that the state has to reduce annual pumping of any water right holder and to protect the public interest However, of the five IGUAs in Kansas the only one in the region overlying the Ogallala consists of 4 mile wide strip along a 150 mile stretch of the Arkansas River in southwest Kansas (Sophocleus 2010). Groundwater thus is a common-pool resource, accessible to the "water-rights" holders and is not priced (Sophocleus 2010). Therefore the private incentive for any user to reduce current consumption is the price of energy for operating the water pumps: the lower the groundwater level gets, the higher the electricity or gasoline/diesel fuel goes. There is a general consensus in the region – also suggested through the newspaper articles and interviews in this study – that farmers will only stop pumping when it becomes economically unfeasible to do so.

Some areas of western Kansas will have groundwater supplies available for many years to come – depletion is problematic only around the periphery. In other areas, the economic depletion of the aquifer is complete or rapidly approaching. The future of many communities in western Kansas and in other parts of the Ogallala Aquifer region depend upon their ability to adjust to the "planned depletion" of the aquifer (Leatherman et al. 2004).

2.6 Agriculture and Ethanol in the Economy of Kansas

Agriculture, manufacturing and the oil and gas extraction have historically been the pillars of the Kansas economy, particularly in west Central Kansas. Although today manufacturing and services produce a greater share of state income, farming is still important as the state ranks third in the U.S. by the number of acres devoted to agriculture (NASS 2011) and for many rural counties in the western part of the state agriculture is still the main industry.

In the mid 1800s settlers were lured to semi-arid western Kansas by the promise of bountiful harvests facilitated by a cycle of average and above average precipitation (Sherow 1990, 2007). Farmers in western Kansas started irrigating their newly broken lands not too long after statehood in 1861 by channeling surface water through their crop fields. Irrigation of millions of acres of dry cropland in western Kansas accelerated after World War Two because deep-well technology made water sources from alluvial aquifers along the rivers accessible. In

the 1960s, the development of deep-well turbine pumps enabled farmers to tap the Ogallala Aquifer. The newly invented center-pivot sprinkler systems allowed farmers to irrigate large circles of dry land and obtain very good crop yields. By the 1970s the withdrawals from the aquifer for agricultural purposes exceeded the natural rate of recharge. The trend continues since, although at a slower pace (Golden and Peterson 2006).

The semi-arid climate and the abundance of feed grains have been the major influence in the concentration of commercial feed yards in the western one third of Kansas. In the 1980s beef processors and meatpacking plants moved in to take advantage of the feedlots that had sprung up because of irrigated agriculture, and the latest industry to benefit from the abundant grain supply is the biofuels industry (Broadway and Stull 2006).

Today Kansas is one of the leading agricultural states in the United States in terms of wheat, beef, and lately corn production. Kansas's corn growers intended to plant 4.6 million acres in year 2013, down 2 percent from 2012, according to the USDA's National Agricultural Statistics Service, Kansas Field Office. If realized, this would still be the fourth largest area planted to corn since 1936 (USDA NASS 2013).

Despite acreage increases, farm jobs in Kansas have seen a steady decline in the past 25 years. Over the past three decades, the percentage of the state's gross domestic product (GDP) from agriculture has decreased while the GDP from services and finance has become much more important. Between 1970 and 1975 agriculture represented over 10 percent of the gross domestic production of Kansas, decreasing to less than 3 percent in the period between 2000 and 2005 (Hall 2010).

Ethanol production has a double impact on water use in western Kansas: groundwater is used to irrigate grains for grain-based ethanol and also in the grains-to-ethanol process. Further, it has multiple impacts on irrigated crops: it increases water use due to increased corn acreage as well as to more intensive irrigation per acre; stimulates greater irrigated corn acreage due to higher profitability of corn versus alternative crops; and results in more intensive irrigation per acre due to the impact of higher corn prices on irrigation cost-benefit decision resulting in greater water use for corn versus alternative crops (O'Brien 2008).

There are several studies related to the biofuels industry and water use. For example, in his work on the energy balance, economics, and environmental impacts of ethanol as renewable fuel, Pimentel (2005) estimated that ground water in the Ogallala region is being "mined" 25

percent faster than its natural recharge rate. When estimating the potential impacts of the biofuels industry on water resources, Pate and colleagues (2007) point out that U.S. demand for energy and consumable water are growing at the same rates, and these demands will directly compete for water resources.

A 2008 The National Research Council report concerning the effects and implications of the biofuels industry on crop water quality and availability found that an increase in biofuels production would lead to an increase in corn and sorghum production (NRC 2008). Corn is a very water intensive crop compared to sorghum and wheat; however, the negative effects of a shift in cropping preferences would not be felt for at least another 5-10 years. It is also highly possible and worrisome that biofuels crops will expand into marginal land (prior enrolled in the conservation reserve program) and areas that currently do not support irrigation, exacerbating the existing water shortages in many of these areas.

The water consumption of a 100-million gallon ethanol plant was about 1,200 acre feet of water a year, which could also irrigate about 800 acres of corn in western Kansas or water 1,000 lawns during an average growing season (Polansky 2009).

During the 1990s, many rural communities throughout much of western Kansas continued to experience economic decline and population out-migration. This was most acute in the smallest communities, with some of them losing as much as 30 percent of their population over the decade. Irrigated areas have had faster population growth, lower median ages, and usually more success in retaining local youth (Leatherman et al. 2004). The thriving feedlots and beef packing industries have attracted a substantial number of Latino and Asian immigrants to places like Garden City, Dodge City and Liberal (Broadway and Stull 2006). The city of Russell was called a “shining star” in a population report because of a population increase of 14 people attributed mostly to the existence of the ethanol plant in the community (Corn, 2005).

Chapter 3 - Literature review

Issues around biofuels development in non-metro areas are complex, bringing together many factors as initiatives are implemented to get small rural communities on the "ethanol bandwagon". The enormous water quantity demands of the municipalities, agriculture and ethanol facilities, as well as the efforts made to meet the legally mandated Renewable Fuels Standards, highlight not only how precious water is as a natural resource in south and west Central Kansas, but also its social and cultural significance as well. To address this complexity holistically, I have drawn on literatures from the ecological modernization and growth machine theories. The two areas of literature integrate knowledge in environmental and community sociology and help analyze the ways biofuels development is encouraged in rural communities where sharing scarce groundwater resources could lead to sporadic opposition.

3.1 Ecological Modernization Theory

I begin the literature review with a discussion of ecological modernization theory (EMT). Joseph Huber originally presented ecological modernization theory in Germany in 1985; however, many of the debates surrounding the theory have been in response to English-language treatments (Fisher and Freudenburg 2001). Ecological modernization began as a political program, and it continues to be geared toward influencing policy (Mol, Sonnenfeld, and Spaargaren 2009). Since then, the ideas and positions of ecological modernization theorists have gained considerable traction; governments and the environmental movements often share their views (Huber 2008).

In his overview of ecological modernization as a sociological theory, Buttel (2000) noted that ecological modernization provides a way for environmental sociologists "to more directly conceptualize environmental improvement by appreciating the particularly fundamental roles that science, technology, capital, and the state might play in the processes of environmental improvement" (Buttel 2000:59). He suggested that while indistinct as a social theory, the basic logic of ecological modernization has two points. On the one hand, he argued, ecological modernization stems from the notion that political processes and practices are particularly critical in enabling ecological phenomena to be incorporated into the modernization process. In this sense, ecological modernization must ultimately be a theory of state and politics. On the other

hand, in his view, the logic of ecological modernization theory suggests that it has very close affinities to several related literatures, particularly embedded autonomy, civil society, and state-society synergy theories in political sociology.

Buttel also described how Mol (1999) distinguished between the first-generation and second-generation literature. The former was based on "the overarching hypotheses that capitalist liberal democracy has the institutional capacity to reform its impact on the natural environment, and that one can predict that the further development (modernization) of capitalist liberal democracy would tend to result in improvement in ecological outcomes" (Buttel 2000:58).

The early promoters and most prominent scholars on the ecological modernization perspectives, A. Mol and G. Spaargaren, (Spargaren 1992, Mol 2000), argued that solutions to the problems caused by modernization, industrialization, and science could be solved only through further advancement in modernization, industrialization, and science. Similarly, others considered continued industrial development as offering "the best option for escaping from the ecological crises of the developed world" (Fisher and Freudenburg 2001:702). Fisher and Freudenburg (2001) also stressed the importance of economy and private market actors in facilitating ecological modernization.

There is a considerable body of scholarly research about the discourse on ecological modernization. For example, John Dryzek (1997) has viewed ecological modernization as a systems approach, which takes seriously the complex pathways by which consumption, production, resource depletion, and pollution are interrelated. He identifies the key agents of ecological modernization as being the governments, businesses, moderate environmentalists, and scientists working together for economic efficiency and environmental conservation. In his view "ecological modernization is a discourse of reassurance, at least for the residents of relatively prosperous developed societies. It assures us that no tough choices need to be made between economic growth and environmental protection or between the present and the long-term future" (Dryzek, 1997 p. 146). However, considering the increasing demand for crude oil, global warming, and the global economic recession, it seems that developed countries have to make tougher choices to ensure they have longevity of resources for the future.

In his work on the politics of environmental discourse, Maarten Hajer (1995) proposed that the discourse that dominated the definition of environmental problems could be best

analyzed in two ways. One, by combining the analysis of the context of the statement made (or to whom the statement is addressed) or two, the analysis of the "particular set of practices through which meaning is given to physical and social realities".

For Hajer ecological modernization was not so much a prediction of strong tendencies to industrial-ecological progress as it was a category for describing the dominant discourses of the environmental policy arenas of advanced countries (Buttel 2000). He saw the elements of the discourse on ecological modernization as focusing on the idea of partnership between government, businesses, scientists and environmentalists for environmental protection and economic prosperity.

Michael Carolan (2004) adopted a somewhat different approach by taking a critical look at the strong ''productivist'' orientation of ecological modernization. He argued that a resolution to our global ecological problems could only be found in the problematization of both production and consumption. In his view, the prominence of ecological modernization theory could be further strengthened if equal conceptual emphasis was placed on both consumption as well as production and the challenges presented by this were adequately addressed.

The ecological modernization theory's main assumption that capitalism is compatible with ecological change "led to a confrontation between the theory and a core thesis in other influential sociological theories of the environment-society relationship: that capitalist economic growth is incompatible with ecological sustainability and social justice" (Holleman 2012:287).

York and Rosa (2003) challenged the claim of environmental modernization theory that continued modernization was necessary for ecological sustainability. They suggested that it was not enough to reveal that societies modify their institutions in reaction to environmental problems and show that such modifications lead to ecological improvements. York and Rosa (2003) argue that these improvements were not sustainable. In their view, the ecological modernization theory must demonstrate that late stages of the modernizing processes would lead to the ecological transformation of production and consumption, but it did not account for the future. Another shortcoming of ecological modernization theory, they suggested, was that it was not absolutely proven that industries that had reduced their direct impact on the environment did not contribute indirectly to the expansion of negative impacts on the environment. Although producing biofuels may be seen as environmentally friendly, it requires enormous amounts of fossil fuels and fertilizers that pollute air and water. However, these consequences are often not

felt locally. The negative consequences of biofuels production end up being felt thousands of miles away – carried through water systems to the Gulf of Mexico.

According to Fisher and Freudenburg (2001), expectations of ecological modernization were believed to be different compared to earlier works on society. In their view, this theory explicitly described environmental improvements as being economically feasible. That is, entrepreneurial agents and economic/market dynamics were seen as playing leading roles in bringing about needed ecological changes. Furthermore, in the context of the expectation for continued economic development, ecological modernization depicted political actors as building new and different coalitions to make environmental protection politically feasible.

3.1.1 Ecological modernization and biofuels

Since the early 1980s, Joseph Huber has considered biofuels as technological environmental innovations (new products, processes, and practices that come with benign environmental effects). As many people had previously accepted biofuel as a positive eco-technical development, researchers embracing the ecological modernization perspective incorporated biofuel analyses in their theoretical studies (Huber 2008; Mol and Jänicke 2009; Mol 2010). In this sense, some considered the promotion of biofuel as evidence of ecological modernization itself (Hollerman, 2012). It seems only recently that environmental sociologists have begun again exploring the implications of biofuel developments and debating them in environmental sociological theory.

Among the first ones to reopen this topic was Arthur Mol, who analyzed the sustainability and vulnerability of biofuels from the perspective of a sociology of networks and flows. In his view biofuel developments in the 2000s should be understood in terms of the emergence of a global integrated biofuel network, where environmental sustainabilities are more easily adjusted than vulnerabilities for marginal and peripheral groups and countries (Mol 2007). Others have been concerned with comparative perspectives, including the ways in which globalization processes might catalyze ecological modernization processes in countries in the South (McMichael 2009, 2010).

Among the technological environmental innovations that exemplify ‘greening strategies’ Huber (2008) enumerated sustainable resource management, clean technologies, benign substitution of hazardous substances, bionics product design for environment, product

stewardship or extended producer responsibility, recycling, low emission processes, and add-on purification technology in emissions control and waste processing. In his view, it should be decided whether a technological innovation is at the same time an environmental one as well. In order to determine this, it has to be decided whether a new technology contributes to significantly increased eco-efficiency. Furthermore, he argues that the most important factors or actors are regulations by nation–state governments "aimed at stimulating and backing eco-innovative activities of pioneer companies, thus creating national lead markets" (Huber 2008:360).

The lynchpin of the ecological modernization theory argument therefore involves technological innovation. Constructing biorefineries to increase ethanol production in rural Kansas seems to fit this model. Corn based ethanol is touted as an environmentally friendly transportation fuel and an incremental replacement for U.S. dependency on foreign oil. However, research has pointed out that the energy input in biofuels production is larger than the output, making it is not as environmentally sound as it has been framed (Pimentel 2003; Pimentel and Patzek 2005). Biofuels production is just a temporary technological fix – created by industry – for our looming environmental and economic needs. Therefore, biofuels production framed as a solution might exacerbate the false sense of security that our consumer society has in regards to environmental problems.

Grain based ethanol or bioethanol is promoted in the United States as a renewable, largely domestic transportation fuel that helps reduce greenhouse gas emissions that also helps the agricultural sector. Meanwhile the ethanol industry is promoted as a new industry creating jobs in rural areas. Biofuel production presents a unique paradox in the fact that it is seen as economically and environmentally beneficial, but at the same time there is substantial contention among environmental scientists that bioethanol used as a vehicle fuel reduces emissions of harmful pollutants and greenhouse gases.

Biofuels development the last few years can be viewed through the ecological modernization perspective (Fisher and Freudenburg 2001; Huber 2008; Fast 2009; Horlings and Marsden 2011). Proponents of the bioethanol industry argue that bioethanol development will revitalize rural communities in the Midwest and will help reduce the nation's dependence on foreign fossil fuels while benefitting both farmers and the environment. From the beginning, as a whole, biofuels development has been regarded optimistically and as an easy and logical replacement for methyl tertiary-butyl ether (MTBE) as a transportation fuel oxygenizer. Biofuels

development has been framed as the "end all, cure all" – as it would simultaneously counter foreign dependency, be environmentally sound, and be very easy to accomplish. If this is the case, it is plausible that the growth machines have used these arguments and the media has picked up this framing of biofuel production that mimics ecological modernization discourse and is described as the "biofuels revolution".

3.2 Growth Machine Theory

In his 1976 seminal work, "The city as a growth machine: toward a political economy of place" Molotch argued that the political and economic essence of virtually any locality was growth. Moreover, the local elites who most vigorously promoted growth were those most likely to reap the benefits: local businesspeople, particularly property owners and investors in locally oriented financial institutions, lawyers, syndicators, and realtors (Molotch, 1976).

Furthermore, he contended, under many circumstances local growth represented a transfer of quality of life and wealth from the local public to a certain segment of the local elite. Therefore, this local elite must persuade the general population that growth was in the best interest of the municipality. This was induced by fostering "a pro-growth ideology that manifested itself in the form of a spirit of civic jingoism regarding the 'progress' of the locality" (Molotch 1976:315). The growth machine theory set forth that the local institution that had the primary responsibility for dispensing elite ideology was the newspaper, which benefited mainly from increased circulation and a greater volume of advertising. According to Rodgers (2009), local newspapers are suggested to be particularly central in instilling local ideologies, since they are often seen as casting various urban development projects as coincident with the wider good of the city or region, usually emphasizing urban pride and greatness.

Growth machine theory portrays the promotion and legitimation of the development of any community mainly on the claim that growth benefits everyone, and that growth is a collective good. This common interest in growth is one of the few issues that unites and politically mobilizes those in the upper echelons of the social hierarchy (Molotch 1976). The basic issues that Molotch's thesis addresses – growth, local economic development, and who promotes these – remain central to the politics of local governments.

The second theory that informs my study is that of the growth machine. There is an extensive body of literature on this sociological theory the majority of which focuses almost exclusively on urban expansion. A smaller body of work argues that the post-industrial urban context has changed so much that the concept has lost much of its power (Clark et al. 2002).

Rural industrial growth received a boost in the 1960s when addition to manufacturing and other non-farm jobs significantly increased close-to-home work opportunities for farm and other rural residents (Haren, 1970). A good part of these extra jobs stemmed from new plant locations or expansions in rural communities. Haren (1970) attributed these developments to the progress on the Interstate Highway System; improvements in processing, marketing, and transportation technologies; and increasing attractiveness of small cities and towns as places to work and live. These changes resulted in a significant broadening of industrial mix, as well as sharp rises in productivity, wage scales, and income for host communities.

Eisinger (1988) called this "the rise of the entrepreneurial state" as the trend toward industrial relocation to countries with cheaper labor continued. Stimulated by these changes, public-private partnerships between various levels of government and private economic development groups emerged. Such industrial development groups are at work today in many rural communities across Central Kansas seeking to attract new businesses into their communities by investing public funds in new roads and water systems.

Molotch (1993) reviewed the growth machine perspective in light of various critiques of urban political economy as being over-deterministic. He showed how growth machines were anchored in local systems of elite sociability, ideological conceptions, and local problem solving by "ignoring cultural issues, place diversity and environmental crises" (Molotch 1993:29). He regarded the growth machine argument as a version of urban political economy that incorporated human agency and culture, the physical earth, urban variability, and a politics of change. He argued that the single most useful concept to encapsulate these matters in the U.S. context was the growth machine:

"*the idea that nested interest groups with common stakes in development use the institutional fabric, including the political and cultural apparatus, to intensify land use and make money. Coalitions with interests in growth of a particular place (large property holders, some financial institutions, the local newspaper) turn government into a vehicle to pursue their material goals"* (Molotch 1993:31).

Furthermore, he argued, these "growth coalitions" had been hegemonic over localities as city governments with the resource base they provided to various interest groups, were in turn made into a growth machine.

By explicitly incorporating the concept of ideological hegemony into the logic of the growth machine hypothesis, Bridger and Harp (1991) provided a broader frame of reference to examine local growth promotion, i.e. the efforts of the local elite to sell growth to the residents of a community.

Local growth is usually seen as population growth and economic development is usually seen as being the main process that triggers it. However, the growth machine model is more than just economics. As Kulcsar and Domokos (2005:551) so elegantly formulate, the growth machine "describes a Gramscian hegemony in which the public administrative elite, the 'big entrepreneurs', the local media and even the leading intellectuals of a community are incorporated in the pro-growth coalition. In a social environment like this, the local elite monopolize community power and can set an exclusive and one-sided discourse to legitimate their pro-growth activities".

Logan and Molotch (1987) have argued at length that contrary to the tenets of growth machine theory and to popular wisdom (Molotch 1993), there is little evidence that growth eased unemployment, high housing costs, or insolvent city budgets. Similarly, Bridger and Harp (1991) highlighted two of the most important consequences of the activities of local growth coalitions. First, they argued, there were increases in growth-related expenditures for the localities while at the same time elites derived substantial profits through higher property values. Second, the claim that local growth reduced unemployment did not hold either as growth merely redistributed, but did not create jobs. Likewise, Trent and Stout-Wiegandt (1984) found that support for local industrial development was not a simple function of the benefits it had brought. Evidence on actual impacts showed that there were both winners and losers and that not all impacts could be seen as universally good for everyone. Their findings suggest that anticipated benefits of development and attitudes toward development itself may be more complex than previously conceptualized.

Cox (1999) distinguished between two kinds of growth ideologies. In his view, one linked growth to a positive symbol to which all residents could relate (e.g. a professional sports

team) while the other kind of ideology encouraged a geographically specific ‘‘us versus them’’ mentality, blaming outsiders for the costs of growth or the costs of decline.

When describing how growth coalitions act, Molotch (1993:34) believed that they fostered the idea, that not unlike development associations and chambers of commerce, “they were generic public betterment associations, rather than narrowly focused on private gain”.

Interest group models of local politics predict that local elected officials are more likely to cater to the preferences of those groups that are better able to deliver political resources (Lubell et al. 2009). Development interests have advantages in local politics because they receive concentrated benefits for pro-development policies and are better organized than diffuse public interests.

In their research on non-metropolitan places most likely to support or oppose proposals for locally undesirable land uses, Bohon and Humprey (2000) found that local areas with higher socioeconomic status tended to oppose the growth of more residential and industrial development, especially those involving heavy manufacturing or risky energy-generating facilities. Residents of communities with higher socioeconomic status favored protecting the use value of land or local environmental quality even though industrial development could increase the market or exchange value of land (Logan and Molotch 1987).

Studying the effects of growth machines in local areas, Humprey and Wilkinson (1993) tried to answer whether leaders in small towns and surrounding areas had actually influenced local economic and demographic growth. Their research did not provide a definitive answer to the question of whether these efforts produced any significant net growth similar to the local areas. However, as Logan (1976:351) pointed out, communities differ “in the kinds of growth they have experienced and are trying to attract, the policies they may manipulate to achieve their aims, and their competitive positions in relation to one another”.

One of the major tenets of contemporary American life is therefore that growth (social, economic, and cultural) is the essence of virtually any given locality, while its ideological prop is that growth creates jobs, thus benefits will be generated in the form of reduced unemployment, and increased tax revenues. Local elites (rentiers, banks, investors, politicians) are ardent promoters of growth and they achieve their goals most often through the local governments.

The mechanisms to promote growth are observable through the activity of local boosters and local jingoism. Politicians, members of the local government, the Chamber of Commerce,

the County and City Economic Development, as well as the local and regional newspapers are deeply engaged in attracting new investments to town. The local newspapers often portray themselves as "the voice of the community" to foster a pro-growth ideology among the citizenry. Growth is presented as an inevitable, virtually uncontrollable process and in the best interest of the community as a whole. This is why the possible negative effects of growth (social and environmental) are not (or very rarely) seriously questioned.

Decisions made by private corporations have major impacts on localities. Plant location decisions depend on labor costs, tax rates, and the costs of obtaining raw materials and transporting goods to markets. Therefore, local governments create and promote a "good business environment": favorable taxation, good labor relations, vocational training, but also decide where infrastructure development goes.

According to Moloch (1976) the local elites (local businesspersons, particularly property owners and investors in locally-oriented financial institutions, lawyers, syndicators, and realtors) who most vigorously promote growth are those most likely to reap the benefits. As growth often becomes a liability in terms of finances and quality of life for the majority of the local residents, local growth constitutes a transfer of quality of life and wealth from the local general population to a certain segment of the local elite. Furthermore, as usually absentee-owned firms control local growth, many of the benefits from development begin to flow outside the community.

The fact that residents from other communities often fill so many jobs in a community can have serious economic implications. If new jobs created through the actions of local government officials and boosters to enhance job growth for their residents are filled by those outside the jurisdiction, then the goal of local tax base growth and economic benefits are not entirely met.

The fact that the same publisher owns five of the eight analyzed newspapers might be a strong indication that the rural growth coalition's ideological hegemony promoting ethanol development in the region is maintained through their power in creating and disseminating information. In this light, the promotion of biofuels development in Kansas can be seen "as a tendency to equate progress with growth – business growth, industrial growth, population growth" (Bridger and Harp 1991:274). The local and regional newspaper articles that I have analyzed confirm the propositions set forth by the growth machine theorists, namely that growth

(in this case biofuels development) is presented as an inevitable process, divorced from the human actions that are the driving force behind it – essential for rural Kansas.

Molotch's discussion of boosterism becomes important when talking about biofuels production. He noted that boosterism "details change, in terms of available technologies, propaganda modes, financing methods, and type of industry being sought, but something special will have to happen, a historical switching will have to take place, if the growth machine system is to ever be overturned or wither away in the United States" (Molotch 1999:249-50). Local boosters and ardent proponents of biofuel development are plentiful in rural Kansas, and coalitions promoting the production of corn-based ethanol attract a wide array of members who have interest in this kind of growth.

The concept of growth machine as a tool that creates inequalities and distributes benefits in a very uneven fashion has grown out of the critical political economy school. It is generally considered as an inherently urban phenomenon (Kulcsar and Domokos 2005). This theory has been applied mostly to urban areas and large cities in particular, assuming that the possible economic benefits are much less significant in rural areas.

In the past less attention has been paid to smaller, non-metro communities where it is conceivable that different social and political dynamics operate. Consequently, there is an increasing need to understand attitudes toward development and factors affecting these attitudes, particularly in rural areas. The study presented here focuses on such communities in the hope of better specifying the applicable range of the growth machine hypothesis in the context of biofuels development in Central Kansas.

The growth machine theory pinpoints particularly powerful actors and organizations by highlighting their common motivation for urban growth. Although a plurality of interests exists, what binds them together is the common goal of promoting growth. The result is they become growth coalitions. The core of growth coalitions (or machines) are the place entrepreneurs (often collectively labeled as rentier class) together with others, such as property investors, developers, and financiers, connected by deriving rent from property. In Rodgers' (2009) view, these primary groups are typically closely associated with at least three other major affiliates: the local politicians, the local media, and the utilities.

Local politicians have significant influence on decisions related to land use. The local media, and particularly newspapers, are important because their preferences for growth are seen

as less particularistic than many other coalition members'. Newspapers are perceived as mediators, acting both publicly, by proclaiming what is good growth, and outside of the public eye through informal social relationships between the newspaper proprietor and coalition members. Newspapers are also considered to be crucial in promoting growth coalition objectives to wider urban publics (Rodgers 2009). The utilities (e.g. water or public transport agencies), similar to local media, are less particular about growth and often take on a mediating role (Logan & Molotch, 1987, Elkins 1995).

Winning the tacit support of a wider public is very important for growth coalitions. In order to carry this out they are said to de-emphasize the exchange value benefits of growth for narrower groups, and emphasize growth as an inherent collective good that will improve the lives of regular people (Rodgers 2009). Furthermore, Rodgers (2009:13) observes that "local newspapers are suggested to be especially significant in instilling local ideologies, since they are often seen as casting various urban development projects as coincident with the wider good of the city or region, usually emphasizing urban pride and greatness".

