Privileged Access and Rural Vulnerabilities: Examining Social and Environmental Exploitation in Bioenergy Development in the American Midwest

1. Introduction

In the mid 2000s, biofuels projects were promoted by governments around the world due to their potential for rural economic development, climate change mitigation, and as an alternative to fossil fuels in the era of ‘peak oil’ (Worldwatch, 2006; FAO, 2006). In the Midwestern United States, the biofuels industry was also portrayed as an opportunity to utilize surplus low valued agriculture production, and provide local employment, thus helping to reverse rural outmigration in some regions (Kleinschmidt and Muller, 2005).

In 2008, broad agreement in the US began to fracture over the ability of biofuels to address the “trilemma” (Tilman et al., 2009) of food security, energy independence, and climate change mitigation (Lehrer, 2010). This was driven, in part, by a growing “food vs. fuel” debate in the international media and within academia that argued that the production of first generation biofuels, which rely on food crops such as corn as biomass, were contributing to the international food crisis. The intensity of that debate was exemplified by UN Human Rights Rapporteur Jean Ziegler’s assertion at the time that biofuels are a ‘crime against humanity’ (Borger, 2008 *cited in* McMichael, 2010: 610). At the same time, a growing number of scientists began to call into question the claims that biofuels could reduce greenhouse gas emissions and mitigate the effects of climate change (Pimentel and Patzek, 2005; Farrell et al., 2006). Since this time, social and natural scientists’ concerns have intensified that the social and environmental benefits of biofuels have at minimum been overstated, but more likely that biofuels have contributed to increased monocultural crop production, with detrimental effects on conservation practices, water quantity

and quality, and greenhouse gas emissions (see for example, McMichael, 2010; Pimentel et al., 2009; Searchinger et al., 2015). Demographic research has also indicated that the presence of a biofuels plant shows little association with population growth. Instead, such developments typically occur in places with already existing capacity, and hence perpetuate spatial inequalities rather than reversing depopulation (Kulcsar and Bolender, 2011).

A growing academic literature reveals that at the community level, the fault lines in biofuel production are largely revealed in terms of potential trade-offs between economic development and environmental impacts, such as loss of land enrolled in conservation programs, nutrient and sediment pollution of waterways, and increased groundwater usage (Bain and Selfa, 2013; Gillon, 2010; Selfa, 2010; Rossi and Hinrichs, 2011). While criticism of biofuels has intensified at the national and international level, a key issue becomes why so few questions are put to biofuel proponents regarding its potential benefits and potential costs and burdens for local communities and the environment? For example, why have so few rural communities challenged the impacts of biofuel development on the local environment, or the value of state and local subsidies and tax breaks for biofuels production, or the discursive claims that have overstated its economic benefits, such as the number of jobs it will provide?

To explore this puzzle, we turn to the work of environmental sociologists (Freudenburg and Gramling, 1994; Freudenburg, 2005; Freudenburg and Pastor, 1992; McCright and Dunlap, 2003) to understand how dominant economic interests use “indirect forms of power” (McCright and Dunlap, 2003:351), together with public complacency, to gain privileged access to economic and natural resources. We apply this approach to frame our analysis of both qualitative and quantitative data collected in a large project investigating the social impact of biofuels in rural communities in Kansas and Iowa, two states with rapidly expanding biofuels industries in the

2000s. In this paper, we extend this analytical approach to consider how environmental problems are framed as non-problematic and economic privileges are naturalized in the rural Midwest as environmental justice issues. Privileged accounts contribute to persistent inequalities, and by extension, they often foster injustice. In the case we discuss in the paper, environmental impact, which is framed as a legitimate trade-off for economic gains, is not affecting all constituents the same way. We show that privileged access and privileged accounts are important drivers behind environmental justice. In the next sections we elaborate on our theoretical approach, followed by a description of research methods. We then present our findings and conclusions.

2. Theoretical Approach

A key concern of Freudenburg (2000) was that sociologists typically focused on how environmental problems were socially constructed while paying little attention to analyzing how environmental *non*-problematicity—or quiescence—is similarly socially constructed. In other words, how are some environmental concerns, such as the over withdrawal of groundwater supplies, defined or determined to be a non-issue. Aligned with this idea is the need for sociologists to analyze how environmental *privileges* are socially constructed. Within this context, the challenge for sociologists is to focus on the ways that “powerful interests” who are typically concerned with “defending the status quo” are able to define certain issues “as non-problematic” (McCright and Dunlap, 2003:349). The study of biofuels production in the Midwest offers an opportunity to revisit this theoretical challenge. This approach extends Allan

Schnaiberg's (Schnaiberg and Gould, 1994) work on the role of corporate actors in using consciousness lowering activities. The objective of corporate actors is to undermine the claims of environmentalists that "environmental problems are serious, are the result of the production system, and can be alleviated without unreasonable costs" (McCright and Dunlap, 2003:349).

