LAGOONS, LITTER AND THE LAW:
CAFO REGULATION AS SOCIAL RISK POLITICS *

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ABSTRACT The restructuring of the animal agriculture industry in the United States, a response to globalization dynamics within the world economy, has created a new social risk profile which did not exist in this industry prior to the adoption of factory farm technology. Analysis of the CAFO [concentrated animal feeding operation] regulation debate in Kentucky illustrates the political economy genesis of social risk politics accompanying this new technology. The politics of regulatory efforts to ameliorate such risk, an increasingly frequent occurrence in the risk society era, are examined in a recent attempt to promulgate a CAFO regulatory regime in Kentucky. This case study shows how globalization processes within the U.S. agri-food system have engendered local re-regulation responses in attempts to alter the location-specific socioeconomic effects of these processes.

Globalization Dynamics and the Restructured
U.S. Livestock Industry

In the swine and poultry subsectors of animal agriculture, vertically-integrated structures of production have changed the farm economy and rural communities in dramatic ways (Barkema and Novack 2001; Drabenstott, Henry, and Mitchell 2000). Farmers now contract with agribusiness giants like Tyson’s Foods to perform one

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growth phase of the production cycle, with the integrator (agribusiness firm) providing standardized genetic stock and feedstuffs and the farmer providing land, labor, and capital (e.g., confinement "grow out" facilities). In the hog subsector, for example, farrow-to-finish production practices by independent producers on diversified crop and livestock farms are being replaced by spatially-dispersed, specialized "batch process" confinement operations under contract with integrators who coordinate the "nodes" of the pork commodity chain. The rapidity of structural change in the industry is noted by trends in operational size of production units and in sales methods. In 2001, large producers (those with inventories of 5,000 head and over) accounted for 75 percent of U.S. hog inventories, up from 27 percent in 1994 (Southard and Haley 2001:4). The number of U.S. hogs sold in spot markets has decreased from approximately 87 percent in 1993 to less than 20 percent in 2000 (Hahn 2002:17). The structure of production increasingly resembles that of the poultry industry (Kim and Curry 1993; Rhodes 1995; Sullivan, Vasantava, and Smith 2000). From the industry perspective, this system is credited with providing ever-more demanding consumers with high-quality, reasonably-priced products through investments in and applications of cutting edge technology and business organization. Supermarket items like lean generation pork and fast food items like chicken nuggets are the end products of such commodity chains. A backlash against this production model emerged in the 1990s, however, as environmental costs, public health dangers, problematic contract and labor practices, and animal welfare concerns began to be charged against claimed productivity increases by vocal critics in the environmental and alternative agriculture movements and by public officials who had to deal with political fall-out from the negative externalities of industrialized animal agriculture.

The restructuring of the swine and poultry industries described above are examples of globalization-induced restructuring of the agri-food system during the last two decades (Barboza 2000; Bonanno et al. 1994; Heffernan 1999; Heffernan and Constance 1994; McMichael 1994). What has happened in the agri-food system mirrors trends in the restructuring of many other industries due to globalization dynamics—financial and labor market deregulation, technological change, the growth of market power of multinational firms, the expansion of international consumer markets for name-brand commodities, and the emergence of new business organization
models (McMichael 2000; Waters 1995:Ch 4). In the U.S. livestock industry, locational shifts of production and processing have accompanied restructuring, with increased concentration of production in certain locales where agribusinesses have found favorable physical production, environmental regulation, and labor market environments (Furuseth 1997; Gouveia 1994; Hoban et al. 1997; Hubbell and Welsh 1998; Stanley 1994). Although cross-national commodity chains in the pork and poultry subsectors of animal agriculture are not yet as pronounced as in many other commodities (Gereffi and Korzeniewicz 1994), the potential exists for substantially more out-sourcing of inputs and final products by agribusiness multinationals headquartered in the United States if costs of U.S. production were to increase relative to other world regions.

The empirical outcomes of globalizing commodity production systems are, of course, location-specific. In the case of animal agriculture in the United States, industry restructuring has concentrated huge amounts of animal waste in small physical areas, resulting in associated environmental concerns that have made the industry a flashpoint for controversy during the last decade (Constance and Bonanno 1999; DeLind 1995; Furuseth 1997; Hubbell and Welsh 1998; Martin and Zering 1997; Thu and Durrenberger 1998). As Polanyi (1944) argued at mid-century, capitalist development proceeds as a “double movement,” with economic growth and sectoral displacement countered by strong sociopolitical pressures from declining sectors and negatively impacted communities for policies to deal with socioeconomic loss. As an illustration of the double movement, political contestation of the negative environmental side-effects of industrialized animal agriculture has resulted in regulatory efforts at the local and state levels in U.S. states where the poultry and swine subsectors are now concentrated (Sullivan, Vasavada, and Smith 2000). Such processes are chronicled weekly in the “Hog Insider” section of the agribusiness trade journal Feedstuffs. As Kalb (2000) notes, globalization processes fueled by market deregulation (neoliberal policies) have generated a re-regulation response, as localities attempt to alter location-specific globalization trajectories—a process Kalb (2000:13) has dubbed “glocalization.” A case study of a location-specific regulatory response, the debate over a Concentrated Animal Feeding Operation (CAFO) regulatory regime in Kentucky, is the topic of this paper.
The major contributions of this paper are two-fold. First, the paper shows how the restructured U.S. livestock industry manifests both "old" market risks and "new" technological risks. This dual risk profile illustrates how globalization processes, as embodied in the restructured livestock industry, not only enhance the dangers from new risks identified by risk society theorists, but may also exacerbate old risks which many thought were mitigated by twentieth century welfare state policies now being dismantled in the present neoliberal political climate (an important ideological manifestation of globalization). As illustrated in the Kentucky case, the political economy of risk generates regulatory conflict that is manifested in a new type of politics that, according to risk society theorists, delineates this new phase of modernity. Second, the paper develops a "meso" level analysis of how such risk society politics unfold in a particular locale. This case study identifies policy domain structures (organizational and institutional nexes of issue-specific policy action), legislative action stages and processes, and other relevant political variables that need to be explored in future cross-state or cross-national analyses of regulatory regimes that emerge in response to the social risks attending globalization processes. Through such analytical frameworks, we can begin to understand the extent to which location-specific political institutions alter globalization trajectories at the local level.