Similarly, Hindman (1996) considered local newspapers as integral components of the community that tend to reflect both the agenda and the tactics of the local power structure. In his view the local power structure in many communities is increasingly constrained by non-local forces, occasionally resulting in public disputes between local elites and non-local bureaucracies, both private and public. Therefore, he argues, accounts of disagreement between local officials and non-local bureaucrats are likely to appear on the pages of the local newspapers. Noting the tendency that American cities were becoming one-newspaper (metropolitan daily) towns (or one-newspaper-company towns), Molotch (1976) himself called the local municipal newspaper the most important example of a business that has its interest attached to the aggregate growth of the locality.

Newspaper reporters are important actors in promoting transformation. The study of Wilson and Mueller (2006) follows expositions on growth coalitions that recognize three key reasons for this. In their view, these actors are allied overwhelmingly with growth coalition designs due to a complex context of constraint, such as editor expectations and newspaper political alliances with businesses and growth organizations that structurally limit the possibility of deviating from this context. Local reporters are key constructors of reality and are widely trusted as chroniclers of local life and events. Thus, growth coalition designs are greatly reflected

in local newspaper reportage. The fact that three quarters of the community survey respondents indicated the local (which are in fact regional) newspapers as their primary source of information about the local ethanol plants and five of the eight analyzed newspapers are owned by the same publisher are suggestive in this sense.

The rural growth coalition's ideological hegemony promoting ethanol development in the region is maintained through their power of creating and disseminating information. In this context, the need for economic growth in rural communities could be interpreted as an emotional and creative construct, since people are driven to imagine shrinking communities in desperate need of wise intervention. Consequently, the discourse progressively becomes central to establishing the logic of transforming communities.

Many scientists recognize the growing challenge in communicating bioenergy, because it is too abstract and lacks clear 'images'. There is still a significant confusion and little understanding among the general population regarding the differences between biofuels for transport, namely first-, second- and third-generation biofuels. This perspective suggests that this may become a serious barrier, not only for biofuels used in transport, but also for the entire bioenergy industry (McCormick 2010).

The effects of media on the public are addressed widely in contemporary communication, public opinion, and political science literature as information dissemination, priming, agenda setting, and framing (Shanahan et al 2008). The construction and operation of ethanol plants in our case study communities receive an abundance of press coverage from local and regional newspapers, but the development of the ethanol industry in the area is also well publicized in national media outlets.

News media has a significant role in shaping public attitudes and policy agendas regarding a multitude of social and environmental issues. Biofuels development in the U.S. Midwest has long been covered and contested in the national and regional newspapers. The majority of existing studies focuses on national news media and does not empirically investigate how local and regional newspapers report and portray biofuels development at regional and local levels (Wright and Reid 2010). Wright and Reid (2010) identify and analyze the media's portrayal of the recent movement to increase biofuel investment and development in the United States using a dataset comprised of *New York Times* articles. They found that media constructed three distinct frames in their efforts to shape public discourse: economic development,

environment, and national security positioned within a larger political and economic context to gain public legitimacy.

Within this context, the present study examines the manifestations of the "growth machine" in rural settings. The research focuses on the ways local boosters promote the establishment of ethanol plants in their communities, including the discourse around development in the regional print media and the perceptions of the community members regarding the benefits of local ethanol production. The link between rural growth machine activities and ethanol development is studied through the discourse on ethanol development promoted in articles of one state level newspaper and seven regional newspapers covering ethanol development in the four case study communities. In-depth individual interviews with local stakeholders and community survey data are also drawn on to interpret the results.

Chapter 4 - Case Study Communities and Research Methods

This chapter explains the steps and procedures used for selecting case study communities and sample selection, instrument development and measurement, data collection procedures, and data analysis. In order the uncover the ways members of local growth coalitions promote the establishment of ethanol plants in the case study communities, a qualitative research method has was applied involving content analysis of eight newspapers while interview and survey data were also drawn on to corroborate the findings.

4.1 Case Study Community Selection

Case study community selection and the interview and community survey questions were predetermined by the project "*Socioeconomic Impacts of the Biofuels Revolution*" at Kansas State University[3]. Case-study communities for the grant project were selected from non-metropolitan counties based on a combination of criteria. Six rural communities with ethanol plants – four in Kansas and two Iowa – were selected for the "*Socioeconomic Impacts of the Biofuels Revolution*" grant project in order to gain variation in terms of date of plant establishment, plant size, type of feedstock used, location, water availability/constraints and ownership structure (Selfa 2010, Selfa et al. 2011).

For the present study, I used the four communities with ethanol plants in Kansas (Table 4.1). These communities were selected for the project because they met one or more of these five criteria:

1. the local ethanol plants was either in the planning or operating stage;
2. the community opposed the ethanol plant at some point;
3. the community faced water scarcity issues;
4. the case study had to involved locally owned refinery;
5. the case study involved a smaller size refinery.

[3] The project was funded by the U.S. Department of Energy ELSI "*The Biofuels Revolution: Understanding the Social, Cultural, and Economic Impacts of Biofuels Development on Rural Communities*" grant. As a Graduate Research Assistant on this project, I participated in the development, administration, and data analysis of these surveys, as well as in the fieldwork related to the in-depth individual and focus group interviews. I also conducted additional and follow-up telephone interviews with key informants in each community.

The four case study communities thus were Russell, Phillipsburg, Liberal, and Garnett (Table 4.1). Russell was the first community to host an ethanol plant since 2001. By industry standards the biorefinery in Liberal is considered large size, the other three are considered mid-size. All four ethanol plants can use both corn and milo as feedstock. The ownership of the biorefineries in Phillipsburg and Garnett is considered local, the other two are owned by diverse non-local entities.

Table 4.1 Characteristics of ethanol plants in the case study communities

Location	**Russell**	**Phillipsburg**	**Liberal**	**Garnett**
Name of plant	(U.S. Energy Partners) White Energy	Prairie Horizion Agri-Energy	Arkalon Energy	East Kansas Agri-Energy
Online since	2001	2006	2007	2005
Size (MGY)	48	40	110	42
Ownership	Non-local	Local	Non-local	Local
Feedstock	Corn/milo/ wheat starch	Corn/milo	Corn/milo	Corn
Community opposition	No	No	Yes	No
Local water scarcity	Yes	Yes	No	No

The construction of ethanol plants in the four case study communities was generally well received. There was a somewhat weak and unorganized opposition against the siting of the biorefinery in Liberal where a few residents of a nearby hamlet were worried about the increased truck traffic and possible decreased water levels in their wells. Both Russell and Phillipsburg faced water scarcities in 2003 and 2006 during prolonged drought seasons.

4.1.1 Socio-Economic and Demographic Profile of the Case Study Communities

All four case study communities are county seats: Russell for Russell County, Phillipsburg for Phillips County, Liberal for Seward County, and Garnett for Anderson County. The ethanol plants in these communities receive feed-grain from farmers operating in a 60 to 100 miles radius around the plant. A socio-economic and demographic description of the counties surrounding the host communities helps us to better understand the economic impacts of

biorefineries since the multiplying effects of the money generated by the ethanol plants exceed the boundaries of host communities (Euken 2006; Swenson and Eathington 2006).

Data for the demographic and socio-economic profile of the four case study communities came from a variety of sources. Many of the demographic and socioeconomic variables were taken from the U.S. Census of the Population (1970–2010) and the Kansas Historical Society's Kansas Counties database (1900–2010). Data on employment and wages originate from the Kansas County Historical Database, the U.S. Census of the Population, County Business Patterns data (1998–2004), from the U.S. Census Bureau, Economic Research data of the Federal Reserve Bank of St. Louis, and Regional Economic Information System data (1969–2004) from the Bureau of Economic Analysis. Data on agriculture came from the US Census of Agriculture (1987–2007) and the Bureau of Labor Statistics provided the Consumer Price Index (1969–2004).

The majority of the data in this study refer to the county surrounding each case study community for several reasons. First, data on small communities is sparse and/or incomplete due to confidentiality problems associated with small size. Second, these towns make up a large portion of the population of their surrounding county. Third, these four communities and their surrounding counties are very similar on the measures that are available for the cities and counties.

In terms of microclimate and annual precipitation, Phillips, Russell, and Seward counties are similar in the sense that the amount of rain is inadequate for intensive agriculture. The first two counties in west Central Kansas sit on the eastern fringe of the High Plains Aquifer (Ogallala) on a shallow and constantly diminishing groundwater source, while Seward County in the southwest part of the state rests over several decades' worth of exploitable aquifer water. Anderson County is located in the east central part of Kansas and receives adequate of precipitation to sustain agriculture without irrigation.

Non-metro counties in Kansas have been experiencing population decline for at least half a century (Table 4.2). Russell, Phillips, and Anderson counties followed this trend and they have more aged people than the United States proportionally, or compared to the Kansas average. In contrast to many communities in western Kansas, the city populations of Liberal and the population of Seward County both have been growing and have much younger populations on

average than other rural areas in Kansas. The most likely cause of this trend is the immigration generated by the meatpacking industry that settled in that county (US Census Data 2013).

Table 4.2 City and county population change 2000-2010

City/County	Russell/ Russell	Phillipsburg/ Phillips	Liberal/ Seward	Garnett/ Anderson
Population*	4506/6,970	2581/5,642	20525/22,952	3415/8,102
Population change 2000-2010 %	-4.0/-5.4	-3.4/-6.0	4.2/2.0	1.4/0.1
Population 65 years and over* (%)	22.6/22.8	27.8/22.0	8.3/8.1	22.1/20.0
Individuals below poverty level* (%)	17.8/15.0	9.6/10.4	18.2/17.3	21.8/12.4
Average annual temperature (F)	54	52.3	55.8	56.5
Average annual precipitation (In)**	23.4	26.3	19.8	40

Sources: *2010 U.S. Census, ** U.S Climate Data http://www.usclimatedata.com

Farming, retail trade, manufacturing, and government jobs dominate in all four counties. There are greater proportion of full-time farmers in Russell, Phillips, and Anderson counties than in Kansas or in the United States as a whole, but in Steward County this number is lower. Farming in Russell and Phillips counties is based on mostly non-irrigated sorghum and wheat cultivation as well as ranching, while the agricultural economy of Seward County is driven by irrigated corn production as well as livestock and the meat packing industry. Top crop items in Anderson County are non-irrigated soybeans, forage (hay), as well as corn, sorghum, and wheat for grain.

The value of average farm agricultural sales in Russell, Phillips, and Anderson counties is lower and farms have a lower total value of land, buildings, and machinery than the average

farms in Kansas. Farms in Seward County bring a bigger net return than the average in Kansas, which is most likely because the amount of irrigated land greatly exceeds the Kansas average.

Table 4.3 Socio-economic features of the case study communities

County	Russell	Phillips	Seward	Anderson
Pop. growth 1950-2010 (%)	-44	-64	54	-6
Pop. at or above age 65 in 2010 (%)	23	21	16	20
Bachelor's degree or higher 2010 (%)	20	17	13.5	16
Rates of poverty 2006-2010 (%)	17	10	17	12
Median household income 2006-10 ($)	36,135	44,381	43,259	39,130
Unemployment rates 2000-2011 (%)	3-4	2-5	2	7
Number of farms in steady decline	yes	yes	no	no

Sources: U.S. Census State and County QuickFacts and U.S. Department of Labor Bureau of Labor Statistics

The percentage of population older than 65 in all four counties was much higher in 2010 than the average of 13.7 percent in both Kansas and the United States, while the percentage of people older than 25 with bachelor's degree or higher was substantially lower than the 29.7 percent in Kansas and 28.2 percent in the United States, respectively. The median household income was lower in all four counties than the state average of $50,594 and the national average of $52,762. However, unemployment rates between 2000-2011 in three of the counties surrounding ethanol plants were lower than both the state (5.4%) and national rates (6.2%).

4.1.1.1 Russell County and the City of Russell

Russell, located in west Central Kansas, is the county seat and largest community of Russell County. The story of Russell's ethanol plant is quite interesting as its project materialized at a time of extreme economic hardship for the community: the explosion of the municipal power plant and the loss of almost 200 manufacturing jobs. Built in 2001, U.S. Energy Partners (White Energy since 2006) was the first modern ethanol refinery developed by ICM, a

Colwich, KS based company that has constructed over half the ethanol plants in North America since then (USDA 2011).

The number of farms in Russell County seems to be in relative steady decline. On average, Russell County had larger farms in 2002 (885 acres) compared to the average farm size in both Kansas (730 acres) and in the United States (450 acres). However, it had fewer valuable farms (about $400 thousand, measured by land, buildings, and machinery) than either Kansas ($600 thousand) or the United States ($604 thousand). Russell County had a greater proportion of farm operators whose main occupation was non-farming (39%) compared to Kansas (37%) but lower than the national level (43%). Many Russell County farm operators increasingly engage in off-farm work and for a smaller proportion farming is not their main occupation.

4.1.1.2 Phillips County and the City of Phillipsburg

Phillipsburg, the county seat of Phillips County, is located at the intersection of U.S. Highway 36 and U.S. Highway 183. The establishment of the *Prairie Horizon Agri-Energy,* LLC ethanol facility in Phillipsburg in 2006 was possible mostly through the local farmers' financial investments and commitment to the cause, although non-local entities had also invested in the plant. The prospect of an ethanol plant was greeted with enthusiasm in the town and the relationship between the ethanol facility and community members has remained very hearty through the years.

The number of farms in Phillips County seems to be in a relatively steady decline in the last 50 years. On average, Phillips County had larger farms in 2002 (1100 acres) than either Kansas (730 acres) or the United States (450 acres), Phillips County had less valuable farms ($630 thousand, measured by land, buildings, and machinery) than Kansas. However, starting with the 1992 Agricultural Census, farms in the county were more valuable than the average U.S. farm. While off-farm work is a part of the lives of many Phillips County farm operators, there seems to be a greater proportion of full-time farmers than in the county than in Kansas or in the United States as a whole. There is an increasing trend in Phillips County for farm operators to have a main occupation other than farming; however, the percentage is lower than that of Kansas and higher than that of the nation. Further, the proportion of farm operators who work more than 200 days off-farm per year in Phillips County seems to be growing (33%), but is lower than that of Kansas (41%) but higher than the national average (31%) in 2002.

4.1.1.3 Seward County and the City of Liberal

Liberal is the county seat of Seward County, KS (population 20,525, U.S. Census 2010), and it is located at the crossroads of U.S. Highway 54 and U.S. Highway 83, three miles from the Oklahoma state line, 40 miles from Texas, 60 miles from Colorado, and 130 miles from New Mexico. It was named for the early day settlers who were "liberal" with the scarce supply of water. The 2010 Census showed that 58.7 percent of the population was of Hispanic or Latino origin.

Liberal has experienced steady economic and demographic growth for the last two decades; it also projects greater expansion in the future. In terms of economic opportunities and investments, Liberal has to offer expanding and relocating business companies a hardworking labor force. Due to their heavy agricultural and petroleum ties, there is an abundance of unskilled and semi-skilled labor and a significant number of skilled workers with different educational and technical backgrounds, large tracts of affordable land, enterprise zone incentives, and a pro-business environment. Most part of Seward Country lies above 287 feet of aquifer water that moves in from the west and north, thus Liberal's farmers produce high quantities of wheat, corn, and sorghum on their irrigated lands.

Beef packing is the region's largest industry; there are six major cattle slaughter plants in the surrounding 100-mile area (processing more than 25,000 head of cattle per day). Several major petroleum firms maintain offices and facilities in and around Liberal. Besides these two large businesses, there is the National Helium, Inc. the world's largest helium extraction plant.

Efforts of the local and county governments to bring economic growth and vitality to Liberal focused on adding value to their grain and investing locally. These efforts materialized in The Arkalon Conestoga plant, being built about eight miles East of Liberal near Hayne. This 110 MGY ethanol refinery started production in December 2007. Locating the ethanol plant in this community was possible through the will of the Liberal Ethanol Steering Committee, in unifying ranchers, farmers, bankers, businessmen and others from Seward County.

Seward County has approximately two-thirds the number of farmers as the state average; however, farming here brings a bigger net return than the average in Kansas. Farming in Seward County 2002 in (3.9%) remained close to the Kansas average (4.4%) and well above the US average (1.8%). In terms of total cropland acres, total harvested cropland, government payments,

and the aggregate net income of all operations the county's average was similar to that of other counties in the state. However, Seward County showed higher numbers on irrigated acres, sales figures, expenses per operation, as well as higher net income per operation.

There were far fewer operators working off farm than in Kansas or the national average, fewer operators said their primary job was not farming, while the number of operators in the county with 200 or more days worked off farm was much greater.

4.1.1.4 Anderson County and the City of Garnett

Garnett, population 3,415 (2010 Census), is the county seat of Anderson County and is located less than an hour southwest of Kansas City on U.S. Highway 169 in east Central Kansas. After years of careful planning the East Kansas Agri-Energy, LLC ethanol plant started to produce in 2005 thanks to the enthusiasm of the local farmers, their commitment to the cause, and willingness to invest. The Garnett community welcomed the ethanol plant in and the good relationship between the biorefinery and the community has continued to persist.

The number of farms in Anderson County seems to be in relative steady decline with slight increases in 1997 and 2007. On average, Anderson County had smaller (585 acres) and less valuable farms ($500 thousand, measured by land, buildings, and machinery) than Kansas but larger than the United States on average. While farmers in Anderson County seem to harvest a higher percentage of their cropland than either Kansas or the United States, their average farm agricultural sales was about 55 percent less than the value of average sales in the state ($130 thousand) and 35 percent less that of the nation ($90 thousand). Although many farm operators had off-farm work, there seems to be a greater proportion of full-time farmers in Anderson County than in Kansas or in the United States as a whole. The proportion of farm operators who work more than 200 days off-farm per year in Anderson County has a growing tendency (44 days), but was close to that of Kansas and the United States as a whole (40 days).

4.2 Research Methods and Data

The main method employed in this research was the content analysis of the articles of one state level and seven regional newspapers. In-depth individual interviews with local stakeholders and community survey data are used to interpret the results.

4.2.1 Newspaper Article Content Analysis

The growth machine theory emphasizes the importance of various media outlets, and particularly that of local and regional newspapers in promoting growth coalition objectives to wider publics (Molotch 1976, 1993). Newspapers are perceived as mediator, acting openly, by enunciating on what is good growth, and outside of the public eye, through informal social relationships between the owners of newspapers and the growth coalition members (Rodgers 2009).

The role of newspapers in reporting and portraying public issues as well as shaping national public opinions and policy agendas has been widely recognized and documented in media agenda setting studies (Liu 2008). One the one hand, newspapers are able to sway the relative salience of a particular pubic issue through repeated news coverage over time (for example Roberts et al. (2002) on agenda setting and issue salience online or Soroka (2003), on media, public opinion, and foreign policy). On the other hand, they can influence how the public and policy makers think about a particular public issue by portraying it in different ways (for example Kiousis (2004), addressing media salience as a multi-dimensional construct).

Issues at the intersection of science and politics, such as climate change, embryonic stem cell research, nanotechnology as well as biofuels receive considerable public interest (Binder et al 2011). The public is rarely well-enough informed or sufficiently motivated to weigh competing ideas and arguments. Faced with a daily torrent of news, people use their value predispositions (such as political or religious beliefs) as perceptual screens, selecting news outlets and web sites whose outlooks match their own. Such screening reduces an individual's choices of what to pay attention to and accept as valid (Nisbet and Mooney 2007 p. 56).

News media has a significant role in shaping public attitudes and policy agendas regarding a multitude of social and environmental issues. Biofuels development in the Midwest has long been covered and contested in the national and regional newspapers. Most existing studies focus on national news media and do not empirically investigate how biofuels development is reported and portrayed at regional and local level by respective newspapers (Wright and Reid 2010). Wright and Reid identify and analyze the media's portrayal of the recent movement to increase U.S. biofuels' investment and development using a dataset comprised of *New York Times* articles. They found that media constructed three distinct frames

in their efforts to shape public discourse: economic development, environment, and national security positioned within a larger political and economic context to gain public legitimacy.

The construction and operation of ethanol plants in the four case study communities has received an abundance of press coverage from local and regional newspapers, but the development of the ethanol industry in the area also is well publicized in the national media outlets.

In this study I have employed the framing analysis method (Entman, 1993, Tankard 2003) to uncover the themes and messages advocates, i.e. representatives of local administration, the ethanol industry, diverse lobby groups, and politicians employed to promote the biofuels development in the media of the region.

Media framing is the analysis of the journalistic message in different media. In this case it is the analysis of newspaper articles by describing how the selection and importance of particular words, phrases, or ideas contribute to shape public perception (Entman, 1993).

Drawing from Goffman (1974), framing analysis defines frames as basic cognitive structures that guide the perception and representation of reality. In his view, they "locate, perceive, identify, and label" knowledge pertaining to the social world (Goffman 1974:21).

Frames provide a consistent framework for analyzing messages. Tankard (2003) sees the media frame as a "central idea" that organizes the message and gives the audience an orientation in terms of relevance, importance, news value, and context. In his research on how newspapers frame the stem cell research debate, Reis (2008) emphasizes the importance of the mass media coverage of scientific issues. In his view, media is the sole provider of information about science and technology for a very large segment of the population, since most people do not have direct contact with researchers, scientific journals, and data to help shape their perceptions of scientific issues.

Framing public opinion has been conceptualized as a collective and social process, in which meanings are constructed actively through public debate, and in which ordinary citizens make use of media discourse, personal experience, and "folk wisdom" in negotiating meaning (Price et al. 2005 p. 180). Media audiences are active in interpreting and discussing public events, but they rely on the mass media to provide common frames of reference that guide interpretation and discussion (Gamson and Modigliani 1989, Price et al. 2005). One of the main functions of the mass media is to construct or interpret social realities through framing

(Scheufele, 1999; McQuail, 2005). In Scheufele's (1999) view, the way the media present or frame topics can influence audiences' perceptions of issues and the importance they give to them. Gamson and Modigliani (1989) posit that certain media packages are more popular due to the fact that their ideas and languages echo with culture-related topics. This resonance increases the appeal of certain news packages, making them look natural and familiar. In a similar sense biofuels development constitutes an important issue in the agenda of regional newspapers in an area where grain farming is very important. Rural communities closely related to agriculture in Central Kansas are tied logically to the ethanol development efforts.

Scheufele (1999) suggests that people develop in their minds what he calls "audience frames" or cognitive schemas about different topics and issues through exposure to media frames. In this sense, the way through which the public understands news is a function of the frames they receive from the mass media. Thus, framing theory focuses on how people understand issues instead of merely asking what topics people learn about from the media. Having this in mind, framing theory offers this study an appropriate framework to analyze how regional newspapers framed biofuels as an issue and how audiences understood this topic based on the newspaper reports.

Little information is available regarding how people in these communities receive and process biofuels development-related information or how they apply this information to their local and regional level needs and issues. Analyzing one state-level and seven regional newspapers will allow us to explore how the local relevance of biofuels development-related issues have been framed and brought to the local community members and policy makers.

My second research question: *How do local and regional newspapers positively influence the public perception of biofuels development in small rural communities*? Data used to investigate this research question consists of 343 news accounts covering biofuels development in a state-level and several regional newspapers between January 1, 2001 and December 31, 2009. The term "regional" is used here to indicate a limited geographical area that includes most of the readership of the analyzed newspapers and where biofuels development might have quite similar, but in many ways peculiar effects.

The unit of analysis for the content analysis of this study is the news article. I used five specific words to search for news items from the analyzed newspapers on the development of biofuels in different databases. These key terms, *ethanol, biofuels, renewable energy, growth,*

and *economic development* were chosen in my article search because previous studies of news coverage on the issue of biofuels development (e.g. Wright and Reid 2010) used similar key terms (*ethanol*, *biofuels*, and *renewable fuels*) to collect news articles from *The New York Times*. The use of similar terms makes it easier to compare our work with other works in this area.

For each case study community, articles were collected beginning one year prior to the opening of the ethanol refinery in each community. News accounts related to ethanol development in Russell and Phillipsburg have been collected from regional papers including *The Hays Daily News (HDN)* and *The Salina Journal (TSJ*). *The Southwest Daily Times (SDT), The Hutchinson News (THN)* and *The Garden City Telegraph (GCT)* have been searched for content related to ethanol production in Liberal, while data for Garnett have come from *The Anderson County Review (ACR),* and *The Ottawa Herald (TOH)*. *The Topeka Capitol Journal (TCJ),* printed in the capital city of Kansas, provided content on state level opinions regarding ethanol production.

Five of the analyzed regional newspapers, *The Hays Daily News, The Salina Journal, The Hutchinson News, The Garden City Telegraph,* and *The Ottawa Herald* have the same publisher; the *Anderson County Review* is an independent weekly newspaper.

The regional newspapers have a combined circulation of more than 100,000 copies and cover virtually all counties in west and south Central Kansas, while the Capitol Journal's 35,400 copies are distributed throughout the entire state. *The Hays Daily News* and *The Salina Journal* articles analyzed for this study were obtained through NewsBank, an online database that provides access to current and archived content from more than 2,000 newspapers, newswires, transcripts, business journals, periodicals, and government documents. Relevant articles from *The Southwest Daily Times, The Garden City Telegram,* and *The Hutchinson News* were collected through *NewspaperArchive*, an online database of digitized newspapers. Data from *The Topeka Journal* and *The Ottawa Herald* were collected directly from the newspapers' online archives. *The Anderson County Review* does not have online archives; however, thanks to the generosity of the editor and publisher of the newspaper who provided a CD containing all their published articles in the last decade, I was able to find the useful hits for my analysis.

I initiated the article coding and data analysis following Altheide's (1996) instructions on qualitative analysis. When selecting the articles, my intent was to identify what claims were

being made about biofuels development; who was making the claims; and on what basis biofuels development in the region was being encouraged or opposed.

Once I collected the relevant newspaper articles, I started looking for words and phrases often used by the representatives of various biofuels lobby groups (such as the Renewable Fuels Association, the American Coalition for Ethanol, and the National Corn Growers Association) to promote biofuels development. I used as a guide the work of Wright and Reid (2010) work on media's portrayal of the recent movement to increase biofuels investment and development in the United States. Their analysis revealed that the national media constructed and packaged three diagnostic frames: *economic development, environment, and national security*. I created an extensive list of claims made about biofuels development in the region. These claims were quite diverse stretching from "*it's a modern day gold rush*", "*the sound of money*", "*blessing for many farmers*", "*hope for rural communities*", to "*it is better for our environment*", "*it contributes to a cleaner environment and helps ease our energy dependence*" or "*it improves our national security*" to "*it's the future!"*

The analyzed regional newspapers as well as the state newspaper – either separately or often combined – constructed and utilized the same three main analytical frames related to economic development, national security, and environmental dimensions of biofuels development to shape public discourse.