A challenge within every society is to not only determine how economic and environmental resources should be distributed to privilege some actors but not others, but to do so in such a way that the rest of society considers it legitimate (Freudenburg, 2005). Freudenburg (2005:89) argues that the social construction of the non-problematicity of environmental issues, technological risks, or in our case the distribution of economic resources, involves a "double diversion." The first diversion involves unequal *privileged access* by some actors to these resources. While many assume that natural resources, such as ground water, are a public good, the reality is that access to these resources, together with the use of nature to absorb waste, is skewed to benefit a few private interests while imposing their associated costs on the majority of the public. The curiosity is why these inequalities, or environmental injustices, are so widely accepted and rarely challenged or questioned? Freudenburg (2005:90) argues that it is through the second diversion, the *privileging of accounts* that such inequities become "taken for granted" or "naturalized." Here, assumptions and arguments are perpetuated that help to "naturalize" and "legitimate" privileged access, which is argued to be economically necessary because it provides jobs and income for local communities or it provides a crucial economic product. Thus, the public's attention is diverted from considering potential problems by focusing on the promised shared economic benefits. Freudenburg has shown that such arguments are rarely questioned even when there is significant evidence that they are wrong.

In discussions of *who* has privileged access and *who* shapes the discourse of privileged access, it is important to examine the role of natural resource interests. Drawing on Freudenburg's concept of conjoint constitution, where nature and society are co-constructed and interrelated, social phenomena are understood as not purely social but rather shaped in response to their relationship with the biophysical world (Freudenburg, 2002). From this perspective, there is a dialectical relationship between natural resources, economic and political decisions, and public policy. Fisher (2006) draws on the concept of conjoint constitution to argue that decisions about energy policy are directly affected by natural resources and "natural resources interests," that is "actors with an economic and/or political investment in natural resources" (Fisher, 2006:472). Fisher (2006) argues that energy policy is always closely tied to concerns related to local and regional economic development, the environment, and national security. Fisher (2006:488) supports her argument by analyzing how the "natural resource endowment" in the US, and the natural resource interests associated with it, have played a key role in shaping climate change policy in the US, not partisan politics as many assume. Other recent studies illustrate how ideology and cultural politics play important roles in portraying development that is environmentally destructive as essential to the cultural identity, history and economy of rural places (Bell and York, 2010; Selfa et al., 2015; Scott, 2010).

We argue that natural resource interests associated with agriculture in Iowa and Kansas play a critical role in delegitimizing environmental and economic problems. This is often accomplished through privileged accounts whereby the economic benefits are emphasized and the potential environmental risks are minimized (Freudenburg 2000). Here, local opportunities and constraints on the use of natural resources, such as soil and water, influence decision making and therefore policy in regards to local and regional development associated with biofuels.

Proponents of biofuels argue that the sector is critical for revitalizing agriculture, sustaining rural economies, and stemming rural population decline, a discourse which was led at the federal level by the USDA and Secretary of Agriculture Tom Vilsack (ex-Governor of Iowa), and by biofuel boosters in Midwestern states, especially state departments of agriculture and commodity organizations (Bain and Selfa, 2013).

While the pro-ethanol consensus at the national and international level has fractured, this has not been the case in Midwestern states, where state governments, and energy and farm groups continue to assert that ethanol production is economically beneficial to commodity agriculture and rural communities (Bain and Selfa, 2013), thereby justifying public support such as tax incentives and other financial subsidies. Proponents of biofuels development argue that biomass production for ethanol is ideally suited to local conditions, where large-scale corn production, the main biomass input, is extensive. These privileged accounts created local unified support for biofuels production and quiescence concerning the disproportionality of benefits, and potential environmental and long term development challenges.

In Iowa and Kansas, there has been scarcely—if any—public debate concerning economic or environmental risks associated with biofuels or that the social and economic benefits might have been overstated (Bain and Selfa, 2013; Selfa et al., 2015). For example, ethanol's economic dependence on federal subsidies, high oil prices, and plentiful supplies of water suggests that the sector might not be economically or environmentally sustainable. At the same time, the promotion of the ethanol industry by powerful actors also legitimized continued resource exploitation. In this study, we illustrate these themes through analysis of both qualitative and quantitative data.

3. Methods

Although proponents argued that biofuels would reinvigorate declining rural economies and communities, very little empirical research on community impacts has been undertaken. To help explain why residents continue to support the ethanol industry despite uneven local impacts of the industry, we present findings from our case study research that investigates the benefits and burdens of the growth of the ethanol industry in six communities in Iowa and Kansas. Criteria for selection of these rural communities with ethanol plants included demographic characteristics, physical characteristics (variation in average rainfall, reliance on irrigated agriculture), plant ownership type (absentee vs. local), community opposition or support for biofuels expansion. This mixed methods project, conducted between 2007 and 2011, included a community survey, media content analysis, focus groups with farmers, ethanol plant workers and community leaders in each community, and in-depth interviews in all six communities. In this paper, we will draw primarily on analysis of the interview and survey data.

