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Promoting sustainable agriculture: Iowa stakeholders' perspectives on the US Farm Bill conservation programs

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Abstract

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Keywords

food systems, environmental sustainability, agricultural policy, agri-environment, soil health, water and nutrient management

Disciplines

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Comments

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Abstract

Farmers perceive a tension between short-term profit and long-term sustainability, which can be bridged by external investments in conservation. In the U.S., the Farm Bill plays an important role in providing this investment through conservation programs. Since the Farm Bill is influenced by various stakeholders, their perspectives tend to inform its programs and practices. We aim to understand influential stakeholders' viewpoints on strengths and weaknesses of major conservation programs as a means for either incremental or transformative changes leading to policy improvements. Interviews were conducted with representatives from key stakeholder groups, including farmer and agribusiness groups, commodity groups, government agencies, and environmental NGOs. Results reveal that commodity group and agribusiness representatives maintain that current conservation programs have been effective at reducing soil erosion and propose incremental changes to them. Specific issues include simplifying the Conservation Stewardship Program (CSP), easing requirements attached to the Environmental Quality Incentive Program (EQIP), avoiding excessive Conservation Reserve Program (CRP) payments to compete with tenant farmers for good agricultural lands, and preventing farmers from being out of compliance on highly erodible land. However, results also reveal that stakeholders now appear to be more concerned about water quality and nutrient management rather than soil erosion. Environmental NGOs and research groups present transformative ideas to address this issue. At the farm level, they promote both infrastructural improvements and conservation-conscious management practices. At the landscape level, many stakeholders recognize the need for holistic,

scalable approaches to soil and water quality conservation. However, interviewed stakeholders unanimously foresee incremental, not transformative, changes to Farm Bill conservation programs and policies.

Key words: food systems; environmental sustainability; agricultural policy; agri-environment; soil health; water and nutrient management.

1. Introduction

Farmers perceive a tension between short-term profit and long-term environmental sustainability (Arbuckle 2016). Investments in conservation can help overcome these issues, as state-led agricultural policies help shape agricultural trajectories (McGranahan et al. 2015). As a means for promoting sustainable agriculture, agricultural policies worldwide have been incorporating new conservation programs (Lambert, Sullivan, Claassen, & Foreman, 2007; Qu et al., 2017).

The United States Department of Agriculture's (USDA) primary legislation governing agricultural policies and programs is called the "Farm Bill" (Johnson and Monke 2017). Farm Bill conservation policy and programs play an important role in promoting conservation-related practices, particularly when farmers lack motivation or resources to protect and restore natural resources (McWilliam and Balzarova 2017). Key Farm Bill policies include working lands programs, such as the Conservation Stewardship Program (CSP) and Environmental Quality Incentives Program (EQIP); land retirement programs, such as the Conservation Reserve Program (CRP); conservation compliance programs (CC); and other programs, such as the Regional Conservation Partnership Program (RCPP) (Johnson and Monke 2017).

To a great extent, historically the purpose of these programs has been reducing soil erosion on private farmland (Lichtenberg 2015), and progress has indeed been made in this arena (García et al. 2016; NRCS

2012; USDA 2015). However, research suggests more can be done to improve soil health (Cox et al. 2011; McGranahan et al. 2015; Rundquist and Cox 2016), and recent studies have highlighted a need for agricultural policies that better address water quality and nutrient management, not just soil erosion (Arbuckle 2013a; Arts et al. 2017; Inman et al. 2018). Nutrient loss reduction is a key technical challenge that has been central to US Environmental Protection Agency (USEPA) efforts to address hypoxia in the Gulf of Mexico through state-led Nutrient Reduction Strategies that promote innovative nutrient management practices (Addy et al. 2016; EWG 2017). Prioritization of environmental protection at the landscape level is also needed (Church and Prokopy 2017; Lichtenberg 2015).

Studies in the US and abroad reveal the challenges of and results from this landscape-level approach (Arts et al. 2017). Experiences worldwide reveal positive results from bottom-up approaches (Toderi et al. 2017) and collaborative governance (Westerink et al. 2017). However, these more holistic approaches are not without their own challenges; studies show there is greater technical complexity in defining the best practices for working at the landscape scale (Álvarez et al. 2017; Reimer et al. 2012; Schall et al. 2018), and these multi-stakeholder approaches may be more difficult to promote and implement (Inman et al. 2018).

The Farm Bill conservation programs may be influenced by the various stakeholder groups whose members use them: farmer groups, commodity groups, conservation and environmental NGOs, and even government conservation agencies themselves. Therefore, stakeholder perspectives tend to have great relevance to final Farm Bill programs and policies (Bosso 2017). Despite the importance stakeholders' perspectives on the USDA conservation programs and policies that impact them, little research has attempted to understand and document those viewpoints. This study aims to develop a comprehensive understanding of key stakeholders' perspectives on the current conservation landscape. Specifically we aim to identify and document stakeholders' articulations of:

- Strengths and weaknesses of existing conservation programs;
- Suggestions for improving conservation programs in future Farm Bill legislation.

By documenting the perspectives of key stakeholders in the agriculturally important state of Iowa, USA, we aim to inform discussion of ways that soil and water conservation programs and policies might be improved.

2. Methods

This research relies on two complementary sources of data: interviews with representatives of key stakeholder organizations and review of official documents published by these organizations, with special attention paid to their official legislative policy documents, whenever available. The interviews were held with stakeholders based in Iowa, which is one of the most important agricultural states in the U.S., producing more corn, soybeans, pork, and eggs than any other state (NASS 2017). Iowa has different state-led conservation programs for promoting sustainable agriculture, in addition to federal programs. Nonetheless, farmland in Iowa is subject to unsustainable rates of soil erosion (DeLong et al. 2015) and continues to be a major source of water quality impairment from sediment and nutrient loading (Arbuckle, 2013). Lessons learned in Iowa on how stakeholders respond to critical environmental situations may help in understanding developing dynamics in other U.S. states.