After I identified these main frames, I searched for sub-frames within each category (Table 4.4). For example, within the economic development frame the ethanol plant was presented as a source of local job and wealth creation, as a tool for revitalizing small rural communities and family farms or as a win-win situation for everybody in the communities with biorefineries. Similarly, inside the environmental frame, several unifying ideas were found. For example: the purported carbon footprint reducing benefit or the minimization of the possible negative effects of the local biorefinery. Initially, a broad list of claims made about the environmental benefits of biofuels development emerged. This ranged from the health benefits of ethanol as a replacement of the carcinogen methyl tertiary butyl ether (MTBE) in gasoline, to the harmless vapors leaving the tailpipe of cars after a cleaner burning, to the carbon recycling due to the renewable plant materials used in the production of biofuels.

In order to determine the frames applied to present the story in each newspaper article, I sought to find the specific viewpoint that was used to present the story, as well as ideas often

mentioned in the story and the content theme that can be conceptualized from the story. Following Krippendorff's (2013) content analysis methodology, I developed the codebook then I organized the articles by eight variables such as year, quarter, length, origin, and type of article; actors promoted in the article; the tone of the article; and the benefits the local ethanol plant was purported to bring for the community. Where needed, the variable was coded as a dichotomous dummy variable.

Each article was coded for tone (an ordinal variable with three levels). When defining or identifying coding units varied from a word or two (in the case of identifying article type) to the article as a whole (for article tone) context units were checked. For example, coding for article tone was based on a scale with three measurements: -1, 0, and +1. Points on the scale were defined as -1 for negative or unfavorable tone (if the content of the story was unequivocally critical of biofuels development), 0 for balanced or neutral tone (no obvious leanings), and +1 for positive or favorable tone (touted the benefits of biofuels development).

In order to minimize criteria confusion, coding units for which there were multiple, mutually exclusive categories (for example article type, or article tone) were limited to a few categories.

Table 4.4 Media frames and sub-frames

The economic development frame	The environmental frame	The energy independence/national security frame
• biofuels development as a source of local job and wealth creation • biofuels development as creator of new markets for the grain farmers • biofuels development as a tool for revitalizing small rural communities and family farms • biofuels development as a tool to slow down depopulation • biofuels production as a way to play a central role on the renewable energy stage • biofuels development as generator of local community pride • biofuels development as a win-win situation for everyone in the community	• biofuels development as carbon footprint reducer • minimization of the possible negative effects of the local biorefinery • the non-issue of the use of diminishing groundwater for irrigation and ethanol production	• biofuels development as elevator of the national and international importance of the region • biofuels development as provider of national and international importance of the region

4.2.2 In-depth Individual Interviews and Focus Groups

Qualitative research methods were used to examine the existence and influence of the growth machine in rural setting, specifically if and how elements of these initiatives contribute to the establishment of ethanol plants in our case study communities.

To substantiate the findings from the content analysis of the newspaper articles, I drew on the focus group and in-depth individual interviews that were conducted in the four Kansas cases study communities between 2008 and 2010. These interviews were part of the larger project – "*Socioeconomic Impacts of the Biofuels Revolution*" – that utilized both quantitative and qualitative methods to investigate the benefits and burdens of the growth of the ethanol industry in six communities in Iowa and Kansas (Selfa 2010; Selfa et al. 2011; Bain et al. 2012).

Between September 2012 and November 2012, I conducted follow-up telephone interviews with five key informants from the large project. These follow up interviews provided substantiating data and allowed snowball sampling to identify additional interview subjects. Key informant interviews were as follows: one in Russell, two in Phillipsburg, one in Liberal, and one in Garnett. At the end of each interview I asked the interviewees for the name of people knowledgeable about the ethanol development in their community. This way I was able to conduct seven additional interviews with new key informants. I talked with a grain farmer and an ethanol businessperson from Russell; a member of the local government and an early investor in the ethanol plant from Phillipsburg; a member of the local government and an investor in the local ethanol plant from Liberal; and one representative of the ethanol plant from Garnett.

The most widely accepted definition of key informants is "those research subjects in ethnographic studies who have a disproportionate weight and role in the conduct and outcome of the research" (Bloor and Wood, 2006:109). According to Bloor and Wood (2006), these informants may be considered 'key' because they facilitate access through sponsorship or through the extensiveness of their social networks. Key informants act as gatekeepers, particularly in the early stages of the research. Further on, they may provide particularly important understandings to the researcher "on aspects of their collectivity, perhaps because they have a particularly rich knowledge of the collectivity through their seniority or through their specialist roles in the setting" (Bloor and Wood, 2006:110).

Participants for this study were drawn from rural municipalities that had successfully attracted and established ethanol refineries into their community. The key informants came from

stakeholder groups that held a vested interest of some type in the establishment and operation of the ethanol plant in each case study community. Focus group interviews were conducted with local grain farmers, ethanol plant workers, and other stakeholders, in order to gain understanding of the nature of their interest and their perspectives on the costs and benefits of ethanol development. In-depth interviews were conducted with representatives of local economic development organizations, community leaders, members of local administration, local business owners, investors, and other participants in the ethanol supply chain. These interviews provided a deeper understanding of how different community stakeholders perceived the social, economic, and environmental benefits and costs of ethanol plants in their communities.

One of the first steps of our research involved visiting the websites of city and county governments, local and county economic development and chamber of commerce offices, school districts, as well as ethanol plants in our case study communities and contacting them through e-mails or phone calls to inform them about our research and requesting their consent for research participation. Extension agents at Kansas State University also were asked to locate "gatekeepers" and guides to facilitate introduction and access to local and area farmers. Community members were made aware of the research through Kansas State University extension office newsletters, and passing the information from person to person by verbal communication. To determine the number to interviews to be conducted we applied the criterion of theoretical saturation, defined by Glaser and Strauss (1967) as a process in which the research continued to sample relevant cases until no new insights were obtained from the data. During our interviews I noticed that typically the name of the same 10-12 names appeared when we were looking for references about "knowledgeable persons" in each community.

Occasionally our key informants were asked to respond to early analyses, and in some instances, they were asked to take on the role of a co-researcher informally, as we were looking for other community members who could elucidate the best elements of growth machine at work while establishing the ethanol plants in these communities. For example, the city clerk in one town and a member of a county commission in another community explained how personal interests might have contributed to the establishment of the ethanol plant in their community. They also provided the interviewer with additional pieces of information and documents regarding community incentives given to comply with the demands of the local ethanol plants.

In contrast with the structured (quantitative) interviews that have a semi-formal character and are often conducted in surveys using a standardized interview schedule, the semi-structured or in-depth (qualitative) interviews are a more informal and have conversational character, being shaped partly by the interviewer's pre-existing topic guide and partly by concerns that are emergent in the interview (Bloor and Wood 2006). The semi-structured interview also can be seen as a basic human interaction, in which both the researcher and the researched construct a framework of mutual interdependences and interactions. Qualitative researchers are generally more inclined to impose less structure on their interviews and thus opt for a semi-structured open-ended interview. "*Most qualitative researchers think of in-depth interviews as an opportunity to allow the words of the respondent, and his or her experiences to shine through*" (Nagy Hesse-Bieber and Leavy 2011:102).

Semi-structured interviews rely on a certain set of questions and try to guide the conversation to remain more loosely on those questions. Semi-structured interviews also allow individual respondents some latitude and freedom to talk about what is of interest and importance to them. While the researcher does try to ask each respondent a certain set of questions, he or she also allows the conversation to flow more naturally, making room for the conversation to go into unexpected directions. Interviewees often have information or knowledge that the researcher may not have thought of in advance by the researcher. When such knowledge emerges, a researcher using a semi-structured design is likely to allow the conversation to develop, exploring new topics that are relevant to the interviewee (Nagy Hesse-Biber and Leavy 2011).

Any time I felt that the answer to a question had been too strong, too simple, or too broad (Rubin and Rubin 2005) or the interviewee was addressing a particular theme that was important for the research, I asked follow-up questions. Follow-up questions were also asked when the researcher felt that an event or explanation had been intentionally omitted or mentioned in an unclear way or needed further clarification (Rubin and Rubin 2005). In our interviews, we were constantly striving to fill in key blanks, and not to leave ideas incomplete, unexplained, or important threads unexplored.

Similarly, at the end of each interview, respondents were asked whether they wanted to add any questions or comments to the interview.

To prevent possible harms to the reputation and social standing of the respondents, confidentiality was maintained for all interviews. During the short debriefing procedure, interviewees were told that their names would never be identified or connected in any way with the information they provide.

All interviews were digitally recorded and transcribed. In order to help identify the themes that would be instrumental in analyzing the data, I reviewed my field notes and listened to the recordings after each interview trip. The table below contains the number of interviews conducted by the location and employment field of the respondents:

Table 4.5 Number of interviews by community

	Russell	Phillipsburg	Liberal	Garnett	Total
Local government	5	4	4	2	15
City or county econ. dev.	1	2	2	2	7
School district	1	1	2	1	5
Ethanol plant rep.	1	3	1	3	8
Investor	1	2	1	2	6
Total	9	12	10	10	41
Farmers (group)	7	10	8	6	31
Stakeholders (group)	6	8	7	6	27
Total	13	18	15	12	58

Interview transcripts were analyzed employing a grounded theory approach (Corbin and Strauss 1990; Chamaz and Belgrave 2003) for differences and similarities; they were also sorted into topical categories and coded for common themes. The procedures of grounded theory are designed to develop a "well-integrated set of concepts that provide a thorough theoretical explanation of social phenomena under study" (Corbin and Strauss 1990:5). According to the grounded theory approach to interviews, actors have the means of controlling their destinies by their responses to conditions. They are able to make choices according to their perceptions, which are often accurate, about the options they encounter.

According to Chamaz and Belgrave (2003) grounded theory coding is at least a two-step process. First, the initial or open coding forces the researcher to begin making analytic decisions about the data. Then selective or focused coding follows, in which the researcher uses the most

frequently appearing initial codes to sort, synthesize, and conceptualize large amounts of data. Grounded theory thus encourages researchers to be reflexive about the constructions including preconceptions and assumptions that inform their inquiry.

I used colored highlights to differentiate the major themes suggested by the research design at the outset, as well as those that emerged from field notes and initial interview analysis. These major themes I identified include: initial planning stages of the ethanol plant, groups and people involved in the initial planning, tax abatements and other incentives given to the ethanol plant, infrastructure works executed by the local government to facilitate the establishment of the ethanol plant, economic impact of the ethanol plant on the community, and the acceptance of the ethanol plant by the community.

Next, I used these themes to sort out specific quotes, and general ideas in a word processing program. I also coded the interviews according to participants' answers to certain specific interview questions. I made a list of every answer, and then grouped answers that conveyed what I judged to be similar sentiments.

This way I compiled a list of all significantly distinct answers with notations about the prevalence of certain responses. Through this approach I determined whether several project participants echoed the same ideas or whether they were unique opinions. After I found these themes, I searched for sub-themes within each category. The open coding approach helped me identify all themes and sub-themes from the collected data.

4.2.3 Community Survey

The survey instrument was designed to measure the perceptions and opinions of community residents towards issues related to biofuels development that had been identified as important to the community. This includes attitudes towards biofuels development, the perceived benefits and risks of an ethanol plant to their community, as well as the perceived economic impacts of biofuels development in the community.

The general opinion survey was designed and implemented using a modified "tailored design method" (Dillman 2000). The research team determined the number of surveys that should be administered to each of the four communities. United States Postal Services NCOA database verified addresses for each community were obtained from Lorton Data, Inc. For example, the community of Garnett was designated as having 1,951 valid residences in zip code

66032. All 1,951 addresses were used to generate a random sample of 500 addresses. The cover letter and survey instrument (initial mailing) was mailed using first-class postage. A postage paid business reply envelope was provided in the mailing for returning surveys. The postcard reminder was sent via first-class postage two weeks after the initial mailing to those who had not yet responded. Ten days after the postcard reminder, the second survey mailing (replacement survey) was sent to non-respondents using first-class postage.

The number of "returned to sender" mailings, requests to be removed from the mailing list, and the returned and completed surveys were all tracked and documented in a Microsoft Excel 2007 spreadsheet. Requests to be removed from the mailing list were documented verbatim, if notation was provided. Data generated from completed surveys were entered into a SPSS Statistics 18 spreadsheet. Where respondents indicated a response outside the pre-defined values set in the codebook, the cell value was left blank (.) and the hard-copy survey was flagged. All written responses were recorded verbatim.

The four surveys were administered between the summer of 2008 and fall of 2010. The Table 4.6 details the number of surveys administered and returned, and response rates per community. The response rate was calculated by adding the number of undeliverable, requests to be removed from the mailing list, and completed surveys and dividing by the number of initial surveys mailed.

Table 4.6 Opinion survey numbers by case study community

Community	Mailed out	Total number of surveys returned	Responded to survey questions	Response rate (%)
Russell	688	340	246	37.6
Phillipsburg	500	226	186	37.2
Liberal	800	176	122	22
Garnett	500	195	148	29.6

The survey instrument used for this study comprised four sections: perceived impacts of the ethanol plant, community issues, attitudes about the environment, and demographics.

The first section consisted of a series of questions related to the perceived economic, social, and environmental impact of the local ethanol plant. This part, with 11 items, examined

the importance the ethanol plant to the economy of the local area, the economic impact, the effects of the ethanol plant on the local population, as well as the impact of the ethanol plant on the environment and local quality of life.

The second section contained nine items that assessed perceptions on community issues that were created by the establishment of the biorefinery. Created issues include the extent of input citizens provided in the decision of local government to attract and establish the ethanol plant, the respondents' level of initial and current support for the ethanol plant, and rating the quality of different aspects of the local community.

The third section measured the respondents' priorities for using or not using higher ethanol blends (E85), as well as their level of awareness and concerns about environmental issues in general and in their community in particular.

The final section of the survey asked for some background information about the respondents and their families. Demographic information collected in section four included age, gender, education, occupation, income, years living in the community, and family size (Table 5.1).

In this chapter, I described the criteria for the selection of the four case study communities as well as the methodological underpinnings of my analysis. I explained the coding procedures for identifying the media frames and sub-frames related to biofuels development in the selected newspaper articles. Further, I presented data I drew upon, but collected for the larger biofuels project: the in-depth individual interviews with key informants and focus group interviews with stakeholders, as well as the community opinion survey.

Chapter 5 - Findings

5.1 Content analysis of newspaper articles

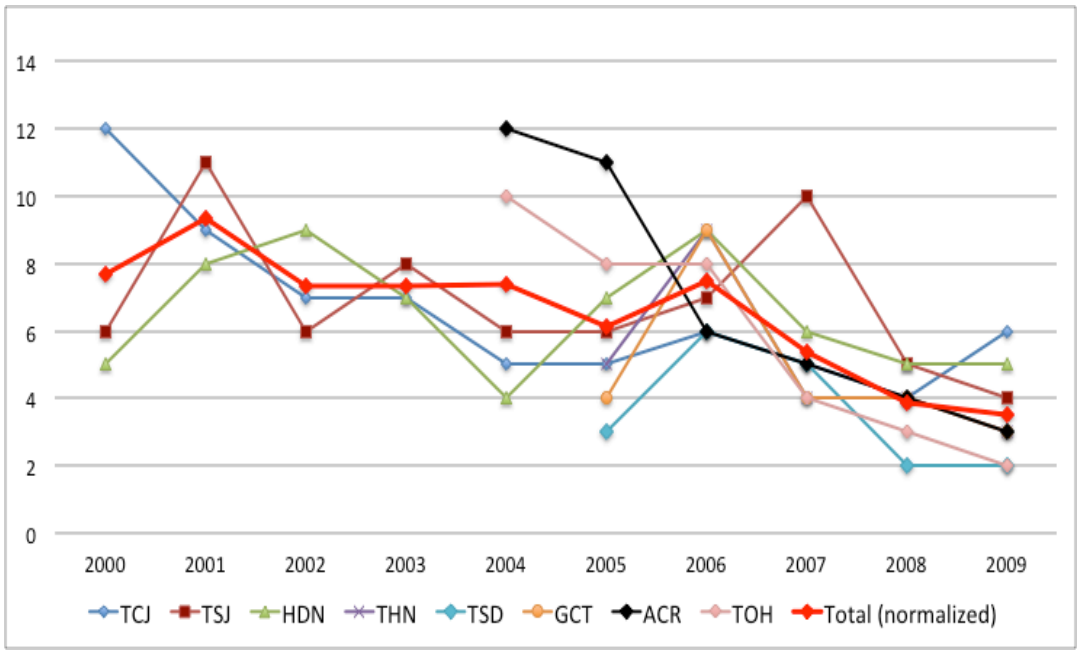
I examined the coverage of biofuels development in Central Kansas in several regional newspapers and one state level newspaper. The term "regional" is used here to indicate a limited geographical area that includes most of the readership of the analyzed newspapers and where biofuels development might have similar, yet bearing many specific effects. Little is known about how these communities receive and process biofuels development-related information and how it is applied to their local and regional level needs and issues. By identifying and tracking this coverage, I explored how the issue of ethanol production in my four case study communities was framed and presented to the local community members and local policy makers.

This analysis enabled me to explore how biofuels development is reported, how it gains relevance locally, and how possible regional and local issues surrounding biofuels development (or solutions to these problems) are presented by these newspapers.

The primary data for this part of the project consists of 343 articles on biofuels development collected in Central and West Central Kansas published between January 2000 and December 2009. Articles related to each case community were gathered starting one year prior to the construction of the local ethanol plant. These findings indicate that the print media did pay attention to the ethanol development in the particular region, and that attention had reached its peak in 2006. There is also a small, descriptive quantitative component of the findings.

The results of this investigation show that between 2000 and 2009, the eight newspapers published a total of 343 articles dealing with the topic of biofuels development in Central Kansas. The number of articles never exceeded 40 publications per year for the eight print media outlets combined (Figure 5.1) until 2005, when the ethanol plant in Garnett came online. The Garnett plant was the second operational biorefinery in the four case-study communities. The other major increase in the number of articles occurred during the prolonged drought of 2006, affecting the whole region. Overall, the number of articles appearing in the regional newspapers was on the decreased in subsequent years.

Figure 5.1 Temporal distribution of newspaper articles on biofuels development 2000-2009



The shortest relevant news item in the newspapers contained 174 words; the longest contained 3,409, while articles presenting the biofuels development in the region averaged 436 words, establishing a median of 390 words. Articles were also categorized by their type and origin. The majority of relevant pieces were articles reporting news (86%), editorials, or opinion pieces written by the senior editorial staff or publisher of a newspaper (10%), and the rest (4%) were letters to the editor (letters sent to a publication about issues of concern from its readers).

The Salina Journal published the most editorials (19 stories). Based on the total number of published articles, The Anderson County Review published the greatest percentage of news (95%). In-house staff members wrote most articles. However, both The Salina Journal and The Hays Daily News reprinted almost 30 percent of biofuels-related updates from national news agencies such as The Associated Press, Bloomberg News, or high impact national newspapers like The New York Times or The Chicago Tribune. The reprints from national media were more critical to the first generation biofuels development especially when the focus was not local. They more often tended to have a negative tone on the food versus fuel debate and on global environmental issues caused by biofuels development than articles written by the staff of regional newspapers. This finding resonates with the conclusion of the analysis of the subject

themes, volume of exposure, and tone found in print media coverage of biofuels and biofuel-related topics by Dyer et al. (2013).

Most news pieces promoted 2–3 actors, typically someone from the local government, a grain farmer, and someone from the ethanol plant. Roughly, half of the analyzed articles presented the opinion of the mayor, the city manager, or the economic development director's view along with the opinion of a representative of ethanol industry. Local and state level politicians were also present in about 15 percent of the articles.

5.2 In-depth Individual Interviews and Focus Groups

I used in-depth personal interviews and focus groups to develop a contextualized and deeply textured understanding of how rural stakeholders/members of communities with ethanol plants perceive the potential impacts of biofuels development. The research progressed inductively, building from field-generated data to identify and collect themes, and to generate new questions.

I employed a comparative approach to study how rural stakeholders help the establishment of ethanol plants in their communities, situating their perspectives within the broader theoretical framework presented in the theoretical framework chapter. I also compared the findings from the four communities in search of similarities and variations, based on legacy and regional variation, and then address the relationship of the micro-level findings to more macro-scale development, paying attention to the elements of growth machine.

Nearly every interview participant is quoted verbatim, and no single individual is relied on for more than a few quoted passages. In the spirit of transparency, I present a good deal of the raw data. The longer quotes allow the reader to participate in the analytical process, and see the credibility of the analysis and conclusions.

The in-depth interviews with various local government officials, school district administrators, municipal utility plant managers, economic development directors, and various stakeholders in the local ethanol plants have led to some very interesting findings. These findings are discussed in accordance to the eight main themes and thirteen sub-themes that surfaced from the interviews and point to the existence of elements of growth machine theory "at work" in rural setting.

Topics that highlight the efforts of growth promoters are:

- the economic boost argument;
- the inevitability of growth;
- the strong local government support;
- the land sale for the siting of ethanol plant;
- investing opportunities in the local ethanol plant;
- community engagement and donations of the plant;
- community pride generated by the ethanol plant;
- the emphasis on the ownership structure and size of the local ethanol plant.

A total of 41 individual stakeholders (11 females and 30 males, most of whom had grown up in the region) were interviewed as follows: nine in Russell, 12 in Phillipsburg, 10 in Liberal, and 10 in Garnett. Twenty-two of the interviewees worked for the local government (seven of them in county or city economic development offices), and five for the local school districts. Furthermore, seven interlocutors were resident investors with investments in the local ethanol plant, and seven worked for biorefineries. The farmer focus groups were composed of local and area farmers, and community members with different interests in the local ethanol plants were present at the stakeholder focus group interviews.

The most common perception among interviewees working in the local administration was that local ethanol plants brought economic benefits for the communities by creating jobs for the local people and generating income for the local government. The overwhelming majority of respondents did not perceive the local ethanol plants as being a potential environmental risk to their community, in spite of their awareness of high water demand during the technological processes.

5.3 Community Survey Data

In order to substantiate the findings of this research I use data (Selfa 2010, Selfa et al. 2011) from community surveys designed to measure the perceptions and opinions of community members toward issues related to biofuels development that have been identified as important in the four case study communities. The survey instrument measured attitudes toward biofuels

development, the perceived risks and benefits of an ethanol plant to their community, as well as the perceived economic impacts of ethanol production in their locality.

Table 5.1 Community survey descriptives

City	Russell	Phillipsburg	Liberal	Garnett	Total
Female (%)	44.9	62.6	47.0	45.5	43.2
Male (%)	55.1	37.4	53.0	54.5	56.8
Age under 35 (%)	9.0	9.0	14.0	12.0	11.0
Age over 65 (%)	71.0	72.0	62.0	67.0	68.0
Lived more than 10 years in the community (%)	85.2	85.8	79.0	80.0	83.0
High school ed. (%)	29.1	23.2	14.7	27.5	24.1
College of four years or more (%)	34.2	26.0	38.8	24.6	30.4
Farming, fishing, and forestry occupation (%)	4.1	11.1	N/A	N/A	7.7
Retired (%)	34.9	31.7	N\A	N/A	33.2
Household income under $60,000.00 per year (%)	56.8	49.1	47.0	66.4	54.8

Forty three percent of the respondents were females, 57 percent males; 11 percent were younger than age 35 and 68 percent were older than age 65, while about 83 percent of them lived in their respective communities for more than 10 years. Less than a quarter of the survey respondents' highest level of education was high school, although 29 percent pursued a college education of four years or more. Only a small fraction of who completed the survey indicated farming, fishing, or forestry as their primary occupation. The yearly household income of 54.8 percent of the respondents was less than $60,000.00.

Survey data show (Appendix A) that a great majority of the respondents (70%) perceived the local ethanol plant as either important or very important to the economy of the local area: 77 percent in Russell, 67 percent in Phillipsburg, 67 percent in Liberal, and 70 percent in Garnett. Further, 79 percent of the respondents agreed that the ethanol plant created new jobs to the local economy, but only 29 percent of them perceived these jobs as high paying ones (37 percent in

Russell, 30 percent in Phillipsburg, 27 percent in Liberal, and 21 percent in Garnett). While only eight percent attended local governmental meetings to gather information about the planned ethanol plant in their community, more than three-quarters of the respondents indicated local newspapers as their source of information regarding ethanol development in their locality.

When asked about environmental issues in their community, of those who completed the surveys 25 percent had high and 57 percent had moderate levels of concern about environmental problems. Furthermore, an overwhelming majority (96%) felt that the public has the responsibility to conserve the water for future generation. As for the local environmental impact of the ethanol plants, 36 percent expressed their concerns about water being diverted from other important needs of their city. Not surprisingly, this perception was the highest in Russell (67%), where the thickness of water-saturated layers of the Ogallala/High Plains Aquifer is the smallest, and thus the area suffered severe droughts in 2003 and 2006. A very strong majority of the respondents (89%) indicated the use of ethanol as somewhat important or important as a reason to reduce the need for foreign oil.

5.4 Media Frames

Guided by typical content analysis methods and procedures (Altheide 1996 and Neuendorf, 2002), I have developed a comprehensive codebook to identify the claims made about biofuels development in the region, and *the source* of these claims (by whom the claims are made). After the first reading I created a database that contained quite diverse assertions stretching from "*it's a modern day gold rush*", "*the sound of money*", *"blessing for many farmers*", "*hope for rural communities*", *to* "*is better for our environment*", "*contributes to a cleaner environment and helps ease our energy dependence*" or "*improves our national security*" to "*it's the future!*".

Overall, a very high percent of the articles supported biofuels development in the region (Table 5.2; Appendix B). About 90 percent of the articles about the biorefinery in Garnett supported the operation of the local ethanol plant, while 25 percent of the news items regarding ethanol development in Russell disapproved of it for reasons like: "*western Kansas is going to face a water shortage when the aquifer dries up because of overuse*", "*ethanol plants are big consumers of water*", or " *I question whether ethanol is a viable fuel when it requires irreplaceable groundwater*".

Table 5.2 Percentage of articles supporting or opposing ethanol development

The article…	Total articles	Russell	Phillipsburg	Liberal	Garnett
Supports biofuels development in the region (%)	85.5	74	83	84	93
Opposes biofuels development in the region (%)	14.5	25	15	15	5

The three analytical frames I have identified were related to the economic development, energy independence/national security, and environmental dimensions of biofuels development. About 83 percent of all articles contained the economic development frame, nearly half of them (48%) contained references to the environmental benefits of biofuels development, and about one third (35%) of them touted the national security/energy independence contributions of biofuels.