In-depth interviews lasted an average of one hour and a common interview protocol was used for each interview, although it was adapted to capture the expertise of individual participants. Individual interviews were conducted with a range of stakeholders in each community, including local government officials, school district administrators, municipal utility plant managers, environmental organization staff, economic development directors, ethanol plant owners and managers, farmers and community members. Focus group interviews were conducted with farmers, ethanol plant workers, and community business leaders. The interviews and focus groups were designed to gather data on how participants saw the role of the ethanol

industry in their communities in Iowa and Kansas. This included their perceptions of the primary social, economic, and environmental benefits, as well as costs and risks, of the ethanol industry in each state. All interviews were recorded and transcribed verbatim, and transcripts were then analyzed for prominent themes related to the perceived effects of the ethanol industry for different stakeholder groups in the state of Iowa and Kansas. During the study, 62 key informant interviews were completed and analyzed.

The survey included a series of questions to measure attitudes about biofuel development, community involvement, environmental issues, as well as basic demographic information. The sample size in the six communities was proportionate to their population size, adding up to a total of 2,800 questionnaires. Participants were randomly selected from the list of households in each community. The researchers first sent a pre-notice letter to participants about the survey, followed by the first questionnaire. Those who did not respond received a reminder postcard two to three weeks after the first questionnaire was mailed, and researchers sent a second survey in a final attempt. The overall response rate was 38.9 percent, resulting in 1088 completed surveys. In our analysis below we present both the qualitative interview and the survey data to contextualize our findings in relation to the theory of privileged access.

4. Constructing Privileged Access

Through interviews with stakeholders in rural communities and open-ended comments on the community survey, we solicited residents' perceptions of socio-economic and environmental impacts of the ethanol plant on their communities. At both national and community levels, the

ethanol industry was widely promoted in the media and by politicians and local economic boosters as central to revitalizing these communities, especially through the creation of “green jobs” (Bain and Selfa, 2013; Selfa et al., 2015). Within this context, residents in many rural communities were hopeful that the biofuels industry would help reverse their town’s decline.

Rural communities often competed with each other in an effort to persuade investors to site an ethanol plant in their community. Our study participants reported the optimism and pride they felt because their community had been chosen as the site for the new plant. In a community focus group, one participant explained the effect of the plant on the community: “[T]here’s an attitude change too [because] you know, we have a new plant....We don’t get a lot of new industry out here, and so it was a big deal when they started building it”. Another survey respondent wrote about the plant in his community: “Glad to have it, especially with several communities losing jobs in western Kansas”.

In building support for plant development, industry proponents tended “to overstate, over-describe, and outright double-count” the economic benefits, especially jobs, linked to ethanol production (Swenson, 2006:1). Once the plants were built, however, there was some surprise and disappointment among participants that more jobs had not been created. After the initial construction phase that brought hundreds of mostly temporary jobs into the community to build the plant, the number of permanent jobs created averaged around forty per plant. As one interviewee from Nevada, Iowa stated, “It was all the buzz when the plant was proposed, everyone was for it, I was even for it. I thought it would be a big boost, but it ends up that it’s not a big employment opportunity.” The demand for jobs was evident when 300 people applied for the 35 fulltime positions available at the ethanol plant in Nevada, Iowa (Bain, 2011).

While believing that their town would have been “worse off” without the plant, many study participants were disappointed that the plant had not generated many of the economic multiplier effects that city boosters had claimed would result. Participants reported that the small number of employment opportunities meant that the plant was not sufficient to attract newcomers into the community, which could have boosted house sales and helped reverse declining school populations. Instead, many of the jobs went to locals who simply traded a commute to work for local employment. Even some city leaders acknowledged seeing few benefits flow onto Main Street, namely new businesses. As one city official said “Farmers are going to farm, are going to buy new equipment regardless of whether there is an ethanol plant here.”

Representatives of local governments and especially farm organizations argued that the ethanol industry would benefit farmers by providing a value-added market for their corn. Yet, our interviews and focus groups with farmers revealed that this view was an oversimplification. Ethanol did add a new market for corn farmers, but for many livestock producers, the ethanol industry had driven up their input costs. Many farmers and local officials expressed frustration that ethanol plants were not selling their dried distillers grains (DDGs), a bi-product of ethanol production that is used as an animal feed locally, as had been initially promised by some of the ethanol plants. Cheap DDGs could help support local livestock producers and even contribute to local economic development by attracting other livestock, dairy or poultry producers to the area, which was one of the promised benefits of the plant. Farmers complained that instead the plants typically sold their DDGs to the national or international market with the best price.

Assessing the overall economic risks and benefits of ethanol plants for rural communities also needs to account for the extent of local public investment that ethanol plants have received.

In the midst of the “speculation mentality” that existed among rural communities in mid 2000s, many local governments across the Midwest offered an array of economic incentives in the hope of attracting an ethanol plant to their community (Bain, 2011). Responses from our case study communities suggest that this strategy was broadly popular since 70 percent of respondents in the community survey agreed that public funds *should* be used to attract new businesses to the area. In privileging some narratives and not others, city officials did not make it clear to residents that tax incentives and public investments, such as the provision or maintenance of new infrastructure to support the plant, could add up to millions of dollars in lost revenue or additional costs to the community. For example, tax abatements on property taxes are a common practice. In an interview, a member of the Board of Supervisors explained to us that the 18 year tax abatement given to the new ethanol plant in his community was worth \$200,000-250,000 a year in lost revenue.

