

Food and Agriculture on the Sidelines: A Theoretical Analysis of the Forgotten Element in U.S. Climate Change Policy

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In the United States, climate change policy remains at the stage of discussion and debate with policymakers focusing overwhelmingly on carbon dioxide emissions from energy production and consumption. All but ignored is another important sector: agriculture. In total, America's food and farm system contributes one-third of the nation's overall greenhouse gas emissions. Given this fact, this paper uses John Kingdon's multiple streams framework to explain the omission of agriculture from the climate change debate.

INTRODUCTION

In December 2008, 187 nations met in Poznan, Poland, to discuss a possible new treaty on climate change. The issue that presented the most significant barrier to progress was not energy, but rather agriculture: “It’s an area that’s been largely overlooked,” said Rajendra Pachauri, head of the renowned Intergovernmental Panel on Climate Change told the *New York Times*¹. Indeed, agriculture as a contributor to climate change is scarcely a footnote in proposed U.S. climate policy. Yet, the American food and farm system accounts for *one-third* of the United States’ GHG output when including transportation (Barker 2007, 4). Given this statistic—as well as the call to reduce emissions by as much as 85 percent—it seems that proposed U.S. climate policies are disproportionately focused on energy and transportation.

This paper, then, seeks to ask: why is agriculture not an element of U.S. climate change policy? We use John Kingdon’s multiple streams framework to answer this question, specifically identifying and examining the factors *preventing* his noted problem, politics, and policy streams from converging. We find that the problem stream is characterized by a lack of a causal connection between climate change and agriculture. In the politics stream, the agriculture subsystem continues to be ruled by an iron triangle of pro-agriculture members of Congress, bureaucrats, and powerful interest groups – like grain giant Cargill – which collectively hold a “jurisdictional monopoly” on policy outputs. And finally, the policy stream is limited to mild instrument tinkering because the closed agricultural subsystem promotes the status quo – public and financial support for traditional farmers and agribusiness. All of the above factors facilitate a continued division between agricultural activities and climate change policies.

In contrast, the energy subsystem provides a starkly different policy story. Energy has been linked to climate change via a clear, causal story, which has opened the policy subsystem and allowed for significant policy shifts.

To see a similar outcome in agriculture, the three streams need to converge in order to open a policy window. At the moment, agriculture’s actor network is tightly bound, agricultural practices are path dependent, and few practical options exist because of limited technology and a small number of tools. In such a context, policy overhaul is unlikely. While history has proven that change is not impossible, early signs from the Obama administration indicate that we can expect more of the same in the future.

BACKGROUND

This paper uses a theoretical lens to explore why agriculture remains a critical yet ignored issue in U.S. climate change discussions. Based on our research, this appears to be a largely, if not entirely, unexplored topic. There is ample scientific research to support the connection between agriculture and climate change. The U.S. Environmental Protection Agency (EPA), which compiles an annual inventory of

¹ See the New York Times’ “As More Eat Meat, a Bid to Cut Emissions.” 3 December 2008. <http://www.nytimes.com/2008/12/04/science/earth/04meat.html?>

greenhouse gas emissions², notes the contribution of agriculture to climate change, and proposes ways for agriculture to be rolled into climate policy. On an international scale, the Intergovernmental Panel on Climate Change (IPCC) – which is the global leader in compiling scientific research on climate change – devotes sections of its reports to agriculture’s contribution to climate change.³

Despite this proven scientific link, the majority of literature that addresses agriculture and climate change pertains to ways in which agriculture will be affected by, and can adapt to, climate change. Almost half of the IPCC’s report pertains to the impact of and adaptation to climate change, detailing in particular how agriculture around the world will be affected by it⁴.

The existing literature does not, however, explore why agriculture is so removed from climate change policy discussions when it has such a clear, scientific link. In this paper we venture into a new area by dissecting the policy environment that has prevented agriculture from being a serious part of the U.S. climate change discussions. This topic cannot be overlooked, as it is the political obstacles and not necessarily the lack of available policy ideas that prevent policy change from occurring.

Greenhouse Gases and Climate Change

According to the U.S. Environmental Protection Agency, “climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer)” (EPA 2006). While climate change can occur naturally, the world is currently focused on climate change due to human activities, specifically increases in greenhouse gases (GHGs). GHGs include water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases. While all these gases occur naturally, all but water vapor are anthropogenic as well. Increases in concentrations of GHGs are problematic because they trap heat inside the troposphere, thereby increasing Earth’s average surface temperature. Earth’s average temperature has increased 1.4°F in the last 100 years and climate models predict additional temperature increases of at least 2 °F, with the possibility of increases as high as 11°F over the next century (National Academy of Sciences 2008). As GHG emissions increase, the likelihood of dramatic effects on Earth also increases. The most likely outcomes are increasing severity and frequency of storms and droughts, and rising sea levels, which would displace millions of people around the world (Intergovernmental Panel on Climate Change 2007).

