EXTENSION’S ROLE IN
sustainability

EXTENSION SUSTAINABILITY OUTREACH
Rising to Meet Public Sustainability Demand

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This year our country celebrates the 100th anniversary of the Smith-Lever Act creating Cooperative Extension. When President Woodrow Wilson signed the Smith-Lever Act on May 8, 1914, the population of the United States was less than 100 million, the majority of people lived in rural areas, and farmers were by far the nation’s most numerous occupational group. By extending agricultural research from the university to farmers, the impacts of Extension were immediate and dramatic.

The world today is vastly different than it was 100 years ago. The U.S. population now exceeds 300 million, the vast majority of residents are urban, and less than one percent live on a farm. An obvious consequence of population growth is greater strain on resources. More people consume more resources. All else being equal, 300 million people consume three times more than 100 million people. But, all else is not equal. Not only has the population increased, but our standard of living has changed as well. People today live in larger homes spread across more land. These homes are filled with modern gadgets from TV’s to tablets and smartphones. People today drive vehicles that consume nonrenewable fossil fuels and release vast amounts of carbon dioxide and other climate changing greenhouse gasses into the atmosphere. Rather than being locally produced, most food consumed today is imported from all over the world. Water has always been a scarce resource in the West, and rapid population growth in the region places more stress on an already limited resource.

While circumstances are vastly different than a century ago, Extension still has a vital role to play. One critical role for Extension in its second century regards sustainability. More people using more resources obviously places greater stress on these finite resources. In October 2013, the Western Rural Development Center organized the first Extension Sustainability Summit in Park City, Utah, under the direction of Dr. Roslynn Brain of Utah State University Extension. Presentations, keynote speakers, and displays all described Extension programs that have been developed around the general theme of sustainability. Dr. Brain defines sustainability as “living with an environmental ethic.” Speakers presented programs designed to help individuals and communities address significant resource issues and concerns. Sessions in the conference included one with an overview on sustainability programming and the five major themes of sustainability: (1) land (Mark Apel); (2) climate and air (Gregg Garfin); (3) water (Bob Simmons); (4) food (Rose Hayden-Smith); and (5) energy (Milton Geiger).

In this issue of Rural Connections, Dr. Brain, and the session chairs examine Extension’s history and its unique position to effect change across the nation. My hope is that readers will be encouraged to continue expansion and growth of sustainability work in Extension. We also encourage you to join us for the second Extension Sustainability Summit to be held in 2015.

--Don E. Albrecht, Director
The community of Extension agents in the Interior West is relatively small compared to other parts of the country and the issues of land use and climate change are acute. Yet, because of its vast open spaces and the richness of its resources, the West, with the help of Extension, still holds the promise of implementing the best land use and sustainability practices.” -- Page 11
Rising to Meet Public Sustainability Demand

Extension Sustainability Outreach

By Roslynn Brain

Introduction
What is sustainability? Who cares about the issues? Have we been walking the talk? What are we currently doing to meet rising demand? This article draws from major sustainability publications, programs, and from a recent Extension Sustainability Summit held in Park City, Utah, in order to answer these questions.

What is Sustainability?
Working as a statewide sustainable communities Extension specialist, I am often asked this question. My short response is: “sustainability is living with an environmental ethic.” Why does the environment serve as my basis in working within sustainability? Because without healthy air, open space, clean water, nutritious food, and clean energy, money and social issues would not matter as we could not survive. The environment serves as the foundation of my sustainability work. Profitability and social prosperity are effective outreach methods and communication tools to use in order to enhance the natural environment and sustain movements working to do so. Thinking about what we need to survive as a species has resulted in the five thematic areas of my statewide sustainability outreach program in Utah: land – conservation and landfill issues; air – quality and climate change; food – sustainable and local food systems; water – conservation and quality; and energy – renewable.

Sustainability Demand
Sustainability is a concept that has spread in popularity over the past decade. As an example, in a study of approximately 4,000 business managers and executives from 113 countries, more than 70 percent or 2,500 companies globally added sustainability to their management agendas in the past six years (MIT Sloan, 2012). Also, in a nationwide survey with 12,000 college applicants by the Princeton Review (2012), 65 percent of respondents stated they would value information about a college’s commitment to the environment. Of that number, 24 percent or close to 2,000 respondents said such information would “very much” impact their decision to attend a school.

Have we as Extension educators, connecting university teaching and research to the people, risen fast enough to meet this rapidly growing demand? In 2008, Cathy Elliot and colleagues published an article in the Journal of Extension entitled “Sustainable living education: A call to Extension.” In the article, the authors state, “to effectively address the need for Sustainable Living Education, Extension must immediately re-focus and re-tool. We need a state-by-state implementation of sustainable living programming to help clientele break from excessive consumption patterns held up as societal norms…if Extension is not prepared
to be a leader in providing education on this overriding challenge of our time, the public will go elsewhere for it—and indeed, the public is already doing so.” Why has the public looked elsewhere for sustainability information, and how is (and must) Extension change to address this problem?

Walking the Talk
Although Extension as a whole has been slow to embrace sustainability outreach, recent years have shown a rapid expansion of environmentally focused Extension programs. In 2010, the National Network for Sustainable Living Education (NNSLE) conducted an online survey of Extension personnel across the USA regarding their habits at work and home relating to environmental conservation and sustainability, which received 633 responses. This survey found that Extension educators were not modeling many environmental behaviors, ranging from paying bills electronically to composting. This internal survey provided insight to the education needed among Extension faculty and staff regarding sustainability, so we can model these behaviors to our clientele as a leader in the field. However, several Extension educators have been practicing a myriad of sustainability behaviors, and providing outreach in this area, which was discovered at the 2013 Extension Sustainability Summit.

Extension’s Move Toward Sustainability
In October of 2013, Utah State Extension Sustainability partnered with the Western Rural Development Center to launch the nation’s first Extension Sustainability Summit. This summit brought together over 50 professionals to share Extension programs and research in environmental sustainability, with 18 oral presentations and 14 exhibits. Presentations at the summit were 15 minutes in length. This shorter time allowed for lightning sessions (similar to a world café approach) in which participants envisioned the successes and future of Extension concerning major sustainability themes. I highlight some of those findings here, and the chair of each summit session will discuss these issues in further depth via the other articles in this issue.

Sustainability
The term sustainability was envisioned to encompass long-term, environmental responsibility, social benefit, and economical viability. Given that sustainability concepts encompass all Extension program areas, participants at the Extension Sustainability Summit agreed that university Extension programs must commit to the concept of sustainability as a whole for the long-term.

Land
Although land conservation efforts must still be targeted toward traditional agriculture, assisting small ranchette and urban farms will become increasingly important for Extension. Extension educators could also benefit from training local officials and communities in fundamental principles of land-use planning and zoning, thus creating opportunities to infuse sustainable development concepts into policy and community-wide initiatives. Extension educators are well positioned to bring outside expertise, including experts in conservation easements, estate planning, and range management who can help with the goal of maintaining and enhancing rural landscapes. With landfill issues, Extension educators can work with city environmental departments, local landfills, and recycling centers to provide educational workshops and outreach to shift attitudes and behavior.

Air and Climate Change
Although climate change is still a hot topic, many universities have explicit climate change

Outcomes and Impacts of the 2013 Summit

Information about the Extension Sustainability Summit is available on the Western Rural Development Center’s website. http://wrdc.usu.edu/htm/programs/ess

The outcomes and impacts report of the Summit is available to view and download. http://wrdc.usu.edu/files/publications/publication/ pub__5893621.pdf
programs, from Florida to Minnesota to Alaska. In order to address climate change, Extension will need to communicate effectively about managing resources in the likelihood of increasingly variable climate conditions. Extension’s role would be most effective in framing discussions about climate variability, improving system resiliency, and managing risk. Support from government officials and university administration will be a great assistance to Extension when it comes to confidently providing information and outreach to clientele. Summit participants agreed, however, that branding sustainability programs under the terms “climate change” or “global warming” would not be of benefit. Instead, Extension educators should be conversant about climate change issues, but not market their existing programs under climate change.

Regarding air quality, in Utah, California, and many other states, air pollution is becoming a growing concern. Although Summit participants agreed this was an important topic, no programs could be identified in Extension directly addressing this issue.

Food
To educate the public and youth about sustainable food systems, we need to document with producers the story behind food production via videos, national geographic-style photos, and intriguing stories. Partnerships will be critical, involving moving past compartmentalization. Having kids grow their own food is a large component of this type of education. Urban agriculture can act as a catalyst for urban economic development and support of small-scale agriculture. Also, from an Extension or land grant perspective, accessing urban agriculture gives us another way to communicate with a new constituent. We also need to focus on food-waste diversion from landfills and into compost, recycling, etc. Offering programs connecting rural and urban audiences, such as breakfasts on the farm, fundraising dinners, socials connecting farmers and chefs, etc., will help bridge the gap. Bridging will also require addressing food justice issues.

Water
Extension needs to better use university resources and develop capacity in the area of urban/suburban water quality, conservation, and stormwater management issues. More of the outreach concerning water issues needs to be urban and suburban focused, including nurseries, landscape businesses, developers, realtors, Master Gardeners, etc. There is also a large need for Extension outreach in water sustainability issues in rural communities with less town and county outreach capacity.

Energy
The local nature of Extension is perceived as an asset not possessed by other state and national organizations. The rapport of Extension in local communities enables the presentation of new information, such as energy, from a position of trust. This allows Extension to be more effective than other, outside, entities. Energy issues also seamlessly integrate into other Extension discussions, such as soil health or community development. Energy education can engage a great variety of Extension’s existing clientele. Personal energy literacy is an overarching goal, where Extension clientele can make informed decisions about how they use energy. It is not just “coal is bad” or “renewables are expensive,” but a more informed discussion about the costs and benefits of our individual and collective choices.