In addition many residents were unaware that local governments were providing generous incentive packages to ethanol plants, some of which would have been built in their community irrespective of the incentives. In one of the locations, for example, the local economic development council worked with the city council to offer a suite of economic incentives to the plant, which included a 20 year abatement on property taxes and \$1.2 million in road and water improvements for the plant. Yet, the company had made it clear that it would have located there regardless of economic incentives because the location provided the plant with prime access to feedstock supplies and infrastructural requirements, such as major highways and railroads. In an interview, a board member argued that he thought that this assistance had more value to the image of the local economic development agency than to the plant itself:

Giving us a couple hundred thousand dollars wasn't going to either stop or make a difference whether this plant was built, but it is sure nice for an agency to be able to run around and tell locations that they have helped develop [the plant] by providing them with loan money to build.

At the same time, ethanol plants can strain local infrastructure, imposing costs that rural counties are not necessarily well positioned to absorb. One of the primary concerns raised by about a third of survey respondents was that the local plant had increased wear and tear on local roads. In Iowa, the ethanol industry has significantly boosted the number of heavy trucks on the road, which has increased the deterioration of the rural transportation infrastructure and added to maintenance costs (Gkritza et al., 2011). This burden is felt most acutely by rural counties, since they are responsible for maintaining most of this infrastructure. Yet, our interviews revealed that assessment of a plant's impact on local infrastructure was rarely conducted and that future costs to municipalities, such as road maintenance or water and sewer systems, were seldom calculated. In open-ended comments on the community survey, residents from every community expressed concerns about the tax burden brought about by the plant:

"It may soon close and we will be burdened with the tax load, as we already are and had no say about it; no election! We done this, now you taxpayers eat it."

"The only problems I have with the ethanol plant is why should our county go into debt to build a paved road to the plant to make the investors' money?"

Our research revealed that biofuels development may generate localized environmental risks to specific rural communities. For example, survey respondents in Russell, Kansas, a drought-prone region were twice as concerned as residents in other communities about water resources used by the ethanol plant. The semi-arid region of western Kansas relies primarily on the Ogallala aquifer for its water supply and the long term viability of the aquifer is threatened due to overuse from feedlots, irrigated agriculture (increasingly corn), ethanol plants, and residential and industrial uses (Sophocleous, 2010). These tensions over water use by ethanol plants were amplified when the region suffered a long-term drought from 2001-2006 and residents were put on domestic water restrictions (Selfa et al., 2011). Related concerns about water availability and water use by the ethanol plant were expressed in open-ended comments in the survey. Respondents wrote:

“Not good. There is not that much water and in a few years there is the possibility that our water sources will be gone. The people for the ethanol plant will leave with their money and we will be stuck without water.”

But other community leaders explained that using water was central to the regional economy, whether for irrigated agriculture or ethanol. A public official in one western Kansas county stated:

“Oh it was a little bit of a controversy, but you know when they was talking about the gallons, the amount of water being used. I figured it up one time and it was the equivalent to running two irrigation wells a year for farming. And you know we have a pot-full of irrigation wells around here. ... An equivalent of two irrigation wells of water

for a circle of corn is about what they use in a year. I really just don't think water is that big of an issue."

Another local leader also naturalized water use by the agriculture and ethanol industries in an interview:

"I think there's always a concern that we use too much water, whether it's at the ethanol plant or in the irrigation of all our grains we grow in the area. I mean, if we didn't have irrigation, circle irrigation, then this would be a different country."

Community residents also face health and safety risks from exposure to air and water pollution from ethanol plants. Selfa (2010) examined environmental violations by ethanol plants in Iowa and Kansas and found that a number of plants had been cited for violating environmental standards for air and water quality. In fact, 21 of the 26 plants in Iowa had at least one citation for air quality exceedances and several plants had as many as seven. In addition, citations for violations were on par for both local and absentee owned plants, challenging the view that locally owned plants are more community and environmentally conscious (Selfa, 2010).

One of the most persistent violators was a locally-owned plant in Iowa. Its environmental record was also controversial because it was one of the few ethanol plants to use coal rather than natural gas as its energy source. In the first years of plant operation, coal was significantly cheaper than natural gas. Our interviews and analysis of local media revealed that local investors in the plant tended to favor the use of coal and downplay the environmental consequences,

especially because the benefits are realized within the company while the negative externalities are absorbed by the community. One local investor explained to us that:

Shareholders are very happy as they are seeing great returns.... There are two key reasons why [the plant] is so profitable, excellent management and that they're using coal rather than natural gas which has allowed them to reduce their expenses by approximately 70 percent. There were some start up problems with air emissions but they now have them under control, I think.

On the other hand, some residents were disgruntled about having a coal-fired plant in their community. One resident explained:

[T]hey say it's clean burning coal but people find coal dust in their animal dishes outside. Every morning there is a gray ribbon moving south with the wind. And it's from the ethanol plant. The people that are invested heavily in it don't like to hear that stuff because of course it is going to get into their pocketbook eventually.

