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Connecting Environmental Woes and the Food System

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“The global production of food occupies nearly one quarter or all the habitable land on earth, it is responsible for more than 70% of fresh water consumption, for 80% of deforestation, is the largest single cause of species and biodiversity loss and produces more than 30% of global greenhouse gas emissions.” (United Nations Environment Program 2012)

In the wake of concerns about severe weather events, deforestation, declining biodiversity, and a host of other large scale environmental problems, sustainability –maintaining the natural environment - has become a top priority for many in the policymaking, scientific, and environmental advocacy communities. The means of achieving sustainability are, however, far from agreed upon. For many years, scientists have linked serious environmental problems including water pollution, species extinction, and climate change to the food system - the processes and products involved in the production, transportation, consumption, and disposal of food and food related products. The level of concern among scientists is evident in the actions take by the Union of Concerned Scientists, which has an entire department of experts dedicated to transforming the American agricultural system from one that promotes environmental catastrophe to one that thrives on sustainable practices

(http://www.ucsusa.org/food_and_agriculture/solutions/advance-sustainable-agriculture/).

Likewise, prominent environmental groups including the Sierra Club and the Natural Resources Defense Council advise that living sustainably inherently means changing the food system along with shifting our collective and individual food habits. Common recommendations include using organic practices to produce food (<http://vitalsigns.worldwatch.org/vs-trend/organic-agriculture-contributes-sustainable-food-security>), making it easier for consumers to purchase more locally produced foods, and reducing the production and consumption of animals and animal products.

Despite a clear recognition of the environmental consequences of our food system in both the scientist and activist communities, a cursory glance at history reveals that when American

politicians, especially presidents, speak about environmental problems they rarely if ever broach the topic of food. Instead, political leaders typically advocate for alternative sources of energy such as biofuels, wind or solar power, and they encourage Americans to recycle and engage in resource conserving behaviors like “turning off the lights” and investing in more fuel efficient vehicles.¹ In this paper, I will conduct a systematic investigation of whether and to what extent recent political discourse has begun to link environmental sustainability and the food system. Specifically, I am interested in whether the unequivocal focus on food as a culprit of environmental woes in the scientific and activist communities has shaped the way presidents conceptualize environmental problems.

From a policy standpoint, this investigation holds important implications. Research on the policymaking process and on the rhetoric of American presidents both suggest that presidents set the collective policy agenda by speaking issues into existence. This use of rhetoric (i.e. speech) is salient because getting an issue onto the public’s radar and onto the agenda of legislators is a necessary first step in the policymaking process. In the context of this study that means if the president is not discussing the environmental impacts of the food system, the public is unlikely to be aware of the problem, and legislators are highly unlikely to enact policies to address the increasingly severe environmental consequences of the food system.

In the paragraphs to follow I will begin by outlining some of the main environmental impacts of the food system as recognized by the scientific and activists communities. I will then discuss the literature on presidential rhetoric, and the role it plays in shaping public attitudes and public policies. Next I will explain the data and methodology I will use to analyze political

¹ Cannon and Riehl’s (2004) longitudinal analysis of “presidential greenspeak” and Bomberg and Super’s (2009) analysis of environmental rhetoric by the Obama campaign during the 2008 election reflect this.

discourse on the environment, and present the results of that analysis. Last, I will discuss the implications these findings hold for the future of environmental policymaking and sustainability.

Environmental Impacts of the Food System:

Scientists have documented that adverse environmental impacts are generated during every step in the food system from production to waste disposal. These impacts extend into virtually every realm of the natural environment from water, to air and soil, contributing to widespread pollution, climate change, and loss of biodiversity. In this section, I will lay out the most widely agreed upon environmental impacts² of the food system beginning with the effects of food production which is the most complex step in the process. Next, I will discuss the impacts of transporting food in an era of global trade, and finally I will present research on the important role consumers play through their purchasing power and in disposing of food waste.