The stakeholders interviewed either support the development and implementation of Farm Bill programs or directly lobby the USDA on behalf of farmers, agribusiness, or in favor of natural resources. The interviewed sample includes farmer groups, commodity groups, agribusiness groups, government agencies, and environmental NGOs (Table 1). The groups included in the study generally represent the broad coalition of interests involved in federal agri-environmental policy. Although all stakeholders were treated as equal voices in this paper, we acknowledge that they have different political power over the process by which the Farm Bill is created. We also acknowledge that within the same stakeholder group,

specific organizations may have different perspectives on conservation programs, also because stakeholders benefit differently from the Farm Bill. As an example, in the farming sector we have interviewed groups that tend to represent larger-scale farmers (IFB), smaller-scale farmers (IFU), and a farmer-to-farmer research and education group (PFI). Studies indicate that the distribution of income from conservation programs as well as from other payments have shifted to larger farms, as opposed to smaller farmers, as U.S. agricultural production continues to consolidate over time (Mcfadden and Hoppe 2017).

We followed a purposive approach to participant selection. First, we identified key organizations that play a significant role in conservation policy and program development and implementation (table 1). Persons who are most involved with conservation programs in each organization were then recruited to participate. Interviews were held with the persons with responsibility for conservation programs in each organization. In several cases, one or two other experts from the organizations joined the interview voluntarily. Interviewees were asked to respond to the questions on behalf of the organizations they work for, therefore representing the organizational team they lead and expressing organizational perspectives. We interviewed multiple stakeholder organizations from each of the following types: farmer groups, state and federal government agencies, commodity groups, agribusiness groups, and environmental NGOs.

Interviews were conducted in the stakeholders' offices following a semi-structured protocol covering the strengths and weaknesses of existing programs as well as suggestions for improvements. Interviews were transcribed and compared to identify convergences and divergences among stakeholders' viewpoints. The results are presented in comparative tables and figures that summarize stakeholders' perspectives and key outcomes are illustrated by quotes. Interviewed persons have authorized the recording of the interviews as well as the use of quotes. To protect participants' identities, quotes are only attributed to the category of organization they work for, not the specific organization.

Table 1: List of interviewed stakeholder groups

Type	Organization	Organization role, as related to Farm Bill and conservation
Iowa farmer group	Iowa Farm Bureau (IFB)	State level of the American Farm Bureau Federation: Lobbies on behalf of farmers
	Iowa Farmers Union (IFU)	State level of the National Farmers Union: Lobbies on behalf of family farmers
	Practical Farmers of Iowa (PFI)	Solution-based farmer-to-farmer research and education
Iowa commodity group	Iowa Corn Growers Association (ICGA)	State level of the National Corn Growers Association: Lobbies on behalf of corn growers
	Iowa Soybean Association (ISA)	State level of the American Soybean Association: Lobbies on behalf of soybean growers
Iowa agribusiness group	Agribusiness Association of Iowa (AAI)	Represents agricultural product retailers and other agribusinesses
	Iowa Agriculture Water Alliance (IAWA)	To unite agribusinesses and other stakeholders in support of water quality
Federal agency	National Laboratory for Agriculture and the Environment (NLAE)	Supports the development of conservation practice standards
	Natural Resources Conservation Service (NRCS)	Implements conservation programs, provides technical assistance in county offices
State agency	Iowa Department of Agriculture and Land Stewardship (IDALS)	Promotes state-level policies for land stewardship in coordination with federal policies
	Iowa Department of Natural Resources (IDNR)	Targets areas of watersheds to improve water quality in Iowa
Environmental NGO	Environmental Working Group (EWG)	Lobbies in favor of protection of the environment
	Iowa Environmental Council (IEC)	Advocates for a cleaner, healthier Iowa

3. Theoretical framework

3.1. Theoretical background

We employ a conceptual framework adapted from Hall (1993) and Atwell et al. (2011) to examine stakeholders' perspectives on strengths and weaknesses of the major U.S. federal conservation programs. We use the framework to guide exploration of stakeholder's assessments of possibilities for

changes in the Farm Bill programs as a means for effective promotion of sustainable agriculture as well as for identifying conceptual differences among different stakeholders' perspectives on policy change.

Comparative policy studies suggest that policy is influenced by interest intermediaries that stand at the intersection between the state and society (Hall 1993). In this sense, different stakeholders may have different political power over the process by which the Farm Bill is framed (Bosso, 2017) as they influence members of Congress responding to electoral incentives (Bellemare and Carnes 2015). By adopting this approach, this paper adds to substantial works on the US Farm Bill (Johnson and Monke 2017; Mcfadden and Hoppe 2017), by presenting an empirical study on stakeholders' perspectives and how they might inform Farm Bill programs and practices.

Policy changes can be disaggregated into three subtypes according to the magnitude of the changes involved. The process of first and second order changes are likely to display the features of incrementalism and development of new policy instruments but still within the same policy paradigm (Hall 1993). Third order change refers to change of paradigm, which is preceded by significant shifts in the locus of authority over policy and experimentation of new forms of policy (Hall 1993). In other words, policy changes include the fine-tuning of existing policy instruments (Tweak), adaptation of the existing instruments (Adapt), and transformation of the policy (Transform) (Atwell et al. 2011).