One business leader thought that the decision to use coal was negatively affecting community support for the plant:

I would say that [the community] still view [the plant] in a positive way, just not as positive as they did and the concern is it is a coal fired facility, which is

getting to have more and more play as relative to what does this coal do to the environment, are there any concerns relative to air quality, water quality?

In sum, local city officials, economic development leaders, and farm organizations sought to build local support for ethanol investment by privileging accounts concerning ethanol's potential economic benefits while seeking to non-problematize potential negative environmental impacts as well as the public investment used to attract plants. Yet, our qualitative data highlight several important local negative impacts experienced by rural communities involved in ethanol production. Nonetheless, despite concerns about the distribution of economic benefits, quality of life issues, and the effect of ethanol plants on the local environment, it is important to acknowledge that the majority of study participants responded positively to the development of ethanol plants, espousing their positive economic benefits while ignoring or minimizing their negative social or environmental impacts. We found that many respondents simply assumed that the plant brought local economic benefits to their community, although they did not have any direct experience or evidence to support these assumptions. Similarly, in interviews most informants assumed that there were no environmental problems, or discounted their importance (Bain and Selfa, 2013). As one business leader expressed: "There is some residue of some sort, I'm not sure what it is, but apparently, it's nothing that's harmful or the environmental people would have been out here screaming and hollering. It's just something that comes with the territory." In another interview, a board member of an ethanol plant argued: "I don't really see too many environmental issues with the ethanol plant right now. Everything is within EPA requirements, and there isn't anything that I can see that's detrimental to the environment." Many interviewees minimized the environmental risks in relation to the perceived economic

benefits the plant brought to the community. One participant explained: “there are environmental issues on just about everything you can have now. But ... like I said, the smell and that is minor for what it does for the area.” Among locally-owned plants, the enrollment of local farmers and elites into plant ownership potentially contributed to community acquiescence concerning environmental problems. Residents of small communities were reluctant to criticize plants when its owners were also their neighbors, colleagues, employers, and friends.

The unqualified belief in local benefits coming from the biofuels industry is perhaps unsurprising since the economic alternatives for many of these communities have been industries considered far less environmentally benign than ethanol plants, including hog confinement lots, beef feedlots, oil refineries, asphalt manufacturing plants, and meat packing plants. Within a context of declining job opportunities and population loss, many rural communities feel they have few choices in terms of economic development and the perceived need for any kind of economic growth acts to curtail criticism of an industry’s negative impacts (Selfa, 2010). However, residents who did experience direct negative impacts, such as restrictions on residential water availability in some Kansas communities, were more critical of the biofuels industry and more circumspect about the industry’s benefits. Yet, such criticism was usually triggered by very localized issues, rather than a public concern about biofuels production in general, further indicating the naturalization of such problems and the positive framing of the discourse on community impacts. We turn now to our survey data to further develop investigate these themes.

5. Public support and private concerns

The household survey indicated that in all communities, support for the plant was substantial. Respondents listed a large number of potential benefits, mostly related to new jobs, and the majority of them indicated that they had been supportive of the local plant ever since its establishment. This overall positive outlook across all study sites was not surprising, given that the survey was conducted in 2008 when the discussion around biofuels production still highlighted the potential benefits (Table 1).

Table 1. Opinions on the local biofuel plant by community

	Avg. number of positive impact items mentioned*	% with medium or high support for the local plant	% saying that the plant is <i>very</i> important to the local economy	% agreeing with using public funds to establish the plant	% saying that the benefits of the plant outweigh the costs
Nevada, IA	2.82	74.4	27.1	45.2	40.8
Phillipsburg, KS	3.15	74.3	30.8	48.9	39.2
Russell, KS	3.15	79.2	38.5	- **	41.2
Hayne, KS	2.65	68.5	34.5	41.5	36.3
Garnett, KS	2.23	71.0	25.7	54.7	34.6
Greene, IA	2.51	83.0	36.0	49.0	44.6
Total	2.77	75.6	31.8	47.8	39.9

* Multiple choice question with eight different statements

** This question was not used in the Russell survey.

One issue we explored in the survey was the impact of media and other information sources on the extent of support for the plant. Several questions were asked about the sources people use to gain information about the plant and biofuels production in general. Preliminary analysis indicated two distinct clusters of information sources. The first cluster was those who used traditional media (TV, radio, newspapers) to learn about the plant. The second was those gained this information informally (friends, plant workers, personal observations). Two new variables were created based on how many of these specific information sources respondents mentioned, and then recoded into a standardized distribution (not using that particular group of sources, using only one source from the group, and using at least two sources from the group).

We first used these two information variables to analyze an index score about perceived positive impacts of the local plant. The score could have been between 0 and 8, based on how many positive examples a respondent listed. Most of them named two or three, but 12% said none while 19% said five or more. Respondents on average mentioned 1.89 items. Those that used at least two of the three information sources in either of the two new variables scored higher on this average. For the traditional (media) news sources this was 1.99, and for the informal sources this was 1.95, small but statistically significant differences. In other words, if one was exposed to a lot of information coverage either through traditional channels or informal networks, that person listed more positive impacts from the plant. This is indirect evidence about how privileged, and largely homogenized, accounts worked: the overwhelmingly positive spin on the impact of the plant influenced the perception of community resident respondents.