The Case for Agriculture

The Intergovernmental Panel on Climate Change (IPCC), comprised of the world’s foremost climate experts, has stated that GHG emissions must be cut by 50 to 85 percent by 2050 to stabilize temperature increases at 3.6 degrees (IPCC 2007). To date, the United States’ efforts to reduce GHGs have focused almost exclusively on energy. This approach makes sense, as production and consumption of fossil fuels is the leading source of carbon dioxide, which accounts for nearly 85 percent of all GHG emissions (EPA 2006). However, carbon dioxide is not the only GHG. James Hansen, one of the leading climate scientists in the world, argues that carbon dioxide is not the issue (Hansen et. al 2000). Rather, contributions of non-carbon dioxide GHGs are more important to the perpetuation of climate change because these other gases are more highly concentrated—meaning, a ton of methane is more damaging to the climate than a ton of carbon dioxide. Non-carbon dioxide GHGs account for the remaining 15 percent of emissions, which is not an insignificant percentage when considering the IPCC’s emission reduction recommendation.

Agricultural activities (including meat production) greatly contribute to emissions of two other GHGs—nitrous oxide and methane. Farming practices like fertilizer application and soil tilling account for 76 percent of all domestic nitrous oxide emissions, while meat and dairy production account for 31 percent of all methane emissions (EPA 2006). In total, agriculture contributes 7.4 percent of total domestic GHGs (EPA 2006). And when including transportation of food products, factory and farm machine energy requirements, as well as the energy requirements along the food supply chain, the American food industry accounts for *one-third* of the United States’ GHG output (Barker 2007).

Up until 2007⁵, the United States was the world’s premier emitter of greenhouse gases (GHGs) (Environmental Protection Agency 2006). Due to the nation’s high level of emissions and growing scientific concern about the consequences of climate change, the issue continues

² In February 2009, the EPA released a draft version of its 2009 Inventory of U.S. Greenhouse Gas Emissions and Sinks (1990-2007). Find the draft at: <http://epa.gov/climatechange/emissions/downloads09/07Inventory.pdf>

³ See IPCC’s Climate Change 2007 Synthesis Report (Fourth) pages: 36-7
http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf

⁴ Ibid. pages: 50 -60.

to rise on the national agenda and gain the attention of policymakers, interest groups, and the general public. Yet the United States has not ratified an international agreement on climate change, or adopted a formal national policy addressing mitigation or adaptation.

The Climate Security Act⁶, by far the largest attempt by U.S. policymakers to enact sweeping climate change legislation, focuses on creating a cap-and-trade system that aims to reduce the levels of carbon dioxide emitted into the atmosphere. As of the last draft of the legislation, which to date has not yet moved past the Senate, the Act does not include any mention of agricultural emissions. In fact, agriculture is mentioned only in the legislation as a way for the targeted industries to *offset* their own emissions—meaning that industry’s emissions of carbon dioxide will merely be replaced by the emissions resulting from agricultural practices.

Considering agriculture’s contributions to GHGs, and the need to cut back overall emissions by 50 to 85 percent, the United States’ approach to climate change appears disproportionately focused on energy.

THEORY: MULTIPLE STREAMS FRAMEWORK

This paper uses John Kingdon’s multiple streams framework to analyze why agriculture is not included in U.S. climate change debates or policy development (Kingdon 2003). Kingdon’s framework defines the policy process as the relationship, or lack thereof, among three metaphorical “streams”—a problem stream in which issue framing and agenda setting occur; a politics stream in which actors battle for power, resources, and influence; and a policy stream in which the nature and type of policies are negotiated among subsystems, interest groups, and other policy actors.

These streams normally operate on different paths. Occasionally, however, the streams converge, presenting a limited “window of opportunity” that, if harnessed, can spur significant policy change. More specifically, the window is opened when a policy problem finds a solution and the political climate is supportive of change. Window openings, Kingdon notes, can be predictable. For example, program renewal and sunset provisions offer scheduled opportunities to reopen debates on policy solutions for given problems. But policy windows can also open unpredictably. Elections resulting in party turnover give new actors the opportunity to push their favored policies or major events such as plane crashes, oil crises, political scandals bring new problems to the forefront, while pushing other problems to the background.

Yet policy windows, while necessary for change, do not guarantee it. In his research, Kingdon (2003) discovered the importance of policy entrepreneurs to policy change. These actors, who can come from many different areas including politics, the media, and academia, are advocates of particular ideas or solutions. They can work behind the scenes for years by “softening” a policy idea on politicians. In addition, when a major event occurs to illuminate a particular problem, an entrepreneur can use available resources, political connections, celebrity, or access to the public to introduce a favored policy solution. No matter how the window opens, entrepreneurs are persistent and skillful, and ready to usher in their idea whenever a window of opportunity arises.

This analysis attempts to explain why agriculture is not included in climate change policy. To this end, we use Kingdon’s framework to identify and examine the factors *preventing* streams from converging. Through the problem stream we examine the factors contributing to agriculture *not* being framed as a problem for climate change. In our analysis of the politics stream, we narrow the discussion to the organized political forces that dominate the agriculture policy subsystem and how they effectively prevent new ideas and new voices from emerging. In the policy stream, we examine the types of policies that result in a closed system. Finally, in our conclusion, we project what could drive or trigger a convergence of the streams, and what or who could come about to harness the open policy window

Alone, analysis of the streams and the agricultural subsystem may be hard to understand, as the focus of this paper is on non-action, that is, the factors preventing the streams from coming together. To aid in understanding, we draw on examples from the energy subsystem, where we do see policy movement on climate change. By comparing the two subsystems we will be able to clearly identify elements that allowed the energy streams to come together while preventing the same outcome in agriculture.