Methods

Evidence for the arguments presented in this paper consists of fieldnotes I took at public hearings on CAFO regulations conducted by the Kentucky Division of Water; a review of publications and website materials on CAFO issues distributed by state agencies, industry interest groups and trade associations, alternative agriculture organizations, and environmental organizations; and a compilation of media articles on the CAFO debate. I attended four public hearings on CAFO regulations over 1998-2000 in Bowling Green, KY (1/22/98), Frankfort, KY (6/25/98), Cadiz, KY (9/21/98), and Madisonville, KY (6/25/00). To an important extent, data employed in the political economy of risk and risk politics sections of the paper (sections IV and V) consist of my paraphrases of pro- and anti-regulation perspectives voiced in public hearings by individuals who made public statements. Since there was much overlap in indi-
vidual hearings in terms of participants and viewpoints expressed, my representation of the CAFO debate discourse is a composite of public hearing testimony I observed. This data is referenced as “author’s fieldnotes” in the text. The validity of my representation of this discourse may be cross-checked through perusal of verbatim transcripts of the individual hearings that may be obtained through the Kentucky Division of Water. Newspaper articles are also cited as supporting documentation of the unfolding of the CAFO regulation debate and administrative and regulatory action.

**Background to the CAFO Regulation Debate in Kentucky**

In the summer of 1997, Kentucky Governor Paul Patton (Democrat) issued an executive order that placed a moratorium on permits for large-scale hog operations until regulations governing their operation could be put in place. The moratorium came in response to several western Kentucky county executives’ (elected Judge-Executives in Kentucky) requests for regulatory action in the wake of announcements of plans to establish large-scale hog farms in their counties. Vall, Inc. of Texhoma, Oklahoma, a subsidiary of a Spanish firm of the same name, purchased 3,200 acres of reclaimed strip mine land in Hopkins and Christian Counties in southwestern Kentucky and declared plans to produce up to 500,000 hogs per year. In neighboring Hickman County, a local entrepreneur backed by Carroll Foods, Inc. of Warsaw, North Carolina, began construction of a large sow-breeding operation. Immediately, citizen opposition in those localities surfaced when these plans became public, spurring the moratorium response by the governor (see Associated Press 1997; Bishop 1997a, 1997b; Community Farm Alliance 1997; Fernandez and Brammer 1997; Muhs and Brammer 1997; Wagar 1997).

Important structure of agriculture and rural politics parallels between North Carolina and Kentucky made Kentucky a likely site for production expansion by vertically-integrated North Carolina hog firms after regulatory initiatives loomed in North Carolina in the wake of serious industry pollution problems (Thu and Durrenberger 1994). Like the hog production areas of North Carolina, rural western Kentucky had a faltering tobacco economy that had been the economic mainstay of many small farms, familiarity with contract farming in nearby poultry operations, a hostile union environment
CAFO Regulation — Burmeister

for processors, and weak land zoning rules (Furuseth 1997). And western Kentucky is located in the Corn Belt, providing a local feedgrain supply for vertically-integrated hog production.

Earlier in his first term of office, Governor Patton had welcomed large poultry operations by offering various economic incentives designed to attract processing plants to depressed rural counties in the western part of the state. Tax breaks, infrastructure support, and worker training assistance were among the subsidies offered as part of a wider rural development strategy to attract industry (Lexington Herald-Leader 2000, Lindenberger 2000a). While Seaboard Farms had established a western Kentucky beachhead in the early 1990s before Patton came into office, Perdue, Cagle’s-Keystone, and Hudson (since bought out by Tyson) were enticed to invest in processing facilities during Patton’s first term. As a result, Kentucky became the 13th largest broiler producer in the United States in 2000, producing over 200,000,000 birds, as the processors quickly organized new contract production in close proximity to the processing facilities (Stull 2000). Most recent University of Kentucky College of Agriculture data show broiler production now ranking second in value among all Kentucky agricultural commodities (Patton 2002:D6). As shown below in Table 1, the poultry industry has grown rapidly in the state during the 1990s, with tremendous increases in production over a short period of time in several western Kentucky counties. Many of these counties had declining populations and lagging socioeconomic indicators during the decade of the 1980s (see Table 2 below). In response to such stagnation, influential segments within the affected local communities welcomed poultry industry investment (Lindenberger 2000b). As noted in the data in Table 2, by the end of the 1990s population growth had increased significantly and economic conditions had improved appreciably in many western Kentucky counties. These trends mirrored statewide trends. Undoubtedly expansion of the poultry industry contributed to these trends in some localities, although broader economic forces, including increasing popularity of some western Kentucky counties as tourist and retirement destinations, were also responsible for this growth.

Neighboring North Carolina’s experience with an explosion of swine production over a short period of time undoubtedly strengthened Patton’s resolve to put a regulatory regime in place to forestall

<table>
<thead>
<tr>
<th>YEAR</th>
<th>No. Produced (1,000s)</th>
<th>Pounds Produced (1,000s)</th>
<th>Value of Production ($1,000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>22,000</td>
<td>88,800</td>
<td>24,864</td>
</tr>
<tr>
<td>1992</td>
<td>43,300</td>
<td>173,200</td>
<td>48,496</td>
</tr>
<tr>
<td>1993</td>
<td>43,500</td>
<td>174,000</td>
<td>52,200</td>
</tr>
<tr>
<td>1994</td>
<td>56,500</td>
<td>237,000</td>
<td>71,190</td>
</tr>
<tr>
<td>1995</td>
<td>64,500</td>
<td>258,000</td>
<td>82,560</td>
</tr>
<tr>
<td>1996</td>
<td>77,000</td>
<td>331,000</td>
<td>122,507</td>
</tr>
<tr>
<td>1997</td>
<td>11,660</td>
<td>497,700</td>
<td>184,149</td>
</tr>
<tr>
<td>1998</td>
<td>172,000</td>
<td>842,800</td>
<td>322,906</td>
</tr>
<tr>
<td>1999</td>
<td>188,800</td>
<td>981,800</td>
<td>363,266</td>
</tr>
<tr>
<td>2000</td>
<td>208,200</td>
<td>1,041,000</td>
<td>343,530</td>
</tr>
</tbody>
</table>

Source: USDA/Kentucky Agriculture Statistics Service 2002.  

environmental problems witnessed elsewhere (Furuseth 1997). After the original moratorium was announced in the summer of 1997, regulatory debates continued in each subsequent legislative session. In Kentucky, the governor, through the constitutional authority granted to the executive branch, has the power to use appropriate administrative agencies to promulgate temporary regulations to deal with an "emergency" threatening the general public welfare. Using this power, the governor authorized the Natural Resources and Environmental Protection Cabinet (hereafter NREPC) to issue temporary regulations for livestock operations defined as CAFOs. In the case of such temporary regulations, the promulgating agency, in this case the Division of Water within the NREPC, is required to hold public hearings to vet the draft. This provision is designed to give the regulatory agency a chance to amend temporary regulations in response to public concerns. These regulations become permanent (in their original or amended form) with passage by the legislature.
### Table 2. Socioeconomic Characteristics of CAFO-Site (Poultry) Counties.