Future Extension Sustainability Summits
Sustainability-focused programs within Extension continue to grow. On the next page is a sample of new programs stemming from Extension to meet demand. Also, given many requests, Utah State University Extension Sustainability and the Western Rural Development Center will host another Extension Sustainability Summit in 2015. This Summit will again be western focused, while allowing relevant speakers and participants to attend from outside of the western region.
Examples of Western Extension Sustainability-Focused Programs

**University of Arizona’s Externships in Community Sustainability Through Cooperative Extension**
This program creates opportunities for University of Arizona students to bring their experience, skills, and enthusiasm to their communities through innovative sustainability projects, such as rainwater harvesting projects, school and community gardens, and farmers markets.
studentaffairs.arizona.edu/greenfund

**Oregon State University Sustainable Living**
Sustainability means meeting the economic, social, and environmental needs of the present without compromising the similar needs of future generations.
extension.oregonstate.edu/metro/sustainable-living

**Utah State University Extension Sustainability**
Providing credible information and trainings fostering increased awareness and behavioral change to improve environmental, social, and economic conditions.
extension.usu.edu/sustainability

**University of Arizona’s Land Use Planning and Sustainable Development Program**
Arizona Cooperative Extension’s Land Use Planning and Sustainable Development program helps citizens define and contribute to the future of their communities by becoming better informed about exurbanization, renewable energy, economic development, land use planning, sustainability and local government structure.
rurallandscapes.extension.arizona.edu

**Agricultural Sustainability Institute at UC Davis**
The Sustainable Agriculture Research and Education Program provides leadership and support for scientific research and education in agricultural and food systems. The statewide program assists farmers and ranchers in developing and implementing sustainable production and marketing systems and supports the state’s rural and urban communities in understanding the concept and value of sustainable agriculture.
sarep.ucdavis.edu

**Colorado State University Extension Farm to Table Program**
This program has resources/information for producers, retailers, and consumers. At each stage of the food chain, from the producer to the consumer, food safety strategies can be followed to minimize contamination and help lower the risk of food-borne illness.
farmtotable.colostate.edu/index.php

**Utah State University Extension: Utah Farm-Chef-Fork**
This program is a collaboration between Utah State University Extension Sustainability, the Utah Department of Agriculture and Food, and Slow Food Utah. The goal is to enhance community vitality and reduce food miles by connecting Utah producers and restaurants through trainings and meet-and-greet opportunities.
extension.usu.edu/sustainability/htm/programs/utah-farm-chef-fork

**University of Nevada Extension Natural Resources Program**
Cooperative Extension water specialists collaborate with agencies, policy makers, industry, and homeowners to save water, protect its quality, and find new water sources. They work to help people find that delicate balance that will keep our ecosystems healthy and sustainable. Programs include: Waterwise Habits, Environmental Stewardship, Nevada Naturalist and more.
unce.unr.edu/programs/natural

**New Mexico State University Cooperative Extension Service Water Task Force**
The NMSU Water Task Force promotes and supports the role of science and technology in addressing critical water issues facing New Mexico through research, education, and Extension outreach. The New Mexico Integrated Water Management Handbook provides guidance on how to evaluate and understand site-specific field conditions.
extension.nmsu.edu/energy_water.html
aces.nmsu.edu/ces/watertaskforce/index.html

**Utah State University Water Quality**
This site provides a wealth of information and programs that help the public protect the quality of Utah’s streams and rivers, lakes and reservoirs, and groundwater.
extension.usu.edu/waterquality

**Colorado Energy Master**
Each of the three courses of this program consists of three classes (two weekday evening short classes that can be taken from one’s home computer and one Saturday half-day class that starts at a County Extension office and ends with a field trip). Individual classes required for aspiring Colorado Energy Masters are also offered.
http://www.ext.colostate.edu/energymaster/

**Montana State University's Exploring Energy Efficiency & Alternatives for the Home, Farm & Ranch (E3A)**
E3A is a source for non-biased, research-based information on small renewable energy technologies. E3A provides free downloadable fact sheets, links to resources, and resources to help you explore small renewable energy systems. For Educators, E3A is a self-guided, self-contained toolkit of resources to help you teach energy. In addition to fact sheets, presentation material, and other resources you’ll find online, the E3A toolkit includes lesson plans and resources to help make teaching energy easy.
e3a4u.info

**University of Wyoming Extension Renewable & Efficient Energy**
The “Renewable and Efficient Energy – Solutions for Wyoming” is designed to provide UW-developed resources, such as publications and assessment tools, and a gateway to the many excellent resources of other partners, such as the United States Department of Energy and National Renewable Energy Lab.
wyoenergy.gov
The Sustainability Revolution

Where are we now? What do we have to know? What happens next?

By Viviane Simon-Brown

WHERE ARE WE NOW?
“May you live in interesting times.” This article offers a snapshot of our time, based on my interpretation of the 2012 UN Rio+20 work report The Future We Want, and the 2005 edition of Andres Edwards book, The Sustainability Revolution: Portrait of a Paradigm Shift. I would like to highlight five key points to know about the Sustainability Revolution; and identify internal stumbling blocks – and catalysts – for Cooperative Extension professionals involved in sustainability education.

Let me begin with the biggest picture possible, and the five key points.

KEY POINT ONE
We are in the middle of the most profound social transformation of our time – the sustainability revolution – and most of us don’t have a clue about its tremendous scope, or the roles we play within it. Think about the Scientific Revolution in the 16th and 17th centuries, and the big names that came out of it – Kepler, Galileo, Descartes, Newton, Voltaire, Rousseau, Linnaeus, and Locke. Consider the Industrial Revolution of the 18th and 19th centuries, and its inventors – Wright Brothers, Ford, Watt, Whitney, Fulton, Edison, Nobel, Pasteur, Lister, Curie.

The Sustainability Revolution is as momentous. There are names associated with it too – McKibben, McDonough, the Dali Lama, Meadows, Robins, Dominguez, Bruntlandt, Hawken, Ray, Mother Teresa, Kumar, Durning, Schumacher, Shiva, Leopold, Macy, Fodor, Petrini – don’t recognize most of them? Don’t worry, 50 years from now, people will. Who knows? Our names could be on this list too.

KEY POINT TWO
The Sustainability Revolution is international in scope, covering all facets of society, including government, industry, the private sector, education, churches, and the arts. All socioeconomic backgrounds, nationalities, religions, and cultural affiliations are represented. You want numbers? Paul Hawken estimates there are 30,000 sustainability groups in the US, and tens of thousands worldwide. Social researcher Paul Ray estimates 50 million sustainability advocates in the US and 80-90 million in the European Union. In 1998, an internet search of the words “sustainable living” revealed three references to the term. This year, an internet search reveals 3.85 million.

Economists take note here: It has a multi-billion dollar economic impact. Ray states there’s a
$230 billion dollar market in the US and a $500 billion dollar market worldwide for sustainable products and services.

**Key Point Three**
Sustainability is often confused with only ecological concerns, but sustainability values represent the broadest context of issues – that literally have spread underground in all sectors of society throughout the world.

Expand your vision of sustainability to include conservation, globalization, socially responsible investing, corporate reform, ecoliteracy, climate change, human rights, population growth, health, biodiversity, labor rights, social and environmental justice, community-supported agriculture, local currency, invasive species, conflict resolution, women’s rights, public policy, trade, and organic farming. While not a complete list, these topics are familiar since Extensionists are involved in every one of these.

**Key Point Four**
While there is no one single ideology, there are remarkable similarities among sustainability groups in their overall intentions and objectives. These include:

1. Concern for the environment, the economy, and social equity; the triple-win, the triple bottom line, the sustainability triangle, the nested model
2. An understanding that our survival and well-being are dependent on the health of natural systems – clean air, clean water, healthy soils and forests, biodiversity
3. Knowledge of the limits of the Earth’s ecosystems and the detrimental impact of unchecked human activities – such as unchecked population, pollution, economic growth
4. Groups all over the world are taking long-term, intergenerational actions and goals

Are you reeling with the immensity of it all? Are you wondering how all of this could be going on without you, an informed Extension professional, knowing about it?

**Key Point Five**
Leadership is decentralized. Leadership within the sustainability revolution is made up of hundreds of thousands of citizens and community leaders from around the world. Paul Hawken says it best: “No one started this worldview, no one is in charge of it, no orthodoxy is restraining it. It is unrecognizable to the American media because it is not centralized, not based on power, nor led by charismatic white males.”

**What Do We Have to Know?**
We have to know where Cooperative Extension fits into this picture. What’s working against us? As an organization, our collectively-conservative ethics make it difficult for Extensionists – and our traditional audiences – to acknowledge the veracity of other groups’ worldviews. As a group, generally, Extension folks don’t consistently model sustainable practices.

**National Network for Sustainable Living Education**
NNSLE’s goal is to “improve quality of life and reduce environmental degradation by fostering new consumption patterns and sustainable lifestyles through NIFA Extension programs, by building an Extension network to investigate, educate, and model sustainable living practices to individuals, families, communities, institutions, businesses, camps, and schools.”
http://www.anrep.org/resources/nnsle

**UN Rio+20 The Future We Want**
“The UN is working with governments, civil society and other partners to shape an ambitious sustainable development framework to meet the needs of both people and planet, providing economic transformation and opportunity to lift people out of poverty, advancing social justice and protecting the environment.”
Sustainability as an overarching concept is rarely an Extension priority. Our program area structure doesn’t support truly multidisciplinary endeavors. We work on one to three year cycles, not 20 to 100 years. And then, there are the dwindling budgets....

However, I submit that Extension has ingrained cultural values which can greatly benefit our sustainability outreach efforts. We promote frugality, family cohesiveness, land stewardship; these are Extension versions of sustainable practices. We have an established presence in most areas of the United States. The new outreach guidelines for large federal grants give Extension a larger platform. We have multiple technologies for distributing needed programming.

WHAT HAPPENS NEXT?
Our clientele – both traditional and new – are hungry for a ‘revolutionary, science-based, paradigm shift’ organization like ours to help them sort through the myriad of conflicting messages. Extension will not be the only source of trustworthy information – we don’t have an exclusive franchise on knowledge – but we can establish ourselves as one of the key players.