From a climate change perspective, the production phase of the food system is the most deleterious, contributing 83% of greenhouse gas (GHG) emissions associated with the food system (Weber and Matthews 2008). The aspects of food production that make it especially problematic include fossil fuel based energy usage, land use changes, generation of carbon dioxide by animals, and food packaging. A recent report from the EPA suggests that 10.5% of the total energy used and 17% of all fossil fuels used in the United States are devoted to food production. This includes the energy required to power the equipment used to plow, plant, and

² There are undoubtedly additional environmental impacts related to the food system that are not mentioned here, my objective was to touch on the most widely agreed upon impacts to meet the space limitations of this paper. I have also omitted certain issues, which are more controversial in the scientific community. For example, some scientists worry that the use of genetically modified crops presents a problem from the perspective of biodiversity and the extinction of native species. Crops that are genetically modified (especially corn) are cross pollinating with native species through wind. As a result, the variety of species grown has diminished considerably. Some of the major concerns are that the loss of native species will create a ripple effect and diminish the biodiversity of the entire ecosystem, and that a lack of variety in the crop might impair the ability of the crop to withstand disease. These concerns, however, lack the level of consensus that exists surrounding the environmental impacts of the food system as discussed in this paper.

harvest food, as well as the energy required to process the raw materials into the products found on grocery store shelves. Additionally, in order to keep up with the ever growing global demand for food, forests which naturally act as climate change adversaries by absorbing carbon dioxide, are being leveled to create more land usable for agricultural production (Sage 2012). The United Nations Environment Program estimates that land use changes, including deforestation largely driven by agriculture, are responsible for up to 30% of global GHG emissions (UNEP – think eat save).

The production of animal protein is especially carbon intensive for a couple of reasons. First, much of the deforestation referenced above is taking place in order to create pasture land for cattle.³ Second, a large portion of the crops grown on the remaining land are used as animal feed, this includes 70% of all grains and 89% of corn produced in the US (UNEP 2012). Third, the animals themselves, cattle in particular, generate large amounts of methane as a byproduct of their waste. Methane is an extremely potent greenhouse gas (GHG) with up to 23 times the global warming potential of carbon dioxide. Correspondingly, reports suggest that three quarters of food based GHG emissions can be attributed to the production of beef, dairy, pork and poultry (Eshel and Martin 2005); the biggest culprit being red meat with GHG emissions at least 150% higher than other animal products (Weber and Matthews 2008).⁴ Moving forward, the GHG emissions from animal production are only likely to escalate as increasing wealth in developing countries yields increasing demand for animal products among those with more disposable income (Sage 2012). If current trends in demand continue as predicted, developing countries are set to double their consumption of animal products by 2050 (Goodland).

³ 40% of Central American rainforests have been cleared or burned to create pasture land for cattle raised for food exports (World-Watch 2004).

⁴ One report argues as much as 51% of human induced GHG emissions are linked to livestock products (Goodland 2012).

The packaging for food products also carries a carbon price tag. First, powering a factory to “produce” and package foods requires energy, which is typically garnered from fossil fuels; however, the elements in the packaging also matter. All major food packaging materials – plastic, glass, and aluminums cans involve a host of carbon-intensive petrochemicals (Ragsdale 2005). A particularly telling example is bottled water. The manufacture of plastic bottles for water requires up to 18 million barrels of oil annually, which is enough to fuel 1 million cars for a year (Sage 2012).

In addition to the climate change implications of food production, there are also other pressing environment consequences including water use and pollution, soil erosion, and exhaustion of resources. Agricultural production accounts for the vast majority of fresh water usage in the United States, with 70% of fresh water being used to produce crops (Pimentel and Pimentel 2003; UNEP 2012 and Diaz et. al. 2003).⁵ Animal-based diets require the largest amount of water (Reijnders and Soret 2003, Pimentel and Pimentel 2003). “The standard [meat-centered] diet of a person in the United States requires 4,200 gallons of water per day (for animal’s drinking water, irrigation or crops, processing, washing, cooking, etc.) A person on a vegan diet requires only 300 gallons a day (World-Watch 2004, 14).”⁶⁶ Large amounts of fresh water are also used in food processing plants to clean and cook food products as well as to produce beverages such as soda and juice (Sage 2012). Food processing and production are second only to crop irrigation in the volume of water required (Sage 2012).