<table>
<thead>
<tr>
<th></th>
<th>Net Change in Population(%)</th>
<th>Median Household Income ($)</th>
<th>Percent Below Poverty</th>
<th>Unemployment Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>KENTUCKY</td>
<td>0.7</td>
<td>9.6</td>
<td>22,534</td>
<td>31,730</td>
</tr>
<tr>
<td><strong>TYSON/PERDUE CONTRACT AREA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breckenridge</td>
<td>-3.3</td>
<td>14.3</td>
<td>17,687</td>
<td>27,050</td>
</tr>
<tr>
<td>Butler</td>
<td>1.6</td>
<td>15.7</td>
<td>17,514</td>
<td>25,578</td>
</tr>
<tr>
<td>Daviess</td>
<td>1.4</td>
<td>5.0</td>
<td>24,399</td>
<td>34,335</td>
</tr>
<tr>
<td>Grayson</td>
<td>0.9</td>
<td>14.3</td>
<td>17,306</td>
<td>25,009</td>
</tr>
<tr>
<td>Hopkins</td>
<td>-0.1</td>
<td>0.9</td>
<td>22,155</td>
<td>29,936</td>
</tr>
<tr>
<td>McLean</td>
<td>-4.6</td>
<td>3.2</td>
<td>20,474</td>
<td>28,841</td>
</tr>
<tr>
<td>Meade</td>
<td>5.8</td>
<td>9.0</td>
<td>23,676</td>
<td>34,885</td>
</tr>
<tr>
<td>Muhlenberg</td>
<td>-2.9</td>
<td>1.7</td>
<td>18,679</td>
<td>26,698</td>
</tr>
<tr>
<td>Ohio</td>
<td>-3.0</td>
<td>8.6</td>
<td>18,196</td>
<td>26,333</td>
</tr>
<tr>
<td>Union</td>
<td>-7.1</td>
<td>-5.6</td>
<td>23,798</td>
<td>31,197</td>
</tr>
<tr>
<td>Webster</td>
<td>-5.9</td>
<td>1.2</td>
<td>21,189</td>
<td>30,325</td>
</tr>
<tr>
<td><strong>CAGLES/KEYSTONE CONTRACT AREA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allen</td>
<td>3.5</td>
<td>21.7</td>
<td>17,915</td>
<td>28,798</td>
</tr>
<tr>
<td>Clinton</td>
<td>-2.0</td>
<td>5.5</td>
<td>11,348</td>
<td>17,104</td>
</tr>
<tr>
<td>Cumberland</td>
<td>-6.9</td>
<td>5.4</td>
<td>12,989</td>
<td>18,217</td>
</tr>
<tr>
<td>Monroe</td>
<td>-7.7</td>
<td>3.1</td>
<td>15,214</td>
<td>23,348</td>
</tr>
<tr>
<td>Russell</td>
<td>7.4</td>
<td>10.9</td>
<td>16,788</td>
<td>22,997</td>
</tr>
<tr>
<td>Wayne</td>
<td>2.6</td>
<td>14.1</td>
<td>12,560</td>
<td>20,242</td>
</tr>
<tr>
<td><strong>CON-AGRA (formerly Seaboard) CONTRACT AREA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ballard</td>
<td>-10.2</td>
<td>4.9</td>
<td>19,371</td>
<td>30,629</td>
</tr>
<tr>
<td>Calloway</td>
<td>2.3</td>
<td>11.2</td>
<td>19,408</td>
<td>29,853</td>
</tr>
<tr>
<td>Carlisle</td>
<td>-4.5</td>
<td>2.2</td>
<td>19,404</td>
<td>28,450</td>
</tr>
<tr>
<td>Fulton</td>
<td>-7.8</td>
<td>-6.3</td>
<td>16,087</td>
<td>23,741</td>
</tr>
<tr>
<td>Graves</td>
<td>-1.5</td>
<td>10.4</td>
<td>20,647</td>
<td>29,677</td>
</tr>
<tr>
<td>Hickman</td>
<td>-8.2</td>
<td>-5.5</td>
<td>20,347</td>
<td>28,542</td>
</tr>
<tr>
<td>Marshall</td>
<td>6.1</td>
<td>10.7</td>
<td>22,413</td>
<td>33,061</td>
</tr>
<tr>
<td>McCracken</td>
<td>2.6</td>
<td>4.2</td>
<td>22,606</td>
<td>33,538</td>
</tr>
</tbody>
</table>

Under past precedent, if the legislature failed to approve regulations emanating from the responsible agency or failed to enact alternatives to what the agency proposed, as happened in the post-1997 legislative sessions with the temporary CAFO regulations, the temporary regulations lapsed. The responsible agency had the option to draft a new set of temporary regulations that had to be different (the legal requirement) from the earlier regulations rejected by the legislature. This merry-go-round between the executive and legislative branches of the state government continued until new legislation changing the executive branch's authority to keep temporary emergency regulations in force was passed at the end of the 2002 General Assembly session (Associated Press 2000a, 2000b, 1998; Baniak 2000; Mead 2000, 1998b; J. Patton 1998b; Wolfe 2000a,b).