It’s up to individuals within Extension to make this happen. The recent Extension Sustainability Summit in Park City, Utah, is an excellent example of Extensionists seeing a need and following through. The National Network for Sustainable Living Education (NNSLE) is another catalyst for change. We can no longer wait for a system-wide mandate. We can make a positive difference if we incorporate the five key points of the Sustainability Revolution.

CONCLUSION
In 2000, an international committee, The Earth Charter Initiative (see next page for the preamble to the Charter), crafted a comprehensive, cross-cultural, multidimensional approach to presenting values for worldwide acceptance. I propose that its spirit be included in our deliberations.

“The social researcher Paul Ray estimates 50 million sustainability advocates in the US and 80-90 million in the European Union. In 1998, an internet search of the words ‘sustainable living’ revealed three references to the term. This year, an internet search reveals 3.85 million.”
Preamble to the Earth Charter
We stand at a critical moment in Earth’s history, a time when humanity must choose its future.

As the world becomes increasingly interdependent and fragile, the future at once holds great peril and great promise.

To move forward we must recognize that in the midst of a magnificent diversity of cultures and life forms we are one human family and one Earth community with a common destiny.

Towards this end, it is imperative that we, the peoples of Earth, declare our responsibility to one another, to the greater community of life, and to future generations.

We must join together to bring forth a sustainable global society founded on respect for nature, universal human rights, economic justice, and a culture of peace.

To read the complete charter, visit http://www.earthcharterinaction.org/content/pages/Read-the-Charter.html
Extension’s Efforts in Land Use Planning and Sustainable Development

By Mark Apel

Introduction
This year, Land-Grant Universities across the nation are celebrating the Centennial Anniversary of the Smith-Lever Act – the Cooperative Extension Service Act that was signed into law by President Woodrow Wilson on May 8, 1914. This act, along with the Morrill Act of 1862 (Land Grant College Act) and the Hatch Act of 1887 (Experimental Research Station Act) reinforced and promoted the mission of Land-Grant Universities to reach out to communities with the latest research-based information, primarily in agriculture. University-based Extension programs throughout the West have long been known as a credible resource to help rural communities address a multitude of issues ranging from childhood obesity to better gardening practices and water conservation. However, as the West has seen an influx of new residents and its rural areas transformed in a relatively short period of time, several compelling trends have emerged to engage university-based Extension efforts in a new programmatic direction of land use planning and sustainable development. In October of 2013, the Western Rural Development Center and Utah State Extension Sustainability hosted the first Extension Sustainability Summit that brought together Extension educators from around the West to present and discuss the relationship of land, air, food, water, and energy to sustainability efforts. This article will discuss the emerging trends around land use and highlight the reasons why Extension is in a good position to help the West’s stakeholders connect the dots between land and sustainability.

Changing Trends
While the West is known for its vast and picturesque open spaces, high mountain ranges, deserts and rangelands, other issues and trends are overshadowing the western landscape and dominating its headlines. One trend has been a dramatic increase in population growth where the rate of growth in the West has exceeded the national average for the last four decades. The Western Rural Development Center’s Population Brief noted that between 1980 and 2006, the 13 states in the Western region saw an increase of over 26 million people, or 60.5 percent. For the same timeframe, by comparison, the rest of the nation only grew by 25.5 percent (Albrecht, 2008). While the Great Recession has slowed this trend down somewhat, the effects are still evident by the amount of land that has been consumed by development and taken out of agriculture and grazing. Per Census 2010, Nevada and Arizona were still the two fastest growing states, respectively, over the last decade despite the economic downturn.
Where and how new residents will be accommodated becomes the question of the day for planners and decision-makers everywhere in the Interior West. Belying the illusion of vast open spaces in the West to accommodate new growth is the fact that nearly half of the land is federally owned, thereby further restricting where and how residential development could occur.

One typical development pattern in the West, exurban development, has led to a fragmentation of rural landscapes and wildlife habitat, loss of prime arable and grazing lands, the introduction of exotic species, and an increase in the intensity of natural processes like wildfire and flooding. Exurbs are large-scale permanent settlements by urban people in rural areas beyond typical commuting distances on lots ranging from one acre to 40 acres. In fact, nationwide, exurbs account for ten times the amount of land in urban and suburban uses (Travis, 2007). This development pattern and its impacts may not be unique to the Interior West. But, because of the Interior West’s vast open spaces and the long distances people are willing to live from metropolitan areas, settlement patterns exacerbate ‘vehicle miles traveled’ or VMT – a telling indicator of potential carbon emissions, in terms of personal vehicle emissions, energy consumption, and the construction of new roads to accommodate traffic. In addition, the West’s water resources are diminishing at alarming rates because of prolonged drought, thereby making the prospects of more demand on those resources even more disconcerting.

The 1990’s and early 2000’s saw a manifestation of large in-migrations and their subsequent impacts to our Western landscapes, as described above. Riding on this wave in the mid-2000’s before the real estate bust of 2007, many counties and cities throughout the West granted entitlements to new subdivisions and master planned communities that, as a result of the post-2007 real estate bust, never got built or only partially completed (Table 1.2). Nonetheless, millions of additional lots were cleared and roads bladed into areas that were once open space or in agricultural production. They now lie fallow or are partially inhabited, contributing little to no tax revenues to the jurisdictions charged with providing services, like road maintenance, schools, etc. These ‘zombie’ subdivisions are difficult to remedy because of fragmented ownership, expired development assurances, and deteriorating infrastructure. The recent publication “Arrested Developments: Combating Zombie Subdivisions and Other Excess Entitlements,” a Policy Focus Report from the Lincoln Institute of Land Policy, provides an overview of these issues as well as some ideas for remediaging this problem in the West. If not corrected, these pseudo-developments will erode communities’ fiscal health, quality of life, and property values (Holway et al., 2014).

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**TABLE 1.2**

Selected Northern Intermountain West Counties—Vacant Subdivision Lots in 2012

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<tbody>
<tr>
<td>Ada County, ID</td>
<td>30.40</td>
<td>392,365</td>
<td>5,460</td>
<td>151,319</td>
<td>127,451</td>
<td>23,868</td>
<td>16%</td>
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<tr>
<td>Jefferson County, ID</td>
<td>36.50</td>
<td>26,140</td>
<td>321</td>
<td>6,331</td>
<td>2,939</td>
<td>3,392</td>
<td>54%</td>
</tr>
<tr>
<td>Teton County, ID</td>
<td>65.50</td>
<td>10,170</td>
<td>403</td>
<td>10,225</td>
<td>3,300</td>
<td>6,925</td>
<td>68%</td>
</tr>
<tr>
<td>Lake County, MT</td>
<td>8.45</td>
<td>28,746</td>
<td>540</td>
<td>12,583</td>
<td>4,356</td>
<td>8,227</td>
<td>65%</td>
</tr>
<tr>
<td>Missoula County, MT</td>
<td>14.09</td>
<td>109,299</td>
<td>1,876</td>
<td>32,470</td>
<td>27,028</td>
<td>5,442</td>
<td>17%</td>
</tr>
<tr>
<td>Yellowstone County, MT</td>
<td>14.39</td>
<td>147,972</td>
<td>1,946</td>
<td>82,173</td>
<td>46,396</td>
<td>35,777</td>
<td>44%</td>
</tr>
<tr>
<td>Laramie County, WY</td>
<td>12.4</td>
<td>91,738</td>
<td>1,378</td>
<td>36,134</td>
<td>28,681</td>
<td>7,453</td>
<td>21%</td>
</tr>
<tr>
<td>Lincoln County, WY</td>
<td>24.2</td>
<td>18,106</td>
<td>367</td>
<td>5,663</td>
<td>2,356</td>
<td>3,307</td>
<td>58%</td>
</tr>
<tr>
<td>Sheridan County, WY</td>
<td>9.6</td>
<td>29,116</td>
<td>314</td>
<td>3,912</td>
<td>2,601</td>
<td>1,311</td>
<td>34%</td>
</tr>
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</table>

Source: Sonoran Institute
Climate change projections, as well, create the imperative to incorporate the best emerging ideas and innovations to off-set and mitigate the effects of future development – especially as it relates to sustainability, carbon footprints, adaptation, and the abatement of greenhouse gases (American Planning Association, 2008). This is especially important in the Interior West where we see a convergence of development and the potential for increased carbon emissions.

The 2013 release of the report, “Assessment of Climate Change in the Southwest United States,” represents the findings of 120 authors, from a variety of scientific disciplines, as well as regional stakeholder input and independent review. The assessment examines what climate and climate change mean for the health and well-being of the Southwest’s human populations and environment in an area encompassing about 700,000 square miles including California, Arizona, Utah, Nevada, Colorado, and New Mexico. Some of the findings include trends that were once projected just five years ago, but are now manifesting in the present. For example:

- The Southwest is getting hotter, with fewer cold waves and more heat waves. Southwest heat waves are projected to become longer and hotter, affecting city residents, transportation, and energy infrastructure. These will result in increased risk of electricity delivery disruption in extreme heat waves and droughts.
- Snowmelt is occurring earlier in the year and is projected to be less, which can decrease water supply reliability and lengthen wildfire seasons.
- Increased wildfires, outbreaks of forest pests and diseases and forest mortality are all directly associated with higher temps and decreased precipitation (Garfin et al., 2013).

**Extension’s Engagement in Sustainability and Land Use**

The significant increases in population as well as the latest climate change projections have compelled many communities, state agencies, researchers, planners, elected officials, and natural resource managers in the West to look for creative solutions and tools to manage the changes occurring to their rural landscapes. Although western metropolitan areas are not immune to the issues discussed here, they are generally better-equipped to address the impending trends. It is the rural areas that are bearing the brunt of the population dispersal patterns with the incidence of exurbanization, as well as changing economies through the conversion of agricultural and grazing lands. It is also in these rural areas that Extension agents in the West are already well-established, providing important education and outreach services on behalf of their land-grant universities, usually on a county by county basis.