PROBLEM STREAM

As the name indicates, the problem stream is concerned with the identification of policy problems. Issues enter the government’s agenda once problems are determined and policymakers decide to address them. Problem definition, however, is not science, but art. The way a

⁵ China took the lead in GHG emissions in 2007. For more information, see the New York Times’ “China Increases Lead as Biggest Carbon Dioxide Emitter.” <http://www.nytimes.com/2008/06/14/world/asia/14china.html?scp=3&sq=china%20lead%20carbon&st=cse>

⁶ For more on the Climate Security Act: <http://thomas.loc.gov/cgi-bin/query/z?c110:S.2191>:

problem is defined determines the policies, the resources, and the people used to address it. Defining problems in certain ways furthers certain agendas. Alternatively, keeping issues undefined as problems is just as likely to further agendas. Knowing this, policy actors, from legislators to interest groups and bureaucrats, engage in competitive “framing” to define problems in the terms they favor.

At its most basic, framing is used to tell stories. In the problem stream, frames spotlight particular causes of problems. They often carry with them what Deborah Stone calls a “causal story”—a clear “x leads to y” relationship (Stone 1989). While creating a causal story is an important component of winning the framing game, not all causal stories result in issues getting on the government agenda. A single issue can have multiple frames and causal stories, with dominant frames overshadowing less familiar and less popular frames.

Climate change has been successfully framed as a carbon dioxide problem. The perpetuation of this causal story has resulted in policies that address energy consumption. While carbon is a significant contributor to climate change, other GHGs, as well as other sectors and industries, play a role. These other contributors have their own causal stories, yet they have been all but erased by the dominant energy frame.

We identify two primary reasons why agriculture has not been framed as a contributing factor to climate change⁷. First, agriculture has yet to see a focusing event or something that will clearly and immediately connect it to climate change. In contrast, energy has had several focusing events. Al Gore’s *An Inconvenient Truth* – which addresses climate change as a whole – focuses on a single greenhouse gas, specifically carbon dioxide from the combustion of fossil fuels. Additionally, carbon seems to be the only GHG capturing the public’s attention as we see a multitude of news stories, political interest and business opportunities cropping up that address carbon emissions, carbon footprints, and carbon offsets. Even gas price spikes and drops over the last year, while not directly related to climate change, reveal the United States’ dependence on oil and fossil fuels, which feeds into the current causal story that climate change is exclusively an energy problem.

The second element preventing agriculture from being connected to climate change is that the relationship between the two is technical and complex. As a result, agriculture’s causal story is complicated, making it harder to explain and understand. The major gases released from agricultural activities, methane and nitrous oxide, are rarely mentioned in climate change discussions. This is in part because they are not visible gases, in the literal or metaphorical sense. You cannot see nitrous oxide released when soil is tilled, nor can you see methane released from a pile of manure. Similarly, these emissions are hard to trace, unlike the exhaust from a vehicle. Consumers do not understand how agricultural activities relate to climate change because the connection occurs so far back in the supply chain. Across the country, food is most often bought from the store, not the farm, where agricultural emissions occur.

In contrast, energy’s contributions to climate change are photogenic in that you can literally see the connection in power plants’ smoke stacks. Additionally, products that draw on fossil fuels make it easier to pinpoint the problem as it relates to climate change. Carbon dioxide emissions can be traced directly from cars, trucks, airplanes, homes, or industry back to the original source: oil companies and electric power plants. Energy and agriculture also differ in the elasticity of their products. Consumers are blatantly aware of the inelasticity of fossil fuels because a lack of alternatives forces people to continue to pump gas and pay their electricity bills. This was the case even in the summer of 2008 when gas prices surpassed \$4 per gallon. Like emissions, energy price increases can be easily traced to the source. As a result, the energy-climate causal story has become even stronger with the addition of a financial element.

In contrast, agriculture’s major product, food, is considered fairly elastic. In April 2008, the world confronted a global food crisis. American consumers, however, were not especially affected. When food prices go up, consumers generally switch to other stores or products. Even if the United States were to be hit with major food price spikes, consumers would not know where to pin the responsibility. They would have to trace the spikes back through the supply chain from the store to the manufacturer to the processor and finally back to the farm. The especially removed nature of food’s origin from consumers’ plates prevents costs from becoming part of the agriculture-climate causal story.

For the reasons noted above, we have seen no focusing event in agriculture. But it is possible that we are seeing a “silent tsunami” of many disaggregated events that, individually, are quite small, but together are significant. In policy, we regularly see problems with focusing events take greater precedent over equally important issues without them. For example, a plane crash is a clear focusing event. Yet despite

⁷ It should be noted that other countries are beginning to grapple with the question of agricultural emissions. See the New York Times’ “As More Eat Meat, a Bid to Cut Emissions.” 3 December 2008. <http://www.nytimes.com/2008/12/04/science/earth/04meat.html?em>

being far less frequent and killing far fewer people annually than car crashes, the plane crash will “win” the framing debate and become a policy focus. This is exactly what is happening with energy and agriculture.

