

RuralCONNECTIONS

A publication of the Western Rural Development Center

SPRING 2016

Enhancing Tribal Health and
Food Sovereignty Among
the Karuk, Klamath, and
Yurok Tribes in the Klamath
Basin through Collaborative
Partnerships

Power of the Fork
Linking Farmers
with Chefs in Utah

Embracing Uncertainty and
Building Community
Participatory Watershed
Assessment and Planning
for the Upper Gila River Arizona

Illicit Drug Abuse in
Rural Communities

Economic Evaluation of
Variable Rate Irrigation
Center Pivot Technology

County Economies 2015
The Uneven Geography of
Opportunity in Rural
Western Counties

Hope for the Best and
Plan for the Worst
Can you Age-in-Place
in YOUR Home?

ON THE COVER:
Preparing Youth for
Today's Economy
A Multidisciplinary
Extension Concern





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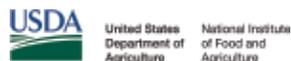
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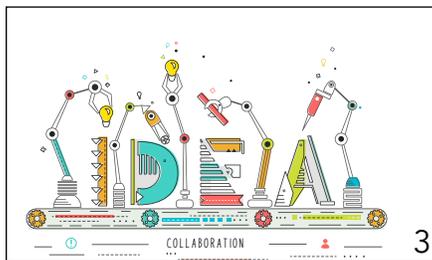
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FOOD SECURITY AND ACCESS
WATER CONSERVATION
PREPARING YOUTH
ECONOMIC OPPORTUNITIES
ILLICIT DRUG USE
AGING IN PLACE

INTRODUCTION

By Don E. Albrecht
Director, Western Rural Development Center

Under the capable leadership of WRDC Assistant Director Betsy Newman, *Rural Connections* helps disperse exceptional applied research and outreach programs being developed by talented professionals from the West. By sharing this information, especially across state lines, we at the WRDC can help achieve our goal of assisting the Land-Grant institutions of the West and others to better meet the needs of rural communities and their residents.

The articles in this issue of *Rural Connections* continue the tradition and describe truly outstanding research and outreach programs that address significant problems and concerns. The topics explored in this issue include food security and access, water conservation, illicit drug use, economic opportunities, and programs to help the elderly age in place.

Jennifer Sowerwine describes how traditional tribal food systems have eroded. Among the tribes of the Klamath Basin, as on most reservations throughout the West, residents now live in food deserts. Dr. Sowerwine and her colleagues are participating in a partnership seeking approaches to address these healthy food concerns. In a second article on healthy food, Shiree Duncan, Roslynn Brain, and Kynda Curtis discuss wide-ranging benefits that result from eating nutritious locally-produced food and then describe successful programs to connect farmers with chefs.

In the West, scarce water resources have always provided severe development constraints. Policies and programs to address these concerns are especially critical today as demand for water continues to grow. Two articles in this current issue provide insights about the more efficient use of scarce water resources. Kelly Mott Lacroix and Mark Apel describe watershed-planning programs

in Arizona, while Brian Lee describes improved irrigation technology.

Another prominent concern in the West is illicit drug abuse. Yoon Lee found that certain segments of the rural population are more likely to use illicit drugs and that the drug of choice varies among people with different characteristics. Armed with this information, policies and programs to better address drug problems in the Rural West can be implemented.

The lack of economic opportunities in rural areas continues to be a major problem. Brian Knudsen of the National Association of Counties describes NACo's report titled *County Economies 2015: Opportunities and Challenges* that show economic opportunities vary greatly from one county to another and that some counties have more fully recovered from the economic recession than others. In continuing the discussion of the economy, Harriet Shaklee, Kathee Tifft, and Katie Hoffman discuss the vital importance of education in helping youth prepare for the modern economy and describe approaches to encourage and assist youth to achieve their educational goals.