The economic development frame was more predominant than either the environmental or the national security/energy independence frame, with the exception of 2006, when the number of articles containing the environmental frame was nearly equal to the one promoting the economic development benefits of biofuels development. The actors promoting these claims in the analyzed newspaper articles were most frequently representatives of the ethanol industry or local and state government officials. Almost half of the examined articles contained at least one news source from either the local, state, or national level representative of the ethanol industry, for example that of the biggest trade group, the Renewable Fuels Association:

"*'Despite the smoke and mirrors campaign to scapegoat ethanol production for rising food prices,' said Renewable Fuels Association president Bob Dinneen, 'Americans fully understand the real reasons they are being squeezed in the aisles.'*" (Carpenter 2007, TCJ 11 11 2007)

I also categorized the full articles according to their perspective on biofuels development (i.e. positive, neutral or negative), or in the case of editorials and letters to the editor, the author's approach regarding this issue. 65 percent of the articles had positive themes, 20 percent were neutral, and only 15 percent were negative, suggesting that the analyzed newspapers promoted a predominantly pro-biofuels development discourse.

Moreover, I found that the articles questioning or opposing biofuels development were predominantly letters to the editor or news reprints from national newspapers. The arguments opposing more ethanol plants in the arid western part of Kansas were most often related to the water used for irrigating corn and for the ethanol plants in general, and related to worries about elevated traffic, noise, and odor levels in the host communities in particular. Through the interview data, I provide illustrations of how these themes were promulgated by local stakeholders.

I have further examined how different actors – those who were promoted in the analyzed articles – perceived biofuels development in the region (Appendix C). The majority of those who expressed their opinion on the pages of the regional newspapers (89%) supported biofuels development, 77 percent of positive letters expressed this view based on economic grounds, while 65 percent on the basis of environmental benefits. Local and state level politicians, as well as the representatives of the ethanol industry, tended to be the most supportive of biofuels development in the region. Those who opposed the development of biofuels in the region (11%) were critical on the ground of potential environmental harms (27%) – specifically the depletion of groundwater reserves, but a few of them also questioned the economic and national security/energy independence benefits of biofuels.

5.4.1 The Economic Development Frame

The analyzed newspapers created and employed a nuanced economic development frame with several dimensions ranging from presenting the ethanol plant as a source of local job and wealth creation to a way of stopping depopulation and strengthening community cohesion through local pride. . They also promoted it as a tool for revitalizing small rural communities and family farms, or as a way for this region to reconnect with the rest of the nation by providing the two coasts with cheap, domestically produced renewable fuel. Furthermore, ethanol development was framed as a win-win situation for everybody in the communities with bio-refineries, as a possibility to invest in something extremely profitable, as a source of pride for all community members. The ethanol facility in the community was depicted as a good corporate citizen, and was personalized as a good helping neighbor. Further, money and fuel ethanol donated to the local school districts were always highly publicized events.

Quite similarly – almost matching these frames and sub-frames – interview data show that respondents believed that ethanol plants had brought significant economic benefits to their community, and these gains were perceived as a win-win across the board for all community members. Throughout the conversations with the respondents, it became clear there had been an overarching organization in each of these communities that led development efforts and/or coordinated the activities of other community groups.

5.4.1.1 Biofuels Development as a Source of Local Job and Wealth Creation

The analyzed newspapers implied that Kansas was becoming a major player in the conversion of corn into ethanol, creating many agricultural jobs. Proposals for bringing an ethanol plant into a community in the region were often promoted by the newspapers starting from the very early stages of planning. One of the strongest and most frequently used arguments for building an ethanol plant was the creation of a significant number of well-paid direct jobs:

"*Nick Hatcher, president of Conestoga Energy Partners, LLC, which is developing the plant [near Liberal, Kansas], said the 55-million-gallon-per-year dry mill ethanol plant would create more than 200 construction jobs and 2,200 sub-contracting jobs during the construction phase that would add $81 million to the area economy. […] Hatcher said when the plant is operational, it likely would employ 35 to 45 people full time and create an additional $16 million for the area's economy.*" (Wilson, GCT 05 25 2006)

Many of the interlocutors expressed the view that the local ethanol refinery had been a really well-planned and well-built facility that brought good quality, high-salaried jobs. Actually it created brand new employment that these communities profoundly needed. In western Kansas, the median household income was under the median for the state and well under $50,000 (USDA ERS 2011), and the yearly household income of 65 percent of the survey respondents was under $60,000. Thus, the high numbers disseminated by industry boosters as potential salaries at the local ethanol plant could seem very attractive to the newspaper readers and potential workers: "*Sources have indicated that the jobs at Conestoga [near Liberal, Kansas] will pay on average about $50,000 per year*" (Watt, SDT 12 19 2006).

The ethanol plant was perceived as bringing jobs for local workers in all four communities, although in each case the management was brought in from elsewhere. This gave a

small boost to the local housing markets, even though in one case the plant manager purchased a house in the neighboring town. A key informant in Garnett explained:

"*First and foremost, there's the jobs: approximately 30-40 very good paying jobs for folks in our community which has been a positive. The second thing would probably be to the agriculture community as a place to, of course, sell their corn…has been very beneficial. It's kind of increased the local price for corn.*"

There was a consensus that during the period of nine months to a year, while the biorefinery was constructed in each community, the original onslaught of temporary construction workers contributed to local revenues. This was achieved through sales taxes, generated by high occupancy in the local motels and restaurants, as well as through the purchase of fuel at the local gas stations and construction materials at the local hardware stores. A member of the local government in one of the case study communities recollected:

"*Yes, there was lot of people that came… there was a lot of activity in that construction phase. We did see an increase in our sales tax…our local sales tax in that time period.*"

The director of the economic development office in the same town spoke in a similar vein:

"*Along with that, they had to hire individuals. There was thirty-four individuals, I do believe. But all those have higher than average salaries for the local area which helps the economy because they're going to have more disposable income and they're going to spend their money locally, hopefully.*"

Survey data shows close similarities in local public perception regarding the good number of new jobs created for and occupied by local workers; however, in contrast with what the newspapers and the interviewed stakeholders said, over two thirds of the survey respondents were not convinced these jobs were high paying ones.

The prospect of local ethanol plants was also touted as generating plenty of indirect jobs through businesses serving the ethanol industry and agriculture in general:

"*The plant will have a huge economic impact on the entire area, Anderson County Commissioner Bill Craig said. "This is going to be one of the biggest things we'll see in my lifetime. […] Long after we're gone, people will celebrate this day*" (Rickel a, TOH 01 27 2005)

However, there was contention among agricultural economists over the number of jobs created by ethanol industry. Promoters suggested that as a consequence of increased economic activity caused by ethanol production nearly 400,000 jobs in all sectors of the economy were created nationwide during 2009 (Urbanchuk 2010). This resulted from ongoing operation, construction of new capacity, as well as research and development.

Others questioned the local economic impact; for example, Swenson and Eathington (2006) estimated that a modern 50 million gallon per year (MGY) plant would have at least 35 to 40 jobs, while 100 MGY plant will have about 45 to 60 jobs. In a study on projected versus actual labor market impacts of biofuels production in the Great Plains, Schlosser (2008) and colleagues found that the 52 MGY ethanol plant in Russell, KS maintained a workforce of 35 to 45 employees. However, Schlosser (2008) argues that the increase of in-commuting causes many of the economic benefits expected to accrue to the county where the job growth occurred , i.e., to be essentially exported to the county where the in-commuters live. Failure to account for the proportion of new jobs filled by in-commuters would lead to significant over estimations of local impacts of employment growth.

5.4.1.2 Biofuels Development as Creator of New Markets for Grain Farmers

Each one of the analyzed newspapers promoted the claim that the planned ethanol plants would create a new demand for agricultural products from local producers – besides highly publicized new good paying jobs for local residents – and would increase the tax base of the surrounding counties by a considerable amount.

Focus groups and individual interviews highlighted the widespread sense that the ethanol industry in general, and the local biorefinery in special, added value to and created a new market for their crops. There was a consensus that ethanol plant gave the area farmers an alternative – a good strong competitor to the co-op elevator system, because it would buy corn directly from the

farmers at a slightly higher price. For example, a big landowner farmer and member of the local government in a case study community described the reasons he had lobbied very hard to bring an ethanol plant to his community:

"*I'll tell you that my motives were somewhat personal because of the lack of added crop value to the crops that I was growing. I wasn't sure that agriculture was going to be a viable industry. And I can tell you at the time I was looking for something to create value for my crop. I just happened to be a part of a joint economic development here in my hometown and I would happen to be the only farmer that was on that council at the time, and I asked about, you know, 'Has anybody ever thought about ethanol?'*"

Farmers firmly believed that ethanol caused grain prices to go up and that helped them tremendously. They believed it helped everyone in the region because the whole region was a big farming community and while farmers were making money, they were also spending it. A self-described "hobby farmer" in Liberal explained:

"*Local market for corn would be the main benefit, and then that creates more jobs for more farmers are able to make more money which brings more money into the community. It's definitely a local economy booster. I don't know if nationally if it helps at all, but it definitely helps locally.*"

However, both focus group and individual in-depth interviews made it clear that farmers of large fields, who owned on-site storage capacities were highly advantaged, since they could store their grain after harvest and hold onto it until the prices were more advantageous, while most small grain producers had to sell their harvest right away at lower prices. Smaller farmers with only a few cattle were also disadvantaged when it came to buying protein rich distiller's grain (DG) directly from the plant. A key informant pointed out:

"*Yeah, you gotta go through a broker to buy the product. I mean, that's what I hear, just a small time guy can't go in there and just say call in today and say, 'I'd like to pick up a load of feed tomorrow.'*"

Virtually none of the interviewees heard or talked about the food versus fuel controversy, or if they did, they believed it was one stirred up by the media. However, there was a consensus that the ethanol development raised the price of feed corn, which was inconvenient for local cattle feeders. A member of the local government in a case study community narrated:

"*I've heard were farmers who feed cattle…the price of corn splashed right up and they blamed it on the ethanol plant whether it was or not.*"

Again, the beneficiaries of this situation seem to be the members of the rural growth machines, who tend to be the most influential farmers with the most land and farm equipment or owners of the big confined animal feeding operations (CAFOs) of the area. They syphon away the valuable protein-rich by-product of ethanol plants from family farm sized feedlots.

5.4.1.3 Biofuels Development as A Tool for Revitalizing Small Rural Communities and Family Farms

Although specific details are omitted, both the state level newspaper and the regional newspapers often mention the potential revitalizing effect of biofuels development on rural communities. Politicians and ethanol industry representatives frequently suggested that the environment can be improved and new, non-polluting economic opportunities may be created for rural and urban areas alike. Biofuels development as an economic revitalization tool for rural communities is a preferred discourse element in speeches given by politicians at all levels. For example, the Governor of Kansas stated that:

"'*This is good for our rural economies, good for our environment and good for our state and nation' [Kansas Governor] Sebelius said."* (Staatz, TCJ 01 11 2007)

Even former President Bill Clinton is cited as saying that: "*It's a good way to revitalize America and bring back small towns.*" (Biles, TCJ 03 03 2007)

Corn ethanol production has been helped by rural development policies that promoted value-added activity to increase the profitability of agricultural production. These policies are based on the idea that corn-ethanol production increases the value of corn and therefore the

income of corn farmers. This added income for farmers combined with the income associated with corn-ethanol production generated local economic and job multipliers, while increasing the local government tax base. The proximity of corn-ethanol plants to corn production has kept the value-added activity in the state where the raw material for that activity is produced (Tigges and Noble 2012).

Most of the interviewees did expect ethanol development in their community to be good for the region's economy in a larger sense, by providing off-farm jobs that bring more capital into the region through multiplier effects. One of the key informants echoed this sentiment:

"*Well, I guess primarily – jobs. That's the probably the biggest benefit, and not just from those people that were hired at the ethanol plant. I think it's helped the farmers and the surrounding community as well as the ripple effects of the truck driving industry and you know, the outreaches of that.*"

At the time of the interviews, there were no available data on the scale of money generated directly or indirectly by the ethanol plant staying in the local community. However, members of the local government in each community expressed their confidence that both salaries and revenues from sales of grain and services would stay in the community. A member of the local government in one of the case study communities, who followed each step of the local ethanol plant development, went as far as estimating the number of times the money turned over before leaving the community:

"*You add 45 good paying jobs to the community, and that money – I think – turns over 7 times, and that makes a big difference in the economics of your town*".

A substantial number of the respondents shared their views that the ethanol industry diversified the local economy. This sentiment was especially strong in Russell, Phillipsburg, and Garnett, where the local economies were less developed and varied compared to Liberal. For example, long-time resident and member of the local government in one of the studied communities opined:

"*From the community's perspective, I think it's been a good thing, again, to diversify our economy. Our economy is primarily around three areas: natural gas, oil, and agriculture.*"

The sate's governor also seemed to echo this opinion: "*ethanol helps grain farmers, promotes energy independence, and improves the environment… It has a positive impact for the entire state*". (Rickel c, TOH 10 15 2005)

5.4.1.4 Biofuels Development as a Tool to Slow Down Depopulation

The economic development of rural communities with biorefineries was linked by the ethanol discourse to slow population decline. The discourse promoted the idea that ethanol industry would help rescue rural Kansas from the scourge of out-migration and down times in agriculture. For example, former Kansas Agriculture Secretary Adrian Polansky "*couldn't say enough good things about ethanol plants in Kansas. He even suggested some of the plants might save some Kansas communities.*" (Corn, TOH 01 11 2008)

Bringing the ethanol plant into a community was portrayed as a win-win situation for the superintendents of the local school districts because "*It helps us keep students here. With declining enrollment, the more students we keep the better*" (Sherard, TSJ 12 02 2005).

There was a widespread agreement among interviewees that the establishment of the ethanol plant had not led to population increases in these depopulating rural communities. Nonetheless, virtually all interviewees agreed that it did have the effect of stabilizing the population and the majority of people felt that their town would have been in worse shape without it. The belief was that due to the stable jobs offered by the plant, communities were able to keep, or even draw other people. A key informant from Phillipsburg aptly highlighted this:

"*They helped us maintain our population through jobs …I believe there was only three new people brought in when they opened and would be the manager assistant and I believe there was another people who worked for this manager come from not far from here. I can't say that they brought in a lot of people to our town.*"

Another interviewee spoke in a similar vein:

"No [it did not increase our population], let's say it maybe slowed down our exodus [...] right now it looks like we have about 35 students whose parents work at the ethanol plant. […] Certainly has not stopped our loss of students, but it slowed down somewhat."

Many felt that holding their own in terms of population and not seeing a large decrease in members was a major feat for a community of 4–5,000 or less. As another key informant also observed:

"I think that if we would not have … if the community would not have accepted the ethanol plant, our enrollment – our school enrollment – would be decreasing significantly."

5.4.1.5 Biofuels Production as a Way to Play a Central Role on the Renewable Energy Stage

Actors promoted in the newspaper articles portray biofuels development as a way for Central Kansas to reconnect with the rest of the nation by providing the two coasts with cheap, domestically produced renewable fuels. After decades of low agricultural commodity prices and acute depopulation, the feeling of gradual isolation from the rest of the state and nation held by citizens of these communities seems to be replaced by hope and optimism as biofuels development was suggested to be the link to the rest of the nation. Many in communities with agriculture-based economies in the High Plains (White, 1994) felt this feeling of isolation. Boosters of ethanol industry in Western Kansas were suggesting that this region of the state would be able to provide parts of the nation with renewable transportation fuel mandated by the Renewable Fuels Standard. This was either impossible or too expensive to be produced through the increased production and distribution of corn-based ethanol in the states on the two coasts:

"*The tiny town of about 3,350 [Garnett, KS] has also become part of a new supply chain, where a small group of fuel distributors and ethanol barons stand to make a mint shipping the alternative fuel from the Midwest, where it is made, to major urban markets on both coasts.*" (Burke, TCJ 02 23 2006)

It was also often implied that the small farming communities were playing a quintessential role in the future of the nation through the production of corn-based ethanol:

"'*If biofuels are in the future for the United States, and I think they are, then Kansas is at the forefront of that future' [Kansas Governor] Sebelius said.*" *(Vandenack 2006a, THN 08 04 2006)*

5.4.1.6 Biofuels Development as Generator of Local Community Pride

By offering different rural development grants and adopting pieces of renewable energy friendly legislation, the state of Kansas encouraged communities in every region of the state to explore the possibility of developing commercialized bioscience industries that feed off their regional economic staples. Producing corn-based ethanol fit quite well the existing infrastructure, possibilities, and development plans of many communities in south and west Central Kansas. The fact that groups of local stakeholders initiated plans for most of the local biorefineries was emphasized on the pages of the analyzed newspapers:

"*What many folks do not know is that today's state-of-the-art dry-mill ethanol plants are also excellent industrial neighbors. As many rural Americans have discovered, the Hayne plant will be a conscientious and positive addition to Seward County, developed by local forward-thinking residents and contributing an economic boost to the community.*" (Board of Directors, Conestoga Energy Partners LLC, SDT 06 09 2006)

Supporters of ethanol production in the region disseminated an upbeat discourse suggesting that an ethanol plant could be a shot in the arm for many ailing communities. They highlighted the fact that ethanol had done wonders for age-based communities where farmers were growing corn. Seemingly everyone in these communities welcomed the plans for the local ethanol plant:

"*It's a project that everybody in Seward County and Liberal can be proud of," [Conestoga Energy Partners LLC President] Hatcher concluded. "I think it will be an exceptional industry to have as far as agriculture is concerned, and I believe that agriculture is probably the main stay of our community.*" (Bridenstine, SDT 06 28 2006)

The editorial boards of all the analyzed newspapers encouraged the development of biofuels in the region. They often suggested that, since value-added agriculture was one of the

most important ways Western Kansas could experience economic growth, members of communities with ethanol plants were just lucky and they should be proud to have local entrepreneurs who would bring such plans together:

"*It's time for some justifiable bragging by this community with regard to the construction of the East Kansas Agri Energy ethanol plant, and it's been a long time coming. […] The product of all those efforts is the single biggest industrial project ever in our region since the coming of the railroad more than a century ago. When completed in June 2005 it will create 30 local jobs, ramp up the area's general economic dynamic and place a billboard in Garnett for ag technology which will be seen internationally.*" (Hicks, ACR 09 24 2005)

Crowe (2006) viewed community success as heavily dependent upon the goodwill of the local residents. Community support is important for the development and successful implementation, as well as overall community economic vitality. Satisfaction with community will potentially generate positive attitude and behavior among community members that will help rural community to prosper. Furthermore, community pride deals with values that hold the community together and this inevitably leads to community attachment (Brehm et al., 2006).

An extensive number of the respondents expressed their conviction that most people were proud that their community already had an ethanol plant that made theirs a progressive, modern city compared to the neighboring town. The prevalent perception was that the plant had given the community a little status when people talked about it. The words of a farmer echoed the feelings of many in his community when he affirmed: "*I think the ethanol plant is looked at as a feather in our cap when you go to Smith Center or Norton.*"

Along the same lines, many respondents felt that the presence of an ethanol plant was a sign of being a community, which was a little bit more progressive than the community next door. Comments ranged from "*We try to be progressive to survive in a rural area…*" to "*It keeps us at the forefront with people paying attention to us*" or "*It gives the community a little status when you talk about it.*" All of these presumed added local benefits set off a contest among localities to attract more businesses.

There was a general perception among the participants in this project that the biorefinery had created a positive outlook. This innovative technology, which represents the next wave in

renewable energy, drew attention to their county and to their portion of the state. One of the ethanol businessmen's words describe how proud his fellow community members were:

"*We couldn't ask for a better project than this. It was good to see this one come to fruition. The ethanol plant was positive, defining moment for Garnett and Anderson County.*"

5.4.1.7 Biofuels Development as a Win-win Situation for Everyone in the Community

The analyzed newspapers framed biofuels as a universal reward for all members of a community by highlighting gains for local farmers, returns for investors, job possibilities, and the general economic growth. The phrase, "*It is a win-win situation*", describing plans for the establishment of an ethanol plant in a community was used quite often by members of the local governments, representatives of the ethanol industry or local and state level politicians.

"'*It's a win-win deal for everybody. […] The ethanol plant will benefit the country and the community*', *[Chairman of East Kansas Agri-Energy] Pracht said*". (Rickel b, TOH 06 01 2005)

As a "modern gold rush" for biofuels development swept through the Corn Belt states in the early and mid-2000s, local initiative groups started planning to build ethanol plants. The discourse focused on the success stories surrounding the biofuels development in the region and encouraged financial investors, farmers, and other members of agricultural communities to put together start-up funds for these initiatives.

"*Ethanol fever fires up heartland. People jumping at the chance to buy into sprouting plants.[…] Ethanol mania is sweeping through Heron Lake and many towns like it across the Corn Belt. Investors are spending billions in rural communities, sparking a wild rush to secure land, an industry movement to alter environmental standards and a rash of fierce bidding by communities desperate for their own plant*." (Browning et al., TSJ 11 07 2007)

Helped by economy-stimulating grants, a good market outlook, and interest for the investment, lenders often suggested or urged that original plant capacity be augmented during the construction, or in the first few years of production.

"*The company's lenders urged the company to expand the size of the plant from 20 million gallons to 35 million gallons. "That was a lot better for us," he [Bill Pracht, East Kansas Agri-Energy chairman] said.*" (Rickel d, OH 3 23 2005)

Promoters of ethanol development touted biorefineries as local economic powerhouses, and investment in biofuels as one of the trendiest in the business world. Local boosters were often promoted in the newspapers encouraging community members to contribute to the initial investment in the local ethanol plant "*as way to diversify one's investments […] The price of ethanol isn't tied to the price of corn but to fuel prices*" (TOH 3 12 2005). By using flashy headlines like "*Ethanol fever fires up heartland – People jumping at the chance to buy into sprouting plants*" (et al TSJ 11 7 2006), or "*Ethanol is just the thing of the future right now*" (Kessinger, GCT 6 10 2006), the media tweaked the economic development frame towards a "*bandwagon effect*" (Wright and Reid, 2010) to spread a sense of urgency for investing in biofuels development as individuals and communities.

Nevertheless, according to Hooper (TCJ 3 10 2008), ethanol development has been the vision and "*fast cash cow"* of the local elites in reality; even buying initial shares excluded those who could not commit high amounts of money, and investors were often required to be producers too.

Interview data suggest that instead of being a good investment possibility for everyone in the community, jumping on the ethanol bandwagon early (Wright and Reid 2010) was a highly selective and secretive endeavor, and clearly advantaged the rural growth coalitions. The way the interviewees described the fundraisers for the ethanol projects left no doubt that the prospect to invest in the local ethanol plant generated enthusiasm in rural communities in Kansas. An interviewee who participated in the planning or the ethanol plant in one of the communities, and stayed as a member of the management team elaborated:

"*All investors understood the importance of the project to our area and we appreciated their confidence of investing in the future of the ethanol industry and East Kansas Agri-Energy.*"

Although often promoted as an extraordinary venture opportunity for the local community members in general, being among the early investors in an ethanol refinery required

an individual to be a member of a quite selective club. As one of the key informants from Phillipsburg pointed out:

"*It seemed to me you had to be able to invest a minimum of $50,000 and even then, if you said, 'Yeah, I'd like to be considered to put in $50,000 in for the ethanol plant' you had to provide them financial information of your assets and your assets had to be at a certain level even for you to be considered to contribute.*"

A local investor spoke in a similar vein, highlighting the reason for the secrecy that had shrouded the first phases of funding:

"*There was a lot of people upset who wanted to put in five to ten, but we really wanted to keep the numbers below five hundred or we might have SEC problems, as investors, so we set it at $20,000. There was a lot of people who wanted to invest, but didn't want to come up with that kind of money or couldn't and were pissed about that. Most people were just pissed because they couldn't get in when they wanted to get in*."

Another interviewee, who was involved in the planning of and invested in a local biorefinery, described the process of finding the original investors:

"*We did a private memorandum deal when we had people come in who were selected by the rules. We give them a good indication of what it was going to cost, so I think everybody was really well informed.*"

When it came to this type of investment, "*there was a certain amount [of information] that can be shared and certain amount that cannot be shared*," explained a member of the local government in one of the case study communities. Thus, the media or the larger public was deliberately left out from the early stages of planning and investment drives. As a, local government member commented:

"*I don't think they advertised to the investors through the media like that, they just did their contacts.*"

One of the key informants offered another reason for the secretive character of the original steps:

"*But for the most part, the concern was that people just didn't understand the rules and regulations you had to go through about the investment. And they were pretty happy that the city and the county weren't investing. They weren't using tax dollars, so that was a key part of that.*"

One of the members of the 15-member joint city and county economic development council in one of the case study communities described quite aptly how the biorefinery in his community emerged. His narrative is quite suggestive as it presents the growth machine in action through the lenses of ethanol development:

"*We had a meeting where fellow council member made a comment: 'You know we have a lot of industry, we have everything, what are we doing with the ag industry?' And I said '[…] what do you suggest?' He said: 'You know, what about ethanol?' I looked around and I said: 'Ok […] you are the chairman of this council, go talk to several people and bring back your recommendations'. And that's how it got started. […] started out with a 'focus group' of four, and then he formed a board of directors and then the board of directors went out and recruited the investors and it started growing and blossoming from there, but were for of 'em on this council, on his committee when they started'. […] recruited investors through the word of mouth, from one person to the next person and like that […] the very first investments needed to be 10 thousand but most of them invested 100 thousand.*"

A member of the county economic development office offered another glimpse into the planning and investment process, limited to only a handful of people. He described how the three phases of investment opportunities had started with a small initial group of 10–12 people, who put together the seed money; then they, the "board" reached out to local community, and later on a wide investor drive(s) was initiated:

"*They [the initiating committee] gave the green light for local investors to go ahead and get investing in it, and quite a few local investors did invest in it. And that was probably…you know, they had the original, just the upstart money, and then they had just the original ten or twenty guys, people. Then they had another sign up that was not quite as good of a deal as these, but you know, it was still a good deal and then the third sign up, they got more people to invest. So they raised a lot of their money locally, but there was a pretty good chunk of money in non-local, just because they couldn't get enough local money ready.*"

The topic of an interest group initiating the establishment of the ethanol plant in each community, along with how biorefineries built earlier returned the investment fast and how the support for the plant among investors remained high even during hard times, often resurfaced throughout the interviews. Members of the local growth machines could count on high and quick profit returns, as they were in the position to initiate and control the planning of ethanol plants.

5.4.2 The Environmental Frame

The growing concern over environmental issues triggered by a number of events associated with global warming, inclined scientists, politicians, and major media sources to paying attention to these environmental issues. In the past few years, production and consumption of biofuels had increased extensively as Congress and many states have enacted public policies promoting the development of renewable fuels. However, later on, biofuels were becoming more controversial, as media and scientific research associated it with a variety of social problems including climate change, water pollution, and higher food prices. Similar to other public discourses about environmental issues where governments, corporations, and industries attempted to shape an image of sensitivity toward nature, the boosters promoted ethanol industry as a friend to the environment: it was renewable and it helped reduce atmospheric carbon dioxide.

5.4.2.1 Ethanol as Carbon Footprint Reducer

Although at national and international levels, biofuels development was promoted for its potential to mitigate climate change through lower greenhouse gas emissions. The analyzed regional newspapers rarely mentioned these advantages.