Several western universities address planning and growth issues have conducted excellent research. University of Colorado’s Center of the American West, Arizona State’s Morrison Institute for Public Policy, and the University of Wyoming’s William D. Ruckelshaus Institute of Environment and Natural Resources are all fine examples of academic engagement in this important topic. Utah State University Extension’s program in Rural Intermountain Planning is active in community planning. The West’s land-grant institutions and...
Extension agents are well-placed to tap into the research, data, best practices, designs, and innovations that are coming forth from their respective universities to help address these issues.

For example, the Climate Assessment for the Southwest (CLIMAS) program, as part of the University of Arizona’s Institute of the Environment, was established to help improve the ability of the Southwest to respond sufficiently and appropriately to climatic events and climate changes. Extension agents, specialists, and land managers alike use the data from this program to support education efforts in best practices with regard to planning for and developing healthy, low-impact, and sustainable communities. Other western land-grant universities, such as Colorado State University, New Mexico State University, and Montana State University have similar programs with focused research on climate change and greenhouse gas mitigation.

The University of Arizona’s (UA) Cooperative Extension is one of several institutions in the Interior West that is assisting community leaders, decision-makers, small acreage landowners, and ranchers with the development issues that are affecting the rural areas in which they live. UA Extension’s Land Use Planning and Sustainable Development program provides workshops to communities, planning officials, and decision-makers on the principles of planning and sustainability; analysis and research of land use suitability for siting large scale solar projects; training for more effective ‘citizen’ planners; and resources for local food systems producers and farmers market managers.

As many planners in the public and private sectors already know, it is not difficult to make the case for sound planning. Population growth and climate change are not unique to the West. Yet, as described earlier, there are compelling factors in our region creating the need to engage as many resources and stakeholders as possible to address these important issues. Extension agents are in a position to facilitate, consult with, and educate stakeholders on land use planning and sustainability issues where many rural counties and small towns only have the resources to handle day-to-day development requests. Many rural jurisdictions have little time or staff to address long-term planning. Private sector planning firms have filled this niche in some areas of the West. Yet, apart from the well-established networks of stakeholders, what enhances an Extension agent’s ability to address land use issues and sustainable development in rural jurisdictions is the wealth of credible resources they have access to in their respective universities. Some of those resources found at most major universities throughout the West, are:

- GIS technology
- Mapping and other web-based tools
- Planning and design degree programs
- Natural resources specialists
- Geography specialists
- Climatologists
- Agriculture and resource economics
- Range management specialists

Extension agents are playing an important role in helping to bring these resources to stakeholders through their Natural Resources, Agriculture, and
Community Resource Development programs and taking into consideration sustainability, economic diversity, and innovation. While the entire West’s resources like water, agriculture/range production, and energy are important to sustain, nothing provides the foundation for all of these like the choices we make about our finite landscapes.

In addition to bringing the latest in research-based information to stakeholders, Extension also excels in being ‘conveners.’ This is a very appropriate role in the arena of land use and sustainability, since there is generally a variety of stakeholders and players, such as conservation and development interests, in addition to landowners themselves, involved with large landscape decisions. Well-connected Extension agents are in a strategic position to bring together outside expertise, such as experts in conservation easements, estate planning, and range management that may benefit landowners and contribute to the goal of maintaining and sustaining our region’s rural landscapes. A county’s comprehensive plan or a town’s general plan, are great places to start to understand the land use issues affecting rural areas and often, Extension agents can be engaged as objective, neutral facilitators, while providing valuable research-based information for decision making.

**Conclusion**

Population growth and economic issues, climate change, and land development trends affecting the West’s rural landscapes have created the imperative to engage as many resources and people as possible to make our communities more resilient in the face of these issues. A number of universities are engaged in the changes that are transforming rural landscapes throughout the Interior West, either through academic research or through Extension programs like Utah State’s Rural Intermountain Planning Program and the University of Arizona’s Land Use Planning and Sustainable Development program. This year, Land-grant institutions across the country will be celebrating the Centennial of the Cooperative Extension Service Act. This has been the blueprint for over 100 years in making our resources and communities more sustainable, more resilient. The community of Extension agents in the Interior West is relatively small compared to other parts of the country and the issues of land use and climate change are acute. Yet, because of its vast open spaces and the richness of its resources, the West, with the help of Extension, still holds the promise of implementing the best land use and sustainability practices.

“A county’s comprehensive plan or a town’s general plan, are great places to start to understand the land use issues affecting rural areas and often, Extension agents can be engaged as objective, neutral facilitators, while providing valuable research-based information for decision making.”
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An Opportunity or an Obstacle to Extension Work?

By Gregg Garfin

Challenges with Climate Change Discourse
In a recent issue of the Journal of Extension, the editor stated that “climate change is obviously on Extension’s radar screen” (Hoelscher, 2013). This statement is supported by a number of publications addressing the topic (e.g., Fraisse et al., 2009; Layman et al., 2013; Burnett et al., 2014), by formal Extension programs and initiatives aimed at informing Extension professionals and clientele (e.g., eXtension Climate, Forests and Woodlands Community of Practice) and initiatives for coordinating with and learning from the research and practitioner community (e.g., Association of Natural Resources Extension Professionals’ Climate Science Initiative) and working with communities to anticipate, prepare for, and respond to climate change challenges (e.g., Haden and Jackson, 2011).

However, at the 2013 Extension Sustainability Summit, Extension professionals expressed a diversity of opinions on whether the topic should be viewed as an opportunity or an obstacle to Extension work (Brain et al., 2013). Some participants in climate change discussions expressed discomfort about discourse with their clientele on the topic; their group conclusion, crudely stated, sounds something like “climate change is the third rail for most Cooperative Extension professionals.” An informal tally of Cooperative Extension climate change web-based pages, products, initiatives, formal programs, annual report announcements and strategic plan commitments, which I conducted for this article, demonstrates the diversity of approaches to the topic. My tally shows that 16 states have explicit climate change programs or research and outreach themes, and 14 refer to climate change in documents and news articles, but lack programs. For eight states, climate change information can only be found by way of the website Search function or links to resource pages (many times only in conjunction with College of Agriculture research, and not explicitly Cooperative Extension work), and 12 states do not mention climate change anywhere on their Extension websites. This diversity of opinions and levels of commitments, within Cooperative Extension, to address climate change reflects the concerns and attitudes of the broader society in the United States (Burnett et al., 2014). This array of attitudes has been well documented in the ongoing Six Americas study (Leiserowitz et al., 2011).

The origins of discomfort with climate change discourse among some communicators, based on their experiences with clientele, have also been well documented, and include: clientele’s lack of trust in government or international sources of information (Brugger et al., 2011), differing tolerances for risk and understanding of uncertainty (Creighton et al., 2011; Moser, 2014), clientele’s bias toward confirming previously held beliefs (Creighton et al., 2011), reliance of some clientele on feeling-based decision-making (Brugger et al., 2011), conflicts with available
information (Burnett et al., 2014), or disbelief in the attribution of any climate changes to human activity (Moser, 2014; Peterson et al., 2013). Dealing with attitudes that contrast with scientific findings is not new, but the cultural polarization associated with attitudes about climate change may be more characteristic of the ways in which some people hold to particular cultural world views (Kahan et al., 2012; Kahan, 2012; McCright and Dunlap, 2011). I think it is safe to say that cultural polarization may be anathema to an organization like Extension, which aims to build bridges between university research and the potential users of that research, and which relies on working within the cultural contexts of its clientele and their communities (Brugger and Crimmins, 2013).

Climate Challenges for the Southwest

Front and center among concerns about sustainable resource management in the Southwest are issues related to water, forests, agriculture, and human well-being. The recently published Assessment of Climate Change in the Southwest (Garfin et al., 2013), a comprehensive scientific review and synthesis of studies on climate change and its impacts in the region, notes two key climate facts that affect six southwestern states: during the last 110 years, regional temperatures have increased, precipitation has not (Hoerling et al., 2013). Given that the Southwest is prone to multi-year dry and wet periods (Hoerling et al., 2013), the observed increase in temperature profoundly affects snowpack and evapotranspiration, which affects the character of drought. These proximate effects have led to cascades of ultimate effects, such as longer frost-free season length, which impacts crops (Frisvold et al., 2013), the life cycles of insect pests (Fleishman et al., 2013), and vegetation diseases, or longer, hotter, and more destructive fire seasons (Fleishman et al., 2013).

Climate models, which afford scientists the opportunity to conduct multiple experiments to understand the effects and interactions between aspects of the global and regional climate systems, project further warming (Figure 1), decreased snowpack, soil moisture and runoff (Figure 2) (Cayan et al., 2013). Given the assumption that one so-called climate forcing factor, heat-trapping gases in the atmosphere, will continue to increase at rapid rates, these projections lead to plausible impacts that can affect every economic and resource management sector in the region. Projected impacts, for a Southwest that is 5-8°F warmer during the course of this century, include less reliable surface water supplies, increased extent of wildland fires, increased risk of the spread of illness and disease, and greater risk of the encroachment of ocean waters into coastal environments and infrastructure (highways, airports, sewage and wastewater facilities, power plants).

Opportunities

The aforementioned climate challenges can suggest a gloomy outlook, but can also create...
opportunities for maintaining, developing, and implementing practices for sustainable resource management. One frame that bridges the worlds of climate change, extension, and sustainability discourse is adaptation, or adjustments “in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities” (McCarthy et al., 2001). This very technical definition can be translated into something along the lines of something’s coming down the road, climate-wise, so let’s get ready, and maybe make some changes so we can get through it, or be first in line to take advantage of it. Moser (2014) mentions “that talking about adaptation rids climate communication of ideological baggage, because it addresses common local interests and occurs far away from the big media and policy arenas where discourses are trapped in polarized camps.” Fraisse et al. (2009) find this particular climate change framing attractive, because it also focuses on developing strategies to prepare for risks associated with seasonal climate variability. Again, the adaptation framing, combined with activities to assess community needs and the state of resource stewardship, builds on Extension’s institutional knowledge, community programs, and “social capital – the trust, respect, and cooperation between its members and stakeholders on both sides of the boundary” (Brugger and Crimmins, 2013). Extension’s deep understanding of local issues, its practice of meeting face-to-face to focus on the concerns of clientele, and its ability to bridge between networks of scientists, professionals, agencies, and residents gives Extension the ability to create neutral environments for discussion, deliberation, and consensus.