In figure 1 we draw primarily on Atwell et al. 2011 to develop a theoretical framework that illustrates possible pathways for future changes in the Farm Bill conservation programs. The mainstream incremental changes focus on tweaks and adaptations on policy instruments operating at the farm level. The alternative transformative changes encompass emerging issues such as the need to address water and nutrient management through policy instruments operating at the landscape level. Ranging from incremental tweaks and adaptations to transformative proposals, stakeholders can be identified along a continuum of paradigmatic orientation (Arbuckle 2009; Taherzadeh and Howley 2018). This theory

reveals possible pathways for policy changes and provides a framework for differentiating stakeholders' perspectives according to their adherence to more incremental or transformative ideas.

Policy resilience is supported by a capacity to absorb new ideas and still maintain its essential configuration (Atwell et al. 2011). However, the process of internalizing new ideas may result in changes in the locus of authority over policy from one stakeholder to another and a broadening of the policy network (Hall 1993) or shifting of policy structures (Cloke and Goodwin 1992).

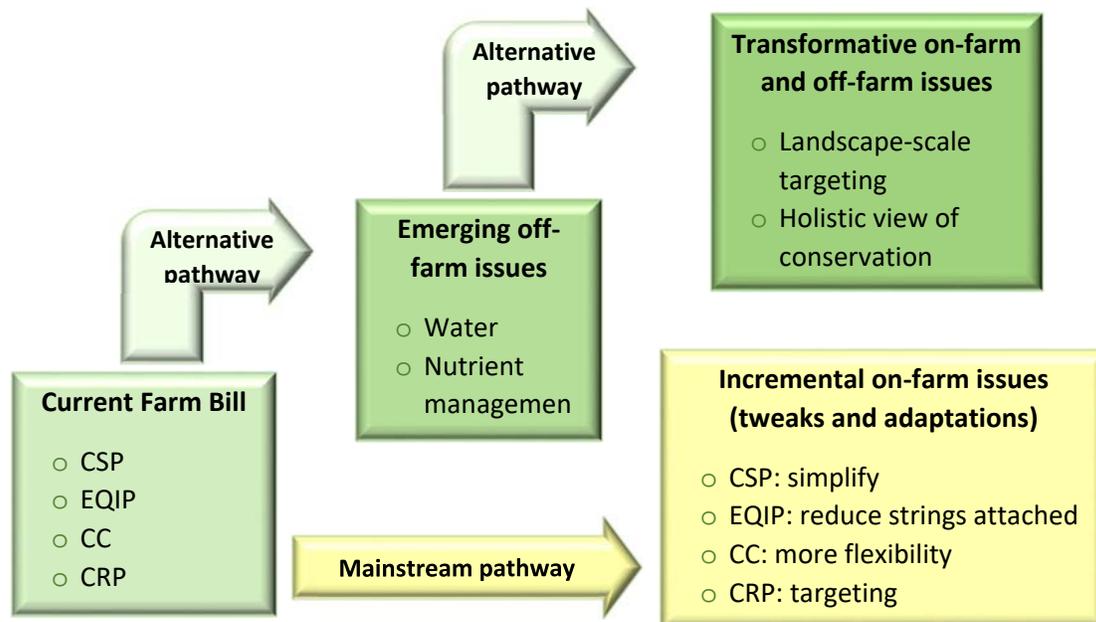


Figure 1. Theoretical framework

3.2. Conservation programs

Key Farm Bill conservation-related programs include: working lands programs, such as the Conservation Stewardship Program (CSP) and Environmental Quality Incentive Program (EQIP) and land retirement programs, such as the Conservation Reserve Program (CRP) and Conservation Compliance (Table 2). The CSP rewards good stewards for existing behavior and promotes further improvements by sharing the

costs farmers have for implementing conservation practices that help ensure the sustainability of their operation. EQIP also addresses natural resource concerns on private lands by providing cost-share to farmers for implementing soil and water conservation practices (Reimer et al. 2013).

The CRP facilitates the removal of environmentally sensitive lands from agricultural production for the length of a contract period (either 10 or 15 years) and provides financial assistance for installation of resource-conserving practices (Hendricks and Er 2018). The CRP program includes the Conservation Reserve Enhancement Program (CREP), which addresses high-priority conservation goals identified by the state, and then federal funds are supplemented with non-federal funds¹ (Lambert et al. 2007).

Conservation Compliance establishes that a portion of crop insurance subsidies or other USDA benefits can be lost if a producer is found to produce an agricultural commodity on highly erodible lands (HEL) without implementing an approved conservation plan or qualifying exemption, or converts a wetland to crop production (Arbuckle 2013a). The RCPP is a relatively new program, established to encourage landscape-scale cooperation that helps farmers to address soil, water, wildlife and related natural resources conservation goals (Johnson and Monke 2017).

Table 2: Aims and incentives provided by the assessed Farm Bill programs

Focus	Program	Aims	Incentives
Working lands	CSP	Rewards good stewards for existing behaviour and promotes further improvements	Shares the costs farmers have for implementing conservation practices in their farms as a whole, including practices such as reduced tillage and nutrient management plans

¹ The most relevant state-level programs in Iowa supplementing federal programs are: 1. State Revolving Funds (to make loans to producers at 3% or less interest); 2. Water Quality Initiative (for addressing issues related to Nitrogen and Phosphorus), and 3. Iowa Financial Incentives Program (a 50% cost-share program).