A lawsuit filed by the Kentucky Farm Bureau and other state commodity groups set this legislation in motion by contesting the constitutionality of executive branch regulatory authority (Associated Press 2001; Brammer 2000; KFB 2001; Wolfe 2001). While the NREPC won an initial victory in a countersuit (Brammer 2001; Yetter 2002), the legislature reacted by passing House Bill 728 (KFB 2002). The bill became law without Governor Patton's signature. This new law requires that any regulation declared "deficient" by the vetting legislative agency, the Administrative Regulation Review Subcommittee (which reviews administrative regulations between legislative sessions), be declared null and void if legislative approval is not forthcoming in the next session. This law means that temporary regulations lapse within a fairly short time after promulgation by an executive branch agency if legislative approval is not secured. Hence, the most recent temporary CAFO regulations (announced by the NREPC in October 2001) are apparently no longer in force (Duncan 2002).

At the outset of the CAFO regulation debate, the regulatory initiatives focused on planned large-scale hog production facilities. Over time, however, the regulatory regime was broadened to incorporate all animal production operations defined as CAFOs---including beef cattle, dairy, poultry, and swine. This omnibus approach was in part a response to a federal attempt to provide responsible state agencies with guidelines to deal with water quality threats posed by CAFOs, namely a presidential executive order to incorporate livestock waste run-off into Clean Water Act mandates. Joint USDA/EPA CAFO guidelines were drafted in the spring of
1999 (EPA 2001; Kaplan, Johansson and Peters 2002). The responsible Kentucky authority (the aforementioned NREPC) drafted its most recent regulations with this federal mandate in mind. The rapid growth of the poultry industry in Kentucky at the end of the 1990s has directed public attention to specific problems associated with CAFOs in that livestock subsector (Associated Press 1999). At a public hearing in Madisonville on June 6, 2000, almost all the public comments supporting a strong regulatory regime were directed at nearby poultry operations (author’s fieldnotes). One speaker estimated that a neighboring county had seen 250 chicken houses (25,000 birds/house) go up during the past year, causing widespread citizen complaints about associated environmental problems (see also Stull 2000).

There were three main provisions to the NREPC-generated CAFO regulations (Frederick 2000). One major provision dealt with setback requirements from dwellings, schools, recreation areas, and so forth, for animal houses, waste disposal sites, and land applications of manure from CAFOs. This provision addressed odor and other nuisance complaints (e.g., fly and vermin infestation are commonly described problems of neighbors) as well as concerns about health impacts on nearby residents. A second major provision dealt with water quality standards by requiring CAFOs to obtain permits for water and waste discharge. The Division of Water, an agency within the NREPC, was charged with monitoring compliance and ensuring that water quality was not compromised by CAFO operations. The final provision made the integrators (corporations like Tyson’s Foods that contract with farmers for animal production and that own the animals and specify production technologies used by farmers) jointly liable with farmers for environmental damages caused by CAFO operations—e.g, clean-up of on-farm accidents or production facility closures.

Throughout the debate over a regulatory regime, a consistent line-up of pro- and anti-regulation groups has testified at public hearings and lobbied the Cabinet and the legislature (author’s fieldnotes). These groups are catalogued in Table 3 below. Basically the agricultural industry is anti-regulation and environmental and alternative agriculture groups are pro-regulation. In public debates on the regulations, the pro- and anti-regulation forces contested all of the important provisions of the regulations, with regulations
critiqued as not strong enough (the pro-forces) or unnecessarily burdensome (the anti-forces) (author's fieldnotes; Lexington Herald-Leader 1998; Mead 1998a; Patton 1998b, 1998c). One study comparing regulatory regimes for hog production placed Kentucky's regime in the "restrictive" category (Beghin and Metcalfe 2000). However, for both sides in the debate, the provision that defined ideas about the ultimate policy impact of these regulations was the joint liability provision. This provision illustrated in a most direct way the political economy catalysts of Kentucky's CAFO regulation debate.

Globalization and the Social Risk Dimensions of the CAFO Regulatory Conflict

The joint liability provision in the proposed Kentucky CAFO regulatory regime was a flashpoint for both the pro- and anti-regulation groups in the debate because it revealed social risk hazards of globalization-induced economic restructuring in the U.S. livestock industry that both sides sought to minimize. What do sociologists mean by the term "social risk" (see Beck 1998, 1992; Giddens 1998)? Social risks are future unwanted outcomes that people seek to control or ameliorate when possible. Many modern social risks are human-made results of the development projects that define in techno-economic terms the industrial and post-industrial eras of human history. Paradoxically, technological efforts to harness nature to benefit humankind can generate physical and/or biological system reactions that pose significant hazards to human welfare.

Giddens (1998:27) differentiates a type of social risk that, historically, has been predictable and insurable from a type of social risk that is less predictable but which is perhaps more threatening to human life. The first type of risk he labels "external" to indicate that it is imposed from the outside through natural forces or macro-level social system fluctuations over which individuals and even nations have little control. These events occur often enough that knowledge is accumulated about them and thus some ameliorative measures can be taken to deal with their negative consequences. Cyclical economic fluctuations in capitalist economies are one illustration, with welfare state social insurance schemes like unemployment compensation a common public policy response. Historically,
TABLE 3. Organizational Actors in Kentucky CAFO Regulation Debate.

<table>
<thead>
<tr>
<th>Pro-Regulation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Farm Alliance (alternative agriculture)</td>
</tr>
<tr>
<td>County-Level NIMBY Protest Groups (e.g., McLean County Citizens Against Factory Farms)</td>
</tr>
<tr>
<td>Democracy Resource Center (progressive politics)</td>
</tr>
<tr>
<td>Kentuckians for the Commonwealth (progressive politics)</td>
</tr>
<tr>
<td>Kentucky Resources Council (environmental)</td>
</tr>
<tr>
<td>Kentucky Waterways Alliance</td>
</tr>
<tr>
<td>Natural Resources and Environmental Protection Cabinet</td>
</tr>
<tr>
<td>Sierra Club</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Anti-Regulation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kentucky Cattlemen’s Association</td>
</tr>
<tr>
<td>Kentucky Corn Growers’ Association</td>
</tr>
<tr>
<td>Kentucky Farm Bureau Federation</td>
</tr>
<tr>
<td>Kentucky Pork Producers’ Association</td>
</tr>
<tr>
<td>Kentucky Poultry Federation</td>
</tr>
<tr>
<td>Kentucky Small Grain Growers’ Association</td>
</tr>
<tr>
<td>Kentucky Soybean Association</td>
</tr>
<tr>
<td>Kentucky State Department of Agriculture</td>
</tr>
</tbody>
</table>

Source: Author’s fieldnotes.

Private insurance companies have handled many of these external risks, such as those stemming from natural disasters.

