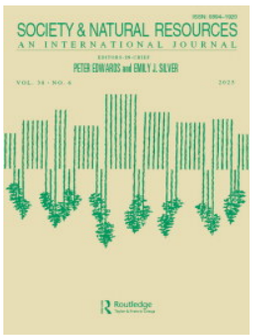

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A Rapid Mapping Review of Studies on the Motivations and Barriers to Participation in the Conservation Reserve Program

Daniel Egerson[a], Bradly S. Thornton[b], Diego Thompson[c], Shannon M. Westlake[d], Mark D. McConnell[a], and Kristine O. Evans[a,b]

[a]Department of Wildlife, Fisheries, and Aquaculture, Mississippi State University, Starkville, MS, USA; [b]Geosystems Research Institute, Mississippi State University, Starkville, MS, USA; [c]Department of Sociology, Mississippi State University, Starkville, MS, USA; [d]Science Application Program, U.S. Fish and Wildlife Service, Louisville, KY, USA

ABSTRACT

The Conservation Reserve Program (CRP) is the largest voluntary land retirement initiative in the U.S., encouraging private landowners to improve environmental quality. This study utilizes the SPIDER framework to examine factors affecting landowner participation in the CRP, reviewing 42 relevant articles from an initial 1,383 search results. Most studies were located in the Midwest, with a notable increase in publications in 2022. Quantitative methods were more common, although much research focused on landowner perspectives rather than practitioners. Key motivators for CRP participation included wildlife/environmental intentions and financial incentives, while barriers involved commodity price fluctuations, contract constraints, perceived program deficiencies, and knowledge gaps. We suggest the need for strategic mechanisms that narrow the information and knowledge gaps among landowners while paying attention to other behavioral factors that influence landowners' decision making beyond incentives.

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KEYWORDS
Barriers; Conservation Reserve Program; Farm Bill; motivations; rapid map review

Introduction

Agricultural land retirement programs have a long history in the United States (Dhingra 2015; Hellerstein 2017). Through the Agricultural Adjustment Act of 1933, which was designed to reduce crop production with relative increase in commodity prices, over 40 million acres (16,187,425 ha) were retired from production in the U.S. (Ferris and Siikamäki 2009). Farmlands are retired for two reasons: (i) to reduce supply and (ii) for conservation purposes (Hodur, Leistritz, and Bangsund 2002; Zulauf et al. 2020). An example of such a retirement program is the Conservation Reserve Program (CRP), found under the Conservation Title of the omnibus set of legislation known colloquially as the U.S. Farm Bill. The CRP originated in the Food Security Act of 1985 as a

CONTACT Daniel Egerson de631@msstate.edu Department of Wildlife, Fisheries, and Aquaculture, Mississippi State University, Starkville, MS, USA.
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voluntary supply control program targeted at highly erodible land (Dhingra 2015; Janssen et al. 2008; C. J. Wachenheim, Lesch, and Dhingra 2006).

Currently, the CRP is designed to establish conservation cover to improve water quality, increase wildlife habitat, and control soil erosion on American farmlands (Dhingra 2015; Ferris and Siikamäki 2009; Hodur, Leistritz, and Bangsund 2002). Producers in the program receive rental payments for removing cropland from production for 10—15 years (Johnson et al. 2016; Schuchard 2011; Stubbs 2014). As of 2022, there were 23 million acres of cropland enrolled in the program, with 5 million acres enrolled in 2022 and an expected 1.9 million acres to expire in 2023 (Ohio Ag Net, 2023). The U.S. Department of Agriculture (USDA) Farm Service Agency (FSA) aims to reach the 27 million acres statutorily estimated for 2023 (USDA-FSA, 2023).

At present CRP is the largest federal private land retirement program, funded by the Commodity Credit Corporation and administered through the USDA's Farm Service Agency (Chang, Lambert, and Mishra 2020; Farm Service Agency 2020; Stubbs 2014). Participation in the program has fluctuated due to a complex set of factors. These include shifts in crop prices, changes to program rules such as soil rental rates, and various provisions enacted through successive Farm Bill legislation. Additionally, CRP participation has been impacted by the economic and environmental effects of certain permitted activities on enrolled land. While such uses like emergency haying, grazing, and limited recreational access are generally restricted, they are allowed under specific conditions and can provide economic relief during adverse events such as droughts. However, if not carefully managed, these activities may degrade habitat quality or soil health. Rising commodity prices, along with legislatively mandated acreage caps which are used to regulate enrollment in response to market trends and funding levels have also influenced participation in the program (Stubbs 2014). These acreage reductions reflect evolving program priorities, fluctuations in enrollment, advances in agricultural technologies, and shifting producer preferences. Together with lower rental payment rates, these factors have limited the availability of land for conservation purposes (Hodur, Leistritz, and Bangsund 2002; Stubbs 2014).

While the CRP is often highlighted for its ecological benefits, including improved vegetation cover, reduced soil erosion, and enhanced habitat for wildlife (A. Allen and Vandever 2012; Johnson et al. 2016; Sullivan et al. 2004), understanding the motivations and constraints faced by landowners is crucial for sustaining participation. Beyond financial incentives, factors such as environmental values, conservation goals, and trust in government programs play significant roles in a landowner's decision to enroll or reenrollll land (Barnes et al. 2019; Caldas et al. 2016; Mitchell and Kimmel 2009). Conversely, barriers such as administrative complexity, technical requirements, and perceived inflexibility can hinder participation and limit program effectiveness (Allen and Vandever 2012; Lute et al. 2018). Given that the enrollment process depends on voluntary decisions from landowners and corresponding approvals by the USDA, understanding these underlying drivers and challenges is essential for optimizing the CRP's conservation outcomes and ensuring its long-term success.

Enrollment in CRP: Historical Perspective

The CRP was born out of a complex interplay between environmental crises and shifting agricultural priorities in the United States. The 1930s Dust Bowl remains one

of the most critical environmental disasters in American history, exposing the consequences of intensive farming and poor land management. It catalyzed a national shift toward soil conservation and set the stage for future policy efforts (McGranahan et al. 2013). By the 1980s, a new crisis loomed—agricultural overproduction led to plummeting crop prices and environmental deterioration, especially in sensitive wetland areas. In response, the U.S. Congress amended Title XII of the Food Security Act of 1985, creating the CRP as a voluntary land retirement program designed to promote environmental restoration and reduce erosion (Berthelsen 1989; Kairumba and Wheelock 1990; Millenbah et al. 1996; Stubbs 2014).

