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Fertile Ground: EU Agricultural Policy as a Sustainability Model for the US

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Abstract: This paper answers a need to develop US Farm Bill measures that promote sustainability through promoting environmental resilience, social equity, and economic viability of farmers and their communities. European Union agriculture policies as structured through Common Agricultural Policy (CAP) were proposed as examples of sustainability measures that the US could adopt. This paper sets out to determine if EU agricultural policy provides an appropriate and feasible model for US policy by determining what sustainability issues were most prevalent, how both Farm Bill and CAP addressed these issues, and their varying degrees of success. A literature review of agricultural sustainability and policy analyses in the US and EU reveals that EU policy deprioritizes production and inhibits harmful agricultural intensification, while promoting rural viability and equitable distribution of assistance through a transparent system. This paper argues the conditions necessary in the US for these policies to be feasible domestically.

Keywords: policy, Farm Bill, reform, CAP, sustainability, EU, USA, ecosystem, rural

1. Introduction:

Globalized markets have shaped the world's food supply. Meeting global food demand relies on healthy soil and clean water, yet agrochemicals and damage ecosystems and deplete biodiversity. Meanwhile, farm incomes skew increasingly to the smaller set of wealthier farms, making the adaptation of conservation practices a risky and unattractive prospect.

Issues of social, economic, and environmental health associated with agriculture are not limited to the United States. The European Union (EU) faces the global issues plaguing US agriculture, and their localized agricultural issues. The US Farm Bill, and EU's Common Agricultural Program (CAP) centralize national and international agricultural policies, providing subsidies for agricultural enterprises. Each policy has programs that promote farm viability and conservation practices through financial and technical assistance.

By parsing out similarity and divergence in US and EU policy instruments, targeting of resources, and sustainability efforts' successes and challenges, EU's CAP provides a model and generates recommendations for the US Farm Bill in improving efficacy of its sustainability efforts.

2. Methodology:

Our methodology establishes a definition of sustainability that prioritizes social equity and economic solvency in promoting ecosystem health, applicable to the US and EU.

Upon establishing this definition, we enacted a multidisciplinary literature review to determine which agricultural practices undermine sustainability in US, EU, and global agriculture. Works from a range of disciplines, with varying emphases on the social, economic, or environmental aspects of sustainability, offer comprehensive and even competing perspectives to ensure an unbiased review of agricultural sustainability issues.

The literature review covers description and evaluation of Farm Bill and CAP policies. This paper notes divergence and similarity in US and EU successes and challenges of supporting agricultural sustainability, and argues the social, economic, and political feasibility of using successful CAP measures to guide Farm Bill reform.

Finally, recommendations point to a possible future for the Farm Bill, and steps to ensure the feasibility of CAP-based sustainability measures in the US.

3. Sustainability Definition

The World Commission on Environment and Development published "Our Common Future" in 1987 (Brundtland et al), which defines sustainable development as "development which meets the needs of the present without compromising the ability of future generations to meet their own needs." We adapt this definition to clarify our focus on agriculture; thus, sustainable agriculture: "meets the social, economic, and environmental needs of the present without compromising the ability of future generations to meet their own needs."

We sought to define not only sustainable practices of agricultures, but also sustainable outcomes. In 2010, the UN prepared a special report entitled, "Agroecology and the Right to Food, affirming that equitable food distribution ensures available, accessible, and adequate food:

Available: In plentiful supply.

Accessible: In reach geographically, and regardless of physical ability.

Adequate: Meets cultural and nutritional needs.

These tenets of sustainable agriculture and equitable food supplies provide a metric against which to judge the sustainability of trends in farming (De Schutter 2010).

4. Sustainability Issues in Agriculture

Sustainability literature demonstrates myriad forces that degrade ecosystems. We outline issues that impact the viability of farming, and note how agricultural practices exacerbates these issues. Farming impacts landscapes, affecting land cover, ecosystem change, and water quality (Broussard et al 2011) This impact may be a contribution to *or* detract from biodiversity, climate regulation.

Consensus among researchers, from land-use policy to agronomists to ecologists, affirms that in the last few decades, US agriculture has shifted significantly toward intensified production, resulting in damage or depletion of various resources necessary for agriculture (Reimer 2015).

