

## Cooperative Extension and Sustainability Outreach: Programmatic Successes, Administrative Support, and Areas for Improvement

### Abstract

According to the 2018 Intergovernmental Panel on Climate Change, without urgent global changes, climate catastrophe caused by warming of greater than 1.5°C will occur by 2030, endangering the planet's capacity to sustain human populations and livelihoods. The National Network for Sustainable Living Education administered a national survey in January 2017 to assess how well-positioned Extension is to address sustainability in the communities the organization serves. Educators from 40 states responded, and 1,395 usable surveys were received. Survey results will help Extension employees discover opportunities for innovation and relevancy in their programming.

**Keywords:** [sustainability](#), [climate change](#), [U.S. Department of Agriculture climate hubs](#), [emerging issues](#), [public issues education](#)

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## Introduction

The U.S. Department of Agriculture (USDA) identifies Cooperative Extension's foundational mission as being

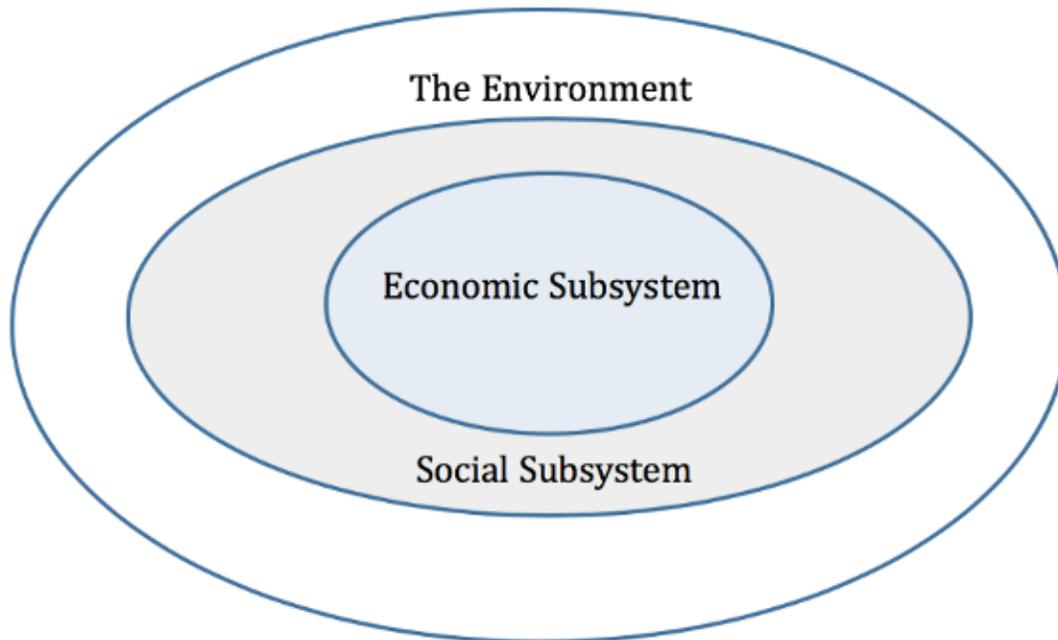
to "improve the quality of people's lives by providing research-based knowledge to strengthen the social, economic and environmental well-being of families, communities and agriculture enterprises" (USDA, n.d., "Extension Services"). According to a recent Intergovernmental Panel on Climate Change (IPCC) report, unless urgent action is taken to keep global warming at 1.5°C or lower, we risk catastrophic climate impacts occurring by 2030, ranging from a complete loss of coral reefs to our inability to grow a sufficient supply of staple crops such as rice, corn, and wheat (Allen et al., 2018). Such projected impacts would harm, on an unprecedented scale, the quality of people's lives around the globe. Authors of the report concluded that "ambitious mitigation actions are indispensable to limit warming to 1.5°C while achieving sustainable development and poverty eradication" (Allen et al., 2018, p. 51). We believe that Extension's greatest potential for accelerating ambitious action, and thereby advancing the organization's fundamental mission, lies in sustainability programming that fosters informed decision making about possible climate action.