The second type of risk, labeled “manufactured risk” by Giddens, is generated as a by-product of advanced technological systems. A wide array of technologies such as nuclear power and genetic engineering pose this risk threat, perhaps illustrated in starkest terms by the Chernobyl disaster. This event was unforeseen and hence difficult to plan for and/or insure against. Manufactured risk reveals the paradox of modern science. While science continues to produce new knowledge leading to breathtaking technological achievements, uncertainties grow concerning possible negative side effects embedded in these advances (Beck 1999:Ch. 6). Such interventions in the biophysical and social worlds are promulgated without comprehending (or some would argue without truthfully
acknowledging) their potential to create adverse system reactions. These threats are compounded by the fact that such system-altering technologies and products are most often developed and disseminated by the private sector using a for-profit decision-making matrix that does not cost out negative externalities.

While participants in the CAFO regulation public hearing did not use the risk profile terminology described above, their testimony fit these risk profile categories. The anti-regulatory forces, basically groups representing the agriculture industry, reacted to the social risk of capital flight posed by the joint liability provision of the CAFO regulatory regime. They argued that stringent industry regulations, in particular the joint liability clause, would drive out potential swine integrators and stall expansion of the poultry industry. According to industry interest groups, contract farming options should be open to all interested farmers. Arguments were often made that CAFO production systems represent the cutting edge of animal agriculture, and that Kentucky farmers must keep pace to advance (or even retain) their position in an increasingly competitive marketplace (author’s fieldnotes).

Interestingly, the social risk of capital flight, an “old” industrial society external risk brought about by people’s increasing reliance on the capitalist market for daily sustenance, has increased for many localities and socioeconomic sectors as the result of the neoliberal deregulation policies that are key components of the current globalization regime. As the New Deal protectionist safety net for Kentucky farmers is dismantled (i.e., the tobacco program), capital flight and other economic dislocation risks reappear and influence policy positions. By arguing against joint liability, industry interest groups were in effect saying that farmers must incur more personal financial risk in order to protect the industry as a whole from capital flight.

The pro-regulation forces saw the joint liability provision of the current CAFO regulations as protection against manufactured risk. Perrow (1984) uses the term “normal accident” to describe this type of risk. He argues that accidents are routine in tightly-coupled, complex industrial production systems. Breakdowns are inevitable due to unanticipated failures in a part of the system, which often magnifies the seriousness of a problem due to the interconnectedness of complex system components. One glitch reverberates in ways that are often not foreseen by engineers and technicians and
thus such accidents are difficult to defend against (e.g., engineer back-up safety mechanisms to deal with accidents) since there is little knowledge of system failures in advance of their occurrence. According to Perrow, we should expect such things to happen and evaluate the dangers of technologies accordingly. If system failure scenarios are too grim, as in the case of nuclear accidents, extreme caution should be used in deploying the technologies.

CAFO production systems, lauded by industry experts as the new global standard of production efficiency (Rhodes 1995; Smith 2001), are good illustrations of how new technologies may pose increased social hazards when contrasted with traditional production methods. The main danger lies, of course, in the exceedingly dense concentrations of animal waste in very confined areas (Gollehon and Caswell 2000). The catastrophic accident potential of CAFOs was evident three years ago when hog waste treatment lagoons were breached by an unexpected natural event, Hurricane Floyd in North Carolina (Kilborn 1999). As yet, the extent of environmental damage caused by this system failure is unclear. Although less dramatic than the breach of CAFO systems by natural disasters, some scientists warn of more insidious ground water pollution (Jongbloed and Lenis 1998) and public health dangers (Brody 2001; Grady 2001; MacKenzie 1998) that are consequences of more routine normal accidents that they claim plague a technically-problematic and poorly-regulated production technology.

To deal with the reality of normal accidents in industrial systems, Perrow argues that either remediable systems must be in place to undo damages caused by system failures or alternative techno-economic paths that present less catastrophic failure risks should be substituted for dangerous technologies. In the Kentucky CAFO regulation debate, the statements of pro-regulation advocates implied that a joint liability provision in the CAFO regulatory regime would do one of two things—either encourage the integrators to modify production technologies in ways that decrease potential damages or stall further integrator investment in the swine and poultry industries (author’s fieldnotes). In fact, the latter response has seemingly occurred in the swine industry. Hog production in Kentucky decreased to an all-time low in 2000 (USDA/Kentucky Agricultural Statistics Service 2002), with a combination of regulatory threats, changes in production structure that negatively impact inde-
dependent producers (i.e., loss of market outlets), and low prices the most likely explanations. Either industry reaction (tighter regulation or lack of investor interest in new CAFO operations), according to the pro-regulation position, will lessen the manufactured risk hazards from the state’s animal agriculture industry.

The type of social risk dangers that motivate the pro-regulation forces are conceptualized by Beck (1998; 1992) and Giddens (1998) as heralding a “risk society” stage of modernity that is globalizing in scope. In this new era, manufactured risks, the inevitable by-products of advanced industrial development, pose serious threats to human welfare, and, as a result, cause deep unease among the citizenry. Dealing with these risks becomes a pressing concern of government. In fact, Beck and Giddens have argued that twenty-first century politics, at least in the advanced industrial countries, may focus more on dealing with such problems (witness such recent debates over nuclear power, mad cow disease, global warming, etc.) than on traditional economic security concerns.

However, the CAFO regulation debate in Kentucky showed that both the old economic security and the new complex technology risks remain very important foci in the arguments of the opposing sides, an indication of important social contradictions inherent in industrial restructuring in this era of globalization. One way to illuminate these contradictions is to note that the neoliberal public policy interventions that promote globalization within the world economy increase economic security risks to many producers (the social risk most feared by anti-regulation proponents) and advance the worldwide dissemination of production technologies by multinational corporate actors which, as in CAFO systems, magnify the potential for serious normal accidents (the social risk most feared by pro-regulation proponents). This double risk whammy of globalization processes breeds regulatory conflict.