The aging of the baby-boom generation means that the proportion of the U.S. population that is elderly continues to grow. Mindy Oxman Renfro tells us that each day 10,000 Americans are celebrating their 65th birthday and joining the ranks of 'older Americans.' There are numerous benefits for both individuals and society if the elderly can age at home rather than in institutions. Programs to assist in achieving this goal are described. ●

Enhancing Tribal Health and Food Sovereignty Among the Karuk, Klamath, and Yurok Tribes in the Klamath Basin through Collaborative Partnerships

By Jennifer Sowerwine



PICTURED: AFRI Food Security Team/Karuk - UC Berkeley Collaborative

The Klamath Basin is one of the most ecologically diverse ecosystems in the western United States (Vance-Borlan, 1995; Wallace, 1983, 1992) and yet tribal populations and rural communities residing there are among the poorest and most food insecure in the country (Norgaard, 2004). Traditional land management by Native peoples in California historically ensured an abundance of nutritious native foods including salmon, deer, elk, acorns, mushrooms, and berries (Bell, 1991; Anderson, 2005; Salte, 2003). Tribal elders in the region recall abundant wildlife, and other native edible foods and medicinal plants that were gathered, dried, smoked, canned, and shared with families up and down the river. As Euro-American settlers arrived, the traditional food system began to erode. Today, the Klamath Basin is classified as a food desert (USDA, 2011).

“This article discusses key successes, replicable highlights, and challenges from the first three years of this five-year initiative. By describing our approach to collaborative research, education, and outreach, we aim to share important lessons learned that may serve as a model for other tribal communities, non-profits, universities, and government agencies seeking to establish these kinds of partnerships.”



PICTURED: Ron Reed, cultural biologist for the Karuk Tribe and his son, Jason, teaching traditional salmon cooking methods on redwood stakes/J. Sowerwine

IMPACT OF COLONIZATION

Rapid changes to the forests and fisheries beginning in the mid-1800s including hydraulic mining, commercial fishing, clear-cut logging, dams, and decades of fire suppression, have resulted in dramatic degradation of the landscape and associated bio-cultural foodways. Policies of genocide and forced cultural assimilation further contributed to the decline in knowledge, management, and consumption of Native foods. As Native Americans lost control of their lands, traditional diets associated with hunting and gathering and dependent on physical activities were replaced by a modern diet of highly processed, low-fiber commodity and store-bought foods, and decreased physical activity. The majority of fresh, locally-grown produce is exported out of the region. Today, Native people in the region have some of the highest rates of food insecurity and hunger, as well as diet-related diseases such as diabetes and obesity.

COLLABORATIVE PARTNERSHIPS

In 2012, the University of California at Berkeley initiated a collaborative partnership with three tribes in the region – the Karuk, Klamath, and Yurok Tribes – together with local non-profit Mid Klamath Watershed Council, UC Cooperative Extension, US Forest Service, and UC Davis to evaluate barriers to and opportunities for reestablishing a sustainable regional food system that reflects Native values and promotes Tribal food sovereignty. With funding from the USDA Agricultural and Food Research Initiative Food Security Program, this project aims not only to

increase access to and consumption of fresh, healthy, culturally appropriate and affordable foods among Native communities in the Klamath Basin, but also to support Tribal efforts to revitalize the overall eco-cultural system with an explicit focus on increasing tribal sovereignty over ancestral lands, cultural resources (foods and fibers), and cultural knowledge. This article discusses key successes, replicable highlights, and challenges from the first three years of this five-year initiative. By describing our approach to collaborative research, education, and outreach, we aim to share important lessons learned that may serve as a model for other tribal communities, non-profits, universities, and government agencies seeking to establish these kinds of partnerships.

UNIQUE OPPORTUNITY

The Klamath Basin is home to some of the largest tribes in the western U.S. Current tribal enrollment for participating tribes are: Karuk, 3,626; Yurok, 5,706; and Klamath Tribes, 3,700. Because of their relative remoteness, tribes in the Klamath have retained much of the wisdom and practices associated with food gathering and traditional land management, including prescribed burning that had sustained their populations and spiritual connection to the world around them for thousands of years.