	EQIP	Addresses natural resource concerns on private lands by promoting specific practices	Shares the costs farmers have for trying out specific conservation practices such as cover crops in the first years
Land retirement	CRP	Facilitates the removal of environmentally sensitive lands from agricultural production	Pay farmers for setting land aside as a means for establishing practices such as pollinator habitat and buffer strips
	Conservation Compliance	Prevents the use of highly erodible lands (HEL) for agriculture without an approved conservation plan or qualifying exemption	Establishes that a portion of crop insurance subsidies or other USDA benefits can be lost if a producer is found to produce on HEL
Other	RCPP	Encourages landscape-scale cooperation that helps farmers to address conservation goals	Support organizations promoting landscape-level conservation initiatives

4. Results

We organize the results section in reference to our theoretical framework. We first examine stakeholders' assessments of existing programs and suggestions for changes that fall into the "tweaks and adaptations" categories. These are generally suggestions that would potentially make incremental improvements but not substantially alter the programs and their implementation. The second section

focuses on stakeholders' ideas and suggestions that would require or create more transformational changes to programs and program implementation.

4.1. Existing programs: Tweaks and adaptations for incremental changes

Most of the farmer and agribusiness groups proposed incremental tweaks and adaptations for the next Farm Bill and beyond (Table 3). In general, farmer organization representatives expressed that existing conservation programs have delivered good outcomes, as indicated by the reduction of soil erosion over time: "The whole basket of conservation programs works fairly well; in some respects there is a little bit of everything for everybody in the basket. In Iowa, the preference is probably for more of the working lands programs rather than retirement programs, but the retirement programs have their place and have done some fairly good stuff relative to the erosion control etc." (Farmer group).

Farmer group representatives also tended to emphasize that conservation is fundamentally an individual farmer issue, as opposed to a public issue: "It is in his [a farmer's] best interest to protect his soil" (Farmer group). Governmental agency representatives appeared to share this vision, emphasizing farmers as protagonists: "The real center of conservation on working lands in a place like Iowa or any major agricultural area, really the ownership has to be with the farmers and ranchers themselves. If people see conservation as something that the government is responsible for, then I think we are in trouble because they will not do anything until they can get an incentive, they are not going to do anything until they can get a cost-share" (Federal agency).

Conservation programs are considered a catalyst of the adoption of conservation-related practices. According to several farmer organization representatives, government should focus on incentivizing this adoption: "We support voluntary conservation efforts, finding ways to incentivize efforts, but not

creating a whole new set of regulations to penalize farmers in a one-size-fits-all approach (Farmer group).

Among Environmental NGOs and some governmental agencies and commodity group participants, however, several suggested a need to broaden the scope of agricultural policies. Governmental agencies promote the concept of soil health as a potential step forward: “We want to take the conversation well beyond erosion and talk about soil health” (Federal agency). At the same time, for some stakeholders, soil erosion remains a core issue: “Soil conservation is so fundamental to sustainability and even the survival of our species that we can’t lose sight of that. And if anyone has declared victory on that they’re wrong...” (Agribusiness group).

Some stakeholders, particularly environmental NGOs, promote targeting existing programs to critical areas: “These programs are kind of operated cafeteria-style, where it’s mostly whatever the producer wants to do, not necessarily what’s best for the environment... If we are going to continue to spend this kind of money, we need to really focus this program on new work by landowners to improve, that’s focused on the most critical environmental issues that agriculture faces. We cannot just see CSP as an alternative way to support farm income” (Environmental NGO). State agency staff echoed this idea: “There are certain areas that can be bigger contributors to problems by virtue of slope, soils, poor practices, soil type... we need to get better at targeting our limited resources” (State agency).

Table 3. Stakeholders' perspectives on changes to be promoted through agricultural policy

	CSP	EQIP	CRP	CC	RCPP
Iowa Farm Bureau (IFB)	Working lands programs are preferred to retirement lands programs.	Supports farmers updating facilities and adopting technologies. Should maintain current focus on livestock.	Cap at 24 million acres, targeting marginal land and not enrolling entire farms. Align payments with current cash rents, not past.	Want more flexibility, simpler notification and appeals processes. Do not extend to all cropland acres.	---
Iowa Farmers Union (IFU)	It should be made available to more farmers.	Should not subsidize concentrated animal feeding operations.	More targeting to environmentally sensitive areas. Enrolling entire tracts of land does not maximize benefits.	Resume enforcement and spot checks, as this has decayed in past years.	It has been effective, but the level of funding is not enough.
Practical Farmers of Iowa (PFI)	Help scale up conservation efforts. Program quality varies by county.	It is a starting point, with farmers eventually rolling over into CSP.	Concerns with high payments and the inability to graze land enrolled in CRP.	It is not a key area for the organization, which focus mainly on CSP and EQIP.	---
Iowa Corn Growers Association (ICGA)	Program complexity a concern. Payment rates not aligned with expectations.	Simplest of the programs, which farmers like.	Payments shouldn't exceed the county average cash rent. Target sensitive areas. Maintain the national 24-million-acre limit.	Want flexibility for extreme weather, more flexibility for regional offices, and one-year grace period.	There are too many hoops for applicants to jump through with RCPP. Participation should be made as easy as possible for farmers.
Iowa Soybean Association (ISA)	Payments should be linked to environmental performance.	Payments are made for improvements, which makes it simple. But it's not as progressive as other programs.	It should focus only on environmentally sensitive lands. Favor allowing haying and grazing of CRP in exchange for a reduced rental payment.	Conservation planning is needed to ensure farmers are taking a holistic look at their farm and for accountability.	It has been a success. The projects are "shovel ready". there is good alignment of partners, and the program fits well with the Nutrient Reduction Strategy.
Agribusiness Association of Iowa (AAI)	Reduce strings attached and improve compatibility with the way farms are run.	Reduce strings attached. Different cost-shares between states cause confusion.	Programs have been effective for what their priorities have been. 100% cost share for CREP is fair.	It has been effective, generally flexible enough. Reluctant to see it applied to all cropland.	---
Iowa Agriculture Water Alliance (IAWA)	Focuses on ecosystem services & real outcomes. It should be linked to performance.	Tease out the benefits each practice as a means to set the level of cost share.	---	It isn't as effective as it could be. There is less emphasis and auditing on it than there was a couple of decades ago.	RCPP is a wonderful program. It has helped catalyze partnerships and landscape-level conservation work.
National Laboratory for Agriculture and the Environment (NLAE)	The specific programs can all be deployed in a holistic, scalable approach that addresses not only soil erosion, but water quality and nutrient management. Farm policy tends to look at a field in isolation, not the entire landscape. It must take a more holistic view.				
Natural Resources Conservation Service (NRCS)	Rewards the good stewards but lacks transparency in the enrollment.	---	---	The program has been effective. Now we want to take the conversation beyond erosion to soil health.	Has been very successful--seeing cover crop adoption at least 10 times the state average.
Iowa Department of Agriculture and Land Stewardship (IDALS)	To restructure tier system as some people are getting into who aren't the best stewards.	Helpful for farmers trying to get to CSP.	Target the most sensitive areas.	It provides needed accountability for farmers receiving federal crop insurance subsidies.	---
Iowa Department of Natural Resources (IDNR)	IDNR does not work directly with these programs. Therefore, the organization has no specific comments on individual programs. To improve water quality, we must target and focus on improving critical areas. Random acts of conservation aren't effective.				
Environmental Working Group (EWG)	Should be more targeted. Pay for performance, not	There are huge opportunities for targeting.	Maintain 25,000,000 acres in CRP through 2023 and target the most environmentally sensitive land for protection(EWG 2017)(EWG 2017)(EWG 2017)(EWG 2017)(EWG 2017)(EWG 2017)	It should apply to all annually planted cropland. Mandate	Provide \$300 million annually to the RCPP to create partnerships with local