A 1992 Extension Committee on Organization and Policy (ECOP) position statement defined public issues education (PIE) as "educational programs that have the objective of enhancing the society's capacity to understand and address issues of widespread concern" and envisioned that PIE could make Extension "the most visible component of the land grant university of the twenty-first century" (as cited in Patton & Blaine, 2001, "Extension's Commitment to Public Issues Education," para. 1). This visibility is exemplified in Extension's key role in addressing critical topics ranging from obesity to natural disaster resilience and could be further increased through conducting research and outreach regarding major emerging sustainability issues. One means of accessing such research is through the USDA regional climate hubs. The USDA established the climate hubs in 2014 "to deliver science-based knowledge, practical information and program support to farmers, ranchers, forest landowners, and resource managers to support climate-informed decision-making in light of the increased risks and vulnerabilities associated with a changing climate" (Johnson, Hohenstein, & Steele, 2015, "Background," para. 1). Cooperative Extension is among the list of key USDA climate hub partners. Also, universities across the United States with which Extension is associated are taking ambitious action to address climate change. As one example, in 2019 Utah State University's faculty senate unanimously approved a resolution to reduce the university's greenhouse gas emissions by 10% per year for the next 20 years (Graham Wood, 2019).

In an effort to expand and improve Extension sustainable living education, members of the Association of Natural Resource Extension Professionals established the National Network for Sustainable Living Education (NNSLE) in 2004. The purpose of NNSLE is twofold: to connect colleagues engaged in sustainability education and to improve quality of life and reduce environmental degradation by building an Extension network to investigate, provide education on, and model sustainable living practices. In defining sustainability, NNSLE considers the environment as a core system with social and economic subsystems as concentric elements within and dependent on the environment for existence (Figure 1).

**Figure 1.**

Sustainability, According to the National Network for Sustainable Living Education



As stated over a decade ago by NNSLE leaders, "The Cooperative Extension System is in a prime position to teach individuals and communities how to live and work sustainably" (Elliott et al., 2008, "Opportunity," para. 1). Clear recommendations regarding how Extension should move forward with sustainable living education were as follows:

- Apply our science and engineering know-how to the task of developing new technologies for energy and water conservation.
- Help our political leaders make a realistic assessment of all the natural resources and ecosystem services our global environment is capable of providing and at what level of sustained demand.
- Offer our communities a crash course in how to live in sync with Earth's limits. (Elliott et al., 2008, "Attaining a Sustainable Future," para. 5)

In 2010, NNSLE members conducted a survey of Extension personnel across the United States regarding their habits at work and at home relating to environmental conservation and sustainability and found that "within Extension there is a clear need for in-service and public education programs related to sustainability, sustainable practices, and why they are important" (Rashash, Elliott, & Madhosingh-Hector, 2015, "Conclusions," para. 3). Only 11% of respondents modeled sustainable behavior by walking or biking to work, and only 3% used public transportation. Comments about recycling, reducing, and reusing ranged from "if it cannot be recycled, composted or legally burned . . . we don't buy it" to "I am not interested in doing any of these things" (Rashash et al., 2015).

Now, a decade later, our team of NNSLE members reports on research we undertook to delve beyond individual Extension educator sustainability practices. Ours was a systematic effort to understand the emergent extent and nature of Extension's collective and programmatic involvement in sustainability, what Extension is doing well in sustainability outreach, and where improvements could be made.

## Methods

We developed our Sustainability Outreach in Extension National Survey using major themes from recorded roundtable discussions on barriers and opportunities for Extension sustainability outreach that took place at the 2016 Extension Sustainability Summit, and we designed the survey in Qualtrics. The survey instrument was reviewed online for face and content validity by participants of the past summit and in-person by over 20 colleagues attending two additional 2016 national conferences: the Community Development Extension Institute and the annual meeting of the National Association of Community Development Extension Professionals.

The introductory section of the survey comprised all required institutional review board information, an informed consent field, and a field for ensuring that participants were 18 years of age or older. Any participant under 18 years of age was taken directly to the end of the survey. The next section presented study background, including descriptions of the survey purpose and intended use of results, a definition of sustainability, identification of who should complete the survey, and an explanation of how to contact the research team with questions. Participants then were asked a set of nine core questions about sustainability outreach in Extension. For example, participants were asked to identify topic areas they thought their state Extension system was doing a good job of addressing and to indicate what level of support they received from state Extension leadership for educating about sustainability. The core questions were followed by a set of three questions about the USDA climate hubs, a question concerning the value of various tools in communicating sustainability to the public, and a question about whether participants offered any sustainability-focused programs. Five demographic questions concluded the survey.