Aside from using fresh water, by dumping loads of fertilizer, pesticides, and animal waste into water ways, the food system is also a leading cause of water pollution. One of the most pressing problems are dead zones, “oxygen-free areas where marine life cannot exist

⁵ Globally that figure is around 90% (Sage 2012).

⁶⁶ The average American diet contains 3 times more meat than the global average (Sage 2012).

(UNEP 2012),” which occur when agricultural chemicals and animal waste run-off into streams and rivers as they make their way to other bodies of water. Only about half of the fertilizer applied to land is absorbed, the remainder washes off into water ways (Sage 2012). This is particularly notable because the use of nitrogen based fertilizers has increased by roughly 10 times over the last 50 years, and over the same period levels of nitrogen in the Gulf of Mexico have tripled. The resulting concentration of nitrogen in the Gulf of Mexico has produced a 6,680 square miles dead zone, roughly the size of Kuwait (UNEP 2012). Worldwide, there are over 400 dead zones (Bello 2008), totaling more than 245,000 square kilometers (Diaz and Rosenberg 2008). Alongside the increase in fertilizers for crop production, the meat industry in the United States generates massive amounts of waste, approximately 61 million tons each year (130 times the volume of human waste) (Sapp 2001). Over 60% of animal manure generated on farms cannot be absorbed into the soil and ultimately ends up in water ways, further contributing to dead zones. The National Resources Defense Council and the EPA report waste from livestock has polluted more than 27,000 miles of rivers in the United States (World-Watch 2004 p. 15).

The steady increase in food demand has also led to the over-use of resources. Intensive farming practices where land is used continuously, rather than intermittently through the alternation of fields, has affected the ability of the soil to recover. “During the second half of the 20th century, 2 billion hectares of arable land were degraded, largely due to intensive agriculture practices. Two to five million hectares are added to this figure annually (Nellemann et.al. 2009 via UNEP 2012 p. 19). Animal production is also a prominent factor in land use. At present, approximately 60% of pastureland in the United States is being overgrazed yielding soil erosion (Pimentel and Pimentel 2003). Correspondingly, the land mass required to support an animal-based diet is 5 times that of a vegetarian diet, when one takes into account the large quantity of

land used to grow grains animals are fed along with pasture land (Sage 2012). Similar problems of over-use and resource exhaustion are present in the fishing industry. The United Nations Environment Program reports 75% of fish and seafood stocks are depleted, overexploited, or being fished to their biological limit (UNEP 2012; also see Sage 2012). The land use and deforestation remarked on above also presents a problem from the perspective of overuse, as it not only removes the trees in an area, but it renders that area uninhabitable for other native animal and plant species (Sage 2012). Research suggests that, “for every 55 square feet of tropical rain forest destroyed, 20-30 plant species become extinct... (Sapp 2001).”

The environmental impacts of the food system do not end when food production is complete; the transportation of food contributes 16% of the greenhouse gas emissions associated with the food system (Weber and Matthews 2008). The transportation phase of the food system is particularly onerous because it almost always requires the use of carbon-intensive fossil fuels. Even as modes of transporting food become more energy efficient, this problem persists because the distance items travel from field to plate is getting longer and longer. Not only do oranges and avocados travel from California to the east coast, but increasingly we import food from all over the world. In fact, the annual imports of fruits and vegetables increased by \$5.2 billion from 1992 to 2006 (Bernatz 2009). These lengthy travels also ramp up the carbon intensiveness of food, because they often require refrigeration during transit which requires more energy and chemical refrigerants that contribute to global warming and other environmental problems such as ozone depletion (Sage 2012). Studies suggest that limiting the transit of food by purchasing locally produced foods could yield a 5% reduction in greenhouse gas emissions for the average American household (Weber and Matthews 2008).