Agriculture may well be building to a silent tsunami as recent stories connecting agriculture to climate change have become more frequent in the media over the past few months.⁸ Yet agriculture’s contributions to climate change remain overshadowed – stories about this causal claim are outnumbered by those connecting energy to climate change. By and large, policy problems are portrayed through their dominant frames. This is largely because stories on complicated topics like agriculture require nuanced reporting. While not absent from the media, stories with complex narratives are not nearly as common as stories with clearly identifiable problems. The lack of competing frames in the press prevents shifts in the larger public policy debate. It can be argued, then, that the media actually helps make dominant frames more dominant, thereby driving the politics underlying the policy stream.

Determining what takes place in the problem stream is not as simple as the exercise performed above. Identifying the dominant and subordinate frames is helpful, but the analysis is incomplete without looking at the motivations of the actors promoting the frames. As Michael Howlett and M. Ramesh note, successful framing and subsequent agenda setting “is related more to the abilities and resources of competing actors than to the elegance or purity of the ideas they hold” (Howlett and Ramesh 2003, 21). To explore this idea further, we turn our analysis to the political forces within the politics stream that play a significant role in preventing agriculture from being aligned with climate change.

POLITICS STREAM

The politics stream is concerned with organized political forces and their influence on policy decisions. In agriculture, we identify two opposing but unequal organized political forces. The first is an iron triangle or “policy network.” The second organized force is a larger policy community that operates around the periphery of the network. This policy community includes less powerful and more loosely connected actors. Through an examination of the power, resources, and relationships of these political forces, this section explains how the politics stream is prevented from aligning with the problem and policy streams.

The Policy Network: Agriculture’s Iron Triangle

The agriculture subsystem is one of the most powerful policy networks in Washington D.C. Comprised of agriculture-related Congressional committees, interest groups, and government bureaucracy, this nearly impenetrable network’s “ironclad control over many aspects of the policy process” earns it the label “iron triangle” (Howlett and Ramesh 2003, 148).

Iron triangles often work towards ends that “ensure that their own self-interests prevail over those of the general public” (Howlett and Ramesh 2003, 148). This is surely true of the agriculture network, which benefits greatly from current agricultural policies. For example, legislators receive job security for their pro-farm voters, while interest groups give campaign contributions and in return receive financial gains in the form of product profits, government grants and research contracts, and business subsidies.

Connecting climate change to agriculture would surely disrupt the status quo, as meaningful emission reductions would require scaling back or dramatically changing modern farming and feed lot practices. Each side of the triangle has its own power and influence that can be harnessed to prevent changes in the status quo. These powers will be examined in the following paragraphs.

Congresspeople representing agricultural areas are not just serving farmers, but agribusiness as well. The most obvious form of representation is through voting on bills and amendments. But this is arguably a Congressperson’s least powerful activity. It is on committees that members really exert influence. Congresspeople seek committee assignments that reflect or serve their own interests, often resulting in issue bias.

The fact that committee self-selection tends to result in bias is not usually of great concern. Semi-regular party turnover via elections reverses committee power, as majorities become minorities. Such switches also tend to reverse dominant constituencies, as Republicans and Democrats often serve opposing interest groups in the same subsystem. For example, in the energy subsystem, Republicans tend to align with large oil interests. In 2008, Republicans received \$27 million in campaign contributions from the oil and gas industry (Opensecrets.org 2009). In contrast, Democrats, who are more connected to alternative energy interest groups, received only \$7.8 million

⁸ For related articles, see: the New York Times’ “As More Eat Meat, a Bid to Cut Emissions.” 3 December 2008; the New York Times’ “From Hoof to Dinner Table, A New Bid to Cut Emissions.” 4 December 2008; the New York Times’ “Obama’s Secretary of Food.” 11 December 2008.

from the oil and gas industry (Opensecrets.org). This party breakdown, however, does not hold true for agriculture. Congresspeople from agricultural states represent agriculture interests regardless of their party affiliation.

Prior to the 2006 Congressional elections, Republicans held majorities in both chambers, and GOP members from agricultural states chaired the agriculture-related committees. In the current Congress, Democrats now hold slim majorities in both chambers, and the agriculture-related committees are still chaired by members (although now Democrats) from agricultural states. The Senate Agriculture, Nutrition, and Forestry Committee is chaired by Tom Harkin of Iowa, the nation's leading agricultural state for corn and soybeans, as well as other grains, oilseeds, dry beans, and dry peas (U.S. Department of Agriculture 2007a). In the House, the Committee on Agriculture is chaired by Collin Peterson of Minnesota, the nation's third largest grain producer and leading livestock state (U.S. Department of Agriculture 2007b). Minnesota is also home to Cargill, the country's largest grain company.