	for practices.		2017)(EWG 2017)(EWG 2017)(EWG 2017)(EWG 2017)(EWG 2017)(EWG 2017)(EWG 2017)	annual reviews of compliance.	entities.
Iowa Environmental Council (IEC)	<u>Supports good stewards but doesn't provide the biggest bang for the buck.</u>	---	Allow grazing and certain other activities on CRP. Long term CRP easements are essential.	<u>It should be extended beyond highly erodible lands to all annually planted cropland.</u>	<u>Should be a priority in the next farm bill. Must be more user-friendly and include funding for outreach.</u>

Source: Interviews with representatives of those organizations.

Label: **Yellow** – Incremental changes; **Underlined green** - Transformative changes; White – Unclear or unspecified.

Overall, farmers' organizations provided incremental proposals for revising current programs. Specific issues included simplifying CSP, easing EQIP requirements, preventing farmers from being out of compliance on highly erodible land due to unforeseen weather events, and avoiding excessive CRP payments competing with farmers for good agricultural lands (Table 3). Farmer and agribusiness groups supported reducing "red tape" surrounding conservation and better adapting standards to farming dynamics. Specific tweaks and adaptations proposed for each program are summarized below:

CSP

Farmer organizations supported increased funding for CSP as "it's great at helping farmers scale up conservation efforts" (Farmer group). They supported growing funding as "some members also believe that the payment rates aren't aligned with this program's high expectations" (Commodity group). At the same time they defended the need to "reduce strings attached and improve compatibility with the way farms are run" (Agribusiness group) once "the complexity of the program is a concern, especially when compared to normal cost share" (Commodity group). In this sense, "CSP should be made available to more farmers as it is now too targeted and restricted because of minimal funding" (Farmer group).

Environmental NGOs, government agencies and some commodity groups supported changes that would more precisely target programs to better optimize benefits: "If we are paying farmers for something they are doing anyway, this might not be the best bang for our buck" (Agribusiness group). "Payments should be linked to environmental performance, not just the implementation of practices" (Commodity group). They argued that CSP "should be more targeted" (Environmentalist NGO) "as some people are getting into CSP who aren't the best stewards...we're putting them into this stewardship security program which is almost an embarrassment." (State agency).

EQIP

In general, farmers' organizations supported working lands programs—particularly EQIP—to a greater extent than land retirement programs: “Most Iowa farmers are interested in updating facilities and adopting new technologies, which EQIP does a good job of supporting” (Farmer group). It is deemed to be the simplest of the programs as “many of the practices supported by this program are structural; depending on what you sign up for, you could be done in a few months” (Commodity group). State agency staff considered EQIP particularly “helpful for farmers trying to get to the CSP level” (State agency).

Environmental organization staff tended to consider that EQIP's impacts would be greatly enhanced if the program were more effectively targeted to resource conservation needs on the landscape, “A lot of our critique of EQIP is similar to that of CSP...there's huge opportunities to target the program better, getting the most effective practices in the most effective places” (Environmental NGO). Other suggestions include investing 15% of EQIP budget to help producers reduce the need for pesticides (EWG, 2017). There are also suggestions “to tease out the benefits each practice has to private farmers and the general public as a means to set the level of cost share” (Agribusiness group). Iowa Farmers Union, which represents mainly smaller-scale farmers, considered that EQIP should not be used to subsidize large concentrated animal feeding operations (IFU, 2017).

CRP

Farmer groups and agribusiness organizations identified several shortcomings of CRP from their perspectives. As one farmer group interviewee proposed, “targeting CRP to marginal land, not enrolling entire farms in the program, as targeted use of land retirement programs such as along stream buffers can often provide water quality benefits without enrollment of whole tracts or fields” (Farmer group). A commodity group participant noted that “CRP payments are too high in some cases, causing farmers to lose out on renting ground and that CRP payments shouldn't exceed the county average cash rent for

comparable farmland” (Commodity group). Several organizations also considered that CRP was too restrictive, as the quote “grazing and certain other activities should be allowed on CRP land as they make financial sense and are environmentally sustainable” demonstrates (Environmental NGO).