Lastly, consumer choices once food has been transported from farm to market also have important environmental implications. Some of these consequences are related to the environmental impacts of the food system discussed above. For example, many environmental advocacy groups call on individuals to eat less meat and to eat food that is locally produced in order to reduce the environmental impacts of the food system noted above. However, another important choice consumers make is what to do with food and food packaging once they have made their purchases.

Globally, nearly one-third of all food produced for human consumption, approximately 1.3 billion tons annually (UNEP – Think eat save; FAO 2011 – Global food Losses), is never consumed, instead it becomes waste. In the United States, the vast majority of this waste occurs at the consumer-level, and almost all wasted food items end up in landfills. According to the EPA (<http://www.epa.gov/region9/waste/features/foodtoenergy/food-waste.html>), food waste makes up 18% of municipal solid waste in the US. To put this in perspective, estimates suggest that the average American throws away nearly a whole day's worth (1400kcal) of calories every day (UNEP 2012; Hall et al. 2009). As this food decomposes, it releases the powerful GHG methane and exacerbates the problem of climate change (EPA, <http://www.epa.gov/region9/waste/features/foodtoenergy/food-waste.html>). Most food packaging, much of which is not biodegradable, also makes its way to the garbage heap. Overall, packaging makes up a third of all solid waste in the United States, and two-thirds of packaging waste is food packaging (Ragsdale 2005; Marsh and Bugusu 2007). Many food packaging products contain carcinogenic compounds, such as BPA, which then leaches into the land (Ragsdale 2005). Not only do these items represent an environmental problem because they create environmental waste-lands in a world where land is scarce, they also represent a huge

waste of energy. For example, 7.1 million tons of cans were put into landfills in the last decade; that is the energy equivalent of 16 million barrels of oil, enough to power 2.7 million American homes for a year (Ragsdale 2005).

The information above presents an overview of the body of scientific research on the environmental impacts of the food system. As noted, these impacts transcend every phase of the food system, contributing to a wide range of environmental problems including climate change, water pollution, soil erosion, loss of biodiversity, and mounting solid waste. In the next section I will examine research on the important role presidential rhetoric plays in influencing the public, legislators, and ultimately the policymaking process. I will then examine to what extent recent presidential rhetoric on the environment has brought to light the environmental implications of the food system discussed in this section.

Presidential Rhetoric

Research on political communication, public policymaking, and presidential rhetoric make clear that the quantity and quality of presidential speeches play a decisive role in determining whether an issue makes it onto the national agenda and in shaping how issues are understood by the public and policymakers (Cannon and Reihl 2004). Implicit in this research is the assumption that problems are socially constructed (Edelman 1988; Stone 2012). Hence, problems – environmental or otherwise – do not officially exist and will never be addressed through policy until individuals in key positions of power, especially the president, define them as problems and convince others to do the same. Correspondingly, presidents are acutely aware of the power of the “bully pulpit,” and they strategically use speaking opportunities to influence the nation’s policy agenda (Kernell 1997). There are multiple means by which presidents can

use discourse to effect problem recognition, problem definition, and subsequent policymaking; these include by influencing the public and by influencing policymakers. In this section I will explore research on the power of presidential speech, which will inform the analysis I conduct on how the president has discussed environment problems, and whether the food system has been a part of that discussion.

First, it is important to distinguish between two important ways presidents can exert influence through their speech – agenda setting and framing. Agenda setting occurs when, by devoting more attention to an issue, the president signals to others – namely the public and policymakers – that the issue is important (Baumgartner and Jones 2009; Kingdon 1997; Walgrave and Van Aelst 2006). In other words, presidents elevate issues on to the agendas of the public and policymakers merely by speaking about them, and the more a president speaks about an issue, the higher it will climb on the agendas of others. Take the following anecdotal example from recent history; when president Obama began calling for action on healthcare in virtually every speech he gave, issues surrounding healthcare became a priority for wide swaths of the public and their legislators. Problems related to the US healthcare system had existed for decades, but only received intermittent attention from politicians and the public. Through his continuous rhetoric on the issue, Obama put healthcare at the top of the national agenda. Equally important, when presidents are silent on an issue, the public and policymakers are much less likely to see the issue as one of pressing importance. It simply never makes it onto their radar.