The recently formed USDA Regional Climate Hubs also provide an opportunity and support for Extension to successfully and fruitfully engage in work on climate change. Secretary of Agriculture, Tom Vilsack, announced the Regional Climate Hub concept in June 2013, and the locations and more specifics about the USDA Regional Hubs for Risk Adaptation and Mitigation to Climate Change in February, 2014 (USDA, 2014). Cooperative Extension is explicitly mentioned in literature on the Hubs, and Extension can play an important role in planning and developing various Hub functions and activities, such as program delivery, partnership development, risk and vulnerability assessments, interpretation of forecasts and information for adaptation planning, and outreach to farmers, ranchers, forest landowners, and rural communities. Moreover, the USDA Climate Change Science Plan (USDA, 2010) suggests numerous opportunities for Extension to engage with USDA clients in applied climate change science, planning, extension, leadership, and outreach activities. The Science Plan articulates four elements: effects, adaptation, mitigation, and decision support (See inset on page 20 for a few of the most germane priorities.)

The Way Forward
“We can’t keep doing the same things of the past and expect to solve the problems of the future,” 2013 Extension Sustainability Summit participant citing one of the presenters.

How might Cooperative Extension move forward to address climate change, a topic clearly on the institution’s radar, in ways that honor the scientific evidence, resonate with clientele and cooperators, and benefit communities, and yet maintain a healthy distance from the third rail? Clearly, not by side-stepping the issue...addressing climate variability and change is essential, if we are to manage natural resources sustainably, and maintain value and vitality in our economic endeavors. Fraisse et al. (2009) suggest the first step is to understand the perceptions, attitudes, goals, decision-making needs and processes of clientele. They, and others (e.g., Brugger et al., 2011; Cone et al., 2011, NRC, 2009), suggest
doing this through participatory methods, face-to-face interactions, and user-focused communication – in other words, start with the perspectives of community participants. This is a time-honored approach in Extension.

After laying a foundation of mutual understanding, Extension professionals can rely on other time-honored tools in their toolkit: facilitation and discussion. Creighton et al. (2011) refer to this as helping people to express their concerns about the uncertainties and the limitations of scientific knowledge, data, and models. They suggest that the use of scenarios, narratives, and analogies may be most productive. These kinds of approaches, used by federal agencies, the military, and businesses (e.g., Schwartz, 1991; Weeks et al., 2011) can help people explore their concerns about plausible future changes, lead to potential pathways that inform the management of risk, and lead to acceptable outcomes (Haden and Jackson, 2011), without resorting to the use of complicated models.

Hand-in-hand with such futuring exercises is the process of deliberation with analysis (NRC, 2009). Extension professionals can use an effective low-tech approach, such as assessing stakeholder needs in person and then framing responses in terms of trade-offs, benefits, opportunities, and threats, which can then be deliberated over by Extension personnel, collaborators, and community members (Brugger and Crimmins, 2013). A more high-tech version of this is discussion support (Nelson et al., 2002), in which conceptual or process models are used not to make a specific prediction of the future, but to inform discussions about community vulnerability, or explore the ways in which a system is sensitive to change.

A down to earth way of thinking about living with climate change is to build on experiences of living with climate (Brugger and Crimmins, 2013). They mention that adaptation to change resonates with Extension’s rural clientele when the focus is on what we can control – meshing the larger context of past management, easy and cost-free individual and household level approaches, and integrating climate change practices into existing procedures and policies. These do not require accurate or controversial projections of future climate. Moser (2014) points out that pointing to past experience, or experiences in other locations, can help people visualize and ground their thoughts about adapting to change, and can provide a sense of continuity between past and future risk.

Finally, Extension professionals can build capacity within its ranks, and within willing communities of interest, by focusing on early adopters – the “army of the willing” – another time-honored practice. One approach is to prioritize audiences, based on their receptivity to the scientific community’s messages on climate change, and to incorporate climate adaptation messages into their existing programs (Burnett et al., 2014). Outreach and training can take many forms, including the use of webinars to reach remote populations, and the formation of knowledge-exchange networks or communities of practice (Gamble et al., 2011).

**USDA Climate Change Science Plan Priorities**

**Effects**

- Enhance our understanding of social and economic indicators relevant to production systems, rural communities, the agricultural workforce, and other human dimensions, and how these sectors are affected by climate change

**Adaptation**

- Strengthen science-management connections (education, extension, and management input into research direction)
- Identify strategies and practices to enable farmers and other landowners to manage for longer growing seasons, increased CO2 concentrations, and potential productivity increases
- Devise new risk assessment and planning processes while improving existing mechanisms

**Mitigation**

- Build stakeholder capacity for estimating, measuring, and tracking GHG emissions and C sequestration at agricultural and forestry production scales

**Decision Support**

- Increase public awareness of climate change science and solutions for policy and behavior change
- Extend models and tools developed to assess adaptation and mitigation strategies with user-friendly interfaces that facilitate decision support
- Inform both public and private decision-making authorities for rural development to protect ecosystems and the environment
It is well understood that water is key to life on Earth, it is also a finite resource that must be properly stewarded. Earth’s water is continually cycling through our atmosphere, precipitation, surface waters, and groundwater, as well as much more gradually through glaciers. Saltwater makes up 97 percent of earth’s water, glaciers 1.7 percent, which leaves only 1.3 percent of that water as potentially useful for people and ecosystems in our ground and surface waters. Clean, fresh water is necessary for a wide range of activities including industrial processes, food processing, irrigation, hygiene, and drinking, as well as a range of ecosystem services and benefits.

The average per capita global consumption of water is 327,500 gallons/person/year, while in the United States that number jumps to 655,000 gallons/person/year for all uses (Hoekstra A., 2007). This can be more easily understood when related to the fact that over 713 gallons of water go into the production of one cotton T-shirt, 1000 gallons of water are required to produce 1 gallon of milk and roughly 634 gallons of water go into the production of one hamburger. (Hoekstra, 2013) Around the home the average American uses approximately 69 gallons per day inside the house (Figure 1) and approximately 101 gallons per day when outside uses are considered (Mayer, 1999).

The importance of potable fresh water is highlighted by startling facts such as that over 780 million people in the world lack access to clean water for basic needs (WHO, 2012). As a result of this over 3.4 million people die each year from water, sanitation, and hygiene-related causes, the majority of which occur in developing countries (WHO, 2009).

**Extension’s Many Roles**

The role of Extension in water sustainability issues is many-fold. Indeed, Extension has been working in these issues since its inception, as water is integral to agricultural production and
quality. Extension’s role has greatly expanded in the past 100 years to embrace supporting agriculture, natural resources, food safety, youth and families, as well community and economic development through providing research-based information and education programs. In all of these realms, water sustainability, namely water quality and quantity, has some if not many roles. More prominent examples include:

**Agriculture**

Increasing water use efficiency through:
- Increasing irrigation efficiency technologies
- Plant breeding to optimize plant water use efficiency
- Improving landowner adoption of conservation oriented irrigation practices
- Increasing the adoption of crops that use water more efficiently

Improving water quality through:
- Increasing the adoption of improved fertilizer and pesticide management strategies
- Plant breeding to reduce the need for pesticides
- Plant breeding to optimize the use of fertilizers
- Increasing the adoption of crop management strategies that reduce the need for pesticides
- Increasing the adoption of crop management strategies to reduce the amount of additional fertilizer inputs
- Increasing the adoption of strategies that reduce the offsite transport of sediment, soils, nutrients, and pesticides

**Natural Resources**

Increasing water-holding capacity of watersheds through:
- Increasing the retention of working forest lands in the landscape
- Improved forestry road layout and management strategies to reduce runoff
- Increasing the adoption of water conservation in home landscapes

Improved water quality through:
- Increasing the adoption of improved forestry road layout and management strategies to reduce offsite transport of sediment
- Increasing the adoption of improved forest harvesting strategies and techniques to reduce offsite transport of sediment
- Increasing the adoption of strategies to reduce the need for pesticides
- Increasing the adoption of Low Impact Development strategies that improve on-site water infiltration, to reduce overall stormwater volume
- Increasing the adoption of improved stormwater management strategies at the site scale, to reduce movement of contaminants to waterways

**An Expanded Role for Extension**

EPA has identified non-point pollution as this nation’s foremost water quality issue. It’s a cause of water quality degradation that results from individual lifestyles and ways individuals and jurisdictions choose to manage the landscape, from large scale agriculture and forest...
management to stormwater runoff, residential landscapes, and hobby farms. Extension has the ability and expertise to reach these audiences at the local level in most counties across the nation. However, in many cases often lacks the capacity to focus on water sustainability issues. The extension of EPA’s National Pollutant Discharge Elimination System (NPDES) permitting requirements to smaller jurisdictions have placed new responsibilities on those jurisdictions which they may not be equipped to effectively accommodate.

One of the elements of the NPDES program is local education and outreach programs directly tied to reducing stormwater volume and reducing contaminant loading to waterways. Addressing these issues is a highly relevant local issue that Extension could address, using its local working relationships and expertise. Extension programs often work in collaboration with local governments, community and non-profit groups, tribes, and volunteers to implement programs, thus leveraging resources effectively. It also has direct ties to the research capacities of the land-grant university in their state. An expanded capacity to focus on water sustainability issues makes sense from efficiency and effectiveness perspectives.

In order to increase its capacity, many Extension programs would need to increase the resources dedicated to water programs. This expanded capacity would likely need to occur through re-alignment of some program priorities or through the creation of new funding streams to support such activities. There are numerous examples across the nation where jurisdictions have funded their local Extension office to develop and implement stormwater education programs to fulfill the outreach requirements identified in their NPDES permit. A more comprehensive and coordinated approach through Extension at the statewide level could greatly expand the effectiveness and utilization of local Extension programs in water resource sustainability issues.