The most acclaimed direct air quality benefit of ethanol is that it significantly cuts carbon monoxide. Environmentalists both praise and criticize the use of ethanol as a gasoline additive as it reduces tailpipe emissions of carbon monoxide and other toxins, whereas the extensive corn growing threatens local and national water resources and it also contributes to indirect land use change. The analyzed newspaper articles often emphasized the former and totally neglected to mention other air quality problems, such as increased release of volatile organic compounds (VOCs) that may affect air quality near biorefineries (MPCA 2007). During the analyzed period, there were only 16 articles mentioning the possible negative effects of biofuels production – indirect land use change, VOCs, salinization of cropland, and hypoxia in the Gulf of Mexico –, and most interestingly, they were all news received from the *Associated Press* (9) or reprints from *The New York Times* (7).

The environmental benefits of biofuels production in the analyzed newspapers were framed to promote the ethanol as a renewable environmental-friendly gasoline oxygenate, a perfect substitute for the toxic MTBE, but all these benefits were sketched rather faintly, with no or very little statistical data to support the pitch. The catchphrases praising the environmental benefits of ethanol were more or less adopted from the discourse of the main national ethanol lobby groups.

"*The more population, the more people are driving and pollution's gonna be an issue. And if it's a problem, then ethanol seems like the logical source. It's not going to replace gasoline, but it is for clean air. I don't even know if that message is even getting out. That's what I've always thought. Make us independent of foreign oil and it's going to be a clean air additive*." (Key informant)

Many of the key informants used elements of the discourse surrounding ethanol development that was promoted by the biofuels industry on national level (Wright and Reid

2010). For instance, one interviewee described the environmental benefit of ethanol production in the community this way:

"*And actually there is a net benefit to that way to, in the fact that you have this market here locally and it cuts down on total truck miles for marketing that particular agricultural commodity.*"

5.4.2.2 Minimization of the Possible Negative Effects of the Local Biorefinery

The negative environmental impacts of local ethanol plants such as odor, increased traffic, and deteriorating roads in these communities were mentioned in the news in passing, and their effects minimized. Many of our interviewees expressed views that suggested their acceptance of these inconveniences when they compared the aroma emanating from the local bio-distillery to that of the many feedlots or oil wells in the area. One of the interviewees summarized the general reaction to the most palpable negative environmental effects of the local ethanol as: "*And I'd rather smell an ethanol plant than I would an oil refinery*" (Ethanol businessperson).

News of studies about the potential negative impacts of the indirect land use change triggered by the ethanol boom, as well as the food versus feed controversy have reached the larger audience in Western Kansas through reprints of news from national media outlets. The analyzed newspapers did not publish their own news on these topics; however, two of the newspapers published a few Letters to the Editor questioning the science behind these studies, along with their doubts on the likely impact on local water supplies due to corn-based ethanol development in the region:

"*It's normal to take offense when some East Coast environmental group criticizes Kansas. What do those lefties know about real life in the Plains? Apparently they know enough to recognize that state water policies are outdated and lack vision."* (Bell 2007, TSJ 09 24, 2007)

Meanwhile many grain producers in the region were convinced that national media artificially created some sort of anti-ethanol hype:

"I've lost all faith in media. They're not doing research projects. They're just reading what somebody else had said and put it together. […] There's so many ways to communicate, the same stories get told over and over incorrectly." (Key informant)

Local farmers' outrage against those who question the wisdom of growing corn for ethanol in the region echoed clearly throughout the pages of the analyzed newspapers as well as in our interviews:

"I would like to say that we have been planting corn for a hundred years and the only time they decided that we shouldn't plant corn is when ethanol come out. And you know, I heard people say, "oh corn is just terrible." We've planted corn all our lives, and now they're saying it's terrible for the rainforest…I don't understand. It just…I get so angry. It's just terrible, because it's happened for a hundred years." (Ethanol businessperson)

5.4.2.3 The non-issue of the Use of Diminishing Groundwater for Irrigation and Ethanol Production

Although the local environmental impacts of biofuels development in Western Kansas became somewhat scrutinized during the drought of 2006, criticism about water use by the ethanol industry was quickly reframed and normalized in the analyzed newspapers. Water use was shown to be part of life as usual, and in particular critical for the regional economic development.

The analyzed newspapers published a total of 33 stories related to the drought in west Central Kansas between July 2006 and August 2007 [4]. To determine how these stories reflect the "non-issue" (Freudenburg 2000) of biofuels development in relation to groundwater mining I have examined their type and tone.

First, based on the type of coverage, I have categorized these stories in two clusters: one for news and editorial, and one for the Letters to the Editor. I chose to organize the articles by these two categories because the former ones tended to minimize the consequences of the excessive water use practices in general, while the latter ones were usually more critical and

[4] Since the water shortage affected mostly the city of Russell, the bulk of these articles came from *The Hays Daily News* and *The Salina Journal*.

perhaps better reflected the views of the inhabitants of the areas covered by the analyzed newspapers.

Second, after a careful reading, I categorized the 33 stories into groups that promoted ground water mining and biofuels development in the region with a positive tone (Table 5.3) in contrast to those that opposed it and had a negative tone (Tables 5.4 and 5.5).

Table 5.3 News and editorial articles suggesting the non-issue of groundwater mining for biofuels development in western Kansas

Date	Newspaper	Title	Catchphrase
07 19 2006	HDN	Much discussion leads to tighter water restrictions in Russell	"It's not something you can just shut down," said Russell Mayor Carol Dawson. "If you want to close this business out of hand, we can deal with that later." A representative of the company said it was trying to reduce its water use as much as possible
07 23 2006	HDN	Russell changing water habits	The plant has cut back on its consumption as much as it can, said Ron Dunbar, vice president of manufacturing ethanol. "Wherever we were using the water once, we're now using it two or three times," he said.
07 28 2006	HDN	Ethanol plant's efforts help keep city out of water emergency	John Neufeld, chief operating officer at U.S. Energy Partners, said the plant's production has not decreased. Water-saving programs have allowed production to remain steady even with a decrease in resources.
08 13 2006	HDN	Ethanol plant focusing eye on Kanopolis	"They have been super, super efficient as far as reusing and recycling. They're squeezing every drop of water they can out of that plant." Arlyn Unrein, public works supervisor for the city of Russell praised Russell residents for conserving as well.
08 17 2006	TSJ	Water Warning	"No offense, but I don't care," said Kevin Kuykendall, CEO of White Energy, the Russell ethanol plant that's already having trouble getting enough water. "We could get it done (on our own)."
08 17 2006	HDN	Russell ethanol plant wants water consortium	Central Kansas communities facing water shortages were given a choice Wednesday - join a water consortium being formed by an ethanol plant in Russell that expects to double its water consumption in the next two years, or fend for themselves.
08 17 2006	TCJ	CEO: Communities ought to join water consortium	Kuykendall said that's about 30 percent less water use than most ethanol plants, in part because White Energy spends $250,000 a month on water-saving measures."We've done as much as we can," he said.
08 20 2006	HDN	Kanopolis holds allure for Russell	Russell City Manager Gary Hobbie said his city is "very interested in a regional water supply system."
08 31 2006	TCJ	Plant hunting for more water - Company has efficiency measures	"We're doing everything we can to find additional water resources," Neufeld said. "We would like to have 1 million gallons per day, but that has to be taken in context that there has to be sufficient water for the community. Our families all live here."
10 25 2006	TSJ	Farmers make good use of water	Thus, there is tremendous value obtained from the water held on farm fields. We are selling it and shipping it out in trains and trucks as hay, grain, meat, cotton, ethanol and more -- rather than watching it run off to the sea. This is the major basis of the Kansas economy.
11 06 2006	THN	Studies: Cities will benefit	Water use isn't the only measure of an ethanol plant's potential effect. […] The benefits collectively come from franchise fees, additional school funding brought on by higher enrollment, and increased sales, property and income tax inflows, among other things
01 07 2007	TSJ	Weather or not?	Tom Moxley, a Republican from Council Grove, will be filling the 68th House seat vacated by Shari Weber, R-Herington. He notes that the state doesn't have enough money to buy back water rights. "If the water isn't there you just can't pump it," he said. "The energy cost may well limit usage."
05 17 2007	TSJ	Gov. Sebelius lifts drought designation	"They have been super, super efficient as far as reusing and recycling. They're squeezing every drop of water they can out of that plant." Arlyn Unrein, public works supervisor for the city of Russell praised Russell residents for conserving, as well.
07 22 2007	TSJ	Polansky: State must embrace change -Ag secretary	Concerns about the water-intensive nature of ethanol production are being addressed through technology, Polansky said, adding that those who play the water card in arguing against ethanol production are using "outdated data."
11 07 2007	TCJ	Ethanol facility raises water concerns	Duane Simpson, vice president of government affairs for the Kansas Association of Ethanol Producers, said ethanol plants recycle most of their water. About three-fourths of the water acquired by a plant is returned to streams, he said.
11 11 2007	TCJ	Some blame ethanol for higher food costs	He sought a way to take advantage of groundwater available for irrigation, the region's abundance of corn and sorghum, and the need to nourish more than 3 million cattle in feed yards. "Ethanol was that solution," Hatcher said.
03 27 2008	HDN	Senator back to roots	The key to effective policies, Brownback said, would be to balance energy needs, economics and environmental concerns. Fuel efficiency must be improved, water consumption trimmed, new technology used. But policies must be implemented in a way that effects changes over time, Brownback said.

Fifty two percent of the articles (17 stories) fell in the first category. They were exclusively news pieces written by in-house reporters and often presented the views of representatives of the agricultural interests or the ethanol industry, and thus promoted ground water mining and biofuels development in the region. The tone of sixteen articles (48%) reflected a negative attitude towards the idea of pumping groundwater for the increased corn irrigation and ethanol production. Most of these writings (9 stories) were Letters to the Editor and originated from concerned residents of small communities in west Central Kansas.

Table 5.4 Letters to the Editor suggesting groundwater mining for biofuels development is detrimental for western Kansas

Date	News paper	Title	Catchphrase
05 23 2006	HDN	We don't have enough water to support ethanol fuel	Might some charges be assessed to these e-plants for depletion of our waterresource?
07 02 2006	HDN	Water: Separating needs from wants	Speaking of ideas, promoting ethanol plants in areas of water decline is a dumb one. Someone should tell our pretty and otherwise sensible Gov. Kathleen Sebelius that.
08 06 2006	HDN	When looking at future, look at water	It seems reasonable to grow corn for ethanol if we irrigate with river water and groundwater that can be replaced. But I question whether ethanol is a viable fuel when it requires irreplaceable groundwater
08 25 2006	HDN	Water rights associated more with Abbott-Costello act	You cannot deplete resources in and around a state park and expect business to flourish there or property value to remain constant, adjacent to that park. No matter what, ethanol plants need water.
09 14 2006	TSJ	Opinion	We have no water now. Start contacting your congressman now. Do not let them put in these ethanol plants where there is no water
02 26 2007	HDN	High Plains not the spot for every industry	Ethanol and Bio-Diesel plants are notorious, prodigious users of water. A couple Ethanol plants in the N. W. quadrant of Kansas are already causing their host communities water delivery problems.
07 09 2007	TCJ	Water essentials	Contact your elected representatives about his problem. Say no to ethanol biofuel.
07 23 2007	HDN	Energy debate	Western Kansans cannot allow others to dictate our future
09 02 2007	TCJ	State has long needed to regulate pumping of water	Do you buy ethanol from corn? I don't. Irrigation needs to be taxed for depletion

Both *The Salina Journal* and *The Topeka Capitol Journal* published at least one editorial questioning the rationale of biofuels development in a region with diminishing groundwater supplies and prone to droughts.

Table 5.5 News and editorial articles suggesting groundwater mining for biofuels development is detrimental for western Kansas

Date	News paper	Title	Catchphrase
07 27 2006	HDN	Water begins flowing	Because of the continuing drought and heavy demand for water from U.S. Energy Partners, the ethanol plant, Russell's water levels continue to deteriorate.
09 17 2006	TSJ	Ethanol plans will tax limited water supply	With the water table in many parts of the state falling and streamflows at all-time lows, the question must be asked: At what point does promoting ethanol production in Kansas become counterproductive?
03 29 2007	TSJ*	Biofuels aren't energy answer	The corn used to make the ethanol at your local gas pump exacts a heavy price from our land and water.
06 18 2007	TCJ*	Water supplies - Waste not	Growing interest in biofuels could have a sharp impact on the state's water supply by raising the demand for corn to produce ethanol.
07 15 2007	TSJ*	Ethanol is a flawed solution	Growing corn demands vast quantities of water. Most of the corn grown in Kansas is irrigated, which contributes to declining water tables and dry riverbeds.
08 26 2007	TSJ*	Rain follows the plow? Hardly	A question I ask: "Is it worth the risk that there will not be enough water left in the aquifer, when ethanol loses its luster, to prevent a recurrence of the Dirty Thirties?"
11 16 2007	TSJ	Local News	Southwest Kansas faces an "abrupt, ugly" halt to its economic viability within a few decades without new water conservation efforts, House Minority Leader Dennis McKinney said Wednesday.

* Editorial article

The fact that the number of stories arguing for and against groundwater mining and biofuels development were similar suggests that the “non-issue” of water problem had been challenged for a short period, although the analyzed newspapers in general were strongly supportive of the production of renewable fuels in the region. It also illustrates how powerful interests worked to prevent potential environmental problems and risks associated with biofuels development in the region from becoming widely defined as a problem in the first place.

Since the drought around Russell was the most acute and that area of the Ogallala Aquifer had the least saturated thickness, most of the criticism came from readers living in this community:

“*Of course, everyone is proclaiming how renewable this fuel is. Maybe it is in other parts of the country with more rainfall.*” (Bailey 2006, HDN 05 23 2006)

The wisdom of growing irrigated corn for ethanol in a region where water is traditionally viewed as a scarce commodity was expressed in one of the opinion pieces. Nevertheless, some of the interviewees also challenged the sustainability of the ethanol plants in the region:

"*It seems reasonable to grow corn for ethanol if we irrigate with river water and groundwater that can be replaced. But I question whether ethanol is a viable fuel when it requires irreplaceable groundwater*." (Miller 2006, HDN 08 06 2006)

However, news stories that mentioned water concerns related to ethanol production were quick to reframe and normalize the water shortages in terms of the overall benefits the ethanol industry would bring to farmers and the region. That is, the use of scarce groundwater for ethanol production in western Kansas was scrutinized, but justified as an integral part of the economic development.

Boosters of ethanol development appealed to the deep-rooted sentiment in the region that the water under the fields was part of the rural identity of local farmers and communities (Solis, 2005). The analyzed articles suggested that farmers know there was a remarkable value obtained from the water held under their fields, and that the value of water was embodied in the produced grains, meat, and ethanol. The opinion of a strong defender of farmers' water rights and proponent of biofuels development in the region illustrated the reframing of water availability in the region:

"*So, there is rarely ever an actual shortage of water. Rather, it is a lack of feasibility or facilities to make it available at the desired location when needed. […] Thus, there is tremendous value obtained from the water held on farm fields. We are selling it and shipping it out in trains and trucks as hay, grain, meat, cotton, ethanol and more – rather than watching it run off to the sea. This is the major basis of the Kansas economy.* (Letter to the Editor, TSJ 10 15 2006)

Farmers also seemed to be well informed about the rapidly diminishing nature of groundwater in the region and feared that the state government's sustainable water proposal (Sophocleous 2010) would lead to restrictions on water use, crippling agriculture. Farmers in Western Kansas claimed ownership of the groundwater under their farms and believed that they must make as much profit as they could out of it while it lasted. The increasingly capital-intensive and specialized production of only a few commodity crops such as corn, milo, wheat, and soybean placed the crop farmers in the region on the "agricultural treadmill" (Cochrane

1993). They were aware of the hard choices they have to make in order to stay at the forefront of the technological curve and maintain viable enterprises:

"*I mean, if you're an irrigation farmer, you have to irrigate that part of your land. You can't just stop watering because then you can't make the money to pay off your debt, and so on. So, they're gonna keep pumping as long as they can sell their crops for the price that can pay for the pumping. And when will that stop?*" (Grain farmer from Russell)

Although corn producers in the region generally agreed that corn acreage had increased over the years, they believed the trend had started before the ethanol plants came to the region. They also believed that producing more corn had not affected water use, since there must be another reason, as one of the interviewed farmers in Phillipsburg explained:

"*And I think the reason…maybe one reason there's so much corn now is [that] these seed companies have really worked to develop a dry land corn that will survive with less moisture and that hot weather.*" (Member of the local government in a case study community)

The conviction that the development of new technologies and drought-resistant types of corn would solve the issue of fading ground water supplies was quite strong in the area and agricultural interests often reinforced it as well. For example, newspapers often cited former Kansas Agriculture Secretary Adrian Polansky on his views on biofuels development in the region:

"*Biotechnology can help answer the world's need for safer, more abundant and more nutritious foods. It can play a part in developing competitive cellulosic ethanol production, and give us crops that require less water.*" (Polansky 2007, TSJ 06 19 2007)

The semi-official view on water mining in the area was summarized as people being on the treadmill to mine water for irrigation. Therefore, it was more or less accepted as normal that if water was going to be consumed then farmers' wanted the highest dollar value possible. For

instance, one of the regional rural water district managers saw "a higher value use of the water that's being consumed" as one of the main benefits of the ethanol plants in the area:

"*It's viewed that ethanol production is an increase in the dollars per unit of water consumed. And out here in western Kansas/southwest Kansas where we're primarily a mine, so once we consume that acre-foot of water, it's gone. It's not renewable. So if we are consuming it, let's consume it with the highest value possible and that's the short of the long from the mindset of folks out here.*"

Some of the interviewees from the three communities sitting on the Ogallala Aquifer mentioned the concern of their community members about the water use of the local plant and its negative impacts on community water resources. In Russell, where residents had faced water restrictions during a long-term drought in 2006, many held the plant responsible for the overuse of local water supplies. Meanwhile, a key informant in Russell expressed her belief (shared with several other interlocutors) that the local plant management showed an exemplary attitude during those hard times:

"*During the period of the water restrictions they showed exceptional leadership in working with the city, working with the community – finding other sources of water and they even went out to do some of their own drilling and filed paper work for example with the reservoir at Kanopolis Lake, so…and then they hooked up with Post Rock to get the secondary water sources and they get as far as we did a program where they purchased low flow water showerheads and we would give them out through the city office, here.*"

Others admiringly emphasized the investment of the local plants in new technologies to reduce water consumption, and expressed their hope regarding the development of new drought-resistant corn and less water-demanding ethanol production processes.

News that biofuels investments started to whittle away in 2008 and that general enthusiasm for corn-based ethanol had weakened also appeared as reprints from the national media. However, there were virtually no signs of critiques mounting in the studied rural communities against the existing ethanol plants.

"*... so the interest, sort of, is to use the consumption of water to build the infrastructure for higher value uses of the water and then hopefully as we talk about and maybe sometime, implement cut backs in the rates that we're consuming the water, we can still sustain a pretty strong economy with the higher value uses.*" (Key informant)

Representatives of the local government made it clear that the primary mechanism for capturing additional income in each case study community was through the sales/income generated by providing services and selling utilities to the plant. Besides retailing electricity and natural gas, supplying water directly from the city system became a vital revenue source. Thus, instead of the declining groundwater levels of Ogallala Aquifer being discussed as an environmental issue, the topic became a slowly advancing economic problem throughout the interviews. With the diminishing water sources, the general belief seemed to be that leaders of these communities could only maintain the health of the economy if the city received the higher value uses. In this sense, as the majority of community products were exported, water used by the ethanol plant became to be perceived by many as being just another product for export.

Meanwhile, all respondents agreed that although they were on a treadmill of water consumption, local farmers made good use of this valuable non-renewable resource. Simply put, water pumped up crop yields and that, in turn, was a major driver of the economy in Kansas. The strongly held general conviction was that water is a natural resource that is inherited with the farmlands and needs to be explored and sold at its highest possible value.

The analyzed newspapers often invoked the powerful threat of economic decline of the region and most locals were somewhat predisposed to accept the biorefineries in their community, as expressed by a representative of the Chamber of Commerce in one of the counties

"*I think in all, you find that all the rural communities where the ethanol plants are located or where most all of the plants are located, the bias would be pro-ethanol. But once you get to the larger concentrations of population, then it goes away.*"

Biofuels production in western Central Kansas had the potential to damage the environment by diverting scarce water supplies, and by stimulating indirect land-use change that

might negatively influence atmospheric carbon balance. However, the environmental benefit frame recreated and employed by the analyzed newspapers presented groundwater use for biofuels development as a non-issue. This was possible by appealing to the deep-rooted sentiment in the region that the water under the crop fields was the organic part of the rural identity of local farmers and communities as well as the main ingredient of their local, agriculture-based economy.

5.4.3 The Energy Independence/National Security Frame

The energy independence frame was based on the claim that ethanol helped reducing dependence on crude oil imports hence increased our national security. The increased political instability in the Middle East during the period I examined gradually fed into the heightened national security benefits discourse frame of biofuels development. Local politicians, for example, very often proclaimed the national security benefits of biofuels development in relation to U.S. foreign policy:

"*But it's also an opportunity for affordable fuels for consumers, he [Congressman Jerry Moran] said, and for better national security. […] We are spending billions of dollars (for oil) outside the United States, and those dollars could very well be used in attacks against our country, against our economy and against our American citizens.*" (Kessinger 2006a, TSJ 08 23 2006)

One of the main arguments promoted was that 10 percent of ethanol's mandated mix into the national gasoline supply replaced gasoline use, and even more if motorists filled up their vehicles with higher blends of this fuel as a patriotic act. The readiness to "kick those foreign imports in the head" often described the enthusiasm of ethanol boosters and echoed through the interviews. Survey data also suggested that this perception resonated well with the respondents.

"*We, the citizens of Kansas and the United States, must start to become less reliant on foreign oil and look at products that don't use foreign oil for our automobiles, trucks, tractors and combines: ethanol and soy-diesel. […] Filling your gasoline-powered car or truck with a 10*

percent blend of ethanol will reduce our dependence on foreign oil by 10 percent." (Phelon, TCJ 05 22 2004)

5.4.3.1 Biofuels Development as Provider of National and International Importance of the Region

By positioning energy independence as a national security issue, biofuels development in Central Kansas has been portrayed as the state's contribution to the nation's energy independence. The regional newspapers appeal to the state's agricultural heritage through the voice of boosters of the ethanol development. For example, the governor of Kansas proudly embraces the perspective of the state contributing once again to the country's national security through its agricultural potential:

"*America is looking for new sources of energy.[…] In Kansas, and in rural areas throughout the nation, we're finding those sources in the grains and grasses that have been grown on the land for generations, and in the wind that blows across the fields and prairies.*" (Kessinger 2006 b, TSJ 06 10 2006)

The narrative is that if biofuels are in the future for the United States, then Kansas will be at the forefront of that future. In a speech at the grant-awarding ceremony for a cellulosic ethanol plant, the governor of Kansas declared:

"*Liberal would be home to additional jobs, as well as 'to our new fuel supply' that the rest of the nation and world will be watching play out.*" (Farley, GCT 8 24 2007)

Although the energy independence/national security frame was much less prevalent than the economic development frame, the importance of domestically produced transportation fuels was often repeated as a mantra. While it was framed as a homegrown industry built on the investment and labor of Americans, advocates of biofuels production in Central Kansas rarely felt the need to detail how the energy independence/national security of the country was furthered by the development of renewable fuels in the region.

Interview data also supported the idea that local promoters framed biofuels development in the region as a very important step in lessening the nation's dependence on the crude oil imported from the Persian Gulf and other politically unstable or unfriendly countries.

"*Then you've got Saudi [Arabia], Mexico, Venezuela, Iraq, Iran, Nigeria who are your other suppliers. Almost all of them are against us, except maybe Mexico, oh and Canada – it's another big supplier. Except for Mexico and Canada, all of them are against and for national security purposes; we need to be at sixty to seventy percent. If we have sixty to seventy percent of our supplied fuel available internally, then we're viable.*" (Ethanol businessman)

The belief that the United States could and should significantly cut back their expenditures on foreign oil by replacing it with domestically produced renewable transportation fuels was resonating throughout the interviews with key stakeholders in the ethanol development in the four case study communities:

"*As far as the bioenergy, the ethanol side of it, it amazes me the amount of money the American people are spending in buying oil overseas. The amount of wealth our country is losing in phenomenal that's going to a foreign country when we have the capabilities of producing an energy form that is basically green – it's natural – and we happen to be sequestering our carbon, our CO2.*" (Member of the local government in one of the case study communities)

Many of the local boosters of ethanol production used the two-word phrase of "energy independence" or "national security." The analyzed newspaper articles suggested that this frame was used to advocate the idea that readers could address their fears of high oil prices and global warming as a nation.

The ethanol-plant building frenzy in the region was touted by promoters and perceived by the interviewees as a big step made by the State of Kansas to the country's energy independence. The message was that if biofuels were in the future for the United States, then Kansas was at the forefront of that future and people in this part of the country felt good to be part of something that works for Kansas and for the entire nation.

In speeches at different biofuels production sites politicians often suggested that besides creating lots of jobs, biorefineries in western Kansas would be the sources of new domestically produced fuels and the rest of the nation and world would be watching how these visionary enterprises played out. Politicians also claimed very often the national security benefits of biofuels development in relation to the U.S. foreign policy, reminding the readers that the country had been spending billions of dollars for oil outside the United States, and those dollars could very well be used in attacks against our citizens and economy.

5.5 Inside the rural growth machine

There are many similarities as well as differences between the original urban growth machine as described by Molotch (1976), Logan and Molotch (1987) or in Jonas and Wilson (1999). The similarities are reflected in the fact that local political, economic, and administrative elites form coalitions of various forms and strengths in order to promote local growth. In general, diverse actors, such as elected officials, business leaders, municipal staff, real estate professionals, as well as other representatives of public and private sector form the urban growth machine coalition. In the rural environment of the four case study communities, local business leaders, bankers, investors, as well as farmers joined members of the local governments in the growth coalition for their common goal of promoting economic growth through biofuels development (Table 6.1).

The coalition of these politically and economically influential actors unified their efforts to direct local political – and often scarce – financial and natural resources toward a shared goal of land development in the urban setting, and to attract manufacturing or other businesses for community economic development purposes in studies the rural communities. In both settings growth is promoted as good for the whole community; however, not everybody benefits. For example the interviews suggest, the early investors in the ethanol plants receiver bigger and faster returns for their investment in Phillipsburg and Garnett.