Overall, 75.7% of the respondents indicated at least moderate support for the plant, but the way that information was obtained made a difference in the support too. When one receives the information on the plant from friends and other informal sources, this number increases (from 69.2% for no informal sources to 77.5% with at least two such sources). This is a clear indication of the power of informal channels of communication. The same is true when we examine the costs vs. benefits variable. Those who checked at least two informal channels were more likely to indicate that the benefits outweigh the costs. Interestingly, this does not work the same way for traditional media channels. While the local media has clearly portrayed the plants in a very positive light (Selfa et al, 2015), a lot of the public support appeared to be gained through informal channels. An interesting question our survey has not addressed is whether the key nodes in these informal networks were the same people with vested interest in biofuels production who had the opportunity to control the traditional local media. However, given how

informal communication networks tend to shape opinions in small communities, we have a reason to believe that those creating and sustaining privileged accounts play a crucial role in the emergence of public support for the plants.

We tested both information source variables in relation to perceived positive impacts and the cost-benefit opinion. Using the information source variables as predictors in linear regression with the positive impact index as the dependent variable showed that the number of sources of either source does have a significant and positive impact on perceived benefits. That is, the greater the number of sources of information a respondent accessed was linked to perception of positive impacts of the plant. However, when the cost-benefit variable is set as the dependent variable in the linear regression, the traditional media predictor becomes non-significant. In other words, the power of informal communication about the plant has a greater impact on the perceptions about benefits of local biofuels production.

In addition to multivariate descriptive statistics, the main analytical process with the survey data is a series of logistic regression models exploring the interaction of complex economic and environmental views in the context of public opinions about the ethanol plants. The dependent variable assesses current overall support for the ethanol plant. The variable was based upon one survey question: “How would you describe your *current* level of support for the local ethanol plant?” Originally there were five response categories between "Very High" and "Very Low", which for the purposes of the regression analysis we recoded as a dummy variable focusing on low support (combining the responses "Very Low" and "Low").

In terms of independent variables, we were particularly interested in the interplay between environmental concerns or attitudes and perceived economic impact. As suggested above by interview data, if economic benefits are highlighted and are portrayed as a community-

wide impact, environmental concerns are downplayed. Environmental issues are naturalized as side effects of community economic development, or as largely external to the specific local issues of biofuels production. To measure this interaction, we have created four independent index variables: economic effects, environmental concerns, environmental attitudes, and environmental behavior (Table 2).

Table 2. Index variables

Index	Name	Variables	Procedure	Cronbach alpha
Economic effects	ECOL	Yes/no (1) added new jobs to the local economy, (2) added high paying jobs to the local economy, (3) provided jobs for local workers, (4) increased the incomes of local families, (5) added new businesses, (6) increased tax revenues, (7) improved local government services, (8) reduced poverty locally	Summing up values of (1) through (8)	0.72
Environmental concerns	SECI	Yes/no (1) increased air pollution; (2) water resources have been diverted from other important needs of the city; (3) increased water pollution; (4) a decrease in the overall quality of the environment	Summing up values of (1) through (4)	0.55
Environmental attitudes	EVAI	Likert scale of agreement (1) I think environmental issues are extremely important; (2) when I see or hear a story about an environmental issue, I pay particular attention to that story; (3) it bothers me that the world's natural environment is changing so quickly; (4) the public should not worry about climate change; (5) the use of natural resources must be balanced against economic development needs; (6) the public has responsibility to conserve resources for future generations; (7) my individual actions will <i>not</i> make a difference regarding global climate change.	Summing up values of (1) through (7), after reversing the scale for items 1, 2, 3, 5, and 6.	0.79
Environmental behavior	EVBI	Scale of 1 to 3, 1 being "Never" and 3 being "Frequently" (1) follow media coverage on environmental issues; (2) buy biodegradable or recycle products; (3) reduce household trash by buying products that come with less packaging; (4) avoid	Summing up values of (1) through (9)	0.72

		chemical use in your yard or garden; (5) donate money to environmental organizations; (6) recycle; (7) compost household kitchen waste; (8) drive a hybrid (gas and electric) vehicle; (9) use compact fluorescent light bulbs.		
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These four index variables constituted the predictors in four logistic regression models, with the support for the plant was used as the dependent variable (Table 3). In addition, we have used standard demographic control variables, such as age, sex, education and income. Race was not used in the analysis, as the vast majority of respondents in these six rural communities were white. Model 1 includes environmental concerns (SECI) as an independent variable, controlling for age, sex, education and income. Table 3 shows that SECI is significantly associated with overall support ($p < 0.0001$). Specifically, for one unit increase in SECI, the odds¹ of low support versus moderate or high support increase 2.928 (3.928-1). This indicates that the respondents' higher environmental *concern* is related to their lower overall support for the plant in their community. While ethanol was initially portrayed as beneficial for the environment in terms of climate mitigation, local environmental concerns that constitute the components of this variable could generate some opposition to ethanol plants. This was validated in further models of the logistic regression.