The Politics of Regulatory Response

The social risk profiles outlined above that accompany livestock industry restructuring are political economy realities endemic to CAFO development in any locality in the United States. State-level responses to this dual risk policy dilemma emerge as regulatory politics and represent attempts to alter globalization trajectories at
the local level. In their survey of state regulations, Beghin and Metcalfe (2000) identify social structural, geographic, and temporal (length of experience with CAFO operations) variables as explanators of cross-state differences in regulatory regimes. While rural population density, agroclimate, and the timing of CAFO development are plausible catalysts for differential regulatory responses, location-specific constellations of political actors and policy domain structures and processes also provide essential keys to understanding local regulatory outcomes. Political action channeled by and through local institutional structures often effect what Kalb calls “glocalization” (2000:13).

Burstein (1991) and Kingdon (1995) provide important insights into the political dynamics of legislation such as CAFO regulatory regime action. Burstein’s “policy domain” framework focuses on organizations as political agents in the legislative arena. Organizations have both material and ideational resources they can use to further their members’ political objectives on issues that matter to them. How they fare in the political arena is often the function of their strategic use of cultural tools (see Swidler 1985) to frame convincing arguments in policy debates. Kingdon’s major contribution is his identification and explication of discrete steps in the legislative process that political agents must navigate to enact their policy preferences into law. In addition, his work also increases awareness of the institutional contexts that channel routine political action and that affect legislative outcomes.

In what follows, Kentucky CAFO regulatory response is explored by showing how political agents within an organizational field of “environment and agriculture” politics developed policy arguments to influence legislation that authorized or opposed regulation (Burstein’s policy domain analysis). This political action is examined through analyses of the issue emergence, alternative solution, and adoption stages of the legislative process as specified in Kingdon’s policy model. At the alternative solution stage of the process, we pause to assess how the Kentucky CAFO regulation debate highlights particular characteristics of risk politics that Beck and others argue reflect the risk society stage of modernity.
Emergence of a Policy Problem

Our earlier description of CAFO regulation in Kentucky indicated that this issue has indeed been put on the policy agenda. As Beghin and Metcalfe (2000) suggest, social structural variables played a role. The state's demographics assured that CAFO facility siting would likely spark NIMBY (not-in-my-backyard) objections. Kentucky is one of the most rural states in the United States, with a relatively large number of rural residences spread throughout the countryside. Any prospective CAFO site is likely to affect a number of residences and generate constituent complaints that politicians must attend to.

The temporal factor was also important in the Kentucky case. Being a relative latecomer to the CAFO investment sweepstakes, threatened neighbors were aware of a plethora of horror stories from surrounding states that experienced an influx of large-scale hog operations earlier in the 1990s (see examples in Thu and Durrenberger 1998, 1994). Information about a range of problems linked to CAFO development has been circulated widely in the media and by environmental and family farm advocacy groups and local NIMBY grassroots opponents of CAFOs (Bishop 1997a, 1997b; Community Farm Alliance 1997; Lindenberger 2000c). Narratives of hog lagoon stench, vermin- and fly-infested poultry litter, drastic declines in the quality of the ambient air environment of those unfortunate enough to live downwind of CAFOs, declines in property values of CAFO neighbors, and health risks to those living in close proximity to factory farms were used widely to legitimate opposition to CAFO intrusion (author's fieldnotes).

The quick response of the Kentucky governor, Paul Patton, to local level concerns about the siting of large-scale hog confinement facilities was also instrumental in putting CAFO regulation on the policy agenda. Before entering politics, Patton was an Eastern Kentucky coal company executive. He has personal experience with the protracted controversies surrounding environmental problems in that industry. As a result, he has argued that industry must confront environmental problems head-on, and that public policy must strike a balance between environmental concerns and economic growth (Patton 1998). While this political stance is not without its inconsistencies (i.e., his administration's subsidy of poultry processors as a rural development strategy), his gubernatorial tenure has been
marked by several high profile initiatives to deal with Kentucky's environmental problems (Mead 2001). As Kingdon (1995:Ch. 2) notes, issues make the policy agenda when the executive branch takes an interest in them and uses its institutional powers to further public debate about them. The Kentucky governor's power to issue administration regulations to cope with an "emergency," and the NREPC's (an executive branch agency) statutory authority to develop regulations and to conduct public hearings to vet the regulations established a routinized public venue for the regulation debate.

Policy Players and Policy Alternatives

The line-up of policy actors displayed earlier in Table 3 identifies an organizational field comprised of three sets of actors who routinely lobby the state legislature--mainstream agriculture interest groups, environmental organizations, and alternative agriculture and other progressive politics advocacy groups. Mainstream agriculture groups constructed policy lines that transformed their economic self-interest in minimal regulation into the general interest and/or widely shared values. The environment-alternative agriculture-progressive politics alliance, on the other hand, tried to develop policy lines that tied the public good of stricter regulation to existing or future private and community troubles (author's fieldnotes). These policy actors combined their ideas and interests into "causal stories" (Burstein 1991) of the socioeconomic consequences of different regulatory regimes. The construction and public dissemination of these discourses constituted much of the policy debate surrounding this issue.

A resonant causal story used by the anti-regulation proponents focused on current problems facing the Kentucky farm economy, the foremost being the collapse of the tobacco economy (author's fieldnotes). Historically, tobacco income has been the economic linchpin of many Kentucky farms. The federal tobacco program, which guaranteed farmers a profitable price in return for their agreement to institute supply management controls, is currently being undermined by substantial reductions in quota due to tobacco companies' increased global sourcing of leaf and the companies' attempts to dismantle the federal program through direct contracting with growers (i.e., the globalization of the tobacco industry) (see
Stull 2000). Loss of tobacco revenue requires diversification into other commodities if farm income is to be maintained. Mainstream agricultural interest groups argued that livestock production is one of the most viable alternatives to tobacco in Kentucky, and that stringent CAFO regulations will foreclose this option at least in the hog and poultry industries. CAFO regulations, in essence, were said to threaten a direct material loss to Kentucky agriculture by reducing potential growth in livestock inventories and by foreclosing a potential in-state feedgrain market for CAFOs.

This story was reinforced by other discourses that the anti-regulation forces hoped would sway policymakers and public opinion in their direction. Among the most important storylines employed was the self-identification of farmers as "the true stewards of the land" (author's fieldnotes). This self-identity was proclaimed to allay fears about farmer-induced environmental degradation. Anti-regulation proponents asked rhetorically why any rational farmer, concerned with leaving the family farm as a legacy to his/her heirs, would engage in destructive environmental practices that would despoil the resources which sustain them economically and spiritually. CAFO development was also portrayed in classical entrepreneurial terms as "cutting edge technology" adopted by the most progressive farmers (author's fieldnotes). Adoption of new technology was identified as the key to maintaining U.S. agricultural preeminence in the global economy. Another frequently employed discourse was to invoke the inviolate right of private property owners to develop their property as they choose (author's fieldnotes). These storylines, frequently invoked in policy debates by the anti-regulation proponents, resonate widely with the general public's preconceptions of farming, agriculture, and the American way. The construction of such storylines illustrates how policy actors' material and ideational interests combine to fashion a policy argument.