Research exploring the ecological processes behind these practices can help bridge the gap between traditional ecological knowledge (TEK) and western science, increase the availability of nutritious traditional foods to Native groups (e.g. acorns and huckleberries), encourage the integration of TEK into

agency land management plans, and promote the continuity of diverse cultural practices and cultural identity. There is tremendous demand for regional food system change among all three tribes and their allies, and great potential to build capacity and shared learning opportunities to address food security issues in tandem with eco-cultural restoration of their watershed.

GUIDING PRINCIPLES

Key principles that guide our collaborative partnership foreground the importance of community-led decision-making, de-centering the role of the university, and respecting tribal sovereignty over traditional knowledge and cultural resources. Developing collaborative partnerships with tribes must begin with an honest acknowledgement of ongoing environmental, social, psychological, and health impacts of settler colonialism. Historical mistrust of universities is part of the story, as many institutes of higher education engaged in extractive research and to this day own vast repositories of sacred tribal belongings including ancestral bones. This legacy requires active and intentional engagement with the institutional structures that reinforce these unequal power relationships, as well as taking time to establish new relationships based on trust and transparency. All research questions are identified by and co-designed with tribal communities, and are applied and policy driven with the goal of benefitting the tribes, tribal trust resources, and their communities. Education and Extension programs are locally designed and community-engaged with an emphasis on building local capacity for sustainability and enduring impact.

PROGRAM AREAS

The Tribal Food Security project has 43 objectives in four programmatic areas related to research, education, and outreach. Highlights include:

Native Food System and Policy Assessment

We are currently evaluating laws and policies that govern access to and management of Native food resources in the Klamath with an eye toward influencing policies that can increase productivity and accessibility of Native foods. We are also implementing a comprehensive Basin-wide Native food system assessment examining challenges and proposed solutions to building a healthy food system from a Native perspective. Existing community food

system assessments in the region focused their analysis at the county level, with very little tribal data and few tribal voices included. Our approach aims to amplify tribal voices by utilizing a bio-cultural regional frame to better understand the experience of food insecurity among tribal communities throughout the Klamath Basin. This approach acknowledges the intimate relationships that Native people have with the land and one another around food and ceremony – relationships not bound by county lines. This explicit bio-cultural regional focus sheds light on concerns that are unique to the Native community, which will complement existing county-specific food system assessments. The geographic scope of the project includes ancestral territory and population centers of the three tribes that cover parts of four counties; assessment questions were developed with tribal oversight over the course of two years through collaborative and participatory processes to ensure cultural appropriateness. Over 700 surveys, 20 focus groups, and 70+ key informant interviews have been conducted and are being analyzed.

Community-led initiatives to increase access, availability, affordability, and consumption of healthy and culturally important foods are reporting record attendance. In Year Three alone, local partners held 384 workshops, youth and family camps, and other events with over 4,000 participants. Highlights include workshops and classes in canning, cooking, healthy baking, gardening, pastured poultry raising, butchering, drip installation, greenhouse vegetable production, orchard revitalization, and improved agro-forestry management to increase supply of traditional foods. Efforts to integrate local and Native foods into school lunches through a new farm/fish/forest to school program and restoration of intertribal trade of cultural foods are expanding. The aim is to increase food security through skill building and self-reliance with an emphasis on youth and intergenerational education.