Model 2 includes SECI and ECOL (economic effects) as independent variables. Both of them are significantly associated with overall support ($p < 0.001$). For one unit increase in ECOL, the odds of low support decline 0.383 (1-0.617). This suggests respondents' higher perception of the economic effect is associated with higher overall support for the plant in their community. Given that this has been the most emphasized local impact of new ethanol plants, such strong support is not surprising. However, low support due to environmental reasons is independent of

Definition of odds: suppose the probability that one respondent has low support is p , and thus the probability that the respondent has moderate or high support is $1-p$. Then the odds that the respondent has low support is $p / (1-p)$

what residents think about the economic impact of the plant. This independent effect is an important finding, because it differentiates between the two major conceptual arguments, environmental and economic benefits, about ethanol plants, and may indicate the differential impact of privileged accounts when focusing on these benefits.

To examine the relationship between respondents' environmental attitudes and their overall support toward the plant in their community, we fit Model 3 including SECI, ECOL and EVAI (environmental attitudes) as independent variables. EVAI ($p < 0.05$) is significantly associated with overall support. For one unit increase in EVAI, the odds of low support decreases 0.072 ($1 - 0.928$), controlling SECI, ECOL and demographics. This indicates respondents' higher pro-environmental attitudes are associated with higher overall support for the plant in their community. This suggests that some people support such developments following the general discourse on the environmental benefits of ethanol production, i.e. the climate mitigation benefits of biofuels. However, this support is still separate from any local environmental problem they may encounter. It is also important to remember that environmental concerns and environmental attitudes had distinct operationalizations in this survey. Environmental attitudes reflect general opinions and attitudes about climate change and natural resources, while environmental concerns reflect local issues of air quality or water shortages. As such, privileged accounts should work stronger in local environmental concerns, yet when problems arise those are sidelined, and the emphasis is placed on the benefits of economic impact.

To investigate the relationship between respondents' environmental behaviors and their overall support toward the plant in their community, we fit a fourth logistic regression including SECI, ECOI and EVBI (environmental behaviors) as independent variables. EVBI is not

significantly associated with overall support controlling SECI, ECOL and demographics. It suggests that while environmental attitudes are strong predictors for lack of support for the plant, environmental behaviors are not. In other words, people may have certain concerns about global environmental issues that predict their support for ethanol production, but their daily practices of environmental behaviors such as recycling and conservation are not connected to their opinion about ethanol plants. This also hints that environmental attitudes and actual conservation behavior may not be as strongly related, indicating a further disconnect between public and private environmental considerations.

There are two major findings we can derive from the logistic regression models. One is that local support for the plant is most strongly associated with the perception of economic benefits of ethanol production. This is not surprising, because the issue of economic benefits was the most heavily emphasized local impact through privileged accounts, as illustrated by the interview data above. Therefore, ethanol production is largely an economic development issue in many people's mind, and as long as there is a perception that it helps revitalizing rural economies then it is supported by the majority.

The other finding is that environmental issues, attitudes and behavior play a complex role in supporting ethanol production. Environmental considerations emerge as multi-faceted concepts in people's mind in relation to biofuels, occasionally generating seemingly contradictory responses. Attitudes about global environmental problems resulted in somewhat stronger local support for biofuels, following the early support for corn based ethanol as part of the climate mitigation solution. Individual environmental behavior, however, does not appear to have much relationship with support for biofuels. Decisions about recycling and other

environmentally conscious practices are made by the respondents independently, and do not coalesce with local approval of ethanol production.

The most important component in the complex conceptual picture about biofuels and the environment is how local environmental concerns about air or water quality are independent of other environmental considerations and are much stronger predictors of lack of support for ethanol plants. People may have their own attitudes toward global environmental problems and individual responses or behaviors in relation to environmental problems, and may or may not be concerned about global environmental issues, but if they experience negative local effects (such as water restrictions or air pollution related to the plant), then their support for the plant weakens considerably. The important question is if these effects emerge as environmental issues or rather as personal or community inconveniences about water shortages and air quality. Since these issues have no relationship to global environmental concerns or to individual environmental behavior, these are seen as just minor inconveniences around a new industrial development likely counterbalanced by the perceived economic benefits. It is important to note though that weaker support is still support, which shows the successful downplaying of environmental externalities for economic benefits. In other words, privileging the economic accounts and neutralizing the environmental ones do influence residents' perceptions on benefits and burdens of biofuels production.