Consistent committee bias towards one interest group leads to what Jones, Baumgartner, and Talbert call "jurisdictional monopoly" (1993). The resulting control over a particular issue is facilitated by the committee role as gatekeeper; by controlling the flow and type of information, they hold great power to determine what does and does not reach the larger chamber. Committees can "formulate propositions that can garner support in the general assembly and reject proposals that the majority might support but that are not in the interests of the constituencies of the members of the committee" (Jones, Baumgartner and Talbert 1993, 659).

A jurisdictional monopoly certainly exists in agricultural policy. Each chamber of Congress has only one committee devoted to agriculture, which effectively prevents a diversity of ideas. These individual committees are responsible for farm policy. They promote and negotiate the specifics of the omnibus farm bills, as well as the one-off agriculture policies that crop up in years between farm bill renewals.

While committees have power as gatekeepers, they are not experts in the subjects they address. Committees heavily rely on background information provided by bureaucrats and special interests. This reliance reinforces the relationships in the iron triangle, as each side needs something from the other. As Jones et al. note, "When an agriculture committee has hearings on pesticides, its members are three times more likely to listen to testimony from representatives from the pesticide industry or from others likely to have a favorable view of pesticides than from health or environmental representatives" (1993, 663).

In most circumstances, bureaucrats provide policy ideas and research, and serve as program implementers, while interest groups provide their own ideas, as well as money. But making this distinction in the agriculture network is fairly futile, as the groups are one and the same. Thomas Bernauer and Erika Meins note in their study of U.S. agricultural biotechnology regulation that there is a widely recognized "revolving door" among this policy subsystem's bureaucracy and interest groups: "[E]mployees move back and forth between the Food and Drug Administration, the Environmental Protection Agency, and biotechnology companies" (2003, 668). For example, prior to becoming EPA's second in command, Linda Fisher was a chief lobbyist for Monsanto, the nation's largest agricultural biotechnology company. After her resignation from the EPA in 2003, she became the vice president of sustainability at DuPont, another major agri-biotech firm. Such transitions are not exclusive to biotechnology. They are also characteristic of the larger agriculture subsystem. For example, former U.S. Department of Agriculture Secretary John Block, who served this post under President Reagan in the 1980s, went on to become an executive at John Deere, one of the nation's largest agricultural equipment manufacturers.

While the line between bureaucrats and interest groups is blurred, it is important to note the individual power held by agriculture's special interest groups. The agriculture lobby is made up of a vast network of organizations and associations, including, but not limited to, the American Farm Bureau Federation, the National Corn Growers Association, the American Corn Growers Association, Grocery Manufacturers of America, and the National Food Processors Association. These groups exert their influence through campaign contributions. Peterson and Harkin, the two chairs of Congress' agriculture committees, are respectively the first and third largest individual recipients of contributions from agribusiness political action committees (Center for Responsive Politics 2008). In 2006 alone agribusiness donated a total of \$44.8 million to Congress (Riedl 2002).

Agribusiness is compensated for its generosity through legislative support for farming. For example, the 2002 farm bill allocated \$191 billion in agricultural subsidies over 10 years (Riedl 2002). These sorts of policies continue to promote agribusiness' influence, as they generate enormous profits that build sector monopolies. Market shares among the major agriculture sectors continue to grow. In the seed business, Monsanto controls nearly 90 percent of the cotton and GM soy markets in the United States, and nearly 100 percent for varieties of pest-resistant corn (Hayenga and Kalaitzandonakes 1999). The nation's top four meatpacking companies control 85 percent (MacDonald and Hayenga 2002) of the market, while the top four grain companies control roughly 75 percent of the grain market (up

from roughly 40 percent in 1977) (MacDonald and Hayenga 2002). One of these grain companies is Cargill, whose business philosophy is to not shy away from their own power and influence. In a 2001 campaign brochure, the company touted:

“We are the flour in your bread, the wheat in your noodles, the salt on your fries. We are the corn in your tortillas, the chocolate in your dessert, the sweetener in eat for dinner. We are the cotton in your clothing, the backing on your carpet and the fertilizer in your field”
(Murphy 2006, 9).

Like agriculture, energy has historically been considered an iron triangle. And like agribusiness, the oil industry remains a powerful lobby with tremendous influence. But in recent years, the energy subsystem has become much more open, and expanded to include a large numbers of “players.” The subsystem’s expansion can be seen in the growing number of Congressional committees dedicated to energy’s negative influence on climate and the environment. In the House alone, there is the House Committee on Energy and Commerce and their Subcommittee on Environment and Hazardous Materials, the House Select Committee on Energy Independence and Global Warming, the House Committee on Science and Technology and their Subcommittee on Energy and Environment, to name only a few.

This committee expansion has had a powerful impact on the energy iron triangle. The growth of an issue in Congress, as Jones et al. note, allows more actors to enter the debate: as an “issue rises on the agendas of other congressional bodies, it is likely to bring an end to the dominant policy bias. New committees will consider different, and often less flattering, aspects of the issue, and the policy bias of the legislation may change dramatically” (1993, 663).

The energy subsystem has been severely impacted by the rising prominence of environmentalists, who continue to gain power. In agriculture, however, we only see the beginnings of a countervailing force—and they have yet to gain widespread support.