The pro-regulation alliance's position, while trying to evoke sympathy for those who had already suffered damage as a result of their close proximity to CAFO operations, focused more on preventing future environmental degradation and public health crises that may harm individuals and communities and cost taxpayers (author's fieldnotes). This emphasis put the pro-regulation forces on a different footing in the policy debate, as future costs to society at large rather than immediate economic impact to specified target groups became the major rationale for policy promulgation.
The policy arguments of the pro-regulation coalition were grounded in critiques of the present agri-food system and in the visioning of expanded roles for agriculture in American society. CAFOs were portrayed as substantial public health risk threats due to waste run-off (e.g., groundwater contamination) and to animal production and processing practices that compromise food safety and the efficacy of essential antibiotics. Undoubtedly, recent media coverage of food safety scares has aided the pro-regulation cause by heightening public awareness of problems in the industrial food system. Appeals to the farming community centered on arguments about how CAFOs, as representatives of agribusiness oligopoly, were eroding the family farm and community social foundations of rural America through business and technology practices that are economically and environmentally exploitative (author’s fieldnotes). They highlighted their strong support for the joint liability provision in the recent temporary regulations as legal protections for family farmers who have little leverage when negotiating a contract with a CAFO integrator. An often understated subtext in the pro-regulation discourse was that agriculture must move toward sustainable environmental and decentralized, locally-oriented agri-food system solutions to its current problems (author’s fieldnotes). This vision provided an important linkage to environmental allies, as both the alternative agriculture and the environmental groups claim that agriculture is now much more than commodity production, with the provision of social goods like environmental services and landscape preservation equally important and deserving of policy support. This alliance is socially more tenuous than the more narrow-scope mainstream agriculture interest group coalition, as intramural squabbles about the reconciliation of farm economy needs with environmental protection demands make the establishment of common policy ground a more taxing political challenge.

**Risk Politics and the Policy Debate**

The signal characteristic of the new era of risk politics was illustrated by the role of science in the policy debate. Both pro- and anti-regulation proponents routinely produced scientific evidence in support of their policy positions (author’s fieldnotes) (see Tesh 2000:Ch 5 for a good discussion of this environmental policy real-
ity. Legislators and the general public must then weigh this conflicting evidence in their evaluation of the merits of competing policy lines. According to Beck, this situation represents the essential dilemma of the risk society era. Science is exposed for what it really is—an intellectual process wherein scientific findings are continually challenged by ongoing research, resulting in controversy and uncertainty about the ultimate validity of what is currently known. The scientific community has not effectively communicated this matter-of-fact situation to policymakers and the lay public who find it difficult to evaluate contradictory scientific evidence. Rather, the scientific community has chosen to increase its institutional power by fostering the notion that science generates "solutions" to all sorts of human problems through technological fixes developed through the application of its scientific expertise (Beck 1992:51-71).

The anti-regulation forces were somewhat successful in linking their position to scientific authorities who were better known to state policymakers and the general public. In the CAFO regulation policy debate, continual references were made to the "sound science" behind CAFO technology and "reasonable" regulatory standards (author's fieldnotes). Research by land grant university scientists, a group of experts who are relatively well-known to the lay public as specialists in agri-food system science and technology, was often cited by anti-regulation proponents in support of their positions regarding the productivity, safety, and self-regulatory attributes of CAFO systems. The other side in the debate was castigated for adopting "emotional" and "unscientific" positions that are "irrational" in modern society. Although the pro-regulation forces brought their own scientific expertise to support their position, this evidence came from less familiar sources (e.g., public interest research groups). Neither the pro-regulation proponents nor the regulators (the NREPC) took time to educate policymakers and the general public about the routinization of scientific conflict that Beck and others argue characterize any public debate over what to do about manufactured risk, a discourse strategy that might have challenged land grant university scientists' evaluations of CAFO risk.

The science issue carries over to the other key element of risk politics, the specter of heightened public regulatory interference in private business and business reaction to that prospect. Technological processes, adopted by businesses to enhance profits in a dynamic
marketplace, may now be increasingly subject to scrutiny and regulation by the government as a result of well-publicized manufactured risk threats. In the eyes of risk society proponents, this marks a new era in business-society-government relations. This issue surfaced routinely in the public discourse on the Kentucky CAFO regulations. Anti-regulatory proponents argued that they are the experts in the technologies they employ and that society should accord them decision-making autonomy in this arena (author's fieldnotes). The Kentucky regulations, which were promulgated within the NREPC without much public knowledge of the process and the players, had a "black box" appearance that was easily attacked by those who favor a laissez-faire regulatory approach. "Who is making the regulations and what is their expertise" were rhetorical questions frequently asked. The implication was, of course, that this is another case of bureaucracy run amok. Regulators, it was argued, did not know the location-specific technological attributes and the economic competition demands of businesses they regulate, and hence are not in a position to write authoritative rules. In an era of skepticism about government regulation (a product of neoliberal ideology that undergirds the globalization project), this policy line resonated strongly in the debate.

The Legislative Impasse

The protracted impasse over a regulatory regime illustrated further the nature of risk politics. The telltale sign in the Kentucky case was the heightened power of administrative agencies vis-a-vis legislators in the construction of a regulatory regime. Since contested science does not present clear answers to legislators and their constituents, the political space for administrative agencies to adjudicate scientific uncertainties over how to deal with manufactured risk expands. After all, personnel in administrative agencies are often more knowledgeable about the technical details of the issues they handle on a routine basis than are legislators. They have policy-making advantages in terms of access to information and in terms of understanding how a policy issue has evolved over time in response to the concerns of groups with varying material and ideational interests. This institutional power puts administrators in a favorable position as a source of policy alternatives and/or solutions. Legisla-
tors can react, but they often lack the time and resources to challenge agency expertise on technical issues.