The original description of the mechanisms of growth machines describes coalitions of elites as working together to promote and adopt policies and practices that best serve their economic interests and propel cities toward growth. However, feuding factions and often lose relationship between various interest groups can slow development projects (Bridger and Harp 1991). In the urban setting, small downtown business owners and suburban residential groups

often stand against land developers, local administration, and external capital (Kulcsar and Domokos 2005). However, local boosters of biofuels development in the case study communities did not have to face confrontation with non-governmental organizations or other civil society groups interfering with local politics by questioning the value of the proposed development.

Individual interviews with key informants further highlighted aspects of the growth machine coalition at work while promoting the development of ethanol plants in rural communities. For example, several interlocutors suggested that growth was useful and that they should not stop it if the community was to survive. This is one of the main tenets of growth machine theory. It was closely related to the economic development frame employed by the analyzed newspapers.

Agriculture in southwest Kansas in general, and ethanol production in particular was described by many of the actors promoted in the newspaper articles and by several of the interviewees as the "lifeblood" of the economy of the region. Ethanol development and economic development in the region were purported as indivisible.

One of the main methods used by newspapers that articulated the economic development frame was to highlight the successes of the ethanol industry and the fast pace at which biorefineries were being built both nation- and statewide. They also mentioned the economic rewards investors had anticipated to achieve. The building costs often exceeded $100 million, and studies of economic impacts on the host community of each ethanol plant was also on the order of millions of dollars. Newspapers always published these economic benefits. The huge dollar amounts for payout to crop producers, the number of direct jobs created and payrolls, meaning potential tax revenues for the community and county, were always emphasized. By publishing that huge dollar amounts were raised in record time for the construction of ethanol plants the newspapers created the perception that the ethanol industry was a growing one, developing at a neck-breaking pace, and its development is unstoppable, "it is really breaking lose".

The ethanol mandates imposed by the two consecutive Renewable Fuels Standards (RFS) constituted a boon for rural communities, and a blessing for farmers, since the humming of the new shiny ethanol facilities represented the "sound of money" and it was doing wonders for agriculture-based communities.

For example, one of the newspapers' editors welcomed any plans targeting economic development of the region, especially those related to energy initiatives:

"*When rural towns in our neck of the prairie take the initiative to diversify their economies and consider innovative industries and alternative approaches, they deserve attention and commendation.*" (Montgomery, HDN 07 21 2005)

5.5.1 The Inevitability of Growth

Molotch (1976) argued that "the political and economic essence of virtually any locality, in the present American context, is growth... the desire for growth provides the key operative motivation towards consensus for members of politically mobilized local elites, however split they might be on other issues, and that a common interest in growth is the overriding commonality among important people in a given locale" (p. 310). Similarly, Peterson (1981) argues that cities typically pursue growth as though it were a public good, and as though it were a natural outcome of rational collective action to enhance the tax base and community betterment. Yet, this does not mean that such pursuit necessarily makes any sense, much less that it is inevitable. However, studies show that contrary to popular wisdom, there is little evidence that growth eases problems of unemployment, high housing costs, or impoverished city budgets (Logan and Moloch 1987).

The analyzed newspapers presented the establishment of the ethanol plants in all four of the case study communities as the outcome of a relentless effort of the members of local government, and especially the city and county economic development office and chambers of commerce orchestrated development efforts with the aim of advancing the welfare of their whole community. The same idea also echoed through the interviews. A key informant who had business ties with one of the ethanol plants, for example, expressed the need for constantly searching for new economic opportunities and the responsibility of finding the right ones for the community:

"They are community leaders. They have been for generations in the community and if they didn't want an ethanol plant, they wouldn't have pushed it. If they didn't think it was good, they wouldn't have done it. I still think it's the responsibility of the city and county

commissioners to help encourage economic development and if they have to do that with some tax abatements, then so be it."

Perhaps the words of the director of the economic development office in one of the case study communities captured the essence of the widespread feeling in the region that growth was inevitable while all the ingredients on national, state, and local level (stimulating policies, subsidies, natural resources, raw material, infrastructure, human resources, etc.) were available for ethanol production:

"Economic development, growth of communities is a necessity. Either they're gonna grow or they're gonna die. So I think that you take advantages of the things that are here and you hope that you don't ruin it for the future."

Another key informant, a farmer and big investor in one of the ethanol plants, described the inevitability that led to the ethanol development in his community in the following words:

"It just made sense that right here in SW KS we have irrigation, we have corn productions, we have cattle, that it was a natural fit and it was something that would add value for agriculture, and add value for the livestock industry as well. And with that having satisfied my own curiosity, we began this process of formulating a company and build an ethanol plant. And we did."

Along the same lines, many respondents felt that the good thing about the biofuels development was that it had brought an industry to the community that was specific to a rural America.

5.5.2 Attempts to Stop Growth Refuted on the Basis of Its Impact on the Economy

Proponents of economic growth often urge communities to make concessions and sacrifices for development in order to gain alleged benefits, and community members are told that slowing growth would be disastrous (Fodor 1998). Whether advocates of growth are able to

legitimate their plans depends in a good part on how successful their critics are in amounting equal or more powerful rhetoric (Roe, 1993).

Participants in this project portrayed the local ethanol plant in positive terms. Most of the interviewees declared that they simply had not heard any negative effects caused by the local ethanol plant. However, when asked specifically about the odor coming from the plant or the increased truck traffic going through town, they partially acknowledged the existence of these nuisances. Even when it came to palpable negative effects, the irritations caused by the ethanol plant were always portrayed as lesser annoyances compared to the existing ones in the respective community. The odor coming from the biorefinery was perceived as the sweet smell of fresh bread or beer, while the stench of the asphalt shingle factory in Phillipsburg or the cattle feedlots in Russell and Liberal were called by some almost unbearable.

Those few who opposed the siting of the biorefinery in Liberal were described by the respondents as not even NIMBYs (Not In My Backyard), but as "skeptical", "against progress", or "simply jealous of other's success". Thus, opponents of progress are most often labeled as naysayers, and seemingly each community has one or two of them. One of the key informants described the opponents of the local ethanol project in Liberal as follows:

"*There's naysayer. I mean, there's people that want it to fail, but no matter what you do anywhere, there's going to be somebody that wants to see you stumble, but that would critical analysis with the people involved, you know, down here. […] You know, there's always people out there all doom and gloom, 'Oh this isn't the right way to go'. It isn't perfect, but it is here today. I think that if you have local participation, people understand that.*"

5.5.3 Strong Local Government Support

According to Jonas (2007), growth machine actors disseminate an ideology of growth, which often proves a potent force to such an extent that all other interests either become incorporated within the essential logic of the machine or face defeat.

Public infrastructure in general refers to publicly subsidized physical networks that support economic activity, promote general welfare, or protect public health and safety. Although infrastructure is a necessary precondition for urban growth to be achieved, local pro-

growth actors have not always had to shoulder the burden for its development directly (Kilpatrick and Smith 2011).

Most economic development projects create additional direct and indirect expenses for the community, and attracting an ethanol plant to a rural community fits the norm. In each one of the four case study communities, the local government has helped in various ways the establishment of the biorefinery.

5.5.4 Infrastructure Work

Most of the additional infrastructure that was necessary to accommodate local ethanol plants involved the construction of new road sections and the extension of the existing city water system. Often there were planned public works that had to be built anyway, but the ethanol plant provided an incentive to speed them up. The prospect of a new industrial entity also stimulated local governments to apply for different development grants, as shared by one of the key informants:

"*The city and county... they were instrumental with helping with the utility infrastructure and some of those taxes, and we were also able to get some community development…different grants by working with the city to obtain those grants… like community development grants.*"

Several respondents stressed that the ethanol plants also contributed money to these infrastructure works. For example, Arkalon Energy LLC in Liberal paid for the seven miles of water line extension from the municipal wells to the plant, whereas where Prairie Horizon Agri-Energy LLC in Phillipsburg agreed to pay $50,000 of the $635,000 toward the county's cost to pave a road with concrete in order to link the highway to the ethanol plant.

Perhaps the most interesting infrastructure work to accommodate the ethanol plant's needs occurred in Russell where the city extended the runway at the airport, so corporate jets could fly in and out. US Energy was the flagship biorefinery of ICM and was used as a showcase and training facility for those interested in biofuels business from all around the world.

5.5.5 Tax Abatements

Logan and Moloch (1987) questioned the wisdom of tax abatements and "subsidies". They found that population growth and economic development was not always a blessing for the community, and it was frequently just a redistribution from the "have not's" to the "haves".

In all four case study communities, the local or county government did forego substantial revenue (in form of tax abatements and cheap credits), although at the time of the interviews the magnitude of the uncollected revenues was not exactly clear. In 2006 the *The Hutchinson News* published a cost -benefit study for an ethanol plant in Liberal. The study emphasized that water use was not the only measure of an ethanol plant's potential affect and shed light on the cost of tax abatements for the community hosting a large size biorefinery:

"*In Seward County, the analysis fixed the benefit - accounting for a 10-year abatement - at $13.3 million, with the money going to the city of Liberal, Seward County, Plains-Kismet USD 483, Seward County Community College and the Seward County Rural Fire Department. The state would generate another $50 million. The tax break - sliding by 10 percentage points annually from 100 percent in year one to zero by year 11 - would cost the local entities $3.8 million and the state $62,000*." (Vandenack 2006b, THN 11 30 2006)

The interviews suggest that local leaders were aware of the need to offer some type of incentive in order to attract the ethanol business in their community. Along with some smaller financial encouragements, all four communities offered ten-year tax increment financing (TIF), the public financing method that was used as a subsidy for redevelopment, infrastructure, and other community-improvement projects. As an investor in one of the ethanol plants aptly highlighted:

"*I understand that to get…part of the reason to get these people here, you have to give some type of incentive. They're not popular with the general public, but I still think if you look at the overall picture, those tax abatements are […] I still think in the long run, we're gonna be further ahead by giving those abatements on the taxes.*"

On the other hand, as one of the main stakeholders in the ethanol plant in one of the case study communities revealed, investors also felt that it was their "right" to ask for stimuli if a community wanted to host their biorefinery:

"*We did ask for tax abatements…But they were…we didn't ask for anything that wasn't being offered in any other community in Kansas. We, you know, felt that it if was being offered in this community, we should have…if they wanted us to come here, then they should offer us the same tax incentive, and they did – both counties did. But they certainly didn't give us anything in addition that they would have done with any other industry or business in Liberal or Garden as well.*"

Although not all community members were happy with the tax abatements, local school district representatives supported them in each town even though their schools lost money in the short term. They argued, similarly to many of the project participants, that after a few years the amount of money available for schools coming from taxes would increase:

"*So, at least we know that if the ethanol plant is here beyond 10 years, then we can start reaping some of that benefit, we did a private memorandum deal when we had people come in who were selected by the rules.*" (Ethanol businessman)

The interviews also shed light on the less-publicized facts that in Liberal, due to a bad experience in the past, the county had been initially reluctant to give any incentives for the ethanol business. The Liberal local government of had previously invested considerable effort and money to attract a swine slaughtering facility, but the deal fell through at the last minute, and the city had to recover its loss. Another interesting development occurred in Garnett. The city sued the county for the tax abatement given to the ethanol plant. The prolonged court battle ended with the city winning the cause, but it was too late for the local school district to receive the money had the ethanol plant not been relieved of its initial tax duty.

5.5.6 Land Sale for the Siting of Ethanol Plant

Logan and Molotch (1987) define the urban growth machine as a political coalition of private and public power holders that promote capital accumulation via land-use intensification and local economic development. In their view, local land-based elites will lead collective efforts to intensify local economic activity in order to increase the "exchange value" of the urban real estate. At the core of the "rentier class" are the large-scale local property owners who share control of places and pursue land transactions to trap growth. This group also includes extra-local owners, property developers, and financing institutions (Logan and Moloch 1987:277).

Rodgers (2009) describes place entrepreneurs as playing a central role in activities oriented towards deriving exchange values from land. They are directly involved in the exchange of land, and/or collection of rents. "They seek to produce a particular set of conditions and relationships to increase the value of their property. These place entrepreneurs are often embodied by more complex organizations that make specific and targeted efforts to influence an array of relevant decision-makers. At the same time, these modern rentiers are most likely to form the core of broader political coalitions seeking to encourage a more general objective: urban growth" (Rodgers 2009:10).

Several years have passed between the establishment of the ethanol plant in each one of the case study communities and the time of the interviews. This may be one of the reasons the respondents often could not remember the very early steps and details of the planning phase. Nonetheless, it seems like there were similarities between the siting of the ethanol plant in Liberal and Phillipsburg; namely, the owners of the land where the plants were built were influential figures in their community and in the initial planning groups. As a county government representative recalled:

"*I don't know, but I think a big part of the deal was […] had the land here and he was kinda the ramrod of it. He just had some land to sell.*"

Some suspected personal interests behind the siting of the ethanol plant in another community, as one of the local business owners pointed out:

"*Oh yeah, well. Yeah, I mean…I think someone wanted to put it one place because either they knew somebody who owned the property where they wanted to put it or a realtor. They could benefit some way about it…*"

5.5.7 The Ethanol Plant as a Good Corporate Citizen

The consensus among the project participants was strongest on their belief that the management of the local ethanol plants did everything to reach out and help their host communities. This willingness to give back to the community would take various forms ranging from monetary donations to arts and sporting events, to buying educational software for schools, or simply plant workers volunteering in the community. The perception was that they contributed to the community through mom-and-pop organizations, donations, by treating their employees well, and by hiring from within the community; after all the ethanol plant was a good corporate citizen. One of the key informants shared her experience:

"*Of course the job and good paying job... and with US White Energy… they were involved in the community… they made donations to the school district and they were very pro-active and having things done and being identified with community events…and so good paying job was number one but I really feel that they were good part of the community… they buy their parts and things locally… so all these things come back – it's not just the job set around by the plant but the local contractors, the local part sellers also benefited by having this industry in place.*"

A member of the local government in a different case study community expressed similar views regarding the local ethanol plant's involvement in various community events:

"*To the community, they donate back. They've donated back quite a bit to different areas of the community, which if you're in a small community, the donations to other groups are a big thing. I know, just from the Chamber point of view, they've always given us something when we've asked. They are willing… their workers are willing to help out at anytime for community events and community service with donations for community events. There's some other deal coming up and they've been there really well for us.*"

5.5.8 The Size Factor

When asked about how they felt about dimensions of the ethanol plant related to the size and possibilities of the hosting community, a typical answer emphasized on the belief that a larger ethanol plant might have created a few more jobs, but it would have taken away too much of the water resources from other uses in each community. Survey data show that this latter opinion was extremely high (67%) among respondents in Russell. The majority of respondents in Russell and Phillipsburg felt that the mid-size plant they had was just the perfect size for their community. On the other hand, as Anthony V. Schuelke of Phillipsburg opined:

"I think if we had more water supplies available they would have built that plant bigger. […] If it was bigger, would probably benefit us because they would have employed more people, so…"

However, the newspapers slightly reformulated the biofuels development discourse in 2006. The biofuels boosterism embedded in the economic development frame became part of the larger bio-science development discourse. As state authorities pushed for Kansas to develop into a leading state in the incipient Midwest Bioscience Corridor, the media discourse suggested that communities in this sparsely populated region of the state were exploring the possibility of developing commercialized bioscience industries that would feed off their regional economic staples (Green a, TSJ 02 18 2006). Ethanol, biodiesel or other products offered the opportunity for Kansas-made products to be more valuable, boosting rural economies and communities in the process while helping the country to decrease its dependence on foreign oil (Green b, TSJ 09 09 2006) – suggested the ethanol discourse.

The general message that came through the actors promoted on the pages of the analyzed regional newspapers (local and state-level politicians, representatives of the local administration and the ethanol industry) was that there was little excuse not to grow the ethanol industry in southwest Kansas. This was further emphasized by the use of the "Made in America" slogan. The slogan suggested ethanol, as a domestically produced transportation fuel, not only generated money for local economies but also contributed to our energy independence through reducing our dependence on foreign oil.

The economic development frame was very pervasive and geared towards promoting high expectations for success. The analyzed newspapers accentuated the profits for farmers and rural communities as well as highlighted the benefits for investors, job seekers, and regional economic growth represented by the biorefineries.

Although by mid-2008 support for corn-based ethanol in the national and international media started to erode. The analyzed regional newspapers were keeping up the beat in praising the benefits its production delivered to the local communities. This also suggests that a well-organized and powerful rural growth coalition was able to sustain its concentrated efforts to sustain the high community acceptance of local ethanol plants, thus shielding their political and economic interests.

5.6 Summary of Findings

Ethanol development in south and west Central Kansas is an issue with implications that go far beyond the boundaries of environmental policies and agricultural politics. The aim of this study was to analyze the ways rural growth machines promote ethanol production in small farming communities in the region and how this has been presented through the discourse around biofuels development in the articles of a state level and six regional newspapers.

"*What can one person - you, for instance - do to reduce pollution, decrease America's dependency on foreign oil and stimulate our economy?*" (Schlageck, HDN 02 24 2008)

The rhetorical question above is a typical example of how the proponents of biofuels development encouraged ethanol production in the region through the analyzed newspapers. It demonstrates how the public discourse surrounding biofuels was framed as providing economic, environmental, and national security/energy independence benefits of renewable transportation fuels produced in Central Kansas. The ethanol industry was portrayed through the pages of the analyzed newspapers as the best fit for the grain farmers and for all the inhabitants of the region. Agriculture in southwest Kansas in general, and ethanol production in particular was often characterized by the actors promoted in the newspaper articles and interviewees as the "lifeblood" of the economy of the region. Furthermore, ethanol development and economic development in the region were claimed to be inseparable.

Actors promoted by the newspapers acclaimed ethanol production to be one of the best tools for revitalizing small rural communities and family farms in western Kansas. The economic gains that biorefineries allegedly brought and would bring, not only to farmers or host communities, but also to the entire region, constituted the central part of this rhetoric. At the same time local "shakers and movers" were emphasizing the economic development and energy independence benefits of ethanol they were also drawing on a cultural attachment to maintain the farming and rural community identity that was challenged by declining population and a diminishing importance of agriculture as a branch of industry in the state. As Bell and York (2010) suggest, agricultural interests possibly maintain their power by actively reconstructing the agro-industrial ideology through appeals to the communities' farming heritage.

This research has found that members of the rural growth coalition tried to maintain and promote a constructed ideology of dependency and agricultural-economic identity in order to facilitate biofuels development by evoking the political, commercial, and symbolic importance of farming. Ideology and legitimation play an important role in maintaining the status quo: the analyzed newspapers promoted actors who cultivated the idea that both the economy and cultural identity of western Kansas centered on agriculture/grain production. Furthermore, promoters of the biofuels industry attempted to lure the public into identifying with the industry. For instance, the industry presented the jobs they provided as out of the ordinary and communities with ethanol plants as being part of the future of the large biofuels producing community.

The environmental benefit frame of biofuels development in the region was largely one-sided. The analyzed newspapers omitted exact details on how biofuels had contributed to improving the environment or they failed to present scientific data to support their claim. This study has found that even when environmental concerns – for example the potential long-term negative environmental effects of groundwater mining – were discussed, they were framed as a non-problematic issue (Freudenburg 2000) and most often in the light of economic benefits. The farmers' claims regarding the use of declining groundwater were discussed in terms of the greater economic benefits captured in value-added biofuels production with an emphasis on the water conservation efforts of the ethanol producers.

These strategies reflected an intensive effort to link biofuels development in western Kansas to a broader shared cultural experience of farming, and by extension the groundwater as part of the area's cultural heritage (Solis 2005). The newspaper articles, along with the

interviews, suggest that farming communities in west Central Kansas continued to support irrigated agriculture and embraced the water-demanding ethanol production.

The interviewees are well aware that their communities' livelihoods depend highly on agricultural and ethanol sectors and that intensive ground water mining would cause foreseeable harm (detrimental environmental and social effects), while providing some benefits to the host communities, such as tax incomes, and auxiliary businesses.

This might suggest that some of the economic and political interest groups focused on rapid short-term gains with less consideration for the next generations of west Central Kansans – even though 96 percent of the community survey respondents felt that the public is responsible for trying to preserve resources for future generations.

The energy independence/national security benefit frame was built strongly on the idea that biofuels could and would gradually replace the crude oil imported from nations with unfriendly or unstable regimes. This frame was used to advocate for higher mandated biofuels blends in all transportation fuels, while appealing to patriotism in their honorable fight for replacing foreign petroleum products with domestically produced renewable fuels.

One of the many similarities this study found in all interviews was that the respondents had not perceived the local ethanol plant as being a potential environmental risk to their community. People routinely associated the smell coming from the biorefinery to the aroma of freshly baked bread or that of a beer brewery, and inevitably contrasted it with the unpleasant stink of other local industrial and agricultural establishments. It was widely believed that the ethanol plant in Russell had actually fixed an older environmental problem in the community: that of the wastewater carrying starchy matter from the gluten plant that often emanated an unbearable stench that used to suffocate the town in the summertime. Even the matter of rapidly diminishing water resources was presented as an economic one. Since the city owned the water right in all case study communities, it was the only supplier capable of providing enough water. Therefore, the sale of water became one of the major income sources for the local governments. Alternatively, many people shared one of the interviewees somber view about the future of ethanol and of the whole region; people will pump the groundwater until it is gone: "*then what'll happen is probably what happened in Appalachia – a lot of people will probably leave and then a lot of people will stay and then they'll be left with less economy. And hopefully we can extend that for some years, otherwise we'll go somewhere else.*"

Another parallel between the four case studies is related to the generally held conviction that even though it had not attracted many new people to town, the local ethanol plant had somewhat slowed depopulation. That is, if the community had not have accepted the ethanol plant then school enrollment would have decreased dramatically. Another popular belief was that the newly-created jobs were filled overwhelmingly by local people, although managers moved in from other places.

After having conducted the initial fundraising drives, and the business opportunity was allowed to be publicized by the federal laws (specifically the SEC rules regarding private placement), local and regional media outlets were very supportive in promoting the local ethanol plants in each community. In fact, some of the interviewees who worked directly or indirectly for the biorefineries confirmed that local newspapers would ask the plant managers and CEOs about facts before publishing articles related to biofuels development in the region.

The scars left on the local economies by the trailer manufacturer leaving Russell, the insurance company closing its doors in Phillipsburg, or the swine slaughter house dropping the deal with the city of Liberal, were still fresh in collective memories. These economic set backs prompted some of the respondents to express their concerns regarding the potentially disastrous consequences if the local biorefinery went bankrupt or had to close even temporarily due to high corn prices. These concerns suggest that in spite of stimulating rural economic development, local ownership of the ethanol plants can constitute a risk factor in these already vulnerable communities.

Interview data suggest that there was little or no hostility towards ethanol development in the case study communities, or at least there were not strong arguments against the local biorefineries. The sporadic opponents of the ethanol projects were often representatives of ethanol industry and members of the local government as naysayers or jealous people, who simply could not accept change. Residents' real base for antagonism, such as the alteration of their life style due to the proximity of the ethanol plant to their homes, or the fear that the biorefinery would syphon the water from their wells were quickly dismissed.

The findings support the suggestion of framing theory that media frames influence audience frames (Scheufele 1999), based on the significant overlap of the two. The great majority of the news articles depicted ethanol development in the region as very positive, and similarly, the interviewees and respondents to the survey were very optimistic about the topic.

The results indicate that the analyzed regional newspapers, being part of the rural growth coalition, have been quite successful in telling people *what* to think and *how* to think about the local renewable fuel production, and successfully influenced their perceptions and attitudes about it. This resonates with the findings of Dyer et al. (2013) who analyzed national, state, and local newspapers' coverage of biofuels and biofuel-related topics and concluded that newspaper coverage of biofuels development that had the potential for positive economic impact within their service area were often more positive than coverage of such development elsewhere.

Chapter 6 - Discussion and Conclusions

Ethanol development in rural Kansas is an issue with implications that go far beyond the boundaries of environmental policies and agricultural politics. So far, little is known about the actual social, economic, and environmental impacts of biofuels industry on local communities where ethanol plants are located. This study aimed to examine who, how, and what role print media played in promoting this development, and how community members perceived the effects of ethanol production in their community. The research focused on the ways local boosters promoted the establishment of ethanol plants in their communities, on the discourse around development in the regional printed media and on the perceptions of community members on the benefits of local ethanol production.

Little attention has been paid to smaller, rural communities where it is conceivable that different social and political dynamics are operative. This study focuses on such communities in the hope of better specifying the applicable range of the growth machine hypothesis. For an analysis on the manifestations of the growth machine in rural settings, the ethanol production offers an excellent opportunity as it represents the ways that current social, economic, and environmental relations are deeply related.

The first research question addressed the mechanisms through which rural growth machines promote biofuels development: "*How do relatively small groups of local political and business elites promote biofuels development in small rural communities in Kansas?"*

Members of the rural growth machine promoted a discourse on biofuels based on the economic, environmental, and national security benefits of ethanol production. The economic boost argument was substantiated by the interviewees' perception that biorefineries created a number of highly paid jobs for local people, and the multiplier effect of the revenues created by the ethanol production helped their communities. Many saw the need for growth as inevitable for their community to survive. Although a majority of respondents perceived the establishment of the biorefinery in their community as a public good, a win-win situation, and a good investment opportunity for everyone, this research found that the initial phases of planning and fundraising for the local plants were very secretive and highly selective. It usually involved ten to twenty well-connected and influential local "movers and shakers" who gathered seed money from friends and relatives partially because of restrictions imposed by the Securities and Exchange

Commission, and partially because of the relatively big minimum amounts needed. Subsequently, these were the same people who had the best and earliest return on their investment after the initial success of the local ethanol plants before the markets turned unfavorable.

Nevertheless, the majority of interviewees expressed their pride generated by the perception that their communities were on the renewable energy map and generated environmental benefits, while contributing to the nation's energy security. For the most part, participants remained skeptical that rural revitalization was even possible considering current economic and agricultural trends. Although there was a general consensus that even though ethanol development did not stop outmigration, especially of young people, the establishment of the ethanol plant in their community helped stabilize the population.

The discourse around biofuels development suggests that communities with ethanol plants were not overly concerned about the possible negative local environmental impacts (such as dropping groundwater levels) of ethanol production. The lack of news stories on the possible negative effects of pumping out the groundwater for intensive irrigation suggest that the local growth coalition kept the availability of groundwater a non-issue. They managed this by appealing to the locals' sentiment of entitlement to use the water under their fields as well as to their belief of inevitability regarding the loss of groundwater through irrigation and biofuels production in the area.

The second question asked: "*How do regional newspapers influence the public perception of biofuels development in small rural communities*?"

The growth machine theory emphasizes the importance of various media outlets, and particularly that of local and regional newspapers in promoting growth coalition objectives to a wider public. The three analytical frames of the ethanol discourse promoted by the analyzed newspaper articles identified in this study are related to the economic development, energy independence/national security, and environmental dimensions of biofuels development. Boosters present ethanol production as a universal reward for all members of a community with and ethanol plant by highlighting gains for local farmers, returns for investors, job possibilities, and the general economic growth.

