# What Influences Extension Agents to Seek Information About Climate-Smart Practices?

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## Introduction

Climate change presents significant challenges for future generations, particularly in the agriculture industry (James et al., 2014). Farmers must contend with extreme weather and increasingly variable climates exacerbated by climate change. Concurrently, they face the dual challenge of ensuring food security by producing more food while reducing resource inputs and greenhouse gas emissions (Lou et al., 2024). Climate-Smart Agriculture (CSA) has been recognized as a foundational practice that addresses these challenges. CSA has 3 main pillars: (1) improving food security, (2) enhancing resilience to climate change, and (3) reducing greenhouse gas emissions (Lipper & Zilberman, 2018). Since the introduction of CSA in 2010, the U.S. Department of Agriculture has made significant investments to support its implementation (USDA, 2024). Given this investment and challenges, it is important to understand how to improve the promotion and adoption of these practices among farmers.

One of the ways these practices can be conveyed to farmers is through the Cooperative Extension Service. Past research indicates that extension agents recognize the potential impact of climate change on agriculture and are a trusted source of climate-related information. However, they face barriers in effectively communicating this information. (Diehl et al., 2017). These barriers have included a lack of information and interest from farmers, as well as knowledge on how to approach conversations about climate change (Burnett et al., 2014). While these barriers and beliefs about climate change are acknowledged, studies have yet to explore how these beliefs influence extension professionals' information-seeking behaviors on practices that may mitigate the risks of climate change. The purpose of this study was to explore whether county extension agents' attitudes, perceived behavioral control, and social and moral norms influence their information-seeking behaviors regarding CSA practices.

## Conceptual Framework

Science communication facilitates the flow of information from scientists to the public. It often involves interpreting, translating, and sometimes simplifying scientific findings to convey key messages in ways that are easier for the public to understand. While the Institutional Model of Science Communication acknowledges this information flows through gatekeepers (Dijck & Alinead, 2020), the Theory of Planned Behavior (TPB) offers a foundation to explore why these gatekeepers seek information. TPB states that behavior can be predicted by the intention of a behavioral act (Ajzen, 1991). Behavioral intention is influenced by three different factors: attitudes, subjective norms, and perceived behavioral control (Surjanti et al., 2023). Adding moral norms into the TPB framework could provide further insight into what influences extension agents' information seeking behavior. This framework is particularly well-suited to explore how extension professionals decide to share information on climate-smart agriculture, where social influence, personal beliefs, and perceived barriers could play significant roles in decision-making.

## Methodology

Using a descriptive research design method, an online survey was created using Qualtrics with Likert-scale questions to measure attitudes ($\alpha = 0.916$) toward climate change as well as subjective norms ($\alpha = 0.882$), moral norms ($\alpha = 0.942$), and perceived behavioral control ($\alpha = 0.775$) regarding the ability to seek and share information about CSA practices. Multiple choice questions asked how frequently participants sought information about CSA practices information and from what communication channels. Open-ended questions asked why they seek information about this topic of interest. A panel of experts in survey research, extension programming, and

CSA practices reviewed the questionnaire to establish face validity. Participants who completed the questionnaire had the chance to enter a drawing for a gift card, which helped improve response rates and decrease non-response error. Using a purposive sampling method, the survey was emailed to county extension agents working within agriculture and natural resources in [state]. Two reminder emails were sent to encourage responses during the 6-week data collection timeframe. Descriptive statistics were conducted using SPSS.

## Results

A total of 129 participants took part in the survey. Participants had an average age of 43 and 61% were males. The majority (66%) had over five years of experience in extension. However, 55% had been in their current role for one to three years. On average, participants had a neutral attitude on climate change, ($M$ = 3.0, $SD$= *0.97*). Participants neither agreed nor disagreed that CSA information was easy to find and understand or that they had the confidence to share it ($M$ = 3.18, $SD$ = 0.66). Participants also neither agreed nor disagreed with questions that captured subjective norms ($M$ = 3.12, $SD$ = 0.67) and moral norms ($M$ = 3.35, $SD$ = 0.81). Most participants (44%) rarely sought CSA information with 35% citing "farmer demand" as a key motivator. While 40% of extension agents find information at events, the same percent reported extension publications were communication materials they use to share information with farmers. One participant wrote, "We need more resources that are simple and easy for producers to understand." Behavioral control ($r_s$ = .362, $p$ < .001), attitudes toward climate change ($r_s$ = .370, $p$ < .001), and subjective norms ($r_s$ = .392, $p$ < .001) showed moderate correlations with how frequently extension agents sought information about CSA. Among these, moral norms ($r_s$ = .425, $p$ < .001) had the strongest correlation with information-seeking frequency (Cohen, 2016).

## Conclusion/Implications/Recommendations/Impacts

By analyzing the correlation between behavioral control, attitudes, moral norms, subjective norms, and information-seeking behavior, this study found that extension agents who actively seek information are more likely to be concerned about climate change. They also feel both a social and moral obligation to share CSA information. Framing climate change messaging to emphasize responsibility and obligation to people and the environment may encourage more CSA information-sharing from extension agents who are already seeking information. This type of messaging may not motivate those who are not currently seeking information on CSA.

Participants were, on average, neutral about statements that measured attitude, behavioral control, and social and moral norms. This suggests they may not hold definitive opinions about CSA. This presents an opportunity to continue to engage with them by emphasizing the practical, economic, and long-term benefits of these practices. Because 40% of extension agents reported seeking CSA information at in-person events, this channel could serve as a primary communication method. However, ensuring that extension agents have access to extension publications during these events will enable them to better share information with farmers, helping to improve the flow of communication on CSA. Additional research is necessary to better understand effective communication efforts regarding CSA.

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