4.1. Ecosystem Degradation

4.1.1. – *Water quality and availability*

Industrially synthesized Nitrogen fertilizer enacted a revolution in the beginning of the 20th century. Nitrogen, an essential nutrient for crop and human health, has since experienced an exponential increase in field applications (Broussard et al 2011). A. Reimer's work in Land Use Policy cites Environmental Protection Agency (EPA) statistics in stating that nutrient run-off constitutes the most significant non-point source pollution of water in the US (Reimer 2015). Nitrogen fertilizer traces a path from the field to groundwater. Broussard, Turner, and Westra's work in Agriculture, Ecosystems, and Environment articulate the economic impact on water treatment centers in the Midwestern US, which implement expensive water treatment mechanisms to keep nitrate-nitrogen at levels physiologically suitable and federally required for human consumption. Nitrate-contamination and "nutrient-loading" afflict drinking water internationally, as noted by the EU's Directorate-General of Agricultural and Rural Development, citing water quality as one sustainability issue which the EU's CAP reform in 2011 seeks to alleviate (EU 2013).

4.1.2. – *Soil health*

The EU CAP policy brief mentions water quality in the same breath and soil health, which impacts agroecosystem resilience in productivity in the US and worldwide (EU 2013). The Annual Review of Public Health's 2015 report on "Food System Policy, Public Health, and Human Rights in the United States" warns of soil's decreasing capacity to retain water and nutrients (Shannon et al 2015). In the same year, Altieri and Nicholls describe "The design of climate-change resilient farming systems," explaining that additions of organic matter provide essential crop nutrients, as well as soil structure that improves soil's ability to retain such nutrients (Altieri et al 2015). Recommendations for adding

organic matter follow a description of practices that divert organic matter from being incorporated into fields.

4.1.3. – Biodiversity in ecosystems and agroecosystems

Biodiversity in cropping systems ensures a farm's environmental and economic resiliency (Altieri et al 2015). Crop variety builds farms and food systems that produce even if one crop fails widely. Crop diversity contributes to diversity of insects, aiding pest management strategies that utilize natural predation of carnivorous insects and microbes to inhibit pest populations (Altieri et al 2015).

The dominance of monocultures renders US agriculture vulnerable to such failures. For example, the Annual Review of Public Health's 2015 publication finds that Monsanto's Roundup Ready ® seeds constituted over 90% of US soybean cropping systems in 2012. Hodge, Hauck, and Bonn find that as agriculture spreads *and* intensifies, biodiversity reduces. Both the CAP brief and EU conservation studies prioritize biodiversity as a key resource in successful agricultural systems (7,10).

4.2 –Trends and Practices that Undermine Sustainability

4.2.1. – Climate change

Altieri's resilient farm systems respond to climate change, an ecosystem shift that demands adaptive agriculture which mitigates contributions to greenhouse gas emissions (Altieri et al 2015). The EU CAP brief asserts that farm systems must build resilience to an increasing occurrence of natural disasters (EU 2013). Climate change limits crop yields through heat and drought, as well as increased pest populations which compete with crops for limited resources (Altieri et al 2015).

Manure management and irrigation management can contribute to greenhouse gas emissions from agricultural production (EU 2012). Additionally, US and EU agriculture exhibit increased dependency on energy-intensive farm machines (Broussard et al 2011) Yet climate change can and must be mitigated by promoting agriculture that is not reliant on fossil fuels, and the greenhouse gases released in fossil fuel's extraction and combustion (5,7).

4.2.2. – Intensification and monocultures

Monoculture production limits crop diversity, which and contributes to high pest populations, increased soil degradation, and nutrient depletion. These issues in turn require higher agrochemical inputs which contaminate groundwater and deplete biodiversity (Altieri et al 2015). Agriculture, Ecosystems, and Environment's publication on farm policy and surface water quality illustrates the relationship between cropping systems and resource degradation. These researchers analyzed maps demonstrating that the Midwest, Great Plains, and Mississippi river corridor host mostly corn-soy rotations, apply more industrial fertilizer and maintain higher nitrate-nitrogen levels in surface waters than the rest of the country (Broussard et al 2011).

4.3. Sustainability and social equity – Food availability and adequacy

A sustainable agricultural system must make available food that is adequate to cultural and nutritional needs (De Schutter 2010). A. Freeman's work in the Seattle Law Review poses similar social sustainability standards through the framework of food oppression theory (Freeman 2015). This theory describes food systems that "physically debilitate members of marginalized and subordinated groups, creating and perpetuating racial and socioeconomic health disparities," (Freeman, 2015, p. 1272). Cropping choices may lead to such debilitation. Government food assistance programs promote agricultural products like corn and soy, Freeman explains, which provide many calories but few nutrients. Increased consumption of these goods disproportionately occurs among low-income individuals (Shannon et al 2015).