Over the decades, the CRP has evolved significantly. Key legislative updates through the 1990, 1996, 2002, 2008, 2014, and 2018 Farm Bills adjusted acreage caps, expanded conservation practices, and introduced new enrollment mechanisms. For instance, the Environmental Benefits Index (EBI)[1] was introduced in 1990 to prioritize contracts based on ecological value, while the 1996 Farm Bill created the continuous signup[2] streamlining access for landowners adopting targeted practices like riparian buffers and wetlands restoration (Hellerstein 2017; Mitchell and Kimmel 2009; Schuchard 2011). Subsequent policies responded to enrollment trends and environmental priorities raising the acreage cap to 39.2 million in 2002, later reducing it to 24 million by 2018, while introducing initiatives like the Clear Lakes, Estuaries and Rivers 30 (CLEAR) program to extend water-quality-focused contracts (Barnes et al. 2019; Yu et al. 2022). Provisions were also made to support socially disadvantaged producers in transitioning from CRP land to other conservation programs[3] or back to production (Schuchard 2011).

Despite these adaptations, CRP participation peaked in 2007 and has declined steadily since 2012, even in the face of increased rental payments (Ferris and Siikamäki 2009; Steinmetz 2018; USDA-FSA 2023). This trend highlights the limitations of relying solely on financial incentives and underscores the importance of understanding deeper behavioral, social, and structural factors influencing landowner decisions. A growing body of literature shows that landowners' motivations to enroll in CRP are not purely economic; rather, they are multifaceted and deeply tied to environmental, cultural, and personal values.

Common motivations include a desire to protect natural resources, reduce soil erosion, improve water quality, and provide habitat for wildlife. Many participants view their involvement as a reflection of land stewardship or legacy values, particularly among landowners with a strong conservation ethic (Dayer et al. 2018; Drescher and Warriner 2022; Ranjan et al. 2019). Financial incentives, including annual rental payments and cost-share for implementing conservation practices, are also powerful motivators, particularly when they offer a viable alternative to farming marginal lands. However, multiple barriers hinder enrollment and long-term participation. Economic uncertainties remain significant, some landowners are reluctant to retire productive land due to concerns about opportunity costs or the potential impact on farm profitability (Young et al. 2014). Others find that conservation practices may conflict with existing management systems, requiring additional labor, equipment, or expertise (Ranjan et al. 2019). These practical challenges are often exacerbated by the complexity of CRP rules, the length and perceived rigidity of contracts, and administrative burdens tied to enrollment and compliance (Dayer et al. 2018; Prokopy et al. 2019).

Social and structural dimensions further complicate decision-making. Trust or distrust in government agencies and conservation programs strongly affects willingness to participate. Peer influence, particularly from neighbors, local farm advisors, or conservation organizations, can also shape decisions, sometimes encouraging and other times discouraging enrollment c). Land tenure is another critical barrier. Farmers who lease land, especially on short-term contracts, often lack the authority or long-term incentive to implement conservation practices. This is especially relevant given that a growing share of U.S. farmland is rented rather than owned (Dayer et al. 2018). Importantly, positive, or negative experiences with past conservation programs also influence future decisions. Landowners who encountered delays in payments, unexpected compliance issues, or limited technical support may be less inclined to reenroll or recommend the program to others (Lu et al. 2022; Prokopy et al. 2019; Schaub et al. 2023). Conversely, those with favorable outcomes often become vocal advocates for the CRP within their communities.

Despite the existence of several related reviews that address conservation programs broadly (Lu et al. 2022; Prokopy et al. 2019; Ranjan et al. 2019; Schaub et al. 2023), few have delved specifically into the nuances of the Conservation Reserve Program. Our study fills this gap by providing an updated and focused examination of landowner motivations and barriers unique to the CRP. By capturing changes over time and anticipating forthcoming Farm Bill provisions, we identify CRP-specific challenges that have been overlooked in prior meta-analyses. Through this targeted lens, we offer actionable insights aimed at enhancing participation rates and better understanding the underlying dynamics that drive enrollment decisions.

Specifically, our objectives include mapping the geographic distribution of research on CRP participation, pinpointing critical methodological deficiencies, and analyzing key factors influencing landowner enrollment including the often-understudied demographic variables. Addressing these components not only deepens knowledge on participation trends but is also essential to reversing recent enrollment declines. Ultimately, gaining a more comprehensive understanding of these drivers and obstacles is vital to sustaining the CRP's considerable environmental benefits and ensuring its long-term success as a cornerstone conservation program.

Methods

Literature Search and Data Sources

Mapping reviews ae done to define and categorize existing evidence base (Fernandez et al. 2015). Our study gathered data from literature search performed using three major accessible databases: ScienceDirect, EBSCOhost, and Google Scholar. This search was, guided by the SPIDER framework (Sample, Phenomenon of Interest, Design, Evaluation, and Research Type) as proposed by Cooke et al. (2012). This framework was chosen for its effectiveness, particularly in qualitative and mixed-methods research (Cooke et al., 2012; Methley, 2014), enabling the capture of methodological approaches reflective of the field's multidisciplinary nature. The SPIDER framework helped to refine the search strategy by systematically focus on studies based on key components: Sample (landowners, farmers, and producers), Phenomenon of Interest (Conservation

Reserve Program), Design (survey studies, interviews, focus groups, observational studies, and case studies), Evaluation (views, experiences, opinions, perspectives, and attitudes), and Research Type (qualitative, quantitative, and mixed-method studies). Keywords employed in the search included terms such as "motivation," "driver," "barrier," "constraint," "participation," "enrollment," "adoption," and "CRP." This approach ensured a focused and comprehensive review aligned with the study's objectives.

Selection Criteria

The study search, guided by the SPIDER framework, selected articles based on specific inclusion criteria, focusing on: (1) studies examining factors influencing the adoption of conservation practices through government incentive agricultural programs and land retirement programs in the U.S., including the CRP; (2) original research on landowner and farmer participation, satisfaction, and challenges in the CRP; and (3) studies capturing the perceptions of different stakeholder groups including landowners, farmers, and program administrators regarding factors that influence participation in the CRP. The review included peer-reviewed articles, brief reports, case studies, academic theses, and other documents alike published under Creative Commons, focusing solely on English-language publications.

The SPIDER framework was instrumental in streamlining the study selection by aligning each component (Sample, Phenomenon of Interest, Design, Evaluation, and Research Type) with specific inclusion criteria. The review process involved multiple screening stages, beginning with the elimination of duplicates and a preliminary title screening, followed by a selection process where one reviewer screened studies against the inclusion criteria and two additional reviewers independently re-verified these selections to mitigate bias. Finally, abstracts and full-text articles were thoroughly reviewed, with studies not meeting criteria excluded. The remaining studies were organized in Mendeley Reference Manager for further analysis.

Data Analysis

We extracted, imported, and organized data from identified studies using Mendeley software v1.19.8. Mendeley facilitated data organization by tagging and annotating studies based on SPIDER criteria, allowing efficient thematic exploration, and tracking of key findings. Themes were defined through an inductive process during full-text review, with recurring concepts categorized based on the SPIDER framework components. Initial coding captured broad areas of interest, which were then refined into specific, consistently observed themes across studies such as motivations, barriers, and participations. For example, "motivation" included drivers like financial incentives and environmental stewardship; "barriers" reflected issues such as administrative complexity and insufficient payments; and "participation" covered patterns in landowner engagement and program experiences. A full-text analysis was completed, and data were tabulated and visualized using Microsoft Excel. This combination of tools provided an opportunity to query, develop a study characteristics matrix, and thematically explore texts for insights into shared patterns and themes across the articles (Saldana 2013).