One such step is a concentrated effort to build a water resource sustainability team of existing faculty and staff, that would work together to identify existing expertise, materials, and programs that have already been developed and seek to improve their utilization. In addition, these teams could identify gaps in expertise, materials, and programs to further address water resource sustainability issues and seek to garner the resources to develop them.

Water sustainability issues will likely become more critical with potential impacts of climate change, where it is expected that dry areas may become drier, wet areas wetter, as well as the potential of more severe weather events. Floods and water quality problems are likely to be amplified by climate change in most regions (United States Global Change Research Program, 2009). It is reasonable to expect that Extension programs related to climate change impact adaptation would integrate water resource sustainability as part of their programming efforts.

A more cohesive and comprehensive approach to water sustainability issues would be highly relevant to existing Extension clientele, as well as create and serve new audiences. As Extension and Land-Grant Universities continue to serve their role in bringing relevant research-based information to the people, water sustainability needs to play a strong role. Indeed, water is an integral part of everyone’s daily life.
At the Western Rural Development Center’s 2013 Extension Sustainability Summit, a cadre of faculty engaged in water issues from across the western states identified the following points related to water resource sustainability.

- Extension should be involved with urban/suburban water quality and stormwater management issues.
- Extension can be proactive and visionary in this area.
- Extension generally does need to develop capacity in this area. It also needs to better utilize campus expertise and resources.
- Extension should evolve a portion of what they do to be more urban/suburban focused. Extension could focus on the municipal/local leadership, as well as professionals and others in the community interfacing with more urban/suburban audiences such as nursery/landscape businesses, developers, realtors, Master Gardeners, etc.
- Extension can develop funding relationships with local governments with NPDES permits so they can provide the outreach that is required.
- There is a strong existing niche and need for Extension amongst small acreage landowners – especially in the fringes of suburban/urban areas.
- There is a higher potential and need for Extension outreach on the range of water sustainability issues in rural communities, where there is less town/county capacity.
- Extension has the credibility and ability to partner with a range of organizations to address water and sustainability issues ie: Sea Grant, Association of State Floodplain Managers, state and federal agencies, county government organizations, tribes, NGOs, conservation districts, NRCS, water treatment/wastewater treatment departments, irrigation companies and districts.
- Extension already has a number of programs for youth audiences that could be used and built upon.
Charting Extension’s History and Food System Models for the Future

By Rose Hayden-Smith

Smith Lever, The First 100 Years, and What Lies Ahead

2014 marks the centennial of the passage of the Smith-Lever legislation, which created the Cooperative Extension Service. The centennial provides an important opportunity to look back, but also requires us to look forward and to actively chart a future that reflects changed circumstances.

As we stand on the threshold of a second century of work, urgent and complex challenges face us, including the need to feed a world population projected to reach 8 billion by 2025; limited environmental resources; climate variability; declining public investment in scientific and agricultural research; and the social, cultural and geopolitical conditions peculiar to our time.

There is also a question of our relevance as an organization and a system of practitioners. Are there are enough of us? Are we organized and deployed effectively and in ways that strategically take advantage of our assets? Are we transitioning to meet the needs of new audiences (particularly in the area of urban agriculture and communities of color) quickly enough, and in ways that are effective? As an organization, have we reached consensus on the meaning of “sustainability,” the term that defines much of our work today? While I would argue with great conviction that our work continues to be vital and important in communities, would communities agree? Are we even known to them?

First: A look back

On a warm Friday - May 8, 1914 - in Washington D.C., two pieces of new legislation awaited President Woodrow Wilson's signature: a proclamation establishing the second Sunday each May as Mother’s Day, and the Smith-Lever Act. The honoring of mothers dominated the news that day, but Wilson recognized the importance of the Smith-Lever Act, calling it “one of the most significant and far-reaching measures for the education of adults ever adopted by government.”

Sponsored by Sen. Hoke K. Smith and Rep. Asbury F. Lever, the bill was the result of national efforts to create a new educational model for U.S. agriculture. At that time, land-grant universities ran farmers institutes and short courses taught by lecturers, and the U.S. Department of Agriculture (USDA) offered its own form of Extension work that focused on pest control field demonstrations in the South and farm management in the North. Yet there was no consistent or efficient
way to deliver important knowledge from the university campuses to the communities that needed it. Passage of Smith-Lever launched a century of innovation in U.S. education that continues to this day. The educational model born out of the legislation was Cooperative Extension (“Extension”), which operates in each of the fifty states. For 100 years these statewide networks of land-grant researchers and educators have developed and provided science-based information to solve locally-relevant challenges in the areas of economics, agriculture, natural resources, youth development, and nutrition.

The intent of the Smith-Lever Act, like earlier agricultural legislation, was broadly democratizing. Initially, Extension focused on improving and reforming rural life, partly in response to the findings of the Country Life Commission, created by President Theodore Roosevelt in 1908. The Smith-Lever Act was rooted in the Progressive philosophy of helping people help themselves, a philosophy that continues to inform Extension’s work today, and it demonstrated Progressive Era beliefs in the value of public-private partnerships and shared funding models. Extension became an integral part of American life during the 20th century as a location of national identification and purpose, of synthesis between competing spheres (urban and rural, domestic and public, consumer and producer, immigrant and native-born) during a period of national transition and transformation.

We often forget that the birth of Extension was accompanied by a great sense of urgency, as the clouds of World War I loomed in Europe, and the need to create a more ordered food system informed by scientific research became a paramount national goal in America. And again, we face that same sense of urgency today, as we contemplate the need to feed a projected global population of 8 billion in 2025, and as we try to determine how to meet the new and evolving needs of communities, while we struggle with limited resources and capacity. Our organization was conceptualized and conceived during a period of rapid change and transformation; we begin our second century during another period of rapid change and transformation, not only in our nation, but globally.

Extension “agents” or “farm” and “home” advisors as we have been called throughout the years, initially worked together with rural families and producers. The work was participatory and personal, the research and results co-created (bringing to mind contemporary research in social network analysis and information hubs), but it was also prescriptive in the way Progressive Era programs were. Urban needs – identified through the work of the Country Life Commission – actually informed the shape of Extension programs for rural audiences in the early years.

The Shifting Location of Our Work
The location of our work, at first in rural areas, has increasingly shifted to urban areas; there are more youth from urban areas than rural dwellers enrolled in Extension’s 4-H program. Urban audiences currently clamor for support for school, home and community gardening projects, Master Gardener programs, urban agriculture and community food systems projects, and food preservation education. In some ways, what urbanites want goes back to the roots of our work
in rural homes one hundred years ago. The social and cultural impulses driving this today are varied, but certainly include a desire for increased self-sufficiency; improved health; increased access to food; a longing to create a stronger sense of community; economic reasons; and also, perhaps, a yearning for what many perceive to be a simpler past, a past that was more linked to the cycles of nature, and an American agrarian ideal.

The Challenge of Defining Terms
One of our biggest challenges as an organization will be finding common understanding of the term “sustainability,” and what the characteristics and components of “sustainability” and a “sustainable food system” are. I would argue that as an Extension organization in a national sense, we haven’t yet had that discussion. The term is somewhat elastic, depending on the perspective of the person defining it. It will be challenging. “Sustainability” is a difficult term to define and discuss, because it’s not contained to a single set of best practices, and the term is laden with values, as well. A discussion of scale is vital to any conversation about sustainability. Sustainability is not a characteristic of any single scale of production, but that is probably not a belief held by the general public. I believe – and the lightning sessions at the 2013 Extension Sustainability Summit in Park City, Utah, also revealed – that creating resiliency in food systems and natural ecosystems might actually be a more meaningful goal to strive for.

Public Investment in Research and Education
The USDA has provided funding through its Community Food Security Grant program to support local food projects, including urban agriculture, which we all know is a growing trend in the United States. More is needed, including education among school-aged children about the “growing” opportunities available in agriculture. Funding to land grant universities - where much of the nation’s agricultural research and knowledge is centered - is being drastically cut in many states, which seems counterintuitive given the many challenges facing national and global food systems. The nation ought to be investing more in agricultural and food systems education at all levels. Research about food systems issues ought to be a national priority as well. Unfortunately, public research dollars to agriculture - which truly serve a public good - have declined in recent years. What is the role of Extension in advocating for this? How can we be more effective in securing the resources we need to serve the public good?

Social Technologies
There is consensus that social technologies are vital – and will be increasingly important – in our work. Social technologies have the ability to not only disseminate information but also to engage, provide opportunities to participate, and to create social movements. This plays into the larger theme that there is a more social and civic aspect to our work. Social technologies will also enable us to reach new audiences, including those that are younger, and more diverse. Our work in food systems should incorporate these technologies, and we must equip ourselves to use them effectively.

The University of California Cooperative Extension (UCCE) is attempting its first “citizen science” day (http://ucanr.edu/sites/100brand/Day_of_Science_and_Service/) using social technologies on May 8, 2014, the centennial of the Smith-
Lever legislation. “Citizen Science,” (also known as crowd science, crowd-sourced science, networked science, or public participation in science research), is a form of participatory scientific research conducted, in whole or in part, by amateur or nonprofessional scientists. Through citizen science projects, community members can engage and participate in scientific research by contributing their own knowledge, observations, and intellectual efforts. An example of an international citizen science project is the Audubon Society’s annual Christmas Day Bird Count. Increasingly, data for these projects are collected via social, web-based technologies, or even via mobile applications. A good example of this is the iNaturalist smartphone application, which is used by a number of organizations, including the University of California Naturalist Program. I would argue that Extension has been crowd-sourcing knowledge for a century; this second century will enable us to harness technology to assist in that process.

