An Exploration of Perceptions Related to Farmers' Roles in Climate Change Issues

Sheriden Schuerman
200 Agricultural Administration
2120 Fyffe Road
Columbus, OH 43210
614-292-6909
schuerman.17@osu.edu

Dr. Cara Lawson
200 Agricultural Administration
2120 Fyffe Road
Columbus, OH 43210
614-292-6909
lawson.182@osu.edu

Dr. Laura Fischer
Box 42131
Lubbock, TX 79409
806-834-0630
laura.fischer@ttu.edu

Dr. Joy Rumble
1328 Dover Road
Halterman Hall 119B
Wooster, OH 44691
330-287-1368
rumble.6@osu.edu

Dr. Scott Scheer
200 Agricultural Administration
2120 Fyffe Road
Columbus, OH 43210
614-292-6909
scheer.9@osu.edu

Introduction

Climate change refers to variation in weather events and includes measures such as temperatures, precipitation amounts, and numbers or severity of storms (Dessler, 2021). Awareness and understanding of climate change, along with its causes and influences, has become of greater concern to individuals more recently due to increasing politicization, media coverage, and increased effects on individuals (Whitmarsh, 2018). The agriculture industry plays a role in climate change effects and has been found to contribute to approximately 11% of estimated U.S. greenhouse gas emissions (U.S.D.A., 2023) through practices associated with crop and livestock production (Balogh, 2020). Despite current challenges, it is possible for those involved in agriculture to enact mitigation strategies to address climate change issues (Lenka et al., 2015). Moving forward, it will be important for those in agriculture to make adaptations to reduce emissions (Castellano, 2018).

Some research has explored farmers' perceptions of climate change. Peterson-Rockney (2022) found farmers to perceive risk associated with climate change on various levels, including physical, policy, and social risks. In another study farmers indicated business pressures, like profitability and labor availability, were more critical issues than climate change impacts (Lane et al., 2018). At the same time, little is known about how those not involved in agriculture perceive farmers. In turn, there is also a lack of studies on the perceptions of farmers' roles in climate change impacts. Given the literature gaps, this study's purpose was to determine perceptions of farmers in the context of climate change issues.

Literature Review

Attribution theory guided this study as it allows for the investigation of causal interpretations applied by individuals to explain happenings within their environments (Weiner, 2010). Attribution theory centers on causes and is used to interpret outcomes or results through the justification of factors that may or may not be explainable (Weiner, 2010). However, assigning cause to the same outcomes or consequences tends to vary as individuals determine cause based in part on whether the individual involved with the outcome is a member of an in-group or out-group (Jang, 2013). Individuals are prone to favor the actors with whom they most identify (Jang, 2013). Attribution theory has been used to explore perceptions of climate change. One study found participants were more likely to attribute climate change to natural causes, rather than human causes in some cases, but not others (Jang, 2013). Additionally, Jang (2013) found placing emphasis on energy use in a message led to decreased belief in and attribution of human-made climate change. In another study, Ogunbode et al. (2019) found the attribution of extreme weather events to climate change to be influenced by participants' social and psychological contexts. In this study, attribution theory was used to determine and interpret differences in perceptions of farmers regarding their roles in climate change effects.

Methodology

Data analyzed in this study were collected as part of a larger study that aimed to explore climate risk perceptions of individuals living in the United States. Data were collected from November 7 – December 8, 2023 using a Qualtrics questionnaire. The population for this study was people living in the United States, 18-years and older. Participants were recruited by Qualtrics Research Services following quotas for gender, state, and community type, which were established based upon data from the U.S. Census Bureau. The study yielded 2,191 responses. To determine

participants' perceptions of farmers' roles in climate change a researcher-developed measure, based on a review of literature (Lane et al., 2018; Peterson-Rockney, 2022), was used. The measure was comprised of 22, Likert-type items. Participants rated their levels of disagreement or agreement for each item (*strongly disagree* = 1, *strongly agree* = 5). Reliability for the scale was assessed during the pilot test and found to be acceptable ($\alpha = .91$) and the measure was reviewed by a panel of experts to ensure validity. Data were exported from Qualtrics to SPSS for analysis, where inferential and descriptive statistics were used to address the research purpose. Negative items were reverse-coded.

Results

The first objective was to explore overall perceptions of farmers in regard to climate change. Participants presented mostly neutral responses to the items in the measure ($M = 3.62$, $SD = .62$). The item with the highest mean was "Famers deserve support in navigating the effects of climate change on their farms and ranches" ($M = 3.98$, SD = .98) and the item with the lowest overall mean was "Farmers believe in climate change less than many other groups" ($M = 3.08$, $SD = 1.24$). The second objective was to determine any differences in perceptions of farmers regarding climate change between regions. Assumptions were checked before proceeding with statistical tests. The assumption of homogeneity of variances was violated, as assessed by Levene's test ($p = .02$). As a result, the Welch's ANOVA was used and revealed a small, significant difference by region of perceptions of farmers' roles in climate change, Welch's $F(3, 1193.99) = 3.43$, $p < .05$, $\eta_p^2 = .01$. A Tukey post-hoc test revealed differences between perceptions in the West ($M = 3.70$, *S*D = .59) and Midwest ($M = 3.60$, $SD = .56$) regions.

Discussion

The purpose of this study was to begin to uncover perceptions about farmers' involvement in climate change effects. As those in agriculture seek mitigation strategies to adapt to climate change (Castellano, 2018; Lenka et al., 2015), an understanding of perceptions about farmers in this area will be key. The data suggest U.S. residents appear to hold a largely neutral stance on the issue. Across regions, only one significant, but small, difference in perceptions emerged, suggesting no region was partial to extreme opinion toward farmers' roles in climate change. Participants from the West had more positive perceptions of farmers on the climate change front than those in the Midwest. The variation in agricultural production between these regions may explain the slight difference in perception. Another explanation may lie in attribution differences as participants likely considered other factors related to climate change (Jang, 2013; Ogunbode et al., 2019; Weiner, 2010). As individuals are prone to favor those with whom they identify (Jang, 2013), future studies should seek to identify audience segments within a population and explore commonalities or differences between perceptions of farmers and ranchers. It is also possible that differences may exist between states. As agricultural communicators, the neutral perceptions that emerged from this study may present a unique opportunity to encourage greater understanding of both farmer and rancher roles in climate change to a population in a possible state of open-mindedness and neutrality. Future studies should strive to determine what message frames influence perceptions of and support for agriculturalists as they seek to navigate and mitigate the effects of climate change (Peterson-Rockney, 2022).

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