Table 3. Logistic regression models (positive coefficients indicate *low* support)

Variables	Model 1		Model 2		Model 3		Model 4	
	Coefficients	Odds ratio	Coefficients	Odds ratio	Coefficients	Odds ratio	Coefficients	Odds ratio
Environmental concern index	1.368***	3.928	1.286***	3.618	1.280***	3.596	1.334***	3.798
Economic Impact Index			-0.483***	0.617	-0.484***	0.616	-0.463***	0.630
Environment Attitude Index					-0.075*	0.928		
Environment Behavior Index							-0.001	0.999
Age	0.003	1.003	0.007	1.007	0.009	1.009	0.011	1.011
Gender	0.113	1.120	0.099	1.104	0.024	1.025	0.012	1.012
Technical school or some college	0.504*	1.655	0.600*	1.823	0.606*	1.834	0.597*	1.816
College or more	-0.001	0.999	0.086	1.089	0.096	1.101	0.030	1.030
Household income (\$10,000-29,999)	-0.251	0.778	-0.357	0.700	-0.234	0.791	-0.550	0.577
Household income (\$30,000-59,999)	0.244	1.276	0.354	1.425	0.385	1.470	0.154	1.166
Household income (\$60,000-89,999)	0.034	1.035	0.308	1.361	0.438	1.550	0.076	1.079
Household income (Greater than \$89,999)	-0.08	0.923	0.215	1.239	0.187	1.206	-0.016	0.984
Phillipsburg	-0.273	0.761	-0.110	0.363	-0.296	0.744	-0.099	0.906
Russell	-1.233***	0.291	-1.014**	0.363	-1.146**	0.318	-1.032**	0.356
Hayne	0.257	1.293	0.104	1.110	-0.176	0.839	0.145	1.156
Garnett	0.107	1.113	-0.098	0.907	-0.343	0.710	-0.124	0.883
Jefferson	-0.330	0.719	-0.383	0.682	-0.535	0.586	-0.408	0.665
Intercept	-2.545 **	0.078	-1.769 *	0.170	-0.014	0.986	-1.599	0.202
Pseudo R ²	0.313		0.398		0.392		0.400	
N	899		898		847		831	

* p<.05 ** p<.01 *** p<.0

6. Conclusions

In this paper, we have argued that powerful local actors, including state and local government officials, economic development leaders, and natural resource interests associated with agriculture, are able to shape public perceptions of the economic impacts of bioenergy as positive. This is despite the lack of substantial job growth or increased population. Additionally, the negative environmental externalities are downplayed by offering privileged accounts of the

industry in rural communities, leading to environmental injustice. Following Freudenburg (2000, 2005) we illustrated the non-problematicity of environmental issues is constructed through a double diversion. We have shown through our case study research in Kansas and Iowa that certain actors had ‘privileged access’ to public resources necessary to build the ethanol industry, including supportive local governments, policies and financial incentives, such as subsidies and tax breaks, and inputs such as ample feedstocks and water, and infrastructural investment that facilitated the quick expansion of these plant throughout the rural Midwest in the mid 2000s. Moreover, the discourses, or privileged accounts, promoted by these powerful actors about positive economic benefits were so persuasive that they overshadowed, sidelined or quieted concerns about environmental externalities and injustice, despite the lack of evidence of economic growth and rural rebound promised by ethanol industry actors. Our qualitative data powerfully illustrate how the “double diversion” plays out in our case studies.

Our survey results supported these conclusion as well. Biofuels production was seen by most residents as an economic opportunity, one that had brought considerable benefits to their communities. Support for the plants was substantial and despite some disappointment expressed by our interview participants, the overwhelmingly positive opinions did not change throughout the years of our study when the plants were in operation. We argue that these generally positive opinions can be attributed, in part, to a positive local discourse that reflected the privileged accounts that dominated in these communities. What was interesting in our cases is that such discourse had an impact through both traditional media channels and informal accounts about the plant operation and its impact on the community. Future research should investigate how the two major types of discourse are connected via actors that have vested interests in promoting biofuels production, and subsequently controlling the privileged accounts.

While the economic impact discourse seemed straightforward and one-sided, our analysis uncovered a more complex picture surrounding the environmental impacts. Given that questions about the climate mitigation benefits was one of the main reason why the general consensus on biofuels production ended, we expected it to play a role in local concerns. Such considerations, however, played little if any role in critical opinions about local biofuels production, showing how privileged accounts were able to filter the discourse presented in rural communities. Problems around biofuels production in these places were neutralized as idiosyncratic inconveniences that are side effects of local economic development, and are relatively easy to solve. A good example of this was the concerns about water. The direct issue was the plant taking water from the city supply, using more than what residents thought appropriate. However, the greater water issue, namely biofuels production using water intensive corn as feedstock was absent in the local discourse despite being at the forefront of global criticism.

The concept of privileged accounts proved to be a useful tool to explore the power of local actors in relation to biofuels production, and to explain why these discourse differ greatly from the national and global conversation on first generation renewable fuel production. Similar to other examples of the interplay between economic interests and political control, biofuels are still portrayed as uniquely well positioned local development opportunities in rural communities in the Midwest. However, there is a marked disconnect between global and local discourses, and those with privileged accounts have diverted attention from the environmental injustices and the inequalities associated with the costs and risks of such economic development. Given the strong need for economic development in rural areas, privileged accounts often mask negative environmental externalities and help perpetuate asymmetries in distributing both benefits and vulnerabilities.

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