The Environmental Working Group supports maintaining 25 million acres in CRP through 2023 and targeting the most environmentally sensitive land for restoration and long-term or permanent protection (EWG, 2017). Government agency participants also tended to support targeting CRP to the most sensitive areas as means to promote edge-of-field practices in areas to be taken out of production (Table 3).

Conservation Compliance

Farmer groups and agribusiness organizations generally supported Conservation Compliance in its current form, which only applies to highly erodible lands (HEL). They opposed extending Conservation Compliance to cover non-HEL or other areas such as water quality or wildlife habitat. Overall, farmer groups have been in favor of conservation compliance, but they think it could be improved—more flexibility, simpler notification and appeals processes; and “the organization does not believe conservation compliance should be extended to all cropland acres” (Farmer group). Corn Growers want flexibility for extreme weather, more flexibility for regional offices to acknowledge whether a farmer has made best efforts at conservation, and one-year grace period where appropriate (ICGA, 2017).

Other stakeholders, including environmental NGOs, commodity groups and some farmer organizations, expressed that crop insurance should be more strongly linked with conservation practices, that Conservation Compliance should be more stringently enforced, and that it should be extended to all agricultural land, “Conservation compliance isn’t as effective as it could be and there is less emphasis on it than there was a couple of decades ago” (Agribusiness group). Farmer organizations also supported resuming enforcement and systematic spot checks to some degree (Table 3). The environmental group

participants suggested that “conservation requirements should apply to all annually planted cropland and it is also important to mandate annual reviews of compliance status with the approved conservation system on no less than 5% of the tracts” (Environmental NGO).

RCPP

Interviewed farmer and agribusiness groups did not have a clear view on the RCPP program, possibly due to the fact that this program is implemented at the landscape level and does not support farmers directly. Environmental NGOs, governmental agencies and commodity groups saw RCPP as a promising program, although it seemed that this view was still based on initial insights because the RCPP was a relatively new policy measure.

4.2. Improving conservation: Transformative changes for dealing with greater challenges

Water quality and nutrient management challenges have come to rival soil erosion management in terms of concern, as one environmental group staff noted: “The whole conversation around these issues is really starting to change, and it’s changing because the environmental consequences of farming are beginning to touch people directly. You know, with drinking water, or toxic chemicals, or beach closings because of pathogens. This is really new” (Environmental NGO). Government agencies also report the challenge: “Soil erosion can be very visual... Nutrients are hard to conceptually see and understand, and factors that affect those [nutrients] can be vastly different” (State agency). Environmental NGOs and agency groups tended to emphasize off-farm challenges more than farmers’ organizations, which focused more on on-farm practices² (Figure 2).

² Some agribusiness organizations, however, also are focusing on these new challenges and have teams for both making clear farmers’ responsibilities and promoting farmers’ achievements: “The nutrient strategy is the reason I work here... With the science we can say in general we have x million acres with cover crops we can expect to see a 30% reduction in N losses” (Agribusiness group).

Conservation practices to improve nutrient management and water quality can be separated into structural practices and management practices. Structural edge-of-field practices were strongly promoted by private agribusiness organizations: “We can’t get to the 45% [the Iowa Nutrient Reduction Strategy’s goal] with infield management alone. ... We need this additional capacity through the edge-of-field practices to achieve at least the goals we have for Iowa. So that gets at, hopefully, I think over time, public policy to better recognize that and to better view the ways that they should be incentivizing that” (Agribusiness group). Another agribusiness group shared a similar viewpoint: “We probably need about 120,000 bioreactors and saturated buffers in Iowa to implement our nutrient reduction strategy, and like I said, we have less than one hundred today” (Agribusiness group).

Other organizations supported management changes:

“The biggest impact for water quality will probably come from getting producers to adopt different systems that change the dynamics of nutrients relative to water. Because if you look at nitrate, nitrate is extremely mobile in the water... We’ve shown that if we go to side-dress applications of nitrogen, splitting that nitrogen out so that it is much more available when the crop needs it rather than being all available at one time in the season, then we have a tremendous impact on water quality. But that requires that producers make a change in their management practices. And it’s not structural.” (Federal agency)

To a certain extent, water and nutrient management is still an on-farm and private issue, as farmers want to keep nutrients in their soil. But water and nutrient management is also an off-farm issue, particularly as farms can become a non-point source of pollution for watersheds. Farm externalities, particularly nutrient runoff, bring attention to the need for scalable agricultural policies that address the issue of water impairment at a landscape level. Several interviewees reported a need for this landscape-level mentality:

“I think farm policy ought to take a much more holistic view than it does. Farm policy tends to look at a field as a unit, and not the landscape as a unit. ... If we can do anything with science, it is to get them [policy makers] to understand that agriculture exists in this landscape-ecosystem context. If we can get that piece of science into it, we can have tremendous impacts on what we do and how we move forward in agriculture.” (Federal agency)

Several stakeholders reported promising on-going water quality and nutrient management initiatives in Iowa. Some are statewide projects, and others are organized on a watershed basis. The Middle Cedar Partnership Project was reported by both state or federal agency groups and commodity groups as a promising initiative addressing increasing concentrations of nitrates and extreme flood events in the Cedar River. This initiative promotes best management practices, such as cover crops, nutrient management, wetlands and saturated buffers. At the state level, the Iowa Nutrient Reduction Strategy is perhaps the most well-known initiative surrounding water quality, as reported by a State of Iowa agency.