4.4. Economic Inequity in US Agriculture

4.4.1. Viability of agricultural sector

Throughout the 20th century, farmland area increased 10% between 1900 and 2002, while the number of farms decreased by 63%. Yet just as a resilient farm system grows many crops to buffer crop failure, a resilient national agricultural maintains variety in farm types and sizes (Elsheikh, E., & Barhoum, N. 2013). An equitable agricultural system makes opportunities for success available to farmers across social and economic strata. UC Berkeley's Haas Institute for a Fair and Inclusive Society, reported the prevalence of corporate consolidation in agriculture (2016). The report explains that as corporations control an ever-increasing share of agricultural production and processing, midsized farms struggle to access a market that favors much higher outputs and lower profit margins. The Union of Concerned Scientists (UCS) affirms that midsized farms are too small to compete on this global market, while often too large to engage in direct sales. The USDA defines farms with 50 to 999 acres in operation as midsized, measuring that over half a million of such farms shut down between 2007 and 2012 (Mulik 2016). For midsized farms, UCS explains, farming is the owner's main occupation and income source.

4.4.2. Rural viability

Midsized farms do not just benefit their operators. Indeed, they are more likely than larger farms to buy inputs from local suppliers (Mulik 2016). The aforementioned EU CAP policy brief adds that rural areas lose population and business as midsized farms disappear (EU 2013). The disproportionately rural distribution of impact undermines social sustainability as well as economic sustainability, as communities shrink and lose opportunities to support their social and material needs.

5. The US Farm Bill

The Haas Institute offers the necessity of analyzing “how public and private institutions are structured and how government programs are administered,” to understand and inhibit the reproduction of marginalizing outcomes. Snapshots of farming at the origins of the Farm Bill, and of contemporary agricultural trends, contextualize the shape and focus of Farm Bill policy.

5.1. The Origins of the Farm Bill

The US federal government established the Farm Bill’s predecessor, The Agricultural Adjustment Act of 1933. World War I decimated European agricultural productivity, providing a market for US farmers. But once European agriculture revitalized, US farmers were plagued with oversupply and plummeting commodity prices. Congress formed the American Agricultural Act to support prices for certain commodities, to limit and control supply, and to supplement farm incomes (Broussard et al 2011). Recipients of subsidies were small, diversified farms, the norm of farming in America at the time. The goal of the policy was economic viability. In 1938 Congress renewed the bill and voted to maintain it as a permanent program to be renewed every five years (Heilingenstein 2014).

5.2. The Farm Bill and Food Assistance

Food assistance, accessibility, and availability indeed pertains to social sustainability (9, 16). Yet the Farm Bill’s Supplemental Nutrition Assistance Program (SNAP) does not regulate or support farms directly, and is thus situated beyond the scope of this paper.

5.3. Farm Bill stakeholders and actors

Government actors in the Farm Bill include legislators in Congress, and regulatory bodies such as the Environmental Protection Agency (EPA), International governance by the World Trade Organization structures the Farm Bill through a framework of permitted and prohibited farm subsidies. Limited subsidies include those that may impact global commodity prices (Glauber & Westhoff 2015). Finally, the Haas Institute lists interest groups and corporations that, through lobbying and campaign donations, determine the shape and focus of the Farm Bill.

5.4. The 2014 Farm Bill Reform

5.4.1. Economic viability, social equity, and rural development

Net farm income derived from federal subsidies increased from 9% in 1930 to 29% between 2001 and 2005, underscoring the dependence of economic sustainability on federal subsidies (Broussard et al 2011). The socio-economic dimensions of sustainability require that a discussion of sustainability and agricultural policy include general, non-conservation focused subsidies and their allocation.

Subsidies contribute to Title I of the Farm Bill experienced a reduction \$14.3 billion from 2008, as direct payments for commodities were eradicated. Title XI, in turn,

maintained a similar budget to that of 2008, subsidizing crop insurance . These types of funding are classified as “safety net” spending, because they serve to buffer farm incomes from fluctuation in weather and commodity prices (Bladford et al 2011).