Policy Community

The politics stream’s second organized political force is a loosely connected group of actors who occupy a metaphorical “outer layer” of the policy universe. We refer to this group as a policy community. It is comprised of environmental groups, organic farmers, and what we call “cult heroes”—actors whose work and activities may give rise to broad social change. This group of actors is connected by their interest in changing the agricultural status quo and promoting more environmental-minded practices. Yet they have little political clout, largely because they have little, if any, access into the iron triangle.

Established environmental groups like the Nature Conservancy, World Wildlife Fund, and the Natural Resources Defense Council (NRDC) have recently taken note of industrial agriculture’s impact on the environment. These groups fund initiatives aimed at altering agriculture’s impact on water resources and reversing farm policies that negatively impacts biodiversity. Projects aimed at agriculture and climate change are few and far between, but there are signs that some of these groups are looking more seriously at the connection. For instance, NRDC has been making the news recently for its research on climate change driven by the American food supply.⁹ While such research is salient in the wake of spiking food prices, it accounts for only a fraction of the work performed by these environmental groups. As a result, there is no real organized effort to push for new climate change policies aimed at agriculture.

Organic farmers are part of the loose policy community that stands in opposition to the status quo. They are very interested in changing the current agriculture benefit structure, as subsidies overwhelming accrue to agribusiness and traditional farmers rather than organic farmers. Additionally, organic farmers use no artificial inputs, meaning that they are not bound by the same path dependence as industrial farmers. While organic farmers across the country support the same goals, they are disaggregated. There is no major lobby group or association working on behalf of organic farm interests. As a result, they have limited voice and authority in the policy community.

Environmental cult heroes are the final group we identify in the policy community. This group is using their skills and talents to illuminate agriculture’s contribution to climate change. Journalist Michael Pollan’s 2006 book *The Omnivore’s Dilemma*, a chronicle of food’s journey to the dinner table, was on the *New York Times* bestseller list for over a year, launched a follow-up book (which also earned a place on the NYT bestseller list), and spawned a cottage industry of related books, magazine articles, and community groups interested in promoting a better understanding of the American food chain. Similarly, Alice Waters, head chef of Berkeley, California’s Chez Panisse restaurant, is considered the founder of so-called California cuisine, a movement aimed at buying local, organic, and seasonal ingredients. Waters has

⁹ For more information about NRDC’s research, see NPR’s story, “Food Footprint: Minimizing GHGs,” available online at: <http://www.npr.org/templates/story/story.php?storyId=89808292>

also started a foundation that supports student-run farms and fresh food cafeterias in Northern California's Berkeley school district.¹⁰ These two figures, while not the only cult heroes, are single-handedly bringing awareness to agriculture and environment. Like the environmental organizations, though, their efforts only peripherally address agriculture's contributions to GHGs.

Currently, the policy community is loosely connected. Organic farmers sell products into local restaurants around the country. People who buy organic food read Michael Pollan's books. But none of these groups are actively working together to change policy. Pollan, for instance, is not working with any environmental groups. As a result, the policy community is a relatively weak force in comparison to the iron triangle. They are generating media awareness, but not much else. And more importantly, this group has no point of access into the iron triangle.

POLICY STREAM

The tightly bound iron triangle of actors identified in the politics stream highlights the closed nature of the agriculture subsystem and the lack of new ideas that can enter the policy debate. Howlett and Ramesh characterize policy subsystems in a number of ways, one being the extent to which new ideas or actors are present, and the resulting effect on policy change. Old ideas are certainly an issue in the agriculture subsystem, not only because of the old actors, but also because agriculture policies in general are path dependent and engrained in our history as a nation.

A closed subsystem does not facilitate major policy overhauls or changes in goals. Rather, "instrument tinkering," or changes to instrument components, is the only change likely to occur. These sorts of marginal adjustments to existing policy are exactly what we see resulting from the agriculture subsystem. The proposed solutions are highly technical, and do not involve any steps to change current agriculture practices. For example, the commonly discussed way of reducing methane emissions is through "methane capture." This process is both costly and dangerous—as turning methane into a usable source of energy is a multi-step process involving a highly combustible gas. Interestingly, the other agriculture policies addressing climate change are concerned with *adaptation* not mitigation; for example, there are subsidies directed toward the research and use of drought and heat resistant seeds. These types of solutions are more like band-aids to the problem, and do not constitute real change.

Policy Path Dependency

Overhauling the American agriculture system would require a much more open and accessible subsystem. Yet even in an environment open to large policy changes, comprehensive policies aimed at mitigating the impacts of climate change might be unlikely given the path dependency of current agriculture practices.

The U.S. food system is dependent on intensive agriculture practices that began decades ago, and that have progressed in several stages. First, non-agricultural lands (forests, wetlands, marginal areas, etc.) were converted to crops. Once the available land for cultivation was maximized, farmers were forced to find a way to increase yields on the land they had. This was the position in which U.S. farmers found themselves in the 1960s and 1970s, when domestic food needs were on the rise and when the Green Revolution forced the United States to compete with agricultural powerhouses like India.