These initiatives have been deployed with the support of the various agricultural policy programs. The 2014 Farm Bill created RCPP, and stakeholders view this program as particularly relevant for addressing these landscape level water quality issues: “RCPP might be the only program that is really intentionally designed for working at the landscape watershed level” (Agribusiness group). “We wanted to scale up [water quality efforts] and do these things in a bigger way, but we’ve been constrained by what the market allows us to do, the government policies allow us to do... RCPP can help catalyze some things and can help support a longer range view but it isn’t the complete driver of success” (Commodity group).

Conservation planning was viewed by some as another fundamental program for promoting water quality: “To have water quality improvements, you need to have boots on the ground and be knocking

on doors and reach out to farmers with critical land and major runoff issues. You don't just want random acts of conservation" (Federal agency). Nevertheless, some stakeholders had critiques, exemplified by a farmer organization participant: "I don't believe many farmers understand [conservation planning] and the need for that" (Commodity group); "A farmer knows what he wants to do, and he's going to get quickly discouraged from having to go through those [conservation planning] hoops when all he wants to do is plant some cover crops" (Commodity group).

Figure 2. Stakeholders perspectives on key issues regarding future Farm Bills

	Perspective	I B	I U	P I	IC G A	I S A	A AI	IA W A	N LA E	N R CS	ID AL S	ID N R	E W G	I E C
	Existing programs													
1	Programs have delivered on soil erosion	■	■	■	■	■	■	■	■					
2	Conservation is a farmer issue	■	■	■	■	■	■	■	■	■				
3	Some issues remain	■	■	■	■	■	■	■	■	■				
3.1	Specific incremental improvements on CSP, EQIP, CC, CRP (see Table 3)	■	■	■	■	■	■	■	■	■	■			
3.2	General (more budget, less red tape, more boots on the ground)	■	■	■	■	■	■	■	■	■	■			
3.3	Revisit T	■	■	■	■	■	■	■	■	■	■			
3.4	Promote soil health									■				
3.5	Focus on critical environmental issues													■
3.6	Avoid internal contradictions in the FB		■							■				■
4	Pay for performance, not practices					■		■						■
	Greater challenges													
5	Water quality and nutrient management are emerging challenges					■	■	■	■	■	■	■	■	■
5.1	Water quality and nutrient management is a private issue					■	■	■	■	■	■	■	■	■
5.1.1	To be dealt with infrastructure (edge field)					■	■	■	■	■	■	■	■	■
5.1.2	To be dealt with behavior change (management practices)					■	■	■	■	■	■	■	■	■
5.2	Need for a landscape/holistic approach					■	■	■	■	■	■	■	■	■
6	Promising on-going projects exist		■											
6.1	RCPP has potential					■	■	■	■	■	■	■	■	■
6.2	Prioritize conservation technical assistance					■	■	■	■	■	■	■	■	■
6.3	Precision conservation is needed					■	■	■	■	■	■	■	■	■

	How to overcome the challenges																			
7	Bridging the short- and long-term gap - the Farm Bill's role	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
7.1	The need for more budget	■	■																	■
7.2	The need for mandatory regulations	■																		■
7.3	Landowner has a role in addressing long-term sustainability	■		■		■	■													■
8	Limited possibilities for transformative changes leading to holistic paradigm	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Source: Interviews with representatives of listed organizations.

Label:  Possible cluster of stakeholders.

Stakeholders all agreed that the Farm Bill has an important role in helping farmers and society to bridge the gap between the short-term pressures to make profit margins and long-term imperatives of conserving natural resources. A staff from a farmer organization pointed out: “If a farm is to do long term conservation goals that cost money, for the farm to stay in business we want a robust risk management program...those programs [farm bill programs] help a farmer stay in business and allow them to make investments for the future, which includes conservation improvements” (Farmer group); “Our number one message was that what’s in front of us for this next farm bill, the task is daunting, it’s big. Farm income is down, farmers are dealing with fewer choices on the agribusiness side of things to buy their products, to sell their products—it’s a consolidated marketplace. At the same time these things are happening, we are asking farmers to do more and more for the water and landscape” (Farmer group).

The need for a mandatory approach was promoted by environmental organizations: “We are arguing that after thirty-some years, it’s time to ask farmers to do more, and with a focus on water quality. So we’re proposing that the conservation requirements apply to all annually planted cropland, not just highly erodible cropland” (Environmental NGO). Other organizations took a similar stance: “There are some standards on farm ground that everybody should be doing. You should be doing minimal or no-till,

you should be doing continuous coverage [cover crops], you should be doing grassed waterways... what we're saying is that policy should enforce certain basic standards of care on all agricultural land" (Environmental NGO). Conversely, commodity and farmers organizations favored the voluntary approach as presented in section 4.1.

Lastly, considering the increasing challenges posed by water quality, nutrient management, and soil health, stakeholders were asked about the possibility of transformative change during the next revision of the Farm Bill. Some stakeholders articulated the need for a transformative approach: "I do think it is going to take something more transformative to seriously address this issue [water quality and nutrient management]" (Farmer group). However, key organizations tended to promote incremental changes (Table 3), and no interviewed stakeholders foresaw transformative change happening for the next farm bill (Figure 2): "The farm bill has always been about evolutionary progress not revolutionary, and we can only go so far in one farm bill" (Agribusiness group); "The reality is that's [transformative change] not going to happen in this Congress, but we think it's really important to start talking about it" (Environmental NGO).

5. Discussion

As stakeholders lobby for changes in future Farm Bills, this study reveals their perspectives on the strengths and weaknesses of existing conservation programs and new conservation challenges to overcome. By doing so, this paper adds to the literature on conservation in the US Farm Bill (Johnson and Monke 2017; Mcfadden and Hoppe 2017) by addressing an important gap in the research regarding stakeholders' perspectives on the relative effectiveness of Farm Bill programs and practices. It therefore contributes to our understanding of the opportunities and challenges for future policy changes to effectively promote sustainable farming practices.