Results

Out of 1,383 articles retrieved from databases and additional sources such as academic repositories, 134 were dropped after using Mendeley's automatic duplicate removal option. The screening of titles and abstracts further reduced the articles by 1,102. In the full-text review, 105 were excluded because CRP participation was mentioned only in passing or as a secondary topic, not as the main focus of the study. Finally, 42 articles were included in this review (Figure 1).

Results According to States

Our results showed variability in response elicitation across the contiguous U.S. (Figure 2). For example, 10 out of the 42 articles were national studies that elicited respondents from the entire contiguous U.S., while 17 articles elicited respondents from a few different states per study, and 15 articles elicited respondents from only one state per study. Many of the studies conducted were in regions and states that have significant participation and enrollment in the CRP, as shown in Figure 3.

The Study Publication Year and Journal of Included Studies

We found a range in publication amount regarding the CRP since its inception in 1985. The earliest studies meeting our inclusion criteria were published in 1986 ($n = 2$), whereas the greatest number of articles was published in 2022 ($n = 4$) (Figure 4). The included studies on landowner participation in the CRP were published more in research journals ($n = 30$) than in other mediums. Top journals include Society and Natural Resources ($n = 4$), Journal of Soil and Water Conservation ($n = 4$), Land Use Policy ($n = 3$), Land Economics ($n = 2$), and the Journal of Agricultural and Applied Economics ($n = 2$), while other journals were in single representation such as Geo-Health, Environmental Management, Journal of Land Use Science, etc. (see Supplementary Figures 2 and 3). Aside from research published as an academic thesis ($n = 3$), other contributions in research were found in Agricultural and Economic Reports, and in USDA working papers.

The Method of Included Studies

According to the study methods in the reviewed articles, we found that the mail survey method was used in most of the studies ($n = 25$), while the longitudinal panel was the least method used ($n = 1$). The longitudinal panel survey is a repeated sampling procedure of a cross-section of respondents for an extended period (Babbie 2008). Twelve studies used secondary datasets (i.e., quantitative data that the researcher did not collect). Although the use of mixed methods has been recommended as an enriching complementary design to support findings derived quantitatively, especially in human dimensions in conservation research (Prokopy 2011; Reimer and Prokopy 2014), only five of the included studies used the mixed methods design (see Supplementary Figure 1).

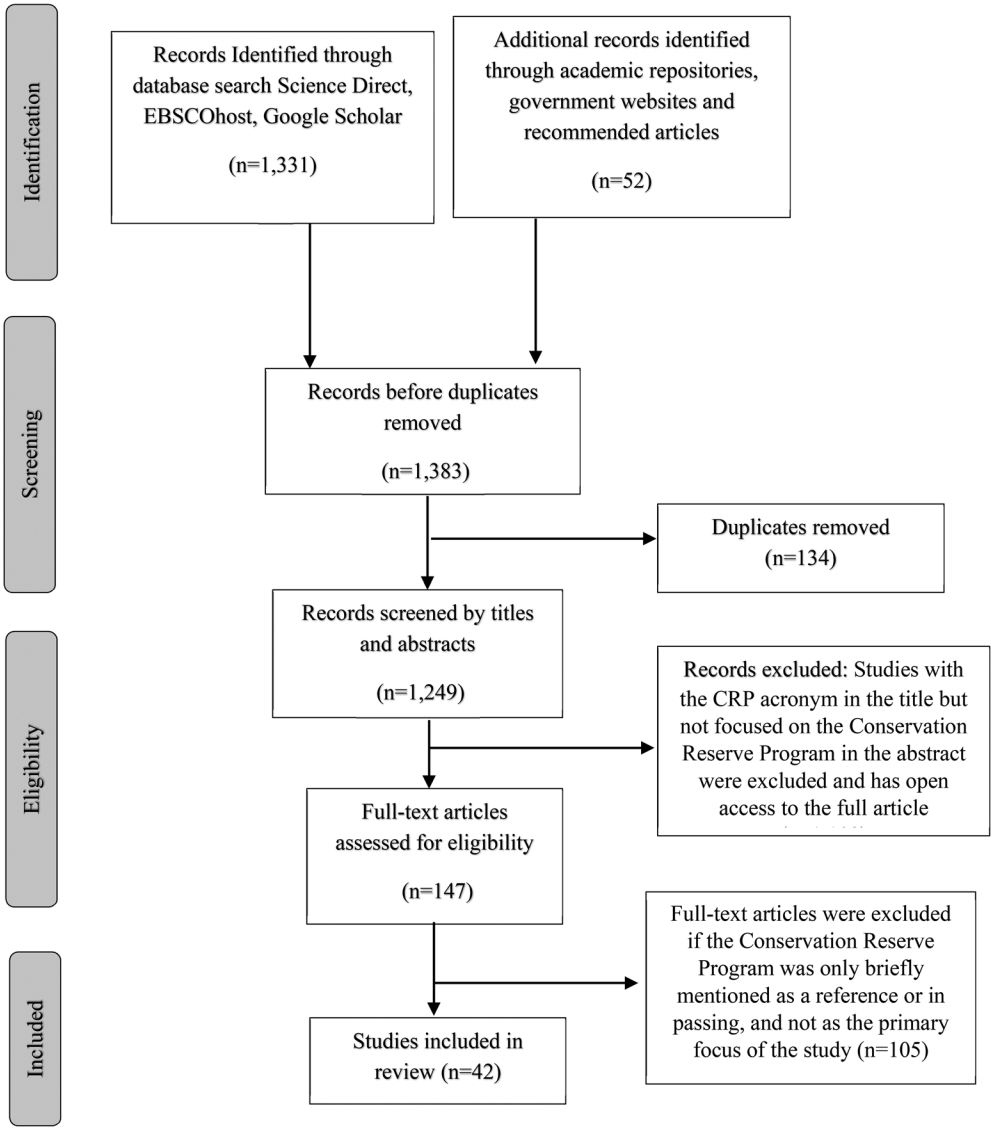

Figure 1. Process for identifying publications that characterize motivations and barriers for participating in the Conservation Reserve Program under the U.S. Farm Bill.

The Study Population of Included Studies

According to the results of the articles included in the study, landowners/farmers were the primary focus in most of the studies ($n = 32$). Other perspectives considered were practitioners ($n = 2$) which includes the USDA's Farm Service Agency, USDA Natural Resources Conservation Service (NRCS), and technical service providers in other conservation agencies and organizations, and specifically on minorities, or small limited resource farmers ($n = 4$). The other perspectives comprise observational studies, and community perceptions (Figure 5).