Educational programming integrates tribal and regional values into workshops, youth camps, K-12 curricula, and a number of resource information sources. Seasonal youth and family camps connect youth with elders to share knowledge and practice of Native food gathering, processing and preservation, regalia making, and story-telling. School and community gardens teach gardening techniques as

well as Native plant identification, cultural uses, and preparation of plants for food, fiber and medicine. The Mid-Klamath Foodshed Facebook page ([tinyurl.com/Mid-Klamath-Foodshed](https://www.facebook.com/Mid-Klamath-Foodshed)) has proven to be a powerful educational and outreach tool for sharing resources, information, and questions related to cooking, canning, seed sharing, seasonal agricultural tips and techniques including production and pest management strategies, and funding opportunities. The Karuk Tribe has launched a novel digital food security library with over 650 curated items to date. It aims to house invaluable cultural information such as historical ethnographies and photos, maps, commissioned reports, academic publications, and demographic/health data that could inform policy-oriented research, eco-cultural revitalization efforts, and enhance overall understanding of Karuk history, language, and traditions.

Building local capacity through education and extension to improve productivity of local and regional food systems and reduce food insecurity has been vital. Successes have included professional development opportunities for field crew to learn new skills related to ecological habitat assessment and traditional land management techniques to increase productivity of Native foods; newly trained tribal Master Gardeners provide mentorship in remote regions on greenhouse production and community garden activities; previous participants are invited back to co-lead food-related workshops through the peer-learning model. Experiential (hands-on) learning has proven to be an effective approach for professional development, community skill building, and youth engagement. Mentorship on strategic planning, outreach, measuring impacts, reporting, and grant writing also supports the likely long-term sustainability of the programs that have been built.

CONCLUSION

Building an unconventional coalition to address tribal food insecurity has been an incredibly rewarding and sometimes challenging experience. This project has brought together seemingly disparate partners to engage in critical dialogue and reflection on difficult issues of power, historical injustices, intellectual property, and tribal sovereignty, all of which inform food insecurity today. Paramount to successful collaborations is respecting cultural and intellectual property and ensuring that tribal knowledge remains secure throughout research activities. Taking time to listen, develop trust and an understanding of social relationships, tribal protocol, and tribal oversight is essential. A community-driven approach requires flexibility and can result in shifting priorities. It can also result in greater local ownership and leadership, expansion beyond original goals, and potentially, long-term sustainability of the program. Working together, collaborators experienced the power of collective action and the value of partnership to secure additional resources, magnify impact, and expand new relationships to further tribal goals and help build a healthy regional food system beyond the life of the grant.●

For more information about the origins of the collaboration and to receive updates on ongoing projects, please visit: nature.berkeley.edu/karuk-collaborative

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PICTURED: Canning workshop with Yurok Tribal members/OSU Extension



Each of us holds significant power when wielding a fork at the dinner table. With every bite taken, we indirectly vote on numerous issues which vary in scope and distribute power accordingly. These issues include how food is raised with regards to fossil fuel inputs, in terms of miles traveled from farm to fork, and also the use of fertilizers, pesticides, and herbicides. This shows our opportunity as individuals to choose to mitigate our impact, especially as the Union of Concerned Scientists (2015), the United States Environmental Protection Agency (2015), among many other leading groups link the primary cause of global warming to the burning of fossil fuels. The one small action of eating dinner does, in fact, have far-reaching implications throughout our world. Or we can take our scope of power distribution down to our local communities where numerous studies have shown that sourcing locally-grown products creates jobs and keeps money in the local community, thereby increasing a community's resilience and security (Swenson, 2009, 2010a, 2010b; Schnell, 2013). Consuming local foods is also one way to increase our health and well being as fresh foods are generally higher in vitamins and minerals (Frith, 2007).

THE CREATION AND VISION

To help others recognize their purchasing power and to successfully link purchasing decisions to Utah's farmers, land, and people, in 2012 the Utah Farm-Chef-Fork program was launched. This program is a collaboration between Utah State University Extension, the Utah Department of Agriculture and Food, and Slow Food Utah. Utah Farm-Chef-Fork combines university research with local expertise to provide workshops, farm tours, farm dinners, and additional opportunities to link farmers and chefs across the state. As research has shown, farmers that directly market their local products to local restaurants will see an increase of income with a resulting decrease in farmland losses (Govindasamy et al., 1996; Adam et al., 1999). Our team has offered eight workshops to-date, ranging from Good Agricultural Practices to Food Hub Explorations. We have also created six meet-and-greet opportunities between farmers and chefs statewide and two farm tours for chefs and the general public.