The economic development frame is more predominant than either the environmental or the national security/energy independence frame. The analyzed newspapers create and employ a

nuanced economic development frame with several dimensions ranging from presenting the ethanol plant as a source of local job and wealth creation, to promoting it as a tool for revitalizing small rural communities and family farms.

The environmental benefit frame became part of the economic benefit frame as intensive ground water use for irrigation and ethanol production is justified in economic terms. By focusing on the tight interaction of agriculture and environment, the ethanol discourse promotes the acceptance of agricultural values of the corn-based biofuel and makes it difficult to criticize the environmental impact of ethanol production.

The national security frame was employed to advance the ethanol industry's goal for higher mandated biofuels blends in all transportation fuels, while appealing to patriotism to gain support for reducing foreign crude oil imports by replacing petroleum products with domestically produced fuels

The third research question addressed local perceptions about biofuels development: *How do members of rural communities with ethanol refineries perceive community benefits from biofuels development?*

Support for biofuels in the mid 2000s amplified and became an obvious driver of American energy, agricultural, and rural development policies. Meanwhile, the actual economic, environmental, and energy contributions of the biofuels boom in the Midwest remained unclear.

Survey respondents and key informants in the case study communities perceived that using ethanol was good, because it reduced the need for imported oil, thus strengthening the nation's energy security. The importance of a biorefinery for the economy of the local area was held high, as was the belief that lots of new jobs had been created for the local workers. However, residents were not convinced that these jobs were high-paying, that the ethanol plant increased tax revenues for the local government's budget, or that it reduced local poverty as the newspaper articles and most of the interviewees tended to imply. The fact that more than one third of residents in each community did think that the benefits of having an ethanol plant in their locality moderately or greatly outweighed the costs suggests that ethanol production was perceived as offering reasonable economic opportunity to rural communities in spite of creating unsettling environmental challenges. It also suggests that the hegemonic ideology of the local growth machines managed to dominate the public opinion regarding biofuels development in the case study communities

In this research, I used both the theory of ecological modernization and the theory of growth machine to understand how newspapers address biofuels development, an issue with significant implications for rural Kansas. The research focused on the ways local boosters promoted the establishment of ethanol plants in their communities, including the discourse around development in the regional print media and the perceptions of the community members regarding the benefits of local ethanol production. In-depth individual interviews with local stakeholders and community survey data were also drawn on to gain a better understanding of the mechanism of the rural growth machine as well as the community perceptions regarding biofuels development in the region.

The analyzed newspaper articles and interviews suggest an increasing interest in environmental technology and an increasing awareness of environmental issues. Farmers in the focus group in one of the case study communities admitted that their environmental awareness has risen after the commitment to produce renewable energy crops year after year on the same fields and adopted the no-till technique to work their fields.

Regional newspapers often cited the former Kansas secretary of agriculture, who had a very optimistic view on bio-technological research and development that can produce high yield, drought tolerant crops for safe, abundant, and nutritious food- and feedstocks. Many key informants and actors promoted in the analyzed newspaper articles were confident that technological advancements could provide crops for first- and second-generation biofuels as well as biorefineries that require less water in the water scarce western part of Kansas.

The ethanol plants, these shiny industrial establishments at the outskirts of the case study communities, generated a great deal of community pride and cohesion. Many of the interviewees perceived the existence of the local biorefinery as a sign that their community was progressive, and as an assurance that these technological marvels helped reducing the nation's carbon footprint and dependence on imported oil.

Ecological modernization means that environmental considerations are increasingly entering economic and societal practices. Proponents of ecological modernization argue that the United States could create more jobs by leading a new environmental revolution that produced greener technology to foster economic progress without environmental destruction. In their view, the development of new technologies is central to efficiency, economic growth, and better environmental conditions (Schlosberg and Rinfet 2008).

Bioenergy production is good example of ecological modernization. It is a technical solution, suitable for the existing production-consumption chains and infrastructure. In general, it does not challenge the existing system but it helps reduce pollution and in some cases means a profitable business (Elliott, 2003). The discourse on biofuels development can be seen as a "growing and increasingly popular American version of ecological modernization, which incorporates two concepts generally absent from earlier European conceptions of EM – national security and blatant consumerism" (Schlosberg and Rinfet 2008:254).

Liquid biofuels can be produced and distributed through the current infrastructural and institutional structures, with little or no modification and restructuring. Thus, biofuels are an example of effectively solving the problems caused by modernization by more modernization (Buttel, 2000). The ecological modernization aspect of the biofuels discourse is partly based on "the ideological belief that manufacturing processes, aided by genetic modification and as yet unknown advances, will evolve biofuel toward less wasteful processes with minimal tradeoffs" (Fast 2009:99).

Projecting biofuels development through the lenses of the ecological modernization theory is appealing for many because it comes with the promise of win-win situations and a positive sum game. Looking at it this way, not only can environmental protection and ecological growth be resolved, but environmental protection and damage control can even become a driver for economic growth.

In the United States, the emphasis is on technology and green consumerism rather than precaution, reflexivity, and consumption levels while it is promoted as reconciliation of environmentally sound development and economic growth. The discourse promoted by the biofuels industry fosters the belief that consumers do not have to pay environmental cost for their consumption.

One of the goals of this project was to analyze the growth machine concept in the rural environment in terms of biofuels development. This kind of research has never been done before. Although these rural communities have strong emphasis on growth, it was reasonable to expect a different type of growth machine in the rural context of biofuels development where some of the typical actors of urban growth machine might have different levels of influence. The growth machine involves concentrated community power of the interrelated elite groups using their institutional network to influence the most important decisions at regional and local level.

In their 2005 study, Kulcsar and Domokos describe a slightly modified version of the original growth machine, an example of Gramscian hegemony where the local administrative elite, entrepreneurs, and media monopolize community power and set an exclusive and unilateral discourse to legitimate their pro-growth actions. The way the rural growth machine worked while promoting biofuels development also differs in many aspects from the mode urban growth coalitions operate. In the four case study communities the boosters' main interest was not as much about financial gains, but rather to maintain their political hegemony, to assure that only the voices of those few who make decisions regarding development are heard in the community.

The local media, particularly newspapers, are important because they are conceived as mediators, acting both publicly, by pronouncing on what is good growth, and outside of the public eye, through informal social relationships between the newspaper proprietor and coalition members. Print media are also seen to be crucial in promoting growth coalition objectives to wider publics (Rodgers 2009:12).

Winning the tacit support of a wider public is very important for growth coalitions. In order to achieve this support they are said to de-emphasize the exchange value benefits of growth for narrower groups, and emphasize growth as an inherent collective good that will improve the lives of regular people (Rodgers 2009). Local newspapers are integral components of the community and tend to reflect both the agenda and the tactics of the local power structure.

The large urban environment typically provides growth coalitions significant potential and capacity for growth and wealth accumulation. However, in the resource scarce rural settings the issue of growth is often approached from a standpoint of hegemony: the local elites promote growth to carry out its own economic and political agenda.

The local elites' growth agenda related to biofuels development was popular in all four case study communities. Because of the dwindling demographic and economic base as well as scarce natural resources, there was a strong desire among the residents for almost any type of economic development. This might explain the weak opposition to the actions of the growth machine in these rural settings. Proposed development was only questioned when it was thought to have an immediate negative impact on the environment, like dropping the potable well water levels in a small community very close to the Arkalon ethanol plant by Liberal. Local community members generally accepted the establishment of ethanol plants, as the impact of

biofuels development (for example the increased truck traffic, deteriorating roads, noise, or the occasional foul smell) was not immediately clear.

Members or the rural growth coalitions used their ideological hegemony in their efforts to "sell" growth – the establishment of ethanol plants – to the residents of their communities (Bridger and Harp 1991). This ideological hegemony was maintained through their power of creating and disseminating information. In this context, the need for economic growth in rural communities could be interpreted as an emotional and creative construct since people were driven to imagine shrinking communities in desperate need of wise intervention. Thus, the discursive progressively becomes central to establishing the logic of transforming communities. The fact that three-quarters of the community survey respondents indicated the local/regional newspapers as their primary source of information about the local ethanol plants and five of the eight analyzed newspapers are owned by the same publisher are suggestive in this sense.

It is difficult to assess which part of these rural communities – besides the local elite – profited from having an ethanol plant in their neighborhood or if this growth lead to any improvement in community, educational or health services. However, the newspapers articles, interviews, and opinion surveys suggested that the overall outcome was perceived as positive and the technological marvels at the outskirts of these communities generated a good deal of pride, community cohesion, and optimism.

One of the main differences between the original urban growth machine concept and the rural version is in their community contexts. In the case of the former, suburban residential groups and downtown small businesses stand against land developers, local administration and external capital. The way rural growth machine promoted biofuels development was different, as the core of the growth coalition (members of the local and county government together with the agricultural interests) were more powerful, and the anti-growth movement non-existent. This practically dissipated the controversy over growth in the case study communities.

Unlike how growth often happens in urban settings, where small downtown business owners and various residential groups stand against local governments' development plans and the influx of external capital, local elites in the rural communities faced no such opposition. Without opposition they were successful in attracting outside capital for funding the establishment of ethanol plants after they put together the seed money for the initial plans.

Table 6.1 Similarities and differences between the urban and rural growth machines

	Urban Growth Machine	Rural Growth Machine
Local elites	Elected officials, business leaders, municipal staff, real estate professionals, newspaper editors, as well as other public and private sector actors	Elected officials, local government staff, business leaders, local bankers, investors, big farmers
Uniting interest	Coalition of powerful actors unified around their desire to direct resources (both financial and political) toward a shared goal of land development	Coalition of actors unified around their desire to direct resources (financial and natural) toward a shared goal of economic development
Quality of life	Transfer of quality-of-life and wealth from the local general public to a certain segment of the local elite	A few early investors benefit the most; community members often bothered by the increased truck traffic, noise, and odors from ethanol plants
Growth coalition "in the locality's best interest"	Feuding factions; often lose relationship	Different interests form a stronger common front
Policies and practices	Coalitions of elites work together to promote and adopt policies and practices that best serve their economic interests and propel cities toward growth	Local boosters work together to promote and adopt policies that promote growth (i.e. the establishment of ethanol plants)
Individual actors within the growth machine	The exercise of power at the local level less coordinated, consensus-driven, and growth-oriented than the growth machine thesis suggests	Consensus, growth-oriented, inclined to impose a hegemonic view about growth
Political and economic interests	Economic power is transformed into political influence	Political interests dominate economic ones
Opposition	Small downtown business owners and suburban residential groups stand against land developers, local administration and external capital	Lack of civil society groups interfering with local politics

The nature of the pro-growth agenda is both political and economic in the biofuels development case. The dominant core of the growth coalition in a rural setting is the local government, and the local businesspersons and farmers sitting as committee members on the local or county economic development and chamber of commerce boards. This strongly influences the composition and initiatives of the rural growth machine, as the local administration depends on local businesses.

The original urban growth model has a relatively greater variety of actors that allows more diversity in the growth coalitions and more diversity in the local political arrangement. The importance of the real estate agents and representatives of construction companies, both key actors of the urban growth coalition, was highly diminished in the rural setting related to the establishment of the ethanol plants. In two of the case study communities (Russell and Garnett) the local government owned the land under the biorefinery, while in the other two case study communities big local farmers, who were also members of the economic development committee in their communities, sold the land directly to the initiators of the ethanol plant. Land development thus was done easily and fast within each community's own administrative system. Highly specialized construction crews brought in from the outside did the construction of ethanol plants, although local hardware stores, housing, and dining services benefited from the several months of construction boom.

The absence of opposition against the biofuels development promoted by the rural growth machines can be explained by the dire need for any type of economic development in virtually all rural communities of Western Kansas. Small agriculture-based communities lack the human, financial, and natural resources to attract businesses that could sustain a steady tax base and income for the local government. The local government of Russell for example tried and failed to attract both the highly profitable prison industry and the booming wind energy industry, right around the time when one of their biggest employers, a recreation vehicle manufacturer relocated its assembly lines in a different state. In this context, the establishment of the ethanol plant in Russell was perceived as a blessing for the community.

Those who hold the economic and political power both in urban and rural setting seek to incorporate all thought and behavior within the terms and limits they set in accordance with their interests. Bridger and Sharp (1991) argued that elites do not need to rely on any kind of forced acceptance as for them controlling the parameters of discourse is sufficient. Local promoters of

growth both in urban and rural setting project their own way of seeing the world so that community members accept it as "common sense" and "natural".

Molotch (1993) suggested that local growth coalitions sometimes pursue economic benefits, sometime political power, more often both. The classic urban growth machine relies heavily on the economic connections to promote growth, as there are more development funds to work with. In comparison, while fostering the development of biofuels, the rural growth machine's motivation is more political. In resource poor, financially struggling rural areas the main goal of the local elites is to protect and enhance their political power and hegemony over the locality by accelerating local growth. The political interests of these groups can be an even more essential factor of community development than their economic interests. The way these groups promoted biofuels development illustrates the need for rural growth machines to prove that they can bring in new businesses despite the demographic and economic decline of the rural communities where they are trying to maintain their hegemony. Attracting an ethanol plant to these communities served well both the political and economic interest of those involved.

6.1 Limitations of the Study

Despite its contributions, the research presented here has limitations that are inevitable in any work on rural community development research. First, the concept of rural growth machine, while useful, it may be more conducive to a research design that allows for a better examination of connectedness. Although this research was able to determine detailed relationships between the initiators of local ethanol projects (e.g. members of the local governments, economic development and chamber of commerce directors, landowners and local investors), uncovering direct ties and the dynamics between these groups and the regional newspapers should constitute an interesting topic for future research.

Furthermore, the concept of growth machine against a rural backdrop presented here overlaps with the notion of self-development (Flora, Gale, Schmidt, Green, and Flora 1993; Sharp et al. 2002). Both seek to create employment and/or income for local people by investing substantial local resources and actively engaging local organizations (usually including the local government) in project initiation and implementation. As a result, the mixed method of content analysis of newspaper articles, combined with interview and community survey data used in this

research is very useful for interpreting the ways in which these local growth coalitions promote their goals. It is worth considering how they relate these with other community members' desires, priorities, and attitudes. It also helps highlighting the similarities and variations of the ethanol project developments among the case study communities.

Second, this study is limited both spatially and temporally. I have pursued an examination of the rural growth coalitions' ways to promote ethanol development as well as different stakeholders' perspectives on these projects, so I have limited my case study to four communities in Central Kansas. To determine whether the findings hold more generally, the study would need representation from a greater number of communities, including localities where homegrown or outside groups mounted significant (and successful) opposition against the establishment of an ethanol plant. Due to the dramatic increase in corn prices, the controversial issue of indirect land use change, the persisting food versus fuel debates, the economic downturn that started around 2008, and the lower-than-anticipated demand for transportation fuels in general, developments significant to the ethanol industry have occurred in the time between fieldwork and write-up. This can potentially date some of the findings although follow-up telephone interviews have confirmed that the general acceptance of the local ethanol plants has remained very high.

In spite of the controversies surrounding biofuels development in Kansas, the economic development, environment, and national security/energy independence frames persisted in the regional media between 2000 and 2009. They also continued in the interviews with key informants and focus groups conducted in the case study communities (Selfa 2010, Selfa et al. 2011). Within this context, I would not be entirely surprised if the quick answer of many in the region to the rhetorical question "what can a rural Central Kansan community do to reduce environmental pollution, decrease America's dependency on foreign oil, and stimulate local economy?" would still be one magical word: ethanol.

References

Alternative Fuels Data Center (AFDC). 2013. *Biofuel Production Facility Tax Exemption*. Retrieved on January 27, 2013. http://www.afdc.energy.gov/laws/law/KS/8306

Altheide, David. 1996. *Qualitative Media Analysis* Sage Publications, Thousand Oaks, CA.

Bailey, Robin. 2006. We don't have enough water to support ethanol fuel. *The Hays Daily News* 05 23 2006.

Bain, Carmen, Anastasia Prokos and Hexuan Liu. 2012. Community Support of Ethanol Plants: Does Local Ownership Matter? *Rural Sociology* 77(2):143-170.

Bell, Shannon and Richard York. 2010. Community Economic Identity: The Coal Industry and Ideology Construction in West Virginia. *Rural Sociology* 75:111–143.

Bernton, Hal William Kovarik, and Scott Sklar. 2010. *The Forbidden Fuel: A History of Power Alcohol*. New Edition. Lincoln, NE: University of Nebraska Press.

Biello, David. 2011. The false promise of biofuels. *Scientific American* 305 (2):58-65.

Biles, Jan. 2007. Clinton: Americans must have global vision. *The Topeka Capitol Journal*, 03 03 2007.

Bloor, Michael and Fiona Wood. 2006. *Keywords in Qualitative Methods: Key informants*. Thousand Oaks, CA: SAGE Publications Inc.

Board of Directors Conestoga Energy Partners LLC. 2006. Today's ethanol plants are good neighbors. *The Southwest Daily Times* 06 09 2006.

Bohon, Stephany A. and Craig R. Humprey. 2000. Courting LULUs: Characteristics of Suitor and Objector Communities. *Rural Sociology* 65(3): 376-395.

Bolsen, Tobey and Fay Lomax Cook. 2008. The polls-trends: public opinion on energy policy: 1974–2006. *Public Opinion Quarterly* 72 (2):364–388.

Bridenstine, Tina. 2006. Ethanol: separating facts from fiction. *Southwest Daily Times* 06 28 2006.

Bridger, Jeffrey C. and Aaron J. Harp. 1991. Ideology and Growth Promotion. *Journal of Rural Studies* 6(3):269-277.

Broadway, M. J., and D. D. Stull. 2006. Meat Processing and Garden City, KS: Boom and Bust, *Journal of Rural Studies* 22 (1): 55-66.

Brooks, Nora L., Stucker T, Bailey J. 1986. Income and well-being of farms and the farm financial crisis. *Rural Sociology* 51(4): 391-405.

Brown-Graham, Anita and William Lambe. 2008. *Measures and Methods: four tenets for rural economic development in the new economy*. Policy Nr. 9. Durham, NH: Carsey Institute. Accessed on January 9, 2013. http://carseyinstitute.unh.edu/publications/PB-Brown-Graham-Measures08.pdf

Browning, Dan, Tony Kennedy, and Chris Serres. 2007. Ethanol fever fires up heartland - People jumping at the chance to buy into sprouting plants. *The Salina Journal*, 11 07 2006. Reprint from The Minneapolis-St. Paul Star Tribune.

Bultena, Gordon, Lasley P, Geller J. 1986. The farm crisis: patterns and the impacts of financial distress among Iowa farm families. *Rural Sociology* 51(4):436-48.

Burke, Garance. 2006. Biofuel boom - Kansas town a supply chain for alternative fuel. *The Topeka Capitol Journal*, 02 23 2006. Reprint from The Associated Press.

Buttel, Frederick R. 2000. Ecological modernization as social theory. *Geoforum* 31:57-65.

Cacciatore, Micheal A., Andrew R. Binder, Dietram A. Scheufele, and Bret R. Shaw. 2012. Public attitudes toward biofuels: Effects of knowledge, political partisanship, and media use. *Politics and the Life Sciences* 31(1-2):36-51.

Carolan, Michael S. 2004. Ecological Modernization Theory: What About Consumption? *Society and Natural Resources,* 17:247–260.

Carolan, Michael S. 2009. A Sociological Look at Biofuels: Ethanol in the Early Decades of the Twentieth Century and Lessons for Today. *Rural Sociology* 74(1): 86–112.

Carpenter, Tim. 2007. Some blame ethanol for higher food costs. *The Topeka Capitol Journal* 11 11 2007.

Chamaz, Kathy and Linda Liska Belgrave. 2003. *Qualitative interviewing*. In The SAGE Handbook of Interview Research: The Complexity of the Craft. Jaber F. Gubrium, James A. Holstein, Amir B. Marvasti, Karyn D. McKinney (eds.). Thousand Oaks, CA: Sage Publications.

Chamberlain, Kristen Ann. 2007. *Environmentalism, Agrarianism, and Patriotism: Epideictic and Critical Implications of Discourse Promoting Ethanol*. Dissertation, North Dakota State University. UMI Microfilm 3308961.

Clancy, Joy and Jon C. Lovet. 2013. *Biofuels and Rural Poverty*. New York, NY: Routledge.

Clark, Terry Nichols. 2002. Codifying LA Chaos. *City and Community* 1(1): 51-58.

Cochrane, Willard W. 1993. *The Development of American Agriculture: A Historical Analysis*. Minneapolis, MN: University of Minnesota Press.

Conger, Rand, Glen Holl Elder, Frederick O. Lorenz, Ronald L. Simons and Les B. Whitbeck. 1994. *Families in Troubled Times: Adapting to Change in Rural America*. Hawthorn, NY: Walter de Gruyer Inc.

Corbin, Juliet and Anselm Strauss. 1990. Grounded theory research: procedures, canons, and evaluative criteria. *Qualitative Sociology* 13(1).

Corn, Mike. 2005. Russell shining star in population report. *Hays Daily News* 06 30 2005.

Cox, Kevin R. 1999. *Ideology and the growth machine*. In The urban growth machine: Critical perspectives two decades later. A. E. G. Jonas & D. Wilson (Eds.). Albany, NY: State University of New York Press.

Crowe, Jessica. 2008. Economic development in the nonmetropolitan West: The influence of built, natural, and social capital. *Journal of the Community Development Society* 39(4): 51-70.

Dale, Angela, Jo Wathan, and Vanessa Higgins. 2008. *Secondary Analysis of Quantitative Data Sources*. In The SAGE Handbook of Social Research Methods (Eds. Pertti Alasuutari, Leonard Bickman, and Julia Brannen). Thausand Oaks, CA: SAGE Publications.

Dillman, D.A. (2000). *Mail and Internet surveys: The tailored design method* (2nd ed.). New York: John Wiley & Sons, Inc.

Dominguez-Faus, R. Susan E. Powers, Joel G. Burken, Pedro J. Alvarez. 2009. The Water Footprint of Biofuels: A drink or drive issue? *Environmental Science Technology* (43): 3005–3010.

Dryzek, John S. 1997. *The Politics of the Earth: Environmental discourses.* New York, NY: Oxford University Press Inc.

Dudley, Kathryn Marie. 2002. *Debt and dispossession: farm loss in America's heartland*. Chicago: University of Chicago Press.

Dyer, Janice, Brajesh Singh, and Conner Bailey. 2013. Differing perspectives on biofuels: analysis of national, regional, and state newspaper coverage. *Journal of Rural Social Sciences* 28(1):106–133.

Eisinger, P.K. 1988. *The Rise of the Entrepreneurial State: State and Local Development Policy in the United States*. Madison: University of Wisconsin Press.

Elkins, David R. 1995. The Structure and Context of the Urban Growth Coalition: The View From the Chamber of Commerce**.** *Policy Studies Journal* 23(4):583-600.

Elliott, David. 2003. *Energy, Society and Environment* (2nd ed.). London: Routledge.

Entman, Robert M. 1993 Framing: Toward clarification of a fractured paradigm. Journal of Communication 43:51-58.

Fargione, Joseph, Jason Hill, David Tilman, Stephen Polasky, Peter Hawthorne. 2008. Land Clearing and the Biofuel Carbon Debt. *Science 319*.

Farley, Stephanie. 2007. Energizing Hugoton. *The Garden City Telegram,* 08 24 2007.

Fast, Stewart. 2009. The Biofuels Debate: Searching for the role of environmental justice in environmental discourse. *Environments Journal* 37(1):83-100.

Federal Trade Commission (FTC). 2012. 2012 *Report on Ethanol Market Concentration. Retrieved on March 22, 2013*. http://www.ftc.gov/reports/ethanol/2012ethanolreport.pdf

Ferrett, Grant. 2007. *Biofuels 'crime against humanity'*. BBC News. Retrieved on November 7, 2012. http://news.bbc.co.uk/2/hi/7065061.stm

Fisher, Dana R. and William R. Freudenburg. 2001. Ecological Modernization and Its Critics: Assessing the Past and Looking toward the Future. *Society and Natural Resources* 14:701–709.

Flentje, H. Edward and Joseph A. Aistrup. 2010. *Kansas Politics and Government: The Clash of Political Cultures*. Lincoln, NE: University of Nebraska Press.

Flora, Cornelia Butler, Flora Jan, and Susan Fey. 2001. *Rural communities: legacy and change* (2nd ed.). Westview Press.

Fodor, Eben. 1999. Better not bigger. *How to take control of urban growth and promote sustainability*? New Society Publishers: Stony Creek, CT.

Fox, Julia. 1999. Mountaintop Removal in West Virginia: AN Environmental Sacrifice Zone. *Organization and Environment* 12(2): 163-183.

Freudenberg, William R. 1992. Addictive economies: extractive industries and vulnerable localities in a changing world economy. *Rural Sociology* 57(3):305-32.

Freudenberg, William R. 2000. *Social Constructions and Social Constrictions: Toward Analyzing the Social Construction of 'The Naturalized' as well as 'The Natural*. In: G. Spaargaren, A. P. J. Mol, and F. H. Buttel (eds.). Environment and Global Modernity. London: Sage. Pp. 103-19.

Gillon, Sean. 2010. Fields of Dreams: Negotiating an Ethanol Agenda in the Midwest United States. *Journal of Peasant Studies* 37(4):723-748.

Goffman, Erving. 1974. *Frame Analysis: An Essay on the Organization of Experience*. New York: Harper Colophon Books.

Golden, Billy B. and Jeffrey M. Peterson. 2006. *Evaluation of Water conservation from more Efficient Irrigation Systems*. Department of Agricultural Economics, Kansas State University Staff Paper No. 03-06. Retrieved on October 3, 2012. http://www.agmanager.info/policy/water/Peterson-K_State_report_final.pdf

Gamson, William A. and Andre Modigliani. 1989. Media Discourse and Public Opinion on Nuclear Power: A Constructionist Approach. *The American Journal of Sociology*, 95 (1): 1-37.

Green, Chris. 2006a. Rural areas could have stake in bio science. *The Salina Journal*, 02 18 2006.

Green, Chris. 2006b. Biosciences could give Kansas an economic boost. *The Salina Journal*, 09 09 2006.

Hall, Arthur P. 2010. Embracing Dynamism: The Next Phase in Kansas Economic Development Policy. *Research Report*. Retrieved on October 29, 2012. http://www.kansasinc.org/pubs/working/EmbrDyn3.11.10.pdf

Hajer, Maarten. 1995. *The Politics of Environmental Discourse*. New York: Oxford University Press.

Haren, Claude C. 1970. Rural Industrial Growth in the 1960's. *American Journal of Agricultural Economics* 52(3):431-437.

Hicks, Dane. 2005b. Time to brag. *The Anderson County Review*, 09 24 2005.

Hindman, Douglas Blanks. 1996. Community newspapers, community structural pluralism, and local conflict with non-local groups. *Journalism and Mass Communication Quarterly* 73(3):708-721.