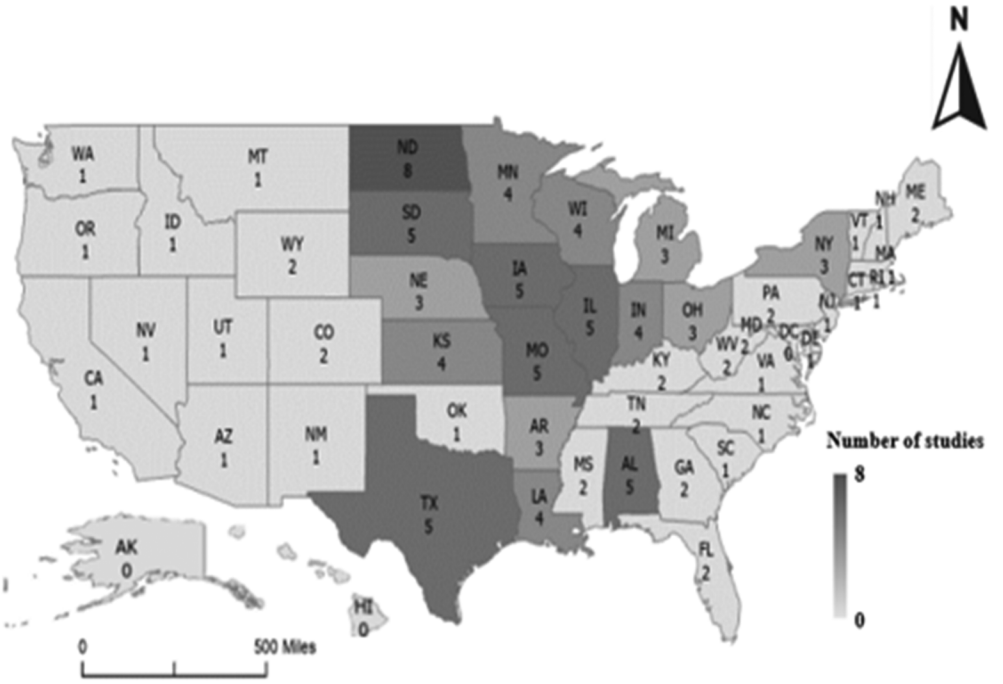

Figure 2. A geographical distribution of the number of study sites identified in the publications across U.S states. Created with Microsoft Excel Geo-Names.

Factors Influencing (Non) Participation in the CRP

We identified several factors along with demographic attributes that characterize participation in the CRP. For instance, attributes like age and income level were the most mentioned defining landowner characteristics in studies ($n = 5$). Other characteristics include education level ($n = 3$), residency pattern of landowners such as absentee or non-absentee landowners ($n = 2$), land tenure system adopted by landowners ($n = 2$), and lastly, landowner status (i.e., those with more assets on farmland and had access to the internet; $n = 2$) as shown in Figure 6. These attributes do not influence participation in itself but are major characteristics defining those that participate in the program.

Demographic Factors

Less than one-third (11 out of 42) of the studies extended their study objectives to examine how demographic factors affect participation in the CRP. One example is residency pattern, where landowners live in proximity to where their properties are located (Figure 6). A study on enrollment in the CRP in the Prairie Pothole Region of the U.S. found that landowners living on the farmland were more willing to participate in the CRP than those who did not live on their farmland (Lim and Wachenheim 2022). Another study by Petrzelka, Buman, and Ridgely (2009) in their study among an understudied group, found that absentee farmers were more discouraged from participating in the program. In a different study, Lute et al. (2018) found in their

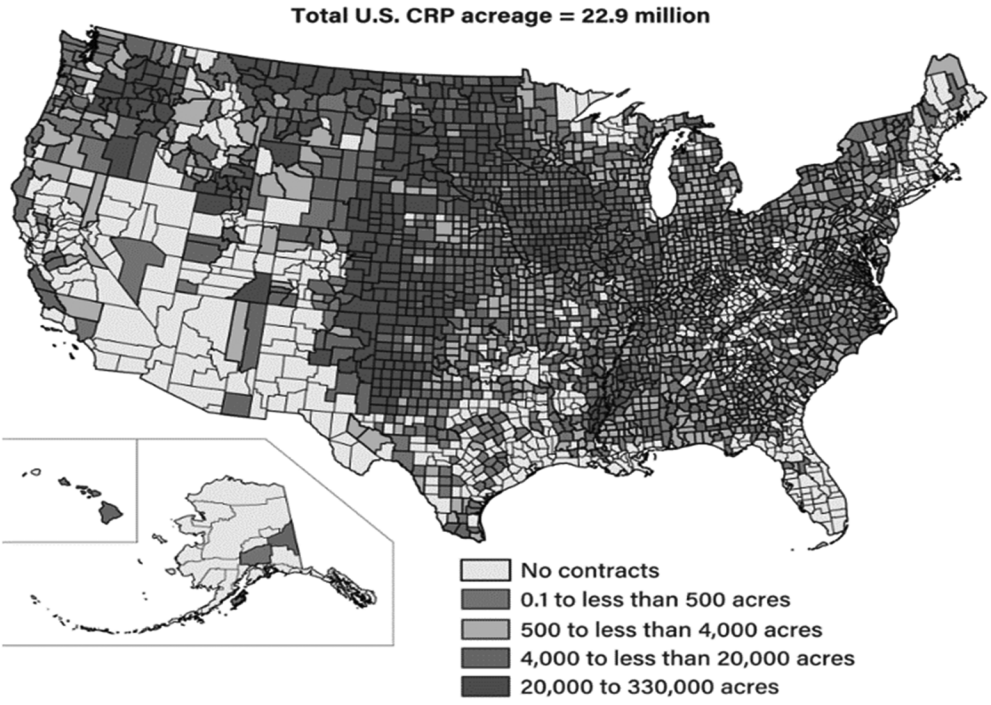

Figure 3. A spatial distribution of acres enrolled in the CRP on September 30, 2023, across the U.S. Adapted from USDA Economic Research Service from USDA Farm Service Agency.