Farm Bill programs that support economic viability may do so on the basis of individual farmers, or pertaining to certain marginalized groups of farmers. 2014’s reform established credit programs and research programs designated specifically for young farmers . Similar programs provide credit and research assistance earmarked for organic operations, farmers of fruits and vegetables, and military veteran. Funds support the development of policy recommendations for socially disadvantaged farmers and ranchers . Finally, rural viability receives support through rural development programs and local food production .

5.4.2. Biodiversity and environmental degradation

The Farm Bill’s Title II contains conservation programs. The 2014 reform dictates a \$4 billion reduction in conservation spending, the first conservation-based budget cut since the Farm Bill’s inception . Researchers note an effort on the part of Congress to streamline conservation programs, and thus encourage participation. The number of conservation programs decreased from 23 to 13 (Reimer 2015)

The Farm Bill reform’s conservation programs operate voluntarily. Non-voluntary compliance measures related to sustainability include linking crop insurance payments to conservation standards. In order to receive crop insurance, a farming enterprise must submit a conservation plan, and may not occupy wetlands or native prairie cleared after 1985 (Reimer 2015). These standards follows the focus of conservation programs on general attention to supporting biodiversity and mitigating environmental degradation.

One such support for general conservation is the Regional Conservation Partnership Program (RCPP), new as of 2014 (Reimer 2015). The RCPP replaces regional conservation programs created by stakeholders outside of the Farm Bill, competitively allocating funds to regional scale projects. Similar mergers include the Agricultural Conservation Easement Program (ACEP). This program represents a merger of the Grassland Reserve Program (GRP) and the Wetland Reserve Program (WRP), which protected pasture and wetlands, sources of biodiversity, from development. The Farm and Ranchland Protection Program (FRPP) also joined the ACEP, to buffer farmland from development (Reimer 2015). Both of these mergers decentralize administration, as ACEP and RCPP rely on partnerships with non-profits and sub-national government (Reimer 2015).

In addition to reducing land use change, environmental sustainability in the Farm Bill targets agricultural intensification as a sustainability issue. The 2002 Farm Bill introduced the Environmental Quality Incentives Program (EQIP), a cost-share and technical assistance programs for farmers practicing conservation on working lands. These conservation measures include careful planning in nutrient application, conservation tillage, and filter strip installation to prevent run-off and nutrient leaching (Reimer 2015).

The Conservation Reserve Program (CRP) and Conservation Stewardship Program (CSP) remain standalone programs that exemplify the retired lands versus working lands

schema (Reimer 2015). CSP provides annual payments five-year contracts to farmers that already pursue one conservation goal, such as habitat conservation or water quality. Applicants must demonstrate plans to address an additional resource goal. CRP also attempts to address multiple resource goals simultaneously, awarding ten-year contracts to remove land from production. 95% of Farm Bill conservation spending falls to CRP, EQIP, CSP, RCCP, and ACEP (Reimer 2015). Meanwhile, Farm Bill cut CRP's available funding from retiring up to 32 million acres, to retiring only 24 million acres by 2018, constituting a budget reduction \$3.3 billion between 2014 and 2023 (Reimer 2015).

6. EU and the Common Agricultural Policy

6.1. Rebuilding Europe and the Origins of CAP

Before the EU formed, the European Economic Community (EEC) connected Belgium, France, Italy, Luxembourg, the Netherlands, and West Germany in economic alliance (EU 2012). In 1962, five years after their consolidation, the EEC implemented a food security program: the Common Agricultural Policy. After a few years of production increases, the abundance of food turned into food waste and an into economic damper by the 1970s. CAP thus implemented price supports and production quotas, such that production would not overwhelm need (EU 2012).

6.3. The Contemporary CAP Structure

6.3.1. CAP stakeholders and actors

As with the Farm Bill, the EU public leverages their voices in the reforming of CAP. CAP reform in 2010 began with a public debate, initiating reform proceedings that culminated in 2013's legislation (EU 2013). Rural landowners influence CAP through participation in its voluntary measures (Bladford et al 2011). CAP citizens further leverage a voice in the proceedings by joining and supporting environmental groups (Bladford et al 2011). CAP deviates from the Farm Bill, however, in structuring the support and compliance of Member States, referring to EU's national constituents (Bladford et al 2011). International actors include the European Parliament, consisting of over 700 delegates, which co-legislated 2013's CAP reform for the first time (EU 2013). The WTO maintains constraints and trade agreements in cooperation with EU, as with the US.