Hitchner, S., and J. Schelhas. 2012. *Social acceptability of biofuels among small-scale forest landowners in the U.S. South*. In Proceedings of the IUFRO 3.08.00 2012 Small-scale Forestry Conference, September 24-27, 2012, University of Massachusetts, Amherst, MA.

Hooper, Michael. 2008. Is ethanol boom going bust? *The Topeka Capitol Journal*, 03 10 2008.

Horlings, L.G. and T.K. Marsden. 2011. Towards the real green revolution? Exploring the conceptual dimensions of a new ecological modernization of agriculture that could 'feed the world'. *Global Environmental Change* 21(2):44-452.

Huber, Joseph. 2008. Pioneer Countries and the Global Diffusion of Environmental Innovations: Theses from the Viewpoint of Ecological Modernization Theory. *Global Environmental Change* 18:360–67.

Humphrey, Craig R. and Kenneth P. Wilkinson. 1993. Growth Promotion Activities in Rural Areas: Do They Make a Difference? *Rural Sociology* 58(2):175-189.

Irvin, Robert. 1996. The Waterscape and the Law: Adopting Prior Appropriation in Kansas. *Kansas History* 19:1.

Jaeger W.K. and T.M. Egelkraut, 2011. Biofuel economics in a setting of multiple objectives and unintended consequences. *Renewable and Sustainable Energy Reviews* 15(9): 4320-4333.

Johnson, J, M. 2002. *In-depth Interviewing*. In: Handbook of Interview Research: Context and Method (Eds. Jaber F. Gunrium and James A. Holstein). Thousand Oaks, CA: Sage Publications.

Johnson, Kenneth. 2006. *Demographic Trends in Rural and Small Town Americ*a. Loyola University Chicago: A Carsey Institute Report on Rural America. Retrieved on June 4, 2012. http://www.carseyinstitute.unh.edu/publications/Report_Demographics.pdf

Jonas, Andrew E.G. and David Wilson. 1999. *The urban growth machine. Critical perspectives two decades later*. Albany, NY: SUNY Press.

Jonas, Andrew E. G. 2007. *Growth Machine*. In Blackwell Encyclopedia of Sociology (Ed. George Ritzer). Blackwell Publishing. http://www.blackwellreference.com/subscriber/tocnode.html?id=g9781405124331_chunk_g978140512433113_ss1-75

Kansas Department of Labor (KSDOL). 2010. *2009 Kansas Green Jobs Report*. Retrieved on March 12, 2013. http://www.dol.ks.gov/lmis/doc/KansasGreenJobsReport.pdf

Kerlinger, F.N. 1986. *Foundations of behavioral research* (3rd ed.). Japan: CBS Publishing Limited.

Kessinger, Sarah. 2006. Governor: Rural areas lack basics to prosper. *The Garden City Telegraph* 06 10 2006.

Kessinger, Sarah. 2006a. Moran backing renewable energy plan - Kansas congressman joins agricultural leaders in push for '25 X '25'. *The Salina Journal* 08 23 2006

Kessinger, Sarah. 2006b. Governor: Rural areas lack basics to prosper. *The Salina Journal*, 06 10 2006.

Kielcolt, K.J. Nathan, L.E. 1985. *Secondary Analysis of Survey Data*. Beverly Hills, CA: Sage.

Kiousis, Spiro. 2004. Explicating Media Salience: A factor Analysis of New York Times Issue Coverage During the 2000 U.S. Presidential Election. *Journal of Communication* 54:1.

Konikow, Leonard F. 2013. *Groundwater Depletion in the United States (1900–2008).* U.S. Geological Survey Scientific Investigations Report 2013–5079.

Kovarik, William. 1982. *Henry Ford, Charles F. Kettering and the Fuel of the Future.* Automotive History Review, Spring 1998, No. 32, p. 7 - 27.

Kovarik, William. 2007. *Biofuels: Back to the Fuel of the Future.* University of Missouri: Paper to the 4th ANnual Life Sciences and Society Symposium. Retrieved on June 4, 2011. http://www.runet.edu/~wkovarik/papers/Kovarik.LSSP.HTML

Krider, Charles, Genna Hurd, Dane Hanson. 2006. *Trends in the Kansas Economy 1985 – 2006.* Research Report. Retrieved on September 26, 2012. http://www.kansasinc.org/pubs/working/Trends%20in%20the%20Kansas%20Economy.pdf

Krippendorff, Klaus. 2013. *Content analysis: An introduction to its methodology* (3rd ed.). Thousand Oaks: Sage Publications.

Kulcsar, Laszlo J. and Tamas Domokos. 2005. The Post-Socialist Growth Machine: The Case of Hungary. *International Journal of Urban and Regional Research* 29(3): 550–63.

Kuletz, Valerie L. 1998. *The Tainted Desert: Environmental and Social Ruin in the American West*. New York: Routledge.

Leatherman, John C., Hanas A. Cader and Leonard E. Bloomquist. 2004. When the Well Runs Dry: The Value of Irrigation to the Western Kansas Economy. *Kansas Policy Review* 26:1.

Letter to the Editor. 2006. Farmers make good use of water - Water pumps up crop yields and that, in turn, is a major driver of Kansas' economy. *The Salina Journal,* 10 15 2006.

Lichtman, M. 2006. *Qualitative research in education: A user's guide*. Thousand Oaks, CA: Sage Publications, Inc.

Liu, Xinsheng, Arnold Vedlitz, and Letitia Alston. 2008. Regional news portrayals of global warming and climate change. *Environmental Science and Policy 11, 379-393.*

Logan, John and Harvey Molotch. 1987. *Urban Fortunes: The Political Economy of Place*. Los Angeles: University of California Press.

Low, Sarah and Andrew M. Isserman. 2009. Ethanol and the Local Economy Industry Trends, Location Factors, Economic Impacts, and Risks. *Economic Development Quarterly* 23(1):71-88.

Lubell, Mark, Richard C. Feiock and Edgar E. Ramirez De La Cruz. 2009. Local Institutions and the Politics of Urban Growth. *American Journal of Political Science* (53):649–665.

Lyson Thomas A. and Falk William W. (eds). 1993. *Forgotten places: uneven development in rural America.* Lawrence: University Press of Kansas.

McCormick, K. 2010. Communicating bioenergy: a growing challenge. *Biofuels, Bioproducts and Biorefining,* 4:494–502.

McMichael, Philip. 2009. The Agrofuels Project at Large. *Critical Sociology 35(6):825-839.*

McMichael, Philip. 2010. Agrofuels in the food regime. *The Journal of Peasant Studies* 37: 4.

McQuail, D. 2005. *Mass communication theory* (5th ed.). Thousand Oaks, CA: Sage Publications.

Miller, Darrel. 2006. When looking at future, look at water. *The Hays Daily News* 08 06 2006.

Mintert, James, Michael Woolverton, Terry Kastens, and John Leatherman. 2006. *Agricultural Commodities Future: Assess Competitive Threats to the Kansas Economy*. Research Report. Retrieved on June 24, 2012. http://www.kansasinc.org/pubs/working/Agricultural%20Commodities%20Future%20-%20Assess%20Competitive%20Threats%20to%20the%20Kansas%20Economy%20-%202006.pdf

Mol, Arthur P.J. 2007. Boundless Biofuels? Between Environmental Sustainability and Vulnerability. *Sociologia Ruralis* 47(4).

Mol, Arthur P. J., David A. Sonnenfeld, and Gert Spaargaren. 2009. *The Ecological Modernization Reader: Environmental Reform in Theory and Practice*. London, England: Routledge.

Mol, Arthur P. J.. 2010. Environmental Authorities and Biofuel Controversies. *Environmental Politics* 19(1):61-79.

Mol, Arthur P. J. and Martin Jänicke. 2009. *The Origins and Theoretical Foundations of Ecological Modernization Theory*. In: The Ecological Modernization Reader, Arthur P. J. Mol, David A. Sonnenfeld, and Gert Spaargaren (eds.). London, England: Routledge.

Molotch, Harvey. 1976. The city as a growth machine: toward a political economy of place. *American Journal of Sociology* 82:309-321.

Molotch, Harvey. 1978. The City as a Growth Machine: Toward a Political Economy of Place. *The American Journal of Sociology* 82(2):309-332.

Molotch, Harvey.1993. The political economy of growth machines. *Journal of Urban Affairs* 1:29-53.

Molotch, Harvey. 1999. *Growth Machine Links: Up, Down, and Across*. In: The urban growth machine. Critical perspectives two decades later, Jonas, A. and D. Wilson (eds.) SUNY Press, Albany.

Montgomery, John D. 2005. Energy initiative. *The Hays Daily News*, 07 21 2005.

Morris, David. 2005. Do bigger ethanol plants mean fewer farmer benefits? *Rural Cooperatives* 72:6.

Nagy Hesse-Biber, Sharlene and Patricia Leavy. 2011. *The Practice of Qualitative Research* (2nd Ed.). Thousand Oaks, CA: Sage Publications, Inc.

National Agricultural Statistics Service (NASS). 2011. *Farms, Land in Farms, and Livestock Operations 2010 Summary*. Retrieved on June 20, 2012. http://usda.mannlib.cornell.edu/usda/current/FarmLandIn/FarmLandIn-02-11-2011_revision.pdf

National Research Council (NRC). 2008. *Water Implications of Biofuels Production in the United States.* Washington, D.C: The National Academies Press.

Neuendorf, K.A. 2002. *The Content Analysis Guidebook*. Thousand Oaks, CA: Sage Publications.

Nisbet, Matthew C. and Chris Mooney. 2007. Framing Science. *Science* 316.

O'Brien, Daniel. 2008. *Ethanol Impacts on Kansas Grain Production*. Retrieved on September 26, 2012. http://www.agmanager.info/energy/GrainProdImpacts_Obrien.pdf

Opie, John. 1995. Is Sustainable Agriculture Possible in the Arid West? The Example of the Ogallala Aquifer. Retrieved on June 4, 2012 www-personal.ksu.edu/~jsherow/opie.htm

Pate, R., M. Hightower, C. Cameron, and W. Einfeld. 2007. *Overview of Energy-Water Interdependencies and the Emerging Energy Demands on Water Resources*. Report SAND 2007-1349C. Los Alamos, NM: Sandia National Laboratories.

Peck, John C. 2004. Protecting the Ogallala Aquifer in Kansas from Depletion: The Teaching Perspective. *Journal of Land, Resources, and Environmental Law* 349.

Pender, John, Alexander Marré, and Richard Reeder. 2012. *Rural Wealth Creation: Concepts, Strategies and Measures.* ERR-131, U.S. Department of Agriculture, Economic Research Service. March 2012. Retrieved on 03 05 2013: http://www.ers.usda.gov/media/365520/err131_1_.pdf

Peters, David J., Liesl Eathington, and David Swenson. 2010. *An exploration of green job policies, theoretical underpinnings, measurement approaches, and job growth expectations. Iowa State University*. Retrieved on October 4, 2013. http://www.econ.iastate.edu/sites/default/files/publications/papers/p12787-2011-04-27.pdf

Peterson, Jeffrey M., Ya Ding, Joshua D. Roe. 2003. *Will the Water Last? Groundwater U.S. Trends and Forecasts in Western Kansas*. Paper prepared for the presentation at the Agricultural Economics Risk and Profit Conference Manhattan, Kansas, August 14-15, 2003.

Peterson, Paul E. 1981. *City limits.* Chicago: University of Chicago Press.

Phelon, Rayeln. 2004. Made in America. *The Topeka Capitol Journal* 05 22 2004.

Pimentel, David. 2003. Ethanol Fuels: Energy Balance, Economics, and Environmental Impacts are Negative. *Natural Resources Research* 12(2):127-134.

Pimentel, David and T. W. Patzek. 2005. Ethanol Production Using Corn, Switchgrass, and Wood; Biodiesel Production Using Soybean and Sunflower. *Natural Resources Research* 14(1): 65–76.

Polansky, Adrian. 2007. Here's what the farm bill needs. *The Salina Journal*, 06 19 2007.

Polansky, Adrian. 2009. *Kansas Agriculture*. Presented at the Western States Water Council Meeting. Retrieved on February 3, 2013. http://www.westgov.org/wswc/polansky-wswc.pdf

Renewable Fuels Association (RFA). 2012. *The New Fuel: E15.* Retrieved on November 8 2012 http://www.ethanolrfa.org/pages/E15

Renewable fuels Association (RFA). 2013. *Biorefinery locations*. Retrieved on May 2 2013 http://www.ethanolrfa.org/bio-refinery-location

Ribeiro, Barbara Esteves. 2013. Beyond commonplace biofuels: Social aspects of ethanol. Energy Policy 57:355–362.

Rickel, Cleon. 2005a. Fueling the trend - Garnett gets in on the ethanol game. *The Ottawa Herald,* 03 23 2005.

Rickel, Cleon. 2005b. Production slated to begin in Garnett in two weeks; full production later. *The Ottawa Herald,* 06 01 2005.

Rickel, Cleon. 2005c. Governor brings state grant to Garnett for ethanol plant. *The Ottawa Herald*, 10 15 2005.

Rickel, Cleon. 2005d. Garnett ethanol plant eyes construction start. *The Ottawa Herald*, 01 27 2005.

Roberts, Marilyn, Wayne Wanta and Tzong-Horng (Dustin) Dzwo. 2002. Agenda Setting and Issue Salience Online. *Communication Research* 29: 452

Roe, Emery. 1993. *Narrative policy analysis: Theory and practice*. Durham, North Carolina: Duke University Press.

Rodgers, Scott. 2009. *Urban geography: urban growth machine*. In: The international encyclopedia of human geography. (Eds. R. Kitchin and N. Thrift). Oxford: Elsevier. Volume 12: 40-45.

Rossi, Alissa M. and Claire C. Hinrichs. 2011. Hope and skepticism: farmer and local community views on the socio-economic benefits of agricultural bioenergy. *Biomass and Bioenergy*, 35 (4):1418–1428.

Rodgers, Scott. 2009. *Urban geography: urban growth machine*. In: The international encyclopedia of human geography. R. Kitchin and N. Thrift (eds). Oxford: Elsevier

Rossi, Alissa and Claire C. Hinricks. 2011. Hope and skepticism: Farmer and local community views on the socio-economic benefits of agricultural bioenergy. *Biomass and Bioenergy* 35:1418-1428.

Rubin, Herbert & Rubin, Irene. 1995. *Qualitative interviewing: The art of hearing data*. Thousand Oaks, CA: Sage Publications, Inc.

Selfa, Theresa. 2010. Global benefits, local burdens? The paradox of governing biofuels production in Kansas and Iowa. *Renewable Agriculture and Food Systems* 25(2): 129-142.

Selfa, Theresa, Laszlo Kulcsar, Carmen Bain, Richard Goe, Gerad Middendorf. 2011. Biofuels Bonanza?: Exploring community perceptions of the promises and perils of biofuels production. *Biomass and Bioenergy* 35: 1379-1389.

Scheufele, D. A. 1999. Framing as a theory of media effects. *Journal of Communication* 49 (1):103-122.

Schlageck, John. 2008. Ethanol, it just makes sense. *The Hays Daily News,* 02 24 2008.

Schlosberg, David and Sara Rinfret. 2008. Ecological modernization, American style. *Environmental Politics* 17(2): 254-275.

Schlosser, Janet A., John C. Leatherman and Jeffrey M. Peterson. 2008. *Are Biofuels Revitalizing Rural Economies?* Department of Agricultural Economics, Kansas State University, Manhattan, KS. http://ageconsearch.umn.edu/bitstream/6123/2/469146.pdf

Shanahan, Elizabeth A., Mark K. McBeth, Paul L. Hathaway, and Ruth J. Arnell. 2008. Conduit or contributor? The role of media in policy change theory. *Policy Science* 42(2):115:138.

Sherman, Jennifer. 2009. *Those Who Work, Those Who Don't: Poverty, Morality, and Family in Rural America*. University of Minnesota Press.

Sherard, Judy. 2005. U.S. Energy donates to schools - Funds will be used for software, fuel and the fine arts. *The Salina Journal*, 12 02 2005. Reprinted from The Hays Daily News.

Sherow, James E. 1990. *Watering the Valley*. Lawrence: University Press of Kansas.

Sherow, James E. 2002. The Art of Water and the Art of Living. *Kansas History*, 25:1; 52-71.

Sherow, James E. 2007. *Grasslands of the United States: An Environmental History*. ABC-CLIO, Inc.

Snow, Nick. 2013. AFPM, API would like to see EPA go further in RIN reform effort. *Oil and Gas Journal*. Retrieved on April 22, 2013. http://www.ogj.com/articles/2013/04/afpm--api-would-like-to-see-epa-go-further-in-rin-reform-effort.html

Solis, Patricia. 2005. Water as rural heritage: reworking modernity through resource conflict in Edwards County, Kansas. *Journal of Rural Studies* 21:55–66.

Solomon, Barry D., Justin R. Barnes, Kathleen E. Halvorsen. 2007. Grain and cellulosic ethanol: History, economics, and energy policy. *Biomass and Bioenerg*y 31:416–425).

Sophocleous, Marios. 2010. Review: groundwater management practices, challenges, and innovations in the High Plains aquifer, USA – lessons and recommended actions. *Hydrogeology Journal* 18: 559–575.

Soroka, Stuart N. 2003. Media, Public Opinion, and Foreign Policy. *Press and Politics* 8(1).

Storey, David. 2009. *Rural Economic Development*. In: International Encyclopedia of Human Geography. Oxford, UK: Elsevier 310-314.

Swenson, Dave and Liesl Eathington. 2006 . *Determining the Regional Economic Values of Ethanol Production in Iowa Considering Different Levels of Local Investment Department of Economics.* Ames, IA: Iowa State University. http://www2.econ.iastate.edu/research/webpapers/paper_12687.pdf

Tankard, J. W. Jr. 2003. The empirical approach to the study of media framing. In Framing public life, Reese, S. D., Gandy, O. H., Jr, & Grant, A. E. Mahwah (eds.) NJ: Lawrence Erlbaum.

Trent, Roger B. and Nancy Stout-Wiegandt. 1984. Support for Industrial Development: the Role of Anticipated Benefits to the Local Area. *Journal of Rural Studies* 1(4):369-374.

Tigges, Leann M. and Molly Noble. 2012. Getting to Yes or Bailing on No: The Site Selection Process of Ethanol Plants in Wisconsin. *Rural Sociology* 77(4): 547–568.

University of Minnesota (UM). 2012. *The value and use of distillers grains by-products in livestock and poultry feeds*. Retrieved on October 23 2012 http://www.ddgs.umn.edu/home_more/index.htm

Urbanchuk, John. M. 2010. *Contribution of the Ethanol industry to the economy of the United States*. Study prepared for the Renewable Fuels Association, February 12, 2010. http://ethanolrfa.3cdn.net/5b9bd0152522901e81_jtm6bhwh7.pdf

Urbanchuk, John M. 2007. *Economic Impacts on the Farm Community of Cooperative Ownership of Ethanol Production. LECG*. Presented at United States Department of Agriculture, Agricultural Outlook Forum, Arlington, VA, March 1–2. Retrieved December 3, 2012 http://www.usda.gov/oce/forum/2007_Speeches/PDF%20speeches/J%20Urbanchuk.pdf

U.S. Census Data. *State and County quick facts*. Retrieved on February 4, 2013. http://quickfacts.census.gov/qfd/states/20/20175.html

USDA Economic Research Service (USDA ERS). 2011. *County-Level Unemployment and Median Household Income for Kansas.*

USDA Economic Research Service (USDA ERS). 2012. *The Renewable Identification Number System and U.S. Biofuel Mandates*. BIO-Economic Research Service/USDA. Retrieved March 30 2012 http://www.ers.usda.gov/media/138383/bio03.pdf

USDA National Agricultural Statistics Service (USDA NASS). 2013. News Release. Kansas Field Office. Retrieved on February 25 2013: http://www.nass.usda.gov/Statistics_by_State/Kansas/Publications/Crops/Production/2013/acg1303.pdf

Vandenack, Tim. 2006a. Governor praises groundbreaking of ethanol plant - Sebelius calls complex a 'big step to energy independence' for state. *The Hutchinson News*, 08 04 2006.

Vandenack, Tim. 2006b. Studies: Cities will benefit. *The Hutchinson News* 11 30 2006.

Watt, Earl. 2006. Global economy right here. *The Southwest Daily Times*, 12 19 2006.

White, Stephen. E. 1994. Ogallala Oases: Water Use, Population Redistribution, and Policy Implications in the High Plains of Western Kansas, 1980–1990. *Annals of the Association of American Geographers*, 84: 29-45.

Wilson, David and Thomas Mueller. 2004. Representing "Neighborhood": Growth Coalitions, Newspaper Reporting, and Gentrification in St. Louis. *The Professional Geographer* 56(2):282-294.

Wilson, Leroy. 2006. Ceremony marks beginning for plant. *The Garden City Telegram* 05 25 2006.

Wright, Wynne and Taylor Reid. 2010, Green dreams or pipe dreams? Media framing of the U.S. biofuels movement. *Biomass and Bioenergy* 35:4(1390–1399).

York, Richard and Eugene Rosa. 2003. Key Challenges to Ecological Modernization Theory. Organization & Environment, 16(3): 273-288.

Appendix A - Appendix A - Community survey results

		Russell	Phillipsburg	Liberal	Garnett	Total
In your view, how important is the ethanol plant to the economy of the local area?	Important or very important	77%	67%	67%	70%	70%
	A little important or not important	23%	33%	33%	30%	30%
The local plant added new jobs to the local economy	Yes	81%	80%	81%	72%	79%
	No	19%	20%	19%	28%	21%
The local plant added high paying jobs to the local economy	Yes	37%	30%	27%	21%	29%
	No	63%	70%	73%	79%	71%
The local plant provided jobs for local workers	Yes	81%	83%	67%	60%	74%
	No	19%	17%	33%	40%	26%
The local plant increased tax revenues	Yes	27%	36%	28%	15%	27%
	No	73%	64%	72%	85%	73%
The local plant reduced poverty locally	Yes	10%	10%	6%	6%	8%
	No	90%	90%	94%	94%	92%
It was appropriate to use public funds to attract or establish the local ethanol plant	Agree or strongly agree	48%	49%	42%	54%	48%
	Disagree or strongly disagree	32%	30%	38%	29%	32%
	To the best of my knowledge, public funds were not used to attract ethanol plant	19%	21%	20%	16%	19%
Local newspapers as sources for information about the local ethanol plant	Yes	81%	76%	67%	74%	75%
	No	19%	24%	33%	26%	25%
Attending local government meetings as source of information about local plant	Yes	12%	6%	7%	6%	8%
	No	88%	94%	93%	94%	92%
Your level of concern about environmental issues in your community?	High level of concern	29%	16%	32%	25%	25%
	Moderate level of concern	54%	68%	48%	56%	57%
	Low level of concern	11%	16%	19%	16%	15%
	Not concerned	6%	0%	2%	3%	3%
Water resources have been diverted from other important needs of the city	Yes	67%	37%	22%	12%	36%
	No	33%	63%	78%	88%	64%
The public has responsibility to conserve resources for future generations	Agree or strongly agree	96%	97%	94%	94%	96%
	Disagree or strongly disagree	4%	3%	4%	6%	4%
Ethanol reduces the need for imported oil	Very Important	59%	56%	62%	67%	61%
	Somewhat Important	34%	30%	25%	25%	28%
	Of No Importance	7%	14%	13%	6%	10%

Appendix B - Newspaper articles by main frames

The article…	Russell (%)	Phillipsburg (%)	Liberal (%)	Garnett (%)
Supports biofuels development in the region	**74**	**83**	**84**	**93**
Expresses national security/energy independence benefits of ethanol production such as…	43	40	40	38
Less U.S. money spent in unfriendly/unstable countries	90	70	85	80
The U.S. less exposed to oil market fluctuations	85	65	60	50
Homegrown fuel	80	75	80	85
Expresses economic benefit of ethanol production such as…	98	95	95	90
Generates local businesses	98	98	99	95
Creates new/good paying jobs	95	95	95	95
Helps increase the tax revenue for the local budget	90	95	95	90
Helps rural development	80	75	70	75
Expresses environmental benefits of ethanol development such as…	85	80	82	80
Replaces MTBE	90	90	85	90
Renewable	100	100	100	100
Clean energy source	90	95	97	95
Helps climate change mitigation	60	45	50	44
The article…	**Russell (%)**	**Phillipsburg (%)**	**Liberal (%)**	**Garnett (%)**
Opposes biofuels development in the region	**25**	**15**	**15**	**5**
Critical of ethanol production on national security/energy independence grounds such as…	5	3	3	0

Ethanol will always be a very small proportion of total transportation fuel	90	90	80	100
Critical of ethanol production on economic grounds such as…	2	2	3	1
Energy balance	20	15	30	10
Increases grain prices	60	65	55	65
Less animal feed-grain available	15	15	10	15
Increases food prices	5	5	5	10
Critical of ethanol production on environmental grounds such as…	90	85	85	80
Air pollution	2	5	0	3
Soil fertility/erosion	3	0	0	7
Decreasing groundwater levels	85	80	70	50
Increased truck traffic	10	15	30	50

Appendix C - Biofuels support by actors promoted in the articles

	Total percent	Politician	Representative of local government	Grain producer	Community member	Representative of ethanol industry
Support for biofuels development in the region	**89**	**96**	**87**	**91**	**73**	**99**
Expresses national security/energy independence benefits of ethanol production	52	51	22	30	25	65
Expresses economic benefit of ethanol production	77	77	75	74	78	82
Expresses environmental benefits of ethanol development	65	67	58	53	64	84
Oppose biofuels development in the region	**11**	**4**	**13**	**9**	**27**	**1**
Critical of ethanol production on national security/energy independence grounds	10	0	6	3	33	9
Critical of ethanol production on economic grounds	14	0	22	17	33	0
Critical of ethanol production on environmental grounds	27	6	46	19	57	5

Appendix D - Interview guide

How long have you been in your position as…? What changes have occurred in the community over your tenure as …?

What do you perceive to be the main benefits of ethanol production to your community/industry?

What do you perceive to be the main challenges for ethanol production to your community/industry?

How do you balance need for employment and growth with declining availability of water?

What do you see as the key environmental issues related to biofuels development and expansion in your community?

What do you see as the key social and cultural issues related to biofuels development and expansion in your community?

What do you see as the key economic issues related to biofuels development and expansion in your community?

What sorts of tax incentives, abatements were given for the construction of the plant

Do you feel that community members were adequately informed about the costs/benefits of biofuels industry?

If not, what was missing?

Was there any opposition to the siting of ethanol plants in your community?

If so, what was the basis of that opposition?

Do you think the size/scale of the plant has any effect on its benefits to the community?

Do you think that the development of biofuels will assist in revitalizing your community and the local economy?

What advice would you give to other communities that are considering an ethanol plant?

And additional questions…