We followed Dillman's (2007) tailored design method for Internet surveys, sending four email contacts. The email invitations were sent to Extension directors in all 50 states and were formatted in a manner that allowed directors to easily forward the invitations to their respective state Extension educators. We also sent the survey invitation to the chairs of the Association of Natural Resource Extension Professionals, National Extension Association of Family and Consumer Sciences, National Association of County Agricultural Agents, and National Network for Sustainable Living Education, with the request that they distribute it to their respective networks. All contacts were made in January 2017. We received 1,693 responses, with 1,395 respondents (82%) agreeing to participate and completing at least 75% of the survey. We analyzed all closed- and open-ended responses using Python and the Pandas, Numpy, and NLTK libraries within it.

To establish a baseline understanding of what is meant by the term *sustainability*, we prefaced the survey with the following text:

For the purpose of this survey, sustainability is defined in accordance with the National Network for Sustainable Living Education (NNSLE): "an ethic of stewardship in which our desire for fulfilling and productive lives is thoughtfully and consciously balanced with the social, economic, and environmental security of life on Earth, now and for future generations."

Sustainability may have subtle differences in meaning to different people, but it boils down to some very basic concepts:

- Activities or practices in any given discipline are undertaken with the objective of continuing that activity indefinitely in a way that doesn't deplete the resource(s) the activity depends upon.

- Sustainability takes into equal account the social, environmental, and economic consequences of every practice, so that a positive, win-win-win result is most closely approximated.
- Nearly every activity or practice, regardless of how small, is related in some degree to a larger issue—such as ground-water depletion or the loss of agricultural lands.

## Respondents

Extension educators representing 40 states responded to the survey, with Georgia, Missouri, and Oklahoma having the highest respondent numbers. Of respondents who reported their Extension roles, 501 (42%) were county and regional educators, 302 (25%) were state specialists, 127 (11%) were county directors, 116 (10%) were regional specialists, and 62 (5%) were administrators. A slight majority of the 1,194 responding about their gender were female (667 respondents, 55.9%). With regard to age, 456 respondents (38.4%) were 55 or older, 271 (22.8%) were in the 45–54 age group, 264 (22.2%) were in the 35–44 age group, and 197 (16.6%) were 34 or younger. Number of years of Extension employment was well distributed, with 371 respondents (31.7%) having 5 years or less, 199 (17%) having 6–10 years, 315 (26.9%) having 11–20 years, 207 (17.7%) having 21–30 years, and 79 (6.8%) having over 30 years.

## Findings

The majority of respondents believed it was either "important" or "extremely important" to engage their clientele in learning about sustainability (1,221 respondents, 92.1%). A statistically significant difference was found for gender, with more females than males feeling this was "extremely important" ( $X^2 = 35.8$ ,  $p < .001$ ,  $df = 3$ ) (Table 1). Also, newer employees were significantly more likely than their more veteran colleagues to assign importance to engaging their clientele regarding sustainability ( $X^2 = 52.7$ ,  $p < .001$ ,  $df = 12$ ) (Table 1).

**Table 1.**  
Perceptions of Importance of Engaging Clientele  
Regarding Sustainability by Gender Identification and  
Years Worked in Extension

Variable	<i>f</i>	%	<i>M<sup>a</sup></i>	<i>SD</i>
Gender				
Female	664	55.9	1.51	.84
Male	525	44.2	1.72	.93
Years in Extension				
0-5	369	31.65	1.46	.87
6-10	199	17.07	1.54	.86
11-20	314	26.93	1.65	.92
21-30	205	17.58	1.80	.87

31+                      79                      6.78                      1.67                      .91

<sup>a</sup>Importance measured on a Likert scale ranging from 1 (*extremely important*) to 4 (*not at all important*).

Participants were asked why they felt it was or was not important to engage their clientele regarding sustainability. From the 925 responses to this open-ended question, five major themes emerged (Table 2).