6.3. – CAP 2013 Reform

6.4.1. – Social and economic measures - economic viability, social equity, and rural development

Funds and programs fall into two pillars EU finances Pillar 1, while Pillar 2 is co-financed by the EU and Member States (Bladford et al 2011). Member States' contributions to Pillar 2 range from 10% to 50% (Bladford et al 2011).CAP's 2013 reform addresses economic viability of farms, as well as viability of Member State's individual agricultural sectors.

The reform shifted funds from supporting a certain product or production level, to supporting producers, such that 94% of direct payments to farms are decoupled from their production (EU 2013).

In terms of social equity, Member States gained leverage in allocating direct payments to marginalized groups, including young farmers and small farms (EU 2013). Through “redistributive payments,” Member States can decide to award direct payments based on “first hectares.” In this scheme, the first counted hectares of a farm receive the largest payments, such that larger operations are not disproportionately supported with a multitude of additional acres (EU 2013). Additionally, states distribute awards based on national minimum average, rather than historical production data from that farm (EU 2013).

Rural viability remains the purview and focus of Pillar 2 (Bladford et al 2011). The 2013 reform provides a new mandate, where Rural Development Programs (RDP) must conform to principles published as “common EU priorities” (pp. 8).

6.4.2. Environmental measures – ecosystem degradation and intensification

Concern for soil and water pollution drove environmental measures (Bladford et al 2011). From 2015 onward, Pillar 1 provides a “green direct payment,” constituting 30% of a Member State’s national direct payment envelope (EU 2013). These funds pay farmers to maintain permanent grassland, and crop diversity. Farmers must maintain an “ecological focus area,” suitable for wildlife habitation. Grassland and crop diversity similarly serve to contribute to carbon sequestration, and biodiversity on the farm and in the surrounding area. Farmers who do not comply receive a penalty of 30% of their direct payment.

Pillar 2 addresses climate change, requiring that that 30% of rural development funds be allocated to voluntary greenhouse gas mitigation, and conservation measures adapted to local needs. Pillar 2 continues to fund organic farming. Payments also reach farmers in “areas of natural constraints,” to fund farmers prohibited from producing on sensitive land (EU 2013).

7. Analysis: Evaluation of Sustainability Outcomes in US Farm Bill

7.1. US Sustainability Successes

This paper utilizes agricultural sustainability literature and policy literature to contextualize Farm Bill programs, and argues as to whether they are effectively structured and implemented.

7.1.1. Well-targeted and resilient programs

Public policies will promote sustainable outcomes of agriculture by prioritizing public goods including extension services, research, rural infrastructure, and access to markets and credit (5, 6). A brief of the Farm Bill identifies that EQIP and CSP promote whole-farm sustainability support, provide financial and technical assistance, and fund land retirement. Within these programs, non-commodity crops and diversified farms received increased funding (Shannon et al 2015). Land-use policy literature remarks that

old programs like EQIP and CSP have grown large; new programs like RCPP could do the same (Reimer 2015). Trade-policy literature similarly notes that farm programs have strong staying-power once introduced into legislation (Bladford et al 2011). Thus new environmental sustainability programs with economic viability measures maintain potential to remain funded and grow.

7.1.2. Knowledge-intensive agriculture

Research on promoting sustainable agriculture sectors recommends public policy which builds infrastructure for regional and local food. New programs ACEP and RCPP programs fulfill this recommendation through regional and place-specific policy focuses, and regional governance. (Reimer 2015).

Localized program governance and priorities may serve to use and disseminate localized knowledge. And Altieri's agronomic publication on climate-resilient farming frames sustainable agriculture as knowledge-intensive, rather than input-intensive, where information and local wisdom contribute to yield more than agricultural chemicals (Altieri et al 2015). One such example includes utilizing an integrated pest management strategy to build an ecosystem that inhibits pest growth, as opposed to applying potentially harmful and mobile pesticides (De Schutter 2010). De Schutter's "Right to Food" goes on to suggest that small farmers should not only receive aid, but be regarded as experts, the source of agricultural knowledge (De Schutter 2010). Reviews of the Farm Bill reform find a rise in governance partnerships which engage local experts and social networks for programs addressing local needs (Reimer 2015).