This May, UCCE will crowd-source data for three citizen science projects throughout the state of California. There are three areas of focus: where food is produced in communities; pollinators; and water conservation. Each UCCE Office, Research and Extension Center (REC), and UC campus has been asked to participate in the Day of Science and Service and recruit their community members, clients, volunteers, partners, colleagues, and students to participate through outreach and educational workshops and activities. The UC ANR Informatics and GIS Statewide Program (IGIS) is developing data collection maps. Individuals will be able to access data maps through their computers or smartphones and add their data directly to the map. Maps will be updated in real-time, and anyone will be able to see the data points on the map as soon as they are added. An initial basic presentation of the data will be provided in real-time as well. Once individuals add their data to the map, they will be taken to a landing page with more information about why the questions are important and links to additional research in these three areas. After the Day of Science and Service, the data will be tabulated and analyzed, and the results will be shared with participants.

This may become an annual event, and its broad use of social technologies (Twitter, Facebook, Instagram, smart and mobile devices, etc.) will likely attract new and younger audiences. We could use this model in communities, using open source technologies.

The Next Generation of Farmers and Ranchers
There is uniform concern about finding and equipping the next generation of farmers and ranchers for success. This is a legitimate concern in a nation that conducts a census of agriculture every five years, while conducting a census of population only once a decade. When President Lincoln signed the Morrill Land Grant Act in 1862, 58 percent of Americans were engaged in agriculture. In the first census conducted after the adoption of Smith-Lever (the 1920 census), the majority of Americans lived in urban areas, and only 27 percent were engaged in agriculture. Today, fewer than three percent of Americans work in agriculture.

There are some promising models that link beginning farmers and ranchers to the growing interest in local and regional food systems and urban agriculture, and that also promote
The University of California Agriculture and Natural Resources division (UC ANR), which operates that state’s Extension organization, has received funding to train small-scale farmers – many of them from communities of color and immigrant populations – to meet the safety requirements to sell their crops to farm-to-school programs in their communities. This program meets multiple needs in the community and food system.

UC ANR is also working with a community-based faith organization, the Abundant Table, which provides internships for beginning farmers at the UC’s Hansen Agriculture Research and Extension Center in Southern California. The interns – mostly college-aged students – are taught by a farmer (formerly a farmworker), and produce food for a local school district’s farm-to-school project. This is an exciting model that Extension and Research Centers might consider.

Youth Programs and Community Food Systems
In 1893, a financial panic hit America, creating mass unemployment and civil strife in urban areas. A relief model of what we might consider urban agriculture emerged in Detroit. Created by Mayor Hazen Pingree, and called the Potato Patch experiment, the successful model was quickly adopted by other cities. More than a century later, urban agriculture in Detroit continues to make news, as a crisis created by depopulation, unemployment, and poverty has led to the development of a number of successful models in urban agriculture. And more than one hundred years after Hazen Pingree introduced the potato patch model to Detroit, a new generation of residents is seeking to transform and revitalize the city through a network of innovative gardening and urban agricultural work.

Today, Michigan State University’s C.S. Mott Group supports some of these efforts. The group has multiple food systems projects, but has initiated a youth community food initiative that is a wonderful model for other Extension organizations. It is multi-purposed, and meets many goals, including positive youth development, diversity, improving community food systems, and fostering the next generation of farmers. The statewide initiative provides technical assistance, networking, participatory
research and outreach, and peer-to-peer educational opportunities. Projects include community and school gardens; programs involving youth in local food production, processing, and retailing, such as youth farm stands (there are currently 16) and 4H; urban agriculture initiatives; youth livestock projects, (from urban chickens to traditional animal husbandry); culturally appropriate food tradition gardening and preservation projects; and rural and urban youth development programs/projects that share an interest in sustainable food systems for food security and health.

The youth farm stands program is particularly notable for its success in integrating work across nutrition education, gardening and vegetable production, as well as skills in entrepreneurship, such as business planning and marketing. Team members stand by to help local Extension staff with project adoption and evaluation. There is also a website to provide resources and support the work.

In California, UC ANR has partnered with Ventura Unified School District (Nutrition Services), Food Corps (the newest AmeriCorps program), and Balboa Middle School (which represents a diverse neighborhood) to create a student-run farm at the University’s Hansen Agriculture and Research Extension Center in Santa Paula. The students work the farm one afternoon a week, and produce food for Ventura Unified School District’s farm-to-school program. In its first year of operation, there are already 17-20 participants each week, and the future looks bright.

New Organizational Models to Promote Programmatic Integration

UC ANR, home of California’s Cooperative Extension, has reorganized its Extension organization around five strategic initiatives (SIs), including one in Sustainable Food Systems. The SFS SI, as it is referred to, serves as an umbrella or hub for agricultural projects and statewide programs covering the full range of scales and production locations. UC ANR has also funded, through its internal grants program, proposals focusing on work in urban agriculture, CSAs, edible landscape, and small farms. Through this internal grants program, UC ANR has allocated nearly $12M in grants to projects.

The organization is rethinking Extension advisor/agent positions, and is currently hiring academics to work as food systems advisors.
and metropolitan agricultural specialists. These positions incorporate components of agricultural production, community and youth development, integrated pest management, and nutrition, depending on the local need. Will these positions end up looking more like the multi-purposed (less specialized) advisor/agent of early years? It will be interesting to see. UC ANR is also trying something novel: locating specialists at “non-agricultural” land-grant campuses to address the complex issues surrounding food, food access, and obesity. While much of UC’s work remains focused on what some term “industrialized” agriculture, in fact, the institution supports all scales and modes of agricultural production, including school, home, and community gardeners.

Rachel Surls from UC ANR is leading an interdisciplinary urban agriculture team (comprised of academics and educators from throughout the state) that is addressing, among other things, issues of production, beginning farmers, youth, diversity, food access, and public policy. Surls sits on the Los Angeles Food Policy Council, and brings vital Extension expertise to bear on public policy issues relating to zoning, cottage food legislation, food access, backyard chickens, food safety, bee keeping, etc.

Good policy is needed, and informing public policy should be a key component of Extension work in urban agriculture and local and regional food systems (or community food systems, as some refer to the field of practice). As interest in urban agriculture grows, there will be more disputes over land access and zoning. Land is wealth, even in what we might consider blighted urban areas. How we move forward in finding ways to produce food on urban lands in a sustainable and equitable fashion will determine how well we deal with the challenges facing us on the food front, and in other areas of social concern. Despite the successful efforts in many urban areas, much work remains to be done.

One thing is clear: there will be no going back, and the local and regional food movement is revitalizing the food system in many ways.

Food Access and Social Justice
We are a hungry nation. The United States Department of Agriculture estimates that 15 percent of American households are food insecure. This includes 50.2 million homes, where nearly 1 in 4 of the nation’s children live (approximately 17 million youngsters, and 9.6 million of them under the age of 6).

A six-state, federally funded research project called “Voices for Food” has been recently launched. It will address food security in isolated communities who some refer to as “food deserts.” “Food deserts” are defined as communities located more than 10 miles from a supermarket or other source of fresh, healthy, and affordable food. The project will seek community-based strategies to increase the availability of and access to nutritious food in rural communities with high poverty rates.

The $4 million, five-year grant was awarded to South Dakota State University, as the lead institution for the multi-state collaborative project, led by Suzanne Stluka, Food and Families Program Director with SDSU Extension, serving as principal investigator. The project and funding will also include university researchers
Conclusion
It is difficult to know where the next century will lead us. Extension has always evolved, innovated, co-created, and survived.

There are challenges. With agricultural research investment declining, agricultural productivity threatened by a number of factors (including limited water and climate variability), and the world’s population expected to increase at a dramatic pace, what we can help others produce is desperately needed.

We tend to take for granted a safe, plentiful, and inexpensive food supply, which helps to assure our nation’s social and political security. But continued investment is required to sustain the vision of the Morrill Act and Smith-Lever, to help all Americans reap the promise of abundance our physical geography offers. How will we choose to support the land-grant mission in the next 150 years?

The mission of Extension and the land-grant institutions, from which we were born, both at home and abroad, remains larger than our collective imagination. We were a nation of farmers at origin: we are still a nation of farmers at heart. The frontier as once envisioned may be gone, but the real frontier — the pursuit of knowledge, the continued opportunity to serve communities, to respond to new challenges — awaits our further exploration.
Energy issues are central to the broader components of sustainability. The thematic areas identified at the 2013 Extension Sustainability Summit – Energy, Food, Land, Water, and Air – are significantly influenced by both the availability of inexpensive energy, primarily fossil fuels, and the associated impacts from their production and consumption. Examples of the interconnection of energy to sustainability abound. The USDA estimates that 15.7 percent of the nation’s energy is utilized in the food system (Canning et al., 2010). Land use changes, such as urban sprawl and ex-urban development, are enabled by the availability of inexpensive fossil energy for transportation. Thermoelectric generation accounts for 41 percent of our country’s freshwater usage (Kenny et al., 2009). Finally, the quality of our air, from local smog to climate change issues, is greatly impacted by our consumption of fossil fuels.

Not only is energy uniquely tied to sustainability, but also energy in itself is a broad and diverse issue. On a practical level, a similar amount of “work” can theoretically be done with one ton of Powder River Basin coal, 140 gallons of biodiesel, or the yearly production of 3.5-kilowatt photovoltaic array located in Laramie, Wyoming, but each resource has greatly different applications and cost structure. Further evidence of this diversity is provided by an entire issue of Rural Connections (Summer 2013) devoted exclusively to energy topics, ranging from biofuels to hydraulic fracturing to wind turbines. Energy has many facets that are rightfully receiving the attention of the national land-grant university system.

To individual Extension clientele, energy is an issue that impacts both their wallets and lifestyle. Across the entire economy, per capita energy expenditures total nearly $4500 per year on energy, compared to approximately $4250 for food (US EIA, 2011 and USDA ERS, 2013)! Energy expenditures offer both a chance to reduce costs, indeed through technology and behavior household energy use has declined over the past 30 years, but it also represents a potentially enormous ($1.4 trillion) new market, especially for rural clientele (US EIA, 2012). Many Extension clientele are also choosing to place a personal value on the non-market attributes of energy production and consumption, often reflecting beliefs in energy independence or sustainability. These clientele are actively pursuing energy alternatives, such as distributed renewable energy, even if costs are greater than traditional fossil fuel sources. Distilling the integral but disparate topic of energy into actionable components is a daunting task, but it is a task
that the nation’s Cooperative Extension system is increasingly engaging.