**Table 2.**  
Why Engaging Clientele Regarding Sustainability Is or Is Not Important: Major Themes and Supporting Participant Quotes

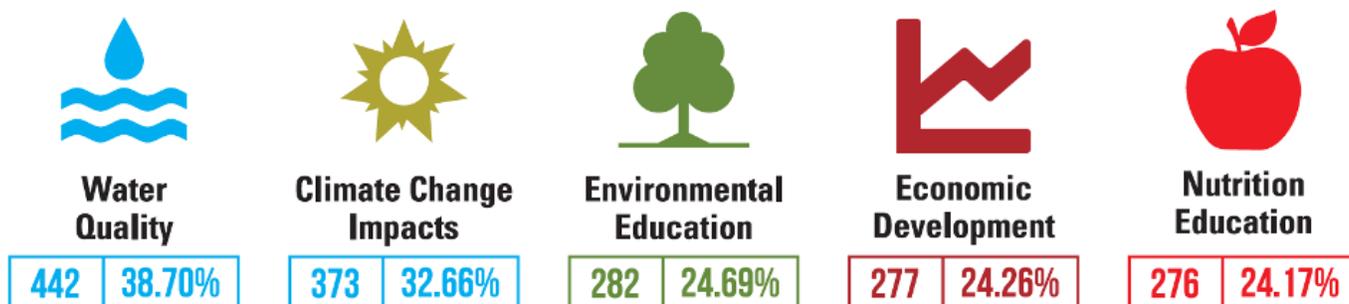
Theme	Sample quotations
Sustainability as defined by using resources	<p>"It enables clientele to make informed decisions about their and society's management of resources."</p> <p>"Resources are limited, population is growing, so we all need to be practicing carrying-capacity thinking to be a successful species."</p> <p>"Everyday decisions impact our natural resources. Cumulatively, peoples' decisions can make a difference."</p>
Sustainability as defined by economic vitality and profitability	<p>"Support of natural resource industries over the long-term has always been a central focus of Extension activities. In the public interest, it is critically important that our work helps to guide these industries toward practices that are profitable and sustainable in the long-term as research-based information helps to clarify this over time."</p> <p>"Vibrant local economies depend upon their ability to sustain themselves through various economic cycles."</p> <p>"We are a rural community that depends on agriculture for our local economy. If we don't keep agriculture and keep it clean, we cannot support the community."</p>
Perception of the word <i>sustainability</i> as problematic or divisive	<p>"I feel like people are confused by the definition and that 'sustainability' is this bad word as it relates to agriculture. I think it is very important to educate the public."</p> <p>"The political leaning in the area is such that sustainability and climate change are considered issues made up by people with an agenda. . . . Anyone who uses the term or appears to support sustainability ideas or climate change is consider[ed] suspect and cannot be completely trusted."</p> <p>"Sustainability is just the 21st century buzzword for stewardship —haven't we always been about good stewardship?"</p>
Sustainability as defined over multiple generations or into the	<p>"A healthy environment = a healthy community. When sustainability is integrated it takes that concept and extends to</p>

"future"	<p>future generations."</p> <p>"All human endeavor is impacted by the future. To be prepared for the future is being aware of sustainable practices and planning."</p> <p>"Survival of the planet, our species, other species, quality of life depends on looking at the impact on the future by what we do now."</p>
Sustainability as integral for community prosperity and well-being	<p>"It is critical for the future prosperity of the community."</p> <p>"It is the basis for economic, social, and environmental health of all within the community—and if the members of the community enjoy good health in all these aspects one would expect there to be less serious conflict and strife."</p> <p>"It is important to educate our clientele about sustainability in order for the community as a whole to move forward in knowledge and action and to help our communities come together and have a healthy future."</p>

Participants were asked to identify topic areas they believed their respective state Extension systems were doing a good job at addressing. Respondents were to consider factors such as dedicated staff time, programs, curriculum development, and fact sheets in making their determinations and were instructed to select all applicable topic areas from the list provided. This question received 1,191 responses. The topic areas identified most frequently were nutrition/health education (890 respondents, 74.7%), water quality (724 respondents, 60.8%), soil health (685 respondents, 57.5%), environmental education (637 respondents, 53.5%), and consumer education (630 respondents, 52.9%). Three of these topic areas—nutrition/health education, water quality, and environmental education—also were among the top five "emerging" sustainability issues participants identified in response to another survey question (Figure 2).