7.2. Farm Bill Sustainability Challenges

7.2.1. Subsidies prop up intensification

Ecological researchers in 2012 inquired about the relationship between federal farm policy and surface water quality. Their findings identify that federal money influences crop choice and land use practices, such that more federal subsidies correlate with lower crop diversity, higher inputs, and higher concentrations of nitrate contamination in surface waters (Broussard et al 2011). Such research clarifies that even when a Farm Bill policy changes, its former impacts may restructure commodity markets and agricultural practices, like corn monocultures. The outcomes then continue despite policy changes (Broussard et al 2011). Farm Bill policies decide which commodities and markets survive (Freeman 2015).

Federal subsidies thus provide funds and technical assistance that lead to overproduction (Nestle 2016). Additionally, agricultural intensification remains uninhibited when conservation programs offer only voluntary compliance (4, 14). Meanwhile, fluctuating commodity prices offer occasionally competitive financial choices that make participation in environmental programs less attractive. (Bladford et al 2011) Such voluntary programs shrink their impact even further when their maximum fundable acreage is reduced, as with CRP's reduction from 32 million acres covered, to 24 million acres. (Reimer 2015). Conservation programs sacrifice participation when they are voluntary and subject to budget cuts.

7.2.2. Lack of transparency

Federal subsidies unrelated to conservation now undermine socio-economic equity by being awarded on a secret basis, rendering allocation of funding no longer accountable to public review or choice. The 2014 Farm Bill began this new policy by eliminating direct payments and offering risk management and farm subsidies in the form of crop insurance (Freeman 2015). The provision rendering crop insurance allocations secret arose in 2000, when the majority of subsidies were direct payments and subject to public scrutiny. Since then, direct payments have been eliminated. The current lack of transparency undermines socio-economic sustainability and constitutes a disempowerment of the public, since the federal government renders its distribution of funds unaccountable to public opinion and consent.

7.2.3. Structural oppression and inequitable distribution of resources

The Haas Institute's Farm Bill report finds that inequity in the food system correlates with society-wide forces of structural oppression, disproportionately impacting individuals from marginalized socio-economic groups. The report also states that food system inequity cannot be addressed without understanding and impacting these oppressive structures .

Federal agricultural subsidies compound inequity when operating in a context of corporate consolidation, and when uncritical of disproportionately awarded funds to farmers. Horizontal corporate consolidation refers to concentrated ownership or control in one aspect of a food system, such as consolidated production enterprises, consolidated processing companies, or consolidated distribution schemes. Vertical corporate consolidation includes many parts of a food chain, such as production *and* processing, under control of one corporate entity .

Corporate consolidation becomes corporate control when farmers must accept price and practice of processors due to limited choices (Shannon et al 2015). In 2007, corporate consolidation resulted in four corporations owning 8% of soybean processing, 82% of beef packing, 63% of pork packing, and half of milk manufacturing . Corporate control also appears in lobbying efforts that shape Farm Bill policy. In the two years of negotiations before the 2014 reform, 600 banking, trade, transportation, and energy companies – along with non-profits - spent \$500 million in Congressional lobbying .

Farm subsidies demonstrate a similarly disproportionate allocation. Policy research finds that less than 5% of US Farms make up nearly half the total value of agricultural production in the US (Bladford et al 2011). 95% of farms are small- and mid-sized family owned operations, yet 67% of working lands program funds reach large and very large family farms, representing a disproportionate favoring of larger farm operations (2, 14). The 2014 Environmental Working Group (EWP) estimates that 10,000 insurance policy holders receive over \$100,000 a year in subsidies, while the other 80% of policy holders receive around \$5,000 per year . Though crop insurance subsidies increased their portion of the Farm Bill budget, much of these increased funds went to private insurance companies and banks .

Unbalanced allocation of funding contributes to a less resilient nation-wide agricultural sector, vulnerable to forces that could render large farms unable to meet food

security and environmental needs. More holes in farm support include a tendency of government farm payments to reach the Midwest, Great Plains, Mississippi River corridor, and the California Central Valley, even when accounting for distribution and density of farmland (Broussard et al 2011). Finally, Farm Bill insurance policies, like the Whole Farm Revenue Protection policy, remain inaccessible to beginning farmers that already face limited access to capital and credit (Mulik 2016).