TASTING IS BELIEVING

In addition to direct marketing workshops, farm-chef meet-and-greets, and farm tours, our team is working to connect Utah farmers with local chefs on a more in-depth level, by pairing the two to collaborate to prepare and host farm dinners. In the autumn of 2015, we coordinated our first farm dinner event at Red Acre Farm in Cedar City, Utah. Two local chefs participated, Michel Attali of The French Spot, and Andrew Nehrenz, Culinary Arts Instructor at Southwest Applied Technology College.

The evening was beautiful with ideal temperatures, twinkle lights, and a full moon to grace the table of 32 people. The food, sourced from various local farms, was prepared in gourmet fashion with exquisite tastes and a beautiful visual appeal. Direct collaboration between the chefs and the farm “make for a more well-rounded event and creativity,” according to Chef Nehrenz. Afterward, a survey was emailed to the ticket purchasers inquiring about their experience as well as their potential increased likelihood of purchasing subsequent food with a local eye. The results confirm that attendees are much more likely to have increased relationships with local foods and farmers as all respondents (n = 18) were either ‘likely’ or ‘very likely’ to request local foods in subsequent dining experiences. And with the exception of one respondent who indicated ‘no change,’ the respondents had a ‘stronger’ or ‘much stronger’ connection with local foods and local farmers.

The respondents seemed very happy with the dinner experience. One survey respondent noted, “What a wonderful event, hope to attend another one.” Another stated, “Most fun and unusual experience we have had in years! Loved meeting the farmers and getting the tour of the farm. Loved seeing the animals! Loved that we got to interact with some animals. Food was great. We’ve not been exposed to farming, farmers, etc. only to backyard gardening and landscaping.” Yet another said, “I hope that more of these start popping up in the Southern Utah area. I also am interested in being a producer.” Lastly, one diner succinctly summed up the evening in their statement, “The whole experience was

perfect.” Farm-chef mingles, farm tours, and farm dinner events have so far produced measurable outcomes such as chefs increasing their use of locally-sourced products and local farms increasing sales of their products to these chefs. Chef Nehrenz noted that as soon as products were available next season he “will be sourcing more from these local producers” as his “knowledge of sources has increased.”

PROMOTING THE POWER

Given the effectiveness of this first Utah Farm-Chef-Fork farm dinner, more dinners are to follow in the future in different communities in Utah. Currently, a lunch is being planned that will occur in Moab in June of 2016, while others are in the works along the Wasatch Front. Our goal is to further communication and collaboration between local farms and chefs and to see an increased sourcing of local foods by the attendees of these events.

Knowledge equals power and power exacted by conscious choices can and will make a difference for local farmland retention through increased farm income and will result in stronger and more resilient local communities. Increase your knowledge and have fun by getting to know your local farmers and chefs. The impact is high in supporting local chefs and restaurants that incorporate local foods into their menus, or by asking whether restaurants source any of their ingredients locally. Never forget the power you wield with your fork! ●



PICTURED: Dinner table - Utah Farm-Chef-Fork/S. Duncan

Embracing Uncertainty and Building Community

Participatory Watershed Assessment and Planning for the Upper Gila River Arizona

By Kelly E. Mott Lacroix and Mark B. Apel



PICTURED: Gila River, Arizona/N. Chor/shutterstock

INTRODUCTION

When demands for water approach or exceed available supplies, competition intensifies among water interests and scarcity becomes a potential source of conflict. Given climate projections of a hotter future with more unpredictable precipitation patterns, the issue of water availability will likely be even more acute in the coming years. To mitigate conflict, it is necessary to not only assess and fairly allocate available resources, but also foster cooperation among stakeholders. This cooperation is particularly critical in rural areas where local planning capacity is often limited and socio-economic