As Bosso (1987) and others have noted, the expansion of the agriculture issue area beyond the "iron triangle" of farm groups, departments of agriculture, and rural legislators means that the organizational field of political action has expanded to encompass a much wider range of interests and ideas. The intra-state politics of CAFO regulation in Kentucky mirrored what has happened at the federal level when environmental and agricultural issues are intertwined. Analogous to conflicts between USDA and EPA, in Kentucky the Department of Agriculture is beholden to a farm group clientele and consistently supports an anti-regulation position in the policy debate. The Natural Resources and Environmental Protection Cabinet, on the other hand, has been the lead advocate of broadening the scope of regulated industry to include agriculture in its attempts to deal with various environmental problems such as water quality. While environmental groups do constitute a countervailing organizational field that can be mobilized to support NREPC actions, these groups are not clientelistic in the sense of the Department of Agriculture-commodity/farm group relationship. NREPC actions often do not satisfy the environmental community. As in the case of EPA regulatory action, the politics of serving the diffuse general interest rather than particular local interests made it more difficult for the NREPC to secure political support in the legislature for making its regulations permanent. The political imbalance is exacerbated in Kentucky by the fact that the Agricultural Commissioner is an elected official, whereas the NREPC head is appointed by the governor.

After the initial executive branch promulgation of CAFO regulations in 1997, Republican capture of the upper house (Senate) from the Democrats produced a less friendly legislative environment for the Patton administration. However, for several years, the administration successfully bottled up anti-regulation challenges in the legislature. Rural legislators from western Kentucky districts with a poultry CAFO presence routinely introduced bills that gutted provisions in the Cabinet's regulations that they (and their constituents in the livestock industry) saw as most onerous, particularly the integrator liability provision (Associated Press 2000b). Democratic chairs in committees in the lower house with jurisdiction over this issue were able to table these bills (Associated Press 2000a). The fact
that industrial hog farm expansion had been stalled by the temporary regulations weakened the anti-regulation forces, as entrenched lobbying pressures from this segment of the industry were not yet well established.

However, the strategy of the anti-regulation proponents to pit legislative prerogatives against administrative authority seems to have worked. In effect, the sine qua non of risk politics, its empowerment of technical administrative agencies vis-a-vis lawmakers, was used to bring down a regulatory challenge to an industry that created new manufactured social risks. A relatively strong state regulatory apparatus in Kentucky has, it seems, been weakened by opponents’ clever political use of the aforementioned administrative biases embedded in risk politics. Even Democrats in the Kentucky legislature who normally supported Patton voted for House Bill 728 (a defacto vote against the CAFO regulatory regime) when the regulatory issue was reframed as executive branch usurpation of their lawmakers’ authority (Brammer 2001; Wolfe 2001).

This brief exposition of the political factors influencing the Kentucky regulatory outcome suggests variables which might be considered in future cross-state and cross-national analyses of regulatory regimes in the livestock industry. Rural/urban demographics, the institutional power of the executive versus legislative branch, intra-state agency configurations and conflicts, agricultural commodity profiles, levels of political party competition, and ideological currents that affect political action are explanatory contenders. Systematic comparative research on regulatory regimes at both the state and national levels is needed to flush out model specifications with explanatory potential. Such comparative research will provide more knowledge of what types of local environments generate what types of location-specific alterations of globalization dynamics.

Conclusion: Globalization, Regulation, and the Future of Rural Places

The vertically-integrated swine and poultry industries incorporate many of the defining characteristics of a globalizing world economy—multinational firm market concentration, diffusion of new business forms with spatial disaggregation of “component” production processes, and the development of global technology standards.
Although not addressed explicitly in this paper, the dependence on immigrant labor is also quite pronounced, another defining attribute of globalization processes (Gouveia 1994; Grey 1999; Stanley 1994). The heightened manufactured risk profile associated with CAFO development has generated fierce political contestation over regulations to deal with environmental, public health, and community well-being problems associated with industry restructuring.

While this paper used a case study of state-level regulation initiatives to explore the political economy of risk profiles that spark regulatory debate and the risk politics dynamics that influence regulatory action, the complexity of the U.S. federal system of governance must be dealt with explicitly in future analyses of CAFO regulation outcomes. As mentioned earlier in this analysis, the promulgation of federal USDA/EPA CAFO guidelines initiated by the Clinton administration to address agricultural pollution problems under Clean Water Act mandates (see EPA 2001; Kaplan, Johansson and Peters 2002) spurred Kentucky authorities to expand the scope of CAFO regulations to include beef cattle and dairy operations. Thus, pro-regulation forces found federal action supportive in their attempts to promote a more comprehensive regulatory regime. As widely anticipated, the Bush administration has recently revised these guidelines in ways that pro-regulation forces argue are too friendly to the animal agriculture industry (Becker 2002). In the course of the Kentucky regulatory debate, anti-regulation forces have used federal guidelines as “maximalist” standards in court action contesting the lawfulness of state-promulgated temporary regulations. Now, with a more laissez-faire regulation stance at the federal level, anti-regulation forces may be in an even stronger position to thwart any new state-level initiatives to institute regulations that go beyond the federal guidelines. Thus, at various times in the unfolding of the Kentucky regulatory debate, opposing sides have found federal actions sometimes supportive and sometimes damaging to their initiatives. In the United States, “glocalization” responses to CAFO development are established within a complex matrix of federal-state-local regulatory actions and prerogatives that complicates regulatory politics and administrative rule-making.

Such “glocalization” responses will determine, in part, the future character of rural places in the United States and elsewhere (see Egan 2002). Competing developmental visions now vie for political support in many rural localities. At one extreme is the position of
the agriculture industry in the United States. According to this view, successful agricultural development strategies (which should remain a cornerstone of comprehensive rural development programs) must follow the CAFO track—that is, investment in high technology, capital intensive agricultural commodity production systems that can compete in deregulated global markets (Beghin and Metcalf 2000; Rhodes 1995; Smith 2001). At the other extreme are advocates of revitalization of rural places through emphasis on the preservation and/or enhancement of social amenities (clean air, pastoral landscape, specialty product identity, gemeinschaft social relations) that many citizens of advanced industrial societies now associate with the countryside (Marsden 1999). In rural areas where animal agriculture remains important in economic and/or sociocultural terms, the kind of regulatory responses described in the Kentucky case study will be important factors in determining where rural places are located on this development continuum.

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