Through framing presidents influence *how* the public and policymakers come to understand or conceptualize issues, not just whether they are aware of an issue. Framing refers to the process by which presidents carefully choose the language they use in discussing an issue in order to, “promote a particular problem definition, causal interpretation, moral evaluation,

and/or treatment recommendation (Entman 1993, 52).” Hence a frame is a way of strategically packaging information about a topic. Scholars use other terms such as stories (Hajer and Versteeg 2005; Stone 2002), narratives (Fischer 2003; McBeth et.al. 2007), policy images (Baumgartner and Jones 2009; Jones 1994), and problem definition (Kingdon 1997; Rochefort and Cobb 1993) to convey the same basic idea. Presidential discourse on alternative energy provides an illustration of framing in practice. In the post 9/11 era alternative energy was most commonly framed as a means to achieving energy security, and in the wake of the “global economic meltdown” it has increasingly been framed as a means of rebuilding the economy. Presidents strategically selected these storylines, because they fit the times and because they were consistent with the broader policy platforms of the contemporaneous presidents. This relays an important point about framing – by emphasizing certain causes, consequences, and solutions to an issue and omitting others, presidents not only shape how others understand an issue, but they also define the range of policy options that are seen as appropriate for addressing it (Entman 1993; Kingdon 1997).

Extensive research suggests that presidents are not the only political actors who attempt to influence the public, policymakers, and the policymaking process through agenda setting and framing – other actors such as the media play a role, and the economic and social climate of the day can help dictate which issues and storylines are appropriate. Nevertheless, they are particularly effective agenda setters and framers. Research has found presidents to be particularly effective in the foreign policy domain (Domke et al. 2006; Reese and Lewis 2009). However, presidents have also had considerable success as framers and agenda-setters in the domestic arena in policy areas including healthcare, education, and the environment (Edwards and Wood 1999; Flemming, Wood and Bohte 1999).

Furthermore, there are multiple avenues through which presidents might use both agenda setting and framing to influence policymaking. Some scholars contend that presidents use rhetoric to influence policymaking by first winning the hearts and minds of the general public. Beginning with Kernell's (1997) landmark study, a substantial body of work suggests that presidents influence policymaking by "going public." The going public strategy involves using the media to grab the attention of the American people, set their agendas and problem definitions, and convince them to call on their legislators to act (Barrett 2004; Kernell 1997). Evidence of the success of the "going public" approach is also widespread, both across time and various issue areas. Kernell's (1997) work provides examples of the effectiveness of going public beginning with Wilson's efforts to generate public pressure for the Senate to ratify the League of Nations treaty. Subsequent research suggests that Reagan, Clinton and both Bush presidencies frequently employed this tactic to great success (Bodnick 1990; Canes-Wrone 2001; Lewis 1995; Powell 1999). With the explosion of new technologies for communicating to the public including Facebook, Twitter, and the multiple blogs maintained by the White House, this strategy seems to be more popular now than ever before. The most telling evidence of the success of going public, however, is Barrett's (2004) comprehensive longitudinal analysis. Barrett (2004) finds that the more frequently a president appeals to the public, the more likely he is to see his policy proposal become law, even controlling for other pertinent variables such as divided government. Again, it is important to note that the opposite is also true – if presidents make few or no public appeals on an issue, the chances of it gaining public attention or becoming a piece of legislation decrease dramatically.

A smaller group of researchers agree that presidents influence policymaking through their discourse, but they contend presidents do not need to go through the public to have an effect.