8. Analysis: EU Policy – Sustainability Evaluation

8.1 EU Sustainability Successes

8.1.1. De-prioritize production

The 2005 CAP reform disconnected subsidy levels and farm production decisions, a measure aligned with hopes that policies would transition from commodity-based support toward ecosystem services (Hodge et al 2015). These Pillar 1 measures occur alongside the 2015 Pillar 1 Green Payment implementation, which penalizes farms that do not maintain permanent grassland and wildlife habitats (EU 2013). Such measures serve to de-prioritize agricultural intensification and subsequent environmental degradation.

8.1.2. Small and midsized farms

Measures that support attention and care to ecosystem health include supporting small farms. Member States may allocate Pillar 2 payments on a first hectares basis, such that the first counted hectares of a farm receive higher payments per hectare than the rest of the farm (EU 2013).

The UCS finds that farmers with smaller farms better understand specific needs of different portions and aspects of their land (Mulik 2016). Areas with moderate-sized farms and a strong middle class offer more socioeconomic stability through minimized poverty and unemployment rates (Mulik 2016). Additionally, small farms that pass from generation to generation within a family also pass on knowledge that enhances farm functions based in integrated management and biodiversity (Mulik 2016). Member States funding small farms are compelled to fund training measures and technical support for these enterprises (EU 2013).

8.1.3. Place specific governance

As with the Farm Bill, CAP's 2013 reform promotes place specific programs by requiring farms to assess their land and care for potential wildlife habitats. Pillar 2 programs prioritize cooperation between local producers as a metric for success, reducing costs and increasing access to credit (EU 2013).

Besides promoting programs that develop and disseminate local knowledge, the 2013 CAP reform introduced a Transparency and accountability measure, rendering information on CAP beneficiaries accessible to the public (28).

8.2 CAP Sustainability Challenges

8.2.1. Budget availability, targeting, and eligibility

EU does not require participation in CAP subsidy programs. Farmers receive awards that make up for foregone profits. As world food supply become insecure, commodity prices increase. Thus, environmental sustainability subsidies must pay more to remain a competitive choice for farmers, putting a strain on CAP funds (Hodge et al 2015). Meanwhile, Member State funding for Pillar 2 measures around social and environmental sustainability suffered due to economic crises in national budgets (Bladford et al 2011). Policy analysts conclude that CAP funds must be more efficiently delineated to make the most impact on socio-economic equity and conservation needs (EU 2013). The European Court of Auditors agrees, citing a lack of clear objectives as leading to inefficient targeting of funds (Hodge et al 2015). CAP critiques similarly cite that EU's voluntary compliance scheme provides only limited monitoring of practices and outcomes. Pillar 1 Green Payments are awarded universally, regardless of skill and spatial planning through which environmentally-based awards could be more efficiently utilized (Hodge et al 2015)

The greening payments that are available will reach a limited amount of land, due to farm size thresholds excluding 88% of farms and 48% of farmed area from the Ecological Focus Area requirement (Hodge et al 2015). Newer Member States have 92% of holdings exempt from crop diversification requirements, since these holdings are less than 10 hectares (Hodge et al 2015).

8.2.2. Differences between member states

Policy reviews discussing the CAP reform process note that lower-income Member States request more redistributive power, indicating that funding allocation schemes do not benefit all Member States to the same degree, or address their varying needs (Bladford et al 2011). Pillar 2 must be co-financed, leading to inconsistent support of rural viability and social equity from state to state, thus reducing the overall effectiveness of CAP in targeting these issues. For example, public expenditure on Pillar 2 environmental sustainability measures ranges from 15 euros per hectare in Spain, to 200 euros per hectare in Austria.

9. Analysis: Comparison of US Challenges, EU Success, and Feasible Solutions

Having evaluated policy challenges and points of success regarding environmental, social, and economic sustainability in the EU and the US, this paper seeks points of comparison to develop feasible recommendations. This section compares US policies that undermine sustainable outcomes with EU mechanisms for addressing those same problems successfully. Upon identifying points of comparison and possible solutions, this paper considers the feasibility of applying solutions based on the following framework:

- Political Feasibility- *Will these reforms have a chance to pass through the legislature? What would the response of the agriculture lobbies be?*

- Economic Feasibility- *Are these reforms cost-efficient, how much money will they cost taxpayers? What programs might have to be cut?*
- Social Feasibility- *Will the public accept these new reforms? Is it in-line with our societies values?*

9.1. Feasibility of Deprioritizing Intensive Agricultural

An evaluation of Farm Bill failures to promote sustainable agricultural practices and outcomes finds that subsidies encourage high-input farming operations, with low crop diversity, that contribute to environmental degradation. Awards supporting conservation measures reach farmers on a voluntary basis, limited in distribution by competition. CAP policy successes include the universal accessibility of subsidies that provide support to farms regardless of their production levels. These subsidies require compliance with measures that protect biodiversity and sensitive ecosystems.