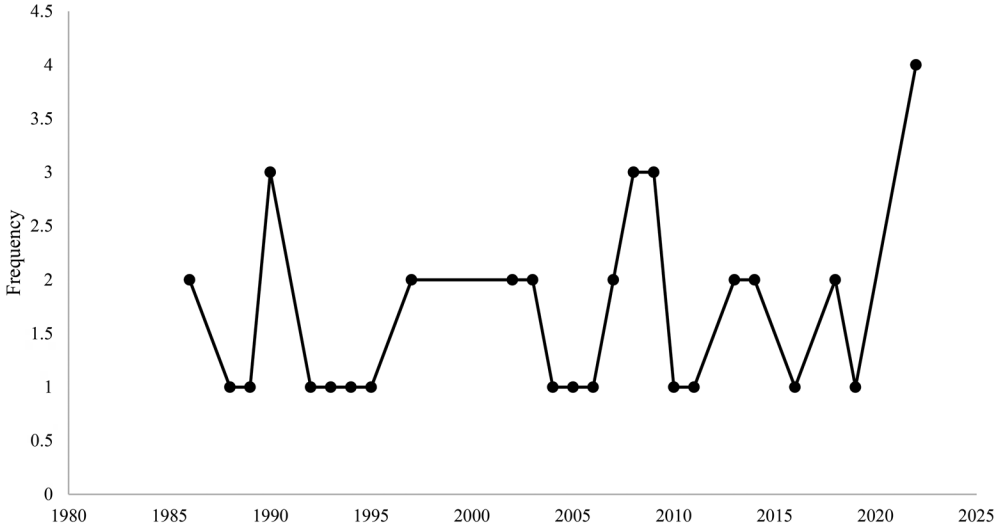

Figure 4. The number of research publications on participation in the conservation reserve program from the included studies between 1986 and 2023.

comparative study between landowners and practitioners that participation in CRP enrollment is greater amongst landowners who do not live on their property, for example, absentee and recreational landowners.

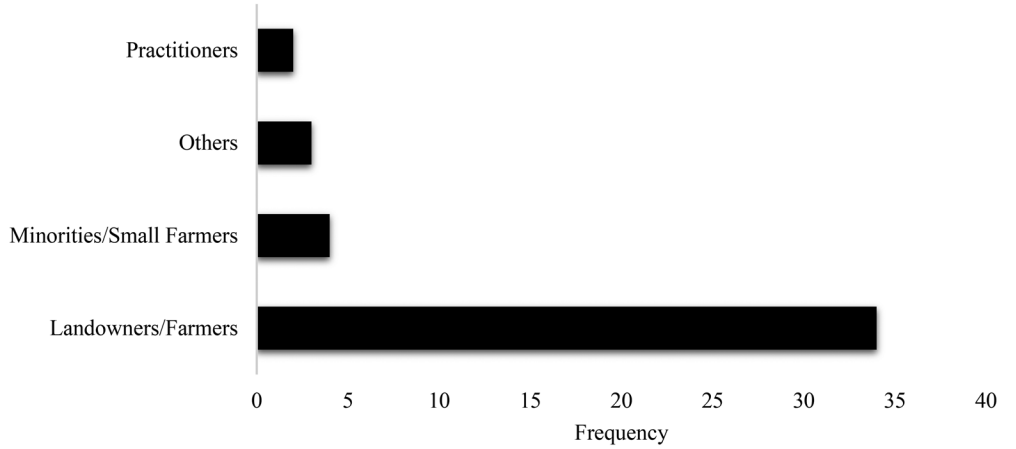

Figure 5. The distribution of the specific target population covered in the included studies.

The land tenure and farm attribute are critical factors. Seven studies on landowner participation found that large farmland ownership influenced participation in the CRP. For instance, Kurzejeski et al. (1992) found that landowners with more assets and high income earners have more reasons to participate in the program. Separately, Lambert et al. (2006), and Loftus and Kraft (2003) found that landowners with off-farm income were more likely to join CRP than those relying solely on farm earnings.

Age and gender are two essential demographic characteristics defining individuals in every population. Several of the included studies ($n = 5$) found that older farmers/landowners participated and were more satisfied with the CRP than younger farmers/landowners. A study by Gyawall et al. (2002) also highlighted the impact of gender on participation, noting that males exhibited higher levels of involvement compared to females.

Education level has been identified as a significant factor influencing landowner decision-making in conservation programs. Among the 42 studies reviewed, only three ($n = 3$) specifically mentioned the importance of education level. Studies like Adhikari et al. (2022) reported that higher education levels were associated with increased satisfaction with the CRP. Other studies reporting on the role of education on improved CRP participation include Mishra and Khanal (2013) and Kurzejeski et al. (1992).

Motivations and Barriers to Participation in the CRP

Our evaluation of studies on landowner motivations for CRP participation shows that the most commonly mentioned motivation ($n = 17$) is the intention to protect wildlife and preserve the environment. This includes efforts to conserve, manage natural resources sustainably, and reduce pollution for the benefit of future generations. We found financial incentive to be another top motivating factor mentioned in the studies ($n = 10$). Several studies reported landowner participation is based on the rental payment rate they expect to receive. Landowners with recreational and esthetic interest on their properties ($n = 3$), and landowners with adequate knowledge of the program ($n = 2$) were also mentioned as motivating factors. Access to technical support and

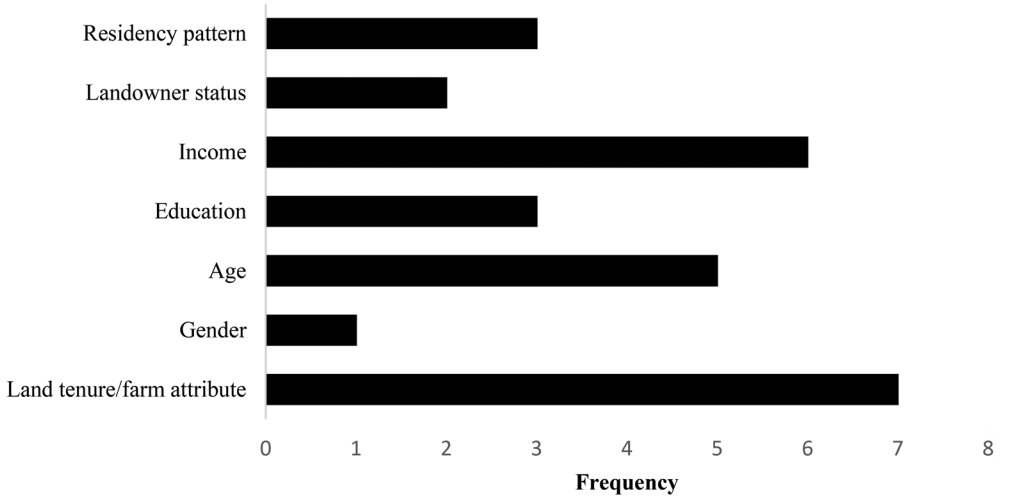

Figure 6. The distribution of various demographic factors influencing participation in the Conservation Reserve Program covered in the included studies.