General issues recognized by farmer and agribusiness organizations include reducing “red tape” surrounding conservation, and better adapting management standards to farming dynamics. All interviewed farmer organizations argued that changes are needed to help bridge the gap between short-term farm profit and long-term environmental sustainability. Overall, farmer groups’ suggestions tended toward incremental proposals for revising current programs. While the Iowa Farmers Union, which tends to represent smaller-scale farmers, was keener on supporting transformative changes on current programs, the Iowa Farm Bureau, the state chapter of what is arguably the most powerful farmer organization in the U.S., supported basically incremental changes (Table 3). These different perspectives within the same sector may reflect the fact that the distribution of income from conservation programs have shifted to larger farms over time, as opposed to smaller-scale operations (Mcfadden and Hoppe 2017). The Farm Bureau’s emphasis on conservation program status quo perhaps lends some credence to recent critiques that the organization tends to represent larger-scale farmers and agribusiness interests (Frerick, 2018; Shearn 2012), which might feel threatened by more transformative actions.

A major challenge for sustainable farming now and into the future is nutrient management and water quality (EWG 2017). Recent studies have brought attention to the need for agricultural policies that better address water quality and nutrient management, not just soil erosion (Arbuckle 2013a; Arts et al. 2017; Inman et al. 2018). Environmental NGOs and governmental agencies suggest this approach is fundamental for bridging the gap between farmers’ needs for continued production and societal demands for improved water quality. At the farm level, these stakeholders promote behavioral changes. At the landscape level, the need for a more transformative and holistic approach opens up a new way of thinking about conservation. These findings agree with previous studies bringing attention to the need for broadening the scope of agricultural policies (Arbuckle 2013b; McGranahan et al. 2015), and prioritizing environment protection at a landscape level (Church and Prokopy 2017; Lichtenberg 2015).

However, interviewed stakeholders unanimously foresaw incremental, not transformative, changes for the next Farm Bill. The most influential farmer organization proposed mainly incremental tweaks and adaptation, restricted to first and second order changes to policies and programs (Atwell et al. 2011; Hall 1993). Understanding the politics of agricultural policy helps understanding why the Farm Bill is shaped the way it is besides the critiques and evidences of shortcomings (Rundquist and Cox 2016). But it also reveals important divergences that can shape future changes such as the ones promoted by environmental NGOs (EWG 2017). The process of internalizing new ideas may result in future changes leading eventually to a new set of structured coherences (Cloke and Goodwin 1992).

Some holistic initiatives are already being implemented across the country. Stakeholders reported promising cases of water quality and nutrient management initiatives in the state of Iowa and lessons from those initiatives may lead to future important changes to be incorporated in the Farm Bill. Studies elsewhere are also starting to accumulate important lessons on how to promote landscape-level management approaches targeting soil and water conservation (Church and Prokopy 2017; Inman et al. 2018; Toderi et al. 2017; Westerink et al. 2017).

This study has identified conceptual differences among different stakeholders' perspectives on needs for changes in the Farm Bill conservation programs. While farmer groups, commodity groups and some agribusiness organizations tended to support incremental changes focused on tweaks and adaptations to existing policy instruments, more transformative changes are supported by environmental NGOs and, to some extent, also by government agencies (Table 3). As a consequence, it is possible to say that the current Farm Bill hosts a strong tension among these two main groups and perspectives. Future changes depend on how lobby groups manage to gain political influence. Theory suggest that the process of internalizing new ideas may result in future changes in the locus of authority over policy from one stakeholder to another and a broadening of the policy network (Hall 1993).

6. Conclusions

An understanding of stakeholder's perspectives on the U.S. Farm Bill conservation programs is critical for policy recommendations that aim to meet the challenge of food and environmental security over the coming decades. Our results reveal that influential farmers groups tend to maintain that current conservation programs have been effective at reducing soil erosion and propose only incremental changes to them. Specific issues include simplifying the Conservation Stewardship Program (CSP), easing requirements attached to the Environmental Quality Incentive Program (EQIP), avoiding excessive Conservation Reserve Program (CRP) payments to compete with tenant farmers for good agricultural lands, and preventing farmers from being out of compliance on highly erodible land.

However, results also reveal that agricultural stakeholders are concerned that water quality and nutrient management now represent complex challenges in addition to the historical focus on soil erosion. Environmental NGOs and government agencies, along with some farmer organizations, present transformative ideas to address these issues. At the farm level, they promote both structural improvements and conservation-conscious management practices. At the landscape level, they recognize the need for a holistic, scalable approach to soil and water quality conservation. Some promising landscape-level, multi-stakeholder initiatives are already being reported; this collaborative mentality may continue to shape the approach to conservation in years to come.

However, all interviewed stakeholders believed that incremental, not transformative, changes to Farm Bill conservation programs and policies would be more likely. Environmental NGOs were the most critical voices supporting more radical or fast-paced changes as opposed to incremental improvements. Nonetheless, for the near future, even these stakeholders foresaw no room for transformative changes in the Farm Bill. The mainstream policy change pathways for the near future tend to be incremental

tweaks and adaptations on the current policy instruments operating at the farm level. According to the interviewed stakeholders, more transformative changes have less chance to be implemented in the near future, meaning a lack of political priority for issues such as water and nutrient management through policy instruments operating at the landscape level. Given the enormous challenges that threaten US agricultural sustainability in the form of water quality impairment of inland waterways (National Academies of Science 2018), hypoxia in the Gulf of Mexico (ibid), and soil degradation (Hatfield et al. 2017), issues exacerbated by climate-change, this status quo inertia and inability to implement sufficiently transformative changes is of deep concern.

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