In order to produce more on less land, U.S. farmers have turned to vast amounts of artificial inputs such as synthetic fertilizers and pesticides (Matson et al. 1997). Not only are these synthetic inputs derived from petroleum and produced in fossil-fuel burning factories, but their use increases the concentration of carbon and nitrogen in the soil. As soil is tilled, these compounds are released as GHGs into the atmosphere. In contrast, organic farms do not employ synthetic inputs or require excessive tilling.

Changes in taste are also a contributing factor to agriculture-based emissions. Economic growth brings with it changes in dietary tastes, particularly meat and more "exotic" or out-of-season foods that the consumer wants regardless of the distance it must travel (Economic Research Service 2001). The meat industry is the leading contributor of methane. The growing demand for more meat resulted in the creation of feedlots and the movement away from pasture-produced cattle. Increases in methane output are attributed to changing cattle diets, primarily due to the transition from grass to grain-based feed (Johnson and Johnson 1995).

As the world population grows, more food will be needed. And as economies develop, more tastes will change. As a result, intensive agriculture practices are likely to be necessary to serve ever-growing demand. The dependency on these practices serves as a barrier to other

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For more information, see the Chez Panisse Foundation's School Lunch Initiative: <http://www.schoollunchinitiative.org/index.shtml>

options. As previously stated, “ control measures would force a major overhaul of farming practices, something that probably has not happened since the introduction of powered farming tools. With that in mind, there are few policies that could easily be implemented that would seriously reduce emissions from agriculture without altering the now engrained expectations of suppliers and consumers.

Opening the Subsystem, Widening the Policy Possibilities

Another way to analyze the policy stream is through James Thurber’s classification of macro and micro subsystems. The agriculture subsystem falls under the latter class, in which decision making is an almost entirely opaque process determined by select few participants (Thurber 1996). This classification explains the disparity that exists between energy policies and agriculture policies in terms of climate change. Using Thurber’s taxonomy, energy has made its way into the macro subsystem, which has fostered the major changes that have occurred to mitigate climate change.

There is growing support for redirecting oil and gas subsidies to alternative energy production. The energy subsystem’s policies have not looked solely at financial tools. It has also welcomed innovative physical tools. Development of fairly simple technologies has made pollutant and GHG mitigation more feasible. For example, catalytic converters were developed and then installed in every vehicle. While everyone had to adopt this policy, it did not require great behavioral adjustment since the change happened on the assembly line. CFLs (compact fluorescent light bulbs) are another recent technological development. These bulbs are considerably more efficient than standard filament bulbs. Again, large behavioral change is not required, as all consumers need to do to switch out their old bulbs.

If the agriculture subsystem were to become more open to new ideas, we might see a policy shift akin to the one in energy. There might be a shift in support from traditional, intensive, high-yield farming practices to alternative types of farming and food supply such as smaller farms, more organic products, or more localized suppliers. There are numerous supply-and demand-side policies that could be tried to achieve GHG reductions from agriculture. In other sectors, cap and trade systems have had widespread support and success because of their free-market principles. Developing a cap and trade system for agricultural emissions could be a feasible solution in the near future, particularly in the area of agricultural inputs. Additionally, regulations such as limiting the use of grain to feed cattle could also be developed as an alternative supply-side solution.

On the demand side, a variety of taxes could be instigated to curb behavior that supports GHG emissions in farming. Consumption taxes either on grain-fed beef, inorganic products, heavily fertilized food, or even out-of-season goods could decrease consumer demand for these products.

Creative policy options exist for reducing agriculture’s emissions from climate change. But the availability of policy ideas is not the only determinant of change. As we have learned from previous sections, policy movement also requires supportive conditions in the politics and policy streams.

CONCLUSION

Facilitating policy change in the agriculture subsystem is a difficult task. Given current conditions, the three streams have few, if any, opportunities to converge and form a policy window. The problem stream has yet to even define agriculture emissions as a problem for climate change; the politics stream is driven by a powerful iron triangle that is showing no sign of relegating its power; and this subsystem’s monopoly supports limited policy development in the policy stream.

The energy subsystem provides a starkly different policy story, facilitating change through the creation of clear causal stories, the opening of the policy subsystem, and simple but effective solutions. Using lessons from this subsystem, as well as examples from the energy subsystem and other parts of the world, we identify factors in agriculture policy that could eventually facilitate change.

First, climate change needs to be reframed as an agriculture issue. The new causal story, unlike the current story, must be clear and stated simply for there to be any hope of agenda setting or comprehensive media coverage. However, the successful promotion of a new causal story is almost entirely contingent on a focusing event. Predicting these events is a guessing game. Even when an issue looks promising, it often turns out not to be. For instance, the World Trade Organization (WTO) recently ruled in favor of the United States over the European Union (EU) on hormone-injected beef¹¹. This was not the expected outcome, since the general consensus was that the EU made

¹¹ See the International Herald Tribune’s “WTO backs US, Canada in beef dispute with EU, but both sides claim victory.” 31 March 2008. <http://www.ihf.com/articles/ap/2008/03/31/business/EU-FIN-ECO-WTO-Beef-Hormones.php>

its case that hormone-injected beef can harm human health. If the WTO case had come down in the EU's favor, we might have expected some of these issues to resonate in the U.S. meat market. Since it did not, however, the streams will continue to be separate until a potent enough focusing event comes along to capture the public and policymakers' attention.