Instead, they propose that when presidents speak other policymakers listen and policymaking takes place (Eshbaugh-Soha 2006; also see Edwards and Barrett 1999, 2000). Among this group is Kingdon (1997, 23) who claims, “the president can single-handedly set the agendas... of people in Congress.” Several empirical studies have confirmed Kingdon’s contention – presidents can and do set the congressional agenda (Eshbaugh-Soha and Peake 2004, 2005; Tan and Weaver 2007; Walgrave and Van Aelst 2006). It is also telling that political figures recognize this presidential power, and even embrace it at times. While undoubtedly motivated by political motives, former governor of Florida Jeb Bush, recently recounted the legislative leadership of prior presidents and pressed Obama to call on Congress to act on Medicare reform.⁷

Based on the research referenced above it seems clear that the president has the power to speak issues into existence, what remains unclear is whether he has done so in the case examined for this study – the environmental problems caused by the food system. There are currently a handful of studies that have examined presidential discourse on the environment overtime, none of which report a mention of the environmental consequences of food system (Bomberg and Super 2009; Cannon and Riehl 2004). These studies indicate that presidents most commonly discuss the environment in symbolic and relatively vague terms, often noting our obligation to protect the environment for future generations, but rarely pointing to specific causes of environmental problems or calling for individuals to change their behavior.⁸ This research, however, is a bit dated, and it did not set out to explicitly examine discourse on a specific cause

⁷ In an interview with NPR, Bush said: If the president is for increasing the eligibility rate, which I think makes sense, given the changing demographic nature of our country, if he's for whatever substantive changes he's for, he should be public about it. This is not a radical idea. This is how it has been done in American history — presidents have led, and they have used all the skills at their disposal to convince and persuade and to find common ground. My brother did it, Bill Clinton did it, my dad did it, Ronald Reagan did it, Lyndon Johnson did it. Why is it such a hard thing for us now to expect presidents to lead? (March 5, 2013, <http://www.npr.org/2013/03/05/173434603/jeb-bush-legal-residency-not-citizenship-for-illegal-immigrants>)

⁸ Jimmy Carter was the only president to explicitly scold the public and request a change in their behavior, and his lecture was not well received by the public.

of environmental problems. Hence, the current study provides the opportunity to probe the topic of presidential discourse on the environment a bit deeper.

Data and Methods

In order to examine presidential rhetoric on the environment, and the extent to which the president has linked the food system to the pressing environmental problems of our day I performed a content analysis of recent presidential communications. The data was drawn from the public papers of the president managed by the American Presidency Project at the University of California Santa Barbara (Wooley and Peters 2009), which includes all public communications by the president. Because I am concerned with the contemporary political milieu surrounding this issue, and because scientific and activist discourse highlighting the environmental implications of the food system have ballooned in the last decade, I have concentrated on recent presidential discourse, specifically the years 2010 through 2012. I have included all communications under the subject heading “environment,” a total of 226 pieces of presidential communication.

My analysis of this data was qualitative in nature, meaning that I did not search for specific terms to see the frequency of their occurrence. Instead, I carefully read each document in its entirety. As mentioned above, I completed this analysis for all documents under the subject heading of “environment.” In order to take advantage of the wealth of information within the data, I not only examined whether and how frequently the president called attention to the relationship between environmental problems and the food system, but also what specific environmental problems the president has focused on, what factors he has identified as causes of the problems, and what solutions should be implemented to address the problems. The results of this analysis are presented below.

Notes to Discussant and Chair:

*I am in the beginning stages of the content analysis. I am hoping to get feedback on whether this methodology seems appropriate for this research. As I have alluded to a couple of times in the paper, I anticipate finding that the president devotes little or no attention to this issue. Does it seem problematic to have a discussion about what is *not* in presidential discourse? On the same point, I do intend to spend a significant amount of time discussing what the president is focusing on in his discourse on the environment – should I alter the first half of the paper to discuss some of these? My main substantive interest is in the environmental impacts of the food system, so I do not want to lose that focus. At the same time, I do not want this to appear to be purely a position paper or advocacy piece. Any thoughts or advice would be greatly appreciated.