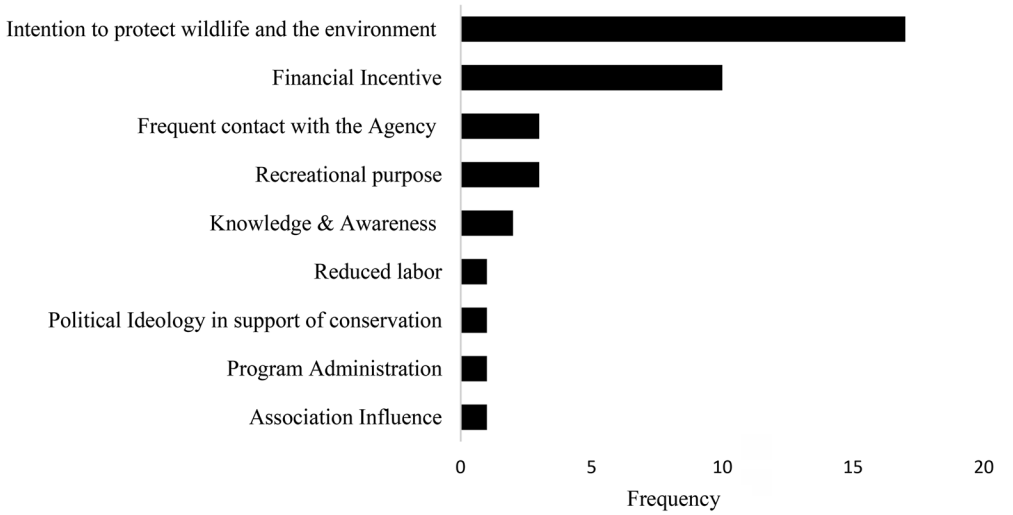

Figure 7. Factors motivating landowner participation in the Conservation Reserve Program according to the included studies.

administrative assistance from conservation practitioners, including agency staff, played a significant role in influencing landowners' decisions to remain in the program ($n = 3$; Figure 7).

The studies also revealed a range of motivations for participating in the CRP, though some were mentioned less frequently. For instance, individual studies identified political ideology ($n = 1$), the desire to reduce on-farm labor ($n = 1$), and influence from membership in non-governmental farm organizations ($n = 1$) as contributing factors to participation. In contrast, several significant barriers to CRP enrollment were consistently reported across the literature, as summarized in Figure 8. Among the most

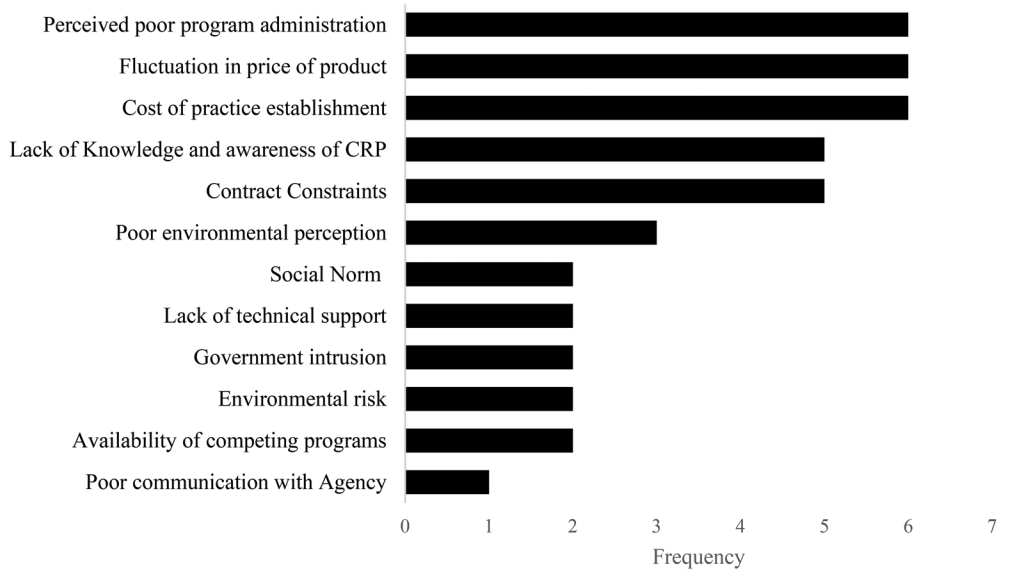

Figure 8. Factors prevailing as barriers to landowner participation in the Conservation Reserve Program as indicated in the included studies.

frequently cited challenges were the high cost of practice establishment ($n = 6$), perceived inefficiencies in program administration ($n = 6$), and market-related concerns such as fluctuations in product prices ($n = 6$). Additionally, contract-related constraints ($n = 5$) were commonly noted, particularly those requiring landowners to commit to long-term land-use planning and to follow prescribed conservation practices in order to remain compliant with the program.

Other barriers included lack of knowledge and awareness of the program ($n = 5$), poor environmental perception ($n = 3$), lack of technical support ($n = 2$), social norms (influences from colleagues, friends, and family) ($n = 2$), government intrusion and frequent policy changes ($n = 2$), perception of environmental risks ($n = 2$), and the availability of competing programs ($n = 2$) that better align with landowners' ecological and financial goals. Poor communication with agency representative also affects landowner participation in the program. Tables 1 and 2 summarize the factors influencing landowners' decisions to participate or not participate in the CRP (see Supplementary Table 1 for definitions).

Discussion

In recent years, the importance of land conservation efforts has become increasingly recognized, with programs such as the CRP playing a pivotal role in preserving vital ecosystems and enhancing biodiversity across the United States. This review highlights the growing recognition of land conservation efforts, particularly through the CRP, which plays a crucial role in preserving ecosystems and enhancing biodiversity. Despite its importance, understanding the motivations and barriers affecting landowners' participation remains complex. The study synthesizes findings from 42 studies across 48 states, identifying key trends and gaps, and emphasizing the need for a more

Table 1. Summary considerations for those likely to participate in the Conservation Reserve Program from the review.

Factor	Consideration	Selected studies
Intention to Protect Wildlife and the Environment	Landowners interested in wildlife habitat loss targeted conservation approach and soil erosion prevention.	(Adhikari et al. 2022; Arbuckle 2013; Barnes et al. 2019; Lute et al. 2018; Reimer and Prokopy 2014; Valdivia et al. 2009; Niemuth et al. 2007)
	The desire for environmental health benefits is an essential indicator of participation.	(Becker et al. 2022; Leistritz, Hodur, and Bangsund 2002; Vukina et al. 2008; Young et al. 2014)
Financial Incentive	Landowners concerned with financial stability and increased income	(Lute et al. 2018; Johnson et al. 1997; Reimer and Prokopy 2014; Schuchard 2011)
	The willingness to participate depends on payment per acre compared to the opportunity costs for removing cropland from production.	(Jang and Du 2018; McLean-Meyinsse, Hui, and Joseph 1994)
	Landowners from counties with high rental rates	(Wu and Lin 2010)
Frequent Contact with the Agency	Participation is dependent on the relationship between landowners and practitioners.	(Lute et al. 2018; Adhikari et al. 2022; Kurzejeski et al. 1992)
Association Influence	Membership in a conservation association allows landowners to participate in conservation programs.	(Onianwa et al. 2004)
Knowledge and Awareness	Awareness of the program and having participated in CRP previously	(Lim and Wachenheim 2022)
Political Ideology in Support of Conservation	Landowners who have greater political conservationism and related policy	(Caldas et al. 2016)
Program Administration	Landowners in states where there is additional state-sponsored cost-share were provided	(Kurzejeski et al. 1992)
Recreational Purpose	Landowners who perceive CRP as a positive environmental program associated with recreation that provides local economic benefit	(Allen and Witter 2008; Leistritz, Hodur, and Bangsund 2002)

comprehensive understanding of the diverse socioeconomic, demographic, and institutional factors influencing participation decisions.