An effective focusing event needs to be significant and powerful enough to blow open the subsystem. Such an event would likely have multiple points of impact—it would create ripples in people's daily lives, affect farmers, and hurt agribusiness' bottom line. We believe that all three of these parties need to be hit for a focusing event to take hold.

Looking to other countries, we see many potential examples of agriculture-related focusing events: the Spring 2008 global food crisis, which resulted in shortage woes like Vietnam's "rice fever"¹², the food price spikes that led to protests a la Mexico's Tortilla Revolution¹³, and environmental and health tipping points like those in India, which have triggered rapid policy change in favor of more sustainable agriculture.¹⁴ Domestically, there may be potential focusing events on the horizon. For example, increased production of corn ethanol may lead to debates about the tradeoffs between energy and food, as more of the nation's cropland is used to harvest fuel rather than grains and vegetables.

The dynamics of the politics stream will remain the same until something occurs to open and widen the actor network. Jurisdictional monopolies are not permanent structures; they can dissolve or explode. Jones et al. note that certain issues can gain momentum when other, rival Congressional committees take note of an issue (1993). For climate change policy to address agricultural causes, new committees may need to be created. Alternatively, current committees on agriculture would need to open to new members with more environmentally-friendly agendas. Change could have occurred in April 2008 when the 2007 Farm Bill was reauthorized in the Senate. At the time, many, including the Bush administration, were calling for reform and an end to the status quo agriculture policy (Hitt 2008). These voices of opposition failed to become levers of change for opening the subsystem and widening the current government-agriculture interaction. Instead, the Farm Bill passed with all the provisions for agribusiness and traditional farming in tact.

Our evaluation of the policy stream reveals that policies aimed at curbing agriculture emissions are only possible in a more open system. Without new actors in the politics stream, the status quo will remain, thereby limiting new policy options. By breaching the cycle, the ball can begin to roll in a direction of curbing the agriculture GHGs. The confirmation of Tom Vilsack as Secretary of Agriculture under President Obama is a recent example of a failure to bring new actors into the agriculture arena. While Vilsack has made public his support for combating climate change and promoting alternative energies, critics were quick to note that the former governor of Iowa has a long history with the agriculture industrial complex: he is pro-ethanol, pro-subsidy, pro-industrial farming, and pro-genetically engineered crops¹⁵. Given these positions, Vilsack is unlikely to become the agent of change who can open the iron-clad agriculture policy triangle.

If the three streams were to converge, most likely due to a food crisis or other focusing event, Kingdon (2003) points out that without an entrepreneur to "cash in" on the opportunity, policy shifts are highly unlikely. Al Gore provides a great example of an entrepreneur. Through exposition and education, Gore informed the public about his pet project, energy and its link to climate change. He used the vehicle of film with *An Inconvenient Truth* to generate support and mobilize people around the world to lobby for his cause. Climate change was an acknowledged issue long before the film, but Gore was able to use his widespread name recognition as a means of promoting a message. In a strange turn of fate, his loss in the 2000 presidential election allowed him to take full advantage of the climate change policy window.

With all of these factors in mind, from streams converging and windows opening, to the need for policy entrepreneurs, it is difficult to imagine change in the current approach to climate policy with respect to agriculture. At the moment, agriculture's actor network is so

¹² For more information on Southeast Asia's rice prices, see The Wall Street Journal's "Soaring rice prices send Asian nations scrambling." Available online: http://online.wsj.com/article/SB120939690263149749.html?mod=todays_us_page_one

¹³ For more information on Mexico's Tortilla Revolution, see The Economist's "Tariffs and tortillas." Available online: http://www.economist.co.uk/displayStory.cfm?story_id=10566845

¹⁴ For more information on India's environmental and health crises, see The Economist's "Chemical generation: Punjabis are poisoning themselves." Available online: http://www.economist.com/world/international/displaystory.cfm?story_id=9856023&CFID=3743669&CFTOKEN=53044510

¹⁵ See Inside Energy's "Obama taps ethanol backer for USDA." 22 December 2008; Los Angeles Times' "Obama taps Vilsack for Agriculture." 17 December 2008; and the Washington Times' "Renewable energy: Vilsack's revolving door; agriculture pick pushes Obama ethics." 14 January 2009.

tightly bound, agricultural practices are path dependent, and few practical options exist because of limited technology and a small number of practical policy tools. This outlook may seem disheartening. However, rapid and unexpected policy change does occur. Recently, we have seen extreme movement in select policy areas, such as homeland security. Prior to 2001, for example, no one could have anticipated the extent to which the government would be able to look into Americans' private lives. But a single focusing event ushered in a period of enormous policy change. While relating agriculture to the events of September 11th might be dubious, the comparison shows us that it is not impossible for policy overhaul to occur when streams align. However, if President Obama's selection of a pro-industrial agriculture secretary to lead the Department of Agriculture is any indication of things to come, the outlook for change does not look good.

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