**Figure 2.**

Top Five Emerging Sustainability Issues as Perceived by Extension Educators (Indicated by Numbers and Percentages of Respondents)

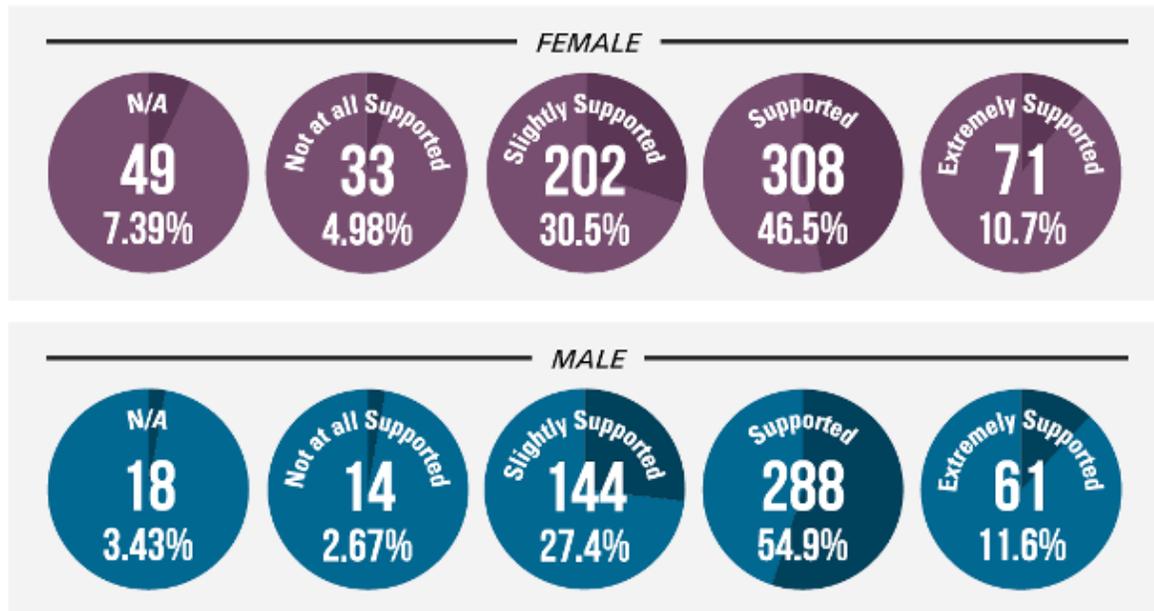


Despite majorities of respondents perceiving that Extension is doing a good job at addressing various sustainability topics, only 259 respondents (21%) reported offering sustainability-focused programs as part of their own Extension programming. When asked about whether they felt supported by Extension leadership in offering sustainability programming, one third of respondents (436 respondents, 32.8%) felt

either "not at all supported" or only "slightly supported." A majority fell into the "supported" category (665 respondents, 50.1%), and a small percentage felt "extremely supported" (149 respondents, 11.2%). Seventy-eight respondents (5.9%) selected "N/A" as their response. Men felt slightly more supported than women ( $X^2 = 17.4, p = .0016, df = 4$ ) (Figure 3). No significant difference was observed relative to age or tenure working in Extension.

**Figure 3.**

Perceived Levels of Support for Offering Sustainability Programming by Gender Identity (Indicated by Numbers and Percentages of Respondents)



Participants next reported on challenges to educating clients regarding sustainability. The relevant question garnered 1,180 responses. Lower mean scores indicated greater challenges. The challenges identified, ranked from greatest (1) to least (9), are as follows:

1. communication (e.g., maintaining a clientele base while talking about politically charged issues, tying in sustainability with various clientele values) ( $M = 2.77, SD = 1.61$ );
2. lack of community interest/competing priorities ( $M = 3.25, SD = 1.99$ );
3. community collaboration (e.g., finding time to engage and discover what is important in communities, establishing a two-way feedback loop) ( $M = 3.49, SD = 1.70$ );
4. lack of staff professional development ( $M = 4.54, SD = 1.87$ );
5. overcoming institutional barriers (e.g., gaining upper administration support, needing to expand Extension's traditional role) ( $M = 4.56, SD = 1.95$ );
6. fear of crossing the line from objectivity to advocacy ( $M = 4.80, SD = 2.02$ );

7. fear of losing political support ( $M = 5.80, SD = 2.00$ );
8. fear of losing employment ( $M = 7.31, SD = 1.65$ ); and
9. other ( $M = 8.49, SD = 1.89$ ).

In addition to identifying challenges, respondents reported on whether there were emerging sustainability issues that state Extension services should *not* address. A minority of the 1,342 individuals who answered the question (222 respondents, 16.5%) felt that Extension should not address one or more of the issues listed. We asked those who responded thusly to provide reasons for their responses, and 163 (73%) did so. Table 3 shows the top five major themes and supporting quotations from responses to this question.