Our results showed that many of the studies conducted were in regions and states that have significant participation and enrollment in the CRP, as shown in Figure 3. For instance, the FSA CRP Statistics revealed that in 2017, states like Texas and Kansas had the highest land enrollment in the CRP with over 2.8 million acres and 2 million acres, respectively (Newton 2018; USDA 2017). It is also not surprising that studies on landowner enrollment in the CRP were higher among states in the Prairie Pothole Region, which is highly rich in plant and aquatic life that provides nesting, breeding, and migratory support to many waterfowl species (Jacobs 2016).

Our findings showed that most of the studies focused primarily on the perspectives of the landowners and farmers in their investigation on participation in the CRP. On the contrary, factors influencing enrollment in the program are complex and need to be understood from a broad perspective that is inclusive of practitioners (Caldas et al. 2016; Pfrimmer et al. 2017). According to Lute et al. the possibilities to improve

Table 2. Summary considerations for nonparticipation in the CRP from the review.

Factor	Consideration	Selected studies
Government intrusion	Frequent government intrusion in the program, the CRP policies are inconsistent and do not reflect the intent of local needs.	(Arbuckle 2013; Barnes et al. 2019)
	Consider the program as the government asserting control over private property rights.	(Lant, Kraft, and Gillman 1995)
Lack of technical support	The CRP rules are too difficult to understand, and some are inappropriate for the local context.	(Barnes et al. 2019; Gustafson & Hill 1993)
Environmental risk	When adopting certain conservation practices, there are risks of damage from pests, weeds, and fire.	(Barnes et al. 2019; Berthelsen 1989)
Contract Constraints	Longer contracts, inflexible land-use system, lower rental payment, and cost-share discourages participation. Minority farmers most times cannot afford the cost-share.	(Barnes et al. 2019; Gan et al. 2005; Lim and Wachenheim 2022; Lute et al. 2018)
Social Norm	Local communities prefer traditional farming practices, and community members discourage people from enrolling.	(Lute et al. 2018)
Poor Communication with Agency	Poor communication between Natural Resource Agencies and farmers (Absentee farmers)	(Petrzelka, Buman, and Ridgely 2009)
Lack of Knowledge and Awareness of CRP	They are unlikely to participate in programs in which landowners are unaware of the potential benefits or its processes. They also wrongly perceive themselves as ineligible most of the time.	(Esseks and Kraft 1986, 1988; Reimer and Prokopy 2014)
Availability of competing programs	Conflicting economic incentive program. The introduction of Pasture, Rangeland, Forage (PRF), Limited Resource Farmer/Rancher (LRFs), and other non-cost share government programs reduces participation in the CRP.	(Gyawall et al. 2002; Yu et al. 2022)
Fluctuation in Price of Product	Agricultural commodity prices and product costs deter participation, and general farm supply businesses prevent participation.	(Lant, Kraft, and Gillman 1995; Leistritz, Hodur, and Bangsund 2002; Secchi and Babcock 2007)
	The financial performance of cropland, including financial ratios like solvency and liquidity, can disrupt participation in CRP.	(Mishra and Khanal 2013)
Perceived Poor Program Administration	Counties with higher rental rates in previous CRP signups reduce the CRP application opportunities.	(Wu and Lin 2010)

conservation participation are skewed toward the underlying motives of the landowners and the local conservation practitioners who oversee the process (Lute et al. 2018). These findings highlight a central argument in our review that participation is not solely the result of environmental values or financial gain, but rather a confluence of demographic, social, and institutional variables that must be addressed in tandem.

Research highlights the limited participation of understudied groups, such as Black and minority farmers, as well as small, limited-resource farmers, in the CRP. Minority farmers, in particular, face significant financial barriers, including the inability to afford the initial cost-share requirements. Although the CRP reimburses up to 50% of the costs associated with establishing conservation practices, the upfront financial burden remains a substantial obstacle (Gan et al. 2005; Loechner 2021). These financial constraints are compounded by systemic challenges. Minority farmers often operate smaller farms with less capital and have limited access to financial resources, making the

upfront investment required for CRP participation difficult to manage (Barnes et al. 2019). Consequently, even with the prospect of reimbursement, many minority farmers may opt out of the program because they cannot afford the initial costs (McLean-Meyinsse, Hui, and Joseph 1994). The review findings echo broader concerns about structural inequality in access to conservation programs and emphasize that improving participation requires targeted, equity-centered interventions that acknowledge and accommodate these financial limitations.

While financial incentives play a significant role in enrollment decisions, other constraints such as a lack of technical support can reduce commitment or lead to withdrawal (Drescher and Warriner 2022). Landowners with strong stewardship-oriented values may persist despite these barriers, prioritizing ecological conservation over economic returns (Gill, Klepeis, and Chisholm 2010). However, for many landowners, participation remains impractical when the tradeoffs are not favorable or when necessary, support is lacking. Even when landowners hold positive views about conservation, the interplay of economic factors, opportunity costs, and fluctuating market conditions often leads them to conclude that CRP enrollment is not a financially sound decision. This underscores the need to recognize that informed decision-making does not always translate to enrollment. Even when landowners perceive the program positively, participation is frequently constrained by real and perceived risks related to income stability and program compatibility with their land use goals.

Beyond financial barriers, participation decisions are shaped by social networks, cultural values, and institutional factors. These interconnected influences underscore the complexity of challenges faced by minority landowners (Gan et al. 2005; Loechner 2021; Barnes et al. 2019). Addressing these barriers requires a nuanced understanding of the socioeconomic impacts of CRP participation. Developing strategic, locally tailored recommendations is essential to meet the unique needs of these groups and enhance their participation. Such efforts should prioritize addressing financial barriers while incorporating the diverse cultural and institutional contexts of minority farmers (Leistritz, Hodur, and Bangsund 2002). Similarly, community-based peer networks may serve as a pathway for increasing knowledge and reducing stigma or mistrust associated with government conservation programs.

Furthermore, Lute et al. (2018) in their summary attributed the decline in the CRP enrollment to high commodity prices, the results of our study have provided alternative explanations and other factors affecting decision making in the CRP. Participation in the CRP, though voluntary, is influenced by landowners' perceptions of costs and benefits, which are shaped by their background characteristics (Johnson et al. 2016; Wallander, Ferraro, and and Higgins 2017). These characteristics, such as age, gender, education level, and land tenure system, can position landowners to assess program incentives differently (Mitchell and Kimmel 2009). Our review highlights that older male landowner, those with higher education levels like a college degree, and those owning the land they farm are more likely to participate in the CRP than others with differing attributes (Adhikari et al. 2022; Lim and Wachenheim 2022; Mishra and Khanal 2013). Older landowners often have a deeper understanding of ecological systems, shaped by their extensive farming backgrounds, and lived experiences, fostering a commitment to conservation initiatives (Koskela and Karppinen 2024; Thapa et al. 2024). With reference to the Theory of Planned Behavior studies further highlights

how entrenched values regarding land stewardship, influenced by generational shifts toward environmental awareness, improve the intentions of older landowners to engage in conservation programs (Thapa et al. 2024; Sander et al. 2024). Furthermore, older adults prioritize legacy and feel a moral obligation to protect natural resources for future generations, enhancing their likelihood of participating in conservation efforts like the CRP (Adenuga, Jack, and McCarry 2024; Zhang and Wang 2024).