Will implementing universally available programs that offer subsidies unlinked to productivity, penalizing non-compliance with conservation measures? These CAP measures invite widespread participation in the EU. Yet CAP budget constraints invite critiques of these conservation awards that lack comprehensive evaluation and monitoring of usefulness. Therefore, these programs may be considered difficult to budget in a targeted and efficient manner, and economically infeasible. Corporate interests, cited above, may fight measures that will reduce production, and raise prices, of commodities that they seek to consolidate for processing and distribution. Yet research indicates that when information about environmental issues becomes available, people's attitudes change, as do social priorities (Reimer 2015). Education about the damage of agricultural intensification increases the social feasibility and public acceptance of such measures, were people to be assured of continued economic viability of farms that reduce production. Such education could ripple to impact the political feasibility of such measures, were the public to hold their legislators accountable to these shifting social attitudes.

9.2. Transparency of Subsidies

The 2014 Farm Bill rendered information about Farm Bill recipients inaccessible to the public. This lack of transparency undermines the socio-economic sustainability of the Farm Bill by disempowering the public whose taxes finance these subsidies, and who are impacted by the agricultural sector that develops from these subsidies. CAP's 2013 reform implemented legislation that makes accessible information on distribution of agricultural subsidies. Can similar transparency legislation enter the Farm Bill?

Social feasibility may operate in the same fashion as noted above, with social opinion following education on the dangers of a non-transparent Farm Bill. The economic costs of this measure would not rise past the costs of administering and distributing this information, which the Environmental Working Group has engaged in previously (Freeman 2015). Corporate interests, again, will likely limit the political feasibility of transparency, as to obscure the inequitable distribution of subsidies to the small portion of producers who receive the bulk of the funding.

9.3. Addressing Inequity through Supporting Small Farms and Rural Viability

In the US, small farms constitute the majority of agricultural enterprises, and will most likely engage in conservation measures while supporting local vendors and rural viability. Yet inequitable distribution of funds put small farmers and beginning farmers at a disproportionate disadvantage in competing with very large and consolidated operations. EU's CAP supports small producers, rural sustainability, and agricultural conservations holistically through Pillar 2 programs that encourage cooperation between producers, allocated according to Member State discretion.

Creating new programs to support small farmers, rural viability, and conservation will be challenged by legislators and interest groups averse to significantly redirecting funding away from production. However, programs encouraging cooperation can share material resources or knowledge resources from one farm to another, such that Farm Bill funding is but one source of support. Reduced overhead costs may derive from administering programs by targeting many operations at once. Additionally, small farmers that contribute to rural viability would receive support from the rural communities to which they contribute. Trends in direct sales from small farms indicate social feasibility and support from the public for these measures.

10. Conclusion: Recommendations for CAP as a Feasible Model for Farm Bill Sustainability Efforts

CAP offers equitably administered measures promoting environmental health, social and rural resilience, and economic viability of agricultural enterprises and national industry. These measures are relevant to the Farm Bill's challenges of agricultural intensification's ecosystem damage, socially unaccountable distribution of funds, and inequitable allocation of subsidies away from crucial small and midsized operations.

Universal inclusion of farmers in conservation programs, unlinked to a farm's production, will invite widespread participation, and promote ecosystem health. A transparent allocation of Farm Bill funding will invite public scrutiny and approval or disapproval of Farm Bill beneficiaries. Both of these measures would meet political intransigence from corporate actors that seek continued agricultural intensification, subsequent decreases in commodity prices, and continued consolidation of farm holdings. Education of the public as to the social and environmental consequences of agricultural intensification may be necessary to garner social support for deprioritizing production, and to ensure that voters hold legislators accountable to protecting public goods. Specific subsidies for small and midsized farms, and for rural development, can initiate a cycle of farms supporting rural communities that in turn support farm viability. Cooperation between farms, and between farms and a willing public, can contribute to the success of these programs.

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