What is “Energy Extension?”
At the 100-year anniversary of the creation of the Extension system, the amended Smith-Lever Act of 1914 now charges the system to “…aid in diffusing among the people of the United States useful and practical information on subjects relating to agriculture, uses of solar energy with respect to agriculture, home economics, and rural energy, and to encourage the application of the same.” (Emphasis added). Despite having two out of the four charges of the national Extension system related to energy, Extension activities in these areas are relatively poorly defined. For example, agriculture has clearly delineated components, such as range management, 4-H livestock judging, horticulture, or soil fertility, but no such clear focus has emerged for Energy Extension.

Looking to the past for guidance, the Extension system has a long, if intermittent, record of offering programming on energy issues. During times of rural electrification, from in the 1930s to the 1950s, Extension worked closely with the Rural Electrification Administration to integrate electricity into the rural home, farm, and ranch to enhance productivity and the overall quality of life. In the wake of the oil crisis of the 1970s, Extension allocated resources to energy conservation (Born, 1980). Many of these conservation and efficiency efforts faded in the 1980s and 1990s, leaving Extension poorly equipped to address the reemerging interest in energy issues.

Across the country Extension is retooling to address energy issues. The Inaugural National Extension Energy Summit, hosted at Colorado State University, brought together participants from 31 states to share best practices in Energy Extension. Attendees came from diverse backgrounds with Energy Extension efforts often integrated with other programmatic foci, such as small acreage, youth, housing, or agricultural profitability. The discussion centered on the following broad topics:

- Biofuels
- Utility-scale solar and wind energy development
- Fossil fuel development impacts
- Conservation, energy efficiency small-scale renewable energy

The focus on biofuels, ranging from feedstock production to community economic development models, receives significant attention from Extension’s traditional agricultural sector. Washington State University’s involvement in the Advanced Hardwood Biofuels Northwest project offers an effective example. Utility-scale wind development also involves a traditional Extension clientele – landowners. Similarly, fossil fuel development particularly shale gas development, involves the landowner clientele, but it also reaches community decision makers. Extension is able to pull from its interdisciplinary resources to address issues, such as legal, water management, and economic development. The Ohio State University Extension’s Energize Ohio signature program is a prominent example that tackles both wind energy and shale gas development.
Conservation (behavior change), energy efficiency, and small renewables are also receiving significant attention, while engaging traditional agricultural stakeholders and new clientele. As energy consumption is ubiquitous, programs such as the University of Minnesota’s Clean Energy Resource Teams engage individuals and businesses to both reduce energy consumption and make cost effective choices concerning renewables.

In short, two general programming approaches for Extension emerged – energy production as a commodity (revenue) and energy as an input (cost). Thus Energy Extension returns to the roots of Extension activities – allow clientele to make informed decisions that increase revenue derived from energy production or to reduce costs resulting from energy consumption.

What is the Future Role of Extension?
Both the Extension Sustainability Summit and Extension Energy Summit highlighted the diversity of Energy Extension programs. Opportunities abound to create new streams of energy-derived revenue and reduce energy expenditures, but the energy education and outreach contains numerous other players. The US Department of Agriculture (USDA) has a large presence, especially in biofuels, agricultural efficiency, and renewables. The Natural Resource Conservation Service’s Environmental Quality Incentive Program (EQIP) and Rural Development’s Rural Energy for America Program target a similar audience as Extension’s agricultural programs. Many Conservation Districts also offer locally-driven energy education. The State Energy Office (SEO) program, partially funded by the US Department of Energy (DOE), provides the funding and technical resources for state-specific efforts focused on energy efficiency and renewable energy. Many SEOs also focus on outreach and technical expertise similar to the Extension model. Uniquely, utility providers are also a leading source of energy education, as many are tasked as public service companies to reduce consumption and promote renewables when in the best interest of consumers. Finally, some progressive local governments have also created structures to promote energy efficiency and renewables. In this crowded field, the Land-Grant University and Extension System faces difficult decisions concerning the appropriate allocation of limited funding to meet this expanding field, while maintaining service to traditional clientele.

At the National Energy Extension Summit, action planning sessions addressed energy issues previously identified by the Association of Public and Land-grant Universities as areas of excellence, including the need to embrace regional development, help inform a national energy policy, bring new discoveries to market, increase society’s energy literacy – agriculture, increase society’s energy literacy – general consumer, and develop our workforce. To achieve these aims, the following general recommendations merit further attention:

- There is a need for formalized sharing of energy resources between state Extension energy personnel. An online clearinghouse or database would be of interest.
- In conjunction with federal partners such as USDA and US DOE, look for opportunities to identify a national unifying vision for
Extension energy education.

• From that, the creation of broad yet customizable energy curricula should be encouraged, developed, and shared effectively.

• Mechanisms such as eXtension.org can be utilized more often for resource sharing.

• New curricula and programming should include a deeper use of proven behavior-change strategies to increase our impact on target audiences.

• Funding should be sought to support at least one full-time Extension energy specialist in every state.

• At the same time, energy work should be integrated into the various existing disciplines within Extension (i.e. agriculture, youth development, family and consumer science) with the support of Extension directors.

• There is a need to identify or perhaps even create appropriate professional development opportunities for Extension energy personnel.

• Enhance partnerships at the federal, state, and local level to expand funding opportunities and leverage resources

• Encourage University research to be purposefully connected to meeting identified needs for unbiased energy information identified by Extension (Colorado State University et al., 2013).

Coming from diverse backgrounds and program foci, attendees at the Extension Sustainability Summit, which were almost entirely distinct from the National Extension Energy Summit, took a less prescriptive method for defining Extension’s role. The group offered three overarching visions for future energy extension efforts:

• Climate Change and Energy
  The inclusion of climate change as a core component of energy programming is a regional/local decision. Caution concerning its inclusion is rooted in the perception that a global issue, such as climate change, may turn off some audiences that could otherwise relate to the economic and social benefits of energy efficiency and/or renewable energy.

• Extension’s Unique Niche
  The local nature of Extension is perceived as an asset not possessed by other state and national organizations. The rapport of Extension in local communities enables the presentation of new information, such as energy, from a position of trust. This allows Extension to be more effective than other, outside, entities. Energy issues also seamlessly integrate into other Extension discussions, such as soil health or community development. Energy education can engage a great variety of Extension’s existing clientele.

• Ultimate Goal of Extension Programming
  Personal energy literacy is an overarching goal, where Extension clientele can make informed decisions about how they use
energy. It is not just “coal is bad” or “renewables are expensive,” but a more informed discussion about the costs and benefits of our individual and collective choices (Brain et al., 2013).

Can Extension Answer the Charge?
Through both the National Extension Energy Summit and the Extension Sustainability Summit, the internal appetite for more robust Extension involvement in energy sustainability issues is apparent. As the input originated from those actively engaged in energy and/or sustainability issues, one would correctly expect the groups to advocate for an expanded role for Extension. Acknowledging this prejudice, the time-tested Extension model of offering unbiased, research-based information through local connections still remains a strong vehicle for future energy education and outreach.

At its founding, Extension directly served the 41 percent of the labor force involved in agricultural production (Dimitri et al., 2005). Extension can continue to serve the two percent now involved in the production of food, feed, fiber, and fuel, but Extension can also further engage a broader clientele, such as the 22-27 percent of households or the 60-65 percent of commercial buildings that the National Renewable Energy Lab estimates can generate their own electricity from photovoltaic arrays (Denholm et al., 2008). Revenue can be generated, savings realized, and sustainability advanced.

The evolution of energy technology and policy has increasingly empowered individuals, enterprises, and organizations with new energy choices. Farmers can grow bioenergy crops. Ranchers can sign leases for oil or wind energy development. Businesses can install increasingly advanced energy efficiency technology and the option to generate your own electricity or thermal energy, which was not practical only two decades prior, is becoming progressively more feasible. With opportunity and choice comes the need for actionable, unbiased information. Extension has a 100-year record of providing just such information, which, when robustly applied to energy, will help create a more sustainable future for all.
Energy Extension Resources for Curious Minds

BioEnergy Friday Web Seminars
University of Nebraska-Lincoln
The webinars provide professional development and public awareness education on renewable energy and energy efficiency.
cropwatch.unl.edu/bioenergy/forums

Clean Energy Curriculum
Colorado State University Extension
Curriculum for middle and high school teachers includes activity sheets, presentations, videos, and lesson plans.
www.ext.colostate.edu/energy/k12-curr.html

Colorado Energy Master Program
Provides participants with overview of Colorado’s renewable energy and energy efficiency and is “intended to empower Coloradans to make wise energy decisions.”
www.ext.colostate.edu/energymaster

E3A: Exploring Energy Efficiency and Alternatives
University of Wyoming and Montana State University
Energy curriculum for Extension on energy efficiencies and “small renewable energy technology for home, farm, and ranch.
e3a4u.info

Energize Ohio
The Ohio State University Extension
Offers energy development curriculum, an energy library, and searchable database.
energizeohio.osu.edu

Energy and Housing
University of Alaska Fairbanks Cooperative Extension
Provides articles on energy conservation, a heat cost calculator, podcasts, publications, and links to other resources.
uaf.edu/ces/energy

Home Energy Community of Practice
eXtension
Provides webinars, Ask an Expert, and resources on energy efficiency.
extension.org/home_energy

NEWbio
Northeast Woody/Warm-season Biomass Consortium
Providing Extension resources including webinars, conferences, shortcourses, publications, blog, and videos on the woody biomass industry.
www.newbio.psu.edu/default.asp

WxTV
Weatherization Training
Montana State University Extension
WxTv is “a national weatherization training show that uses a blend of expert advice, how-to techniques, innovation, and reality TV to create entertainment-based learning.”
wxtvonline.org
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