Through our review, we ascertained that landowner who live on their property and have a higher income, including those involved in off-farm activities, participate more often in CRP. While on the other hand, landowners who cannot afford fluctuations in income and are unable to afford the cost associated with the program are constrained from participating. For instance, depending on the specific conservation practices adopted, there are initial costs associated with establishing conservation measures such as planting native vegetation, creating wildlife habitat, or implementing erosion control measures. Also, landowners are typically responsible for maintaining the conservation practices throughout the duration of the CRP contract. This involves ongoing expenses for maintenance activities such as mowing, weed control, or erosion management.

Similarly, the cost requirement for adopting practices in the CRP deter landowners from participating in the program especially among landowners who prioritize ecological conservation but without the financial capacity required (Lim and Wachenheim 2022; Wachenheim et al. 2018). While there are cost-share provisions to assist landowners, there is evidence of landowners not being able to also afford the cost-share provisions, further influencing their participation in the program (Berthelsen 1989; Esseks and Kraft 1988; Gan et al. 2005; Lim and Wachenheim 2022; Parks and Schorr 1997). Moreover, state-sponsored cost-share assistance shows promise in improving participation. Still, the frequent amendments to the CRP and recent tax treatment of CRP rental payments as Self-Employment Tax are two underexplored factors that may be contributing to enrollment declines. Addressing these financial and regulatory issues requires adaptable policy instruments that offer flexible cost-sharing, extended payment schedules, or enhanced assistance to landowners with limited financial capacity.

Aside from financial constraints, lack of awareness and knowledge of the CRP is another barrier to participation. Similarly, poor landowner communication with the agency affects program knowledge. Poor communication can lead to information asymmetry or misinformation, causing landowners to wrongly perceive themselves as ineligible or the program as unprofitable (Esseks and Kraft 1988; Valdivia et al. 2009). Although few studies examine the impact of regular agency contact on participation, we recommend this as an important factor for future research. A more deliberate and personalized communication strategy can foster trust and reduce misperceptions. When landowners feel respected, heard, and guided through program complexities, they are more likely to enroll and stay committed.

Although there are few studies (e.g., Lute et al. 2018; Mortensen et al. 1990) reporting on the influence of social norms (e.g., peer influence, family, friends, community, etc.) on landowner participation in the CRP, with references to the Midwest region (e.g., Nebraska and North Dakota), this is an underexplored but important factor that significantly influence participation (Kaiser, Hubner, and Bogner 2005; Maleksaeidi and Keshavarz 2019). According to Ajzen's theory of planned behavior, subjective norm is a predictor to an individual's intention and possible behavior (Ajzen 1985; Ajzen et al.

2011). For instance, where social norms like community perception have direct impact on landowner conservation intension (Lute et al. 2018). Thus, reinforcing positive social norms through community-based support networks can normalize and celebrate conservation, improving both awareness and enrollment. Harnessing peer advocacy could serve as a key tactic in shaping attitudes and strengthening participation.

Methodologically, most studies reviewed rely on survey-based data collection, which limits their ability to capture non-monetary factors influencing landowner participation in the CRP. While financial incentives play a role, other motivations also shape enrollment decisions. Future research should adopt a mixed-methods approach to provide a more comprehensive understanding of these diverse influences. Incorporating qualitative insights from interviews and focus groups could reveal deeper cultural, social, and psychological dimensions that are not easily captured through quantitative methods alone.

Participation in the CRP is a complex decision influenced by multiple factors beyond information access and program perception. While the CRP's incentive structure is designed with the expectation that landowners would naturally be inclined to participate and may only need encouragement, this assumption does not always hold. For many landowners, participation in the CRP may not be a financially viable option, regardless of how well-informed they are or how positively they perceive the program. Nonetheless, this aspect remains an area that requires further research and exploration.

Conclusion

This review mapped and analyzed factors influencing landowner participation in the CRP. The findings highlight various barriers to enrollment and emphasize the importance of understanding these obstacles to improve engagement. Participation is not driven solely by financial incentives or environmental motivations, but rather by an intricate web of interdependent factors, including administrative complexity, demographic disparities, and social pressures. For some, alternative land uses remain more profitable, making participation unviable despite the program's conservation appeal.

For landowners who find the program financially viable, addressing barriers such as information deficits, policy ambiguity, and negative perceptions is crucial. Enhancing communication channels and providing clear, accessible information through centralized digital platforms, case studies, and practitioner support can help landowners navigate the enrollment process more effectively. Such transparency and responsiveness would foster informed decision-making while improving trust in the program. Social norms and community dynamics also influence landowner decisions. Embedding community-based support networks can encourage knowledge sharing, reinforce conservation-oriented behaviors, and culturally normalize CRP participation. Tailoring outreach and support to reflect diverse landowner demographics, including women, younger farmers, and absentee landowners, can also reduce structural inequities and broaden program accessibility. However, while improved information and program perceptions may increase participation among willing landowners, economic factors such as CRP contract profitability relative to other land uses remain key determinants.

Importantly, increasing participation should not be the sole objective. Some landowners will conclude that CRP enrollment does not align with their financial priorities or long-term land management strategies. While reducing barriers can enhance

participation among interested and eligible landowners, it is equally important to respect diverse decision-making processes and acknowledge that, for some, alternative land uses are a better choice.

In conclusion, enhancing CRP participation requires a multifaceted approach that integrates economic, social, psychological, and institutional dimensions. Improving communication, consolidating resources, and fostering inclusive, community-driven engagement can help the program better align with landowner needs. By providing the tools and support necessary for informed, values-based decision-making, the CRP can not only increase participation but also advance its broader objectives of agricultural viability and environmental stewardship.

Notes

1. The EBI is a USDA scoring system used to rank land offers for CRP enrollment based on environmental criteria such as wildlife habitat, water quality, and erosion control. Higher scores reflect greater ecological value and influence contract selection.
2. Continuous sign-up allows landowners to enroll eligible lands at any time without a specific sign-up period.
3. Other USDA programs include the Wetlands Reserve Program (WRP), which restores and protects wetlands; the Environmental Quality Incentives Program (EQIP); and the Conservation Stewardship Program (CSP), which rewards ongoing conservation efforts on working lands. The Agricultural Conservation Easement Program (ACEP) supports the purchase of easements to safeguard agricultural land and wetlands.

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