**Table 3.**  
Sustainability Issues Extension Should Not Address: Major Themes and Supporting Participant Quotes

Theme	Sample quotations
Extension should not be involved in political matters	"There is too much politics in all that we do . . . I feel that being part of extension should relate me more to science rather than politics."  "Climate change is a theory that has had very controversial data to both support and negate it. Extension's role in throwing money into a political agenda only serves to degrade our reputation as an entity and to further strain our limited resources and personnel."
There are not enough resources to go around	"With tight budgets, Extension needs to choose what we can do better than anyone else and do it! Gone are the days where Extension can do everything well."  "There are so many more areas [in which] Extension could make a dramatic impact but there is no funding or inadequate funding."
There is risk in promoting policy changes in Extension	"Policy changes should be left to decision makers. Extension's role is to generate and disseminate information and new technologies, and [Extension] can develop data for decision makers, but [Extension] should not have the direct role of policy changes."  "Sometimes advocating for policy change can get you in a bind with political entities, individuals, etc. These must be played safely to assure solid footing organizationally in the future."
Some topics are addressed by other organizations	"Climate change impacts, alternate forms of transportation, issues currently addressed by federal, state and local governments. Why duplicate their activities?"

Extension should focus on distributing scientific, research-based data	<p>"Some of the topics are addressed by other state agencies."</p> <p>"Extension offers quality information by basing its programs on data. It does not need to chase popular fads, such as 'soil health,' unless that term can be defined and measured scientifically."</p> <p>"Extension efforts should be focused on providing science-based information to those engaged in utilization of natural resources. That in itself is a rather broad scope. While I embrace the existence of social issues like food and environmental justice, I don't see these belonging within the scope of Cooperative Extension."</p>
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Near the end of the survey, participants reported on their awareness of USDA climate hubs. There were 1,236 respondents to a question regarding whether they were aware of the USDA regional climate hubs. Of those, 411 (33.25%) indicated that they had heard of the climate hubs, and 825 (66.75%) indicated that they had not, despite the USDA's listing Cooperative Extension as a major partner for the hubs. For the 411 who had heard of the hubs, we asked whether they had worked with anyone and/or used materials from the hubs. Most (254 respondents, 61.8%) had not.

The complete results of our survey can be viewed at <https://extensionsustainability.usu.edu/national-sustainability-focused-extension-programs/>.

## Discussion

Although Cooperative Extension is "in a prime position to teach individuals and communities to live and work sustainably" (Elliott et al., 2008, "Opportunity," para. 1), less than a quarter of respondents to our 2017 national survey reported any sustainability-focused programming as part of their responsibilities. Despite this low number, the majority of respondents felt this type of programming was either "important" or "extremely important." This gap between actual program delivery and perceived importance of the topic demonstrates a large potential for new position development and training opportunities for Extension educators across the country. Given that females and newer employees were significantly more likely to assign importance to sustainability, these groups would be wise choices as initial audiences for sustainability-focused training and program development. However, although women assigned higher importance to sustainability education as compared to men, they also felt less supported by Extension leadership in offering sustainability programming. This disconnect serves as an opportunity for administrators to enable their state Extension educators by openly encouraging sustainability outreach and supporting the interweaving of sustainability messaging into existing programming. As identified by respondents, the challenge of communicating about sustainability must also be overcome, especially with regard to determining how to frame information, fostering community interest, and finding time to engage audiences to discover top needs at the community level.

Clearly, systemic potential remains for Extension to address the emerging sustainability issues perceived by the educators in our study, including water quality and climate change impacts. Reported challenges to achieving this potential resoundingly highlight community engagement themes (communication, community interest, collaboration) that Extension's evolving PIE tradition addresses head on (Smutko et al., n.d.). A

*Journal of Sustainability Education* article, "The Accidental Sustainability Agent," offers a consonant strategy: Incorporation of sustainability in programmatic outreach can be achieved "not just through programs specifically designed to address sustainability, but through well-established programs and cooperative demonstrations that have helped farmers, ranchers, businesses, and common people to make educated choices, which has played a role in improving the American standard of living for over 100 years" (Apel, Jones, & McDonald, 2013, "Conclusions," para. 2).

The themes we identified regarding why it is or is not important to engage clientele in sustainability offer insight into how educators can communicate in a way that meets clientele interests. This includes communicating sustainability through a lens of resource management and economic vitality and profitability. Depending on the target audience, terms such as *stewardship* and *conservation* may resonate better than *sustainability*.

Lastly, although Extension is listed as a key USDA climate hub partner, just over a third of respondents had even heard of the hubs, and of those who had, less than a third had ever worked with or used materials from the hubs. Professional development opportunities such as webinars, regional meetings, and state Extension conference presentations could help better connect Extension educators with their regional USDA climate hubs.

The time is ripe to reconsider how we can best fulfill Extension's mission to improve the quality of people's lives and enhance society's capacity to understand and address areas of widespread concern (ECOP, 1992, as cited in Patton & Blaine, 2001; U.S. Department of Agriculture, 2019). Although community-based and internal organizational challenges exist, Extension can and should turn increasingly to the top emerging sustainability issues identified herein, ranging from climate change impacts to the need for environmental education. Doing so will enhance our PIE work and help achieve ECOP's vision, making Extension "the most visible component of the land grant university of the twenty-first century" (ECOP, 1992, as cited in Patton & Blaine, 2001).

## References

- Allen, M., Dube, O. P. Solecki, W., Aragón-Durand, F., Cramer, W., Humphreys, S., . . . Zickfeld, K. (2018). Framing and context. In *Global warming of 1.5°C. An IPCC special report*. Retrieved from <https://www.ipcc.ch/sr15/chapter/chapter-1/>
- Apel, M., Jones, C., & McDonald, D. (2013). The accidental sustainability agent. *The Journal of Sustainability Education*, 2013(Winter). Retrieved from [http://www.susted.com/wordpress/content/the-accidental-sustainability-agent\\_2013\\_02/](http://www.susted.com/wordpress/content/the-accidental-sustainability-agent_2013_02/)
- Dillman, D. A. (2007). *Mail and Internet surveys: The tailored design method* (2nd ed.). Hoboken, NJ: John Wiley & Sons Inc.
- Elliott, C., Hyde, L., McDonell, L., Monroe, M., Rashash, D., Sheftall, W., . . . Tupas, L. (2008). Sustainable living education: A call to all Extension. *Journal of Extension*, 46(2), Article 2COM1. Available at: <http://www.joe.org/joe/2008april/comm1.php>
- Extension Committee on Organization and Policy. (1992). *Public issues education: The Cooperative Extension System's role in addressing public issues*. Washington, DC: Extension Service, U.S. Department

of Agriculture.

Graham Wood, E. (2019, February 5). USU faculty senate OKs proposal to reduce emissions. *The Herald Journal News*. Retrieved from [https://www.hjnews.com/news/education/usu-faculty-senate-oks-proposal-to-reduce-emissions/article\\_6ba90b64-0e4d-547d-af52-c9e4464efd0a.html](https://www.hjnews.com/news/education/usu-faculty-senate-oks-proposal-to-reduce-emissions/article_6ba90b64-0e4d-547d-af52-c9e4464efd0a.html)

Johnson, R., Hohenstein, B., & Steele, R. (2015). USDA regional hubs for risk adaptation and mitigation to climate change (USDA Climate Hubs). Retrieved from <https://www.climatehubs.oce.usda.gov/archive/sites/default/files/pdf/Updated-Hubs-Factsheet-01-22-2015-RS.pdf>

Patton, D., & Blaine, T. (2001). Public issues education: Exploring Extension's role. *Journal of Extension*, 39(4), Article 4FEA2. Available at: <https://www.joe.org/joe/2001august/a2.php>

Rashash, D., Elliott, C., & Madhosingh-Hector, R. (2015). Extension professionals and sustainability practices: Are we walking our talk? *Journal of Extension*, 53(2), Article 2RIB4. Available at: <https://joe.org/joe/2015april/rb4.php>

Smutko, S., Ayers, J., Babbitt, K., Corcoran, P., Culik, M., Dorsey, M., . . . Singletary, L. (n.d.). *Public issues education: Increasing competence, enabling communities*. Retrieved from <https://www.farmfoundation.org/wp-content/uploads/attachments/30-PIEIncreasingcompetencebook.pdf>

U.S. Department of Agriculture. (n.d.). Co-op research and Extension services. Retrieved from <https://www.usda.gov/topics/rural/cooperative-research-and-extension-services>

Vaughan, E. (2016, April 12). US wind power jobs hit record, up 20 percent in 2016. Retrieved from <https://www.awea.org/resources/press-releases/2016/us-wind-power-jobs-hit-record,-up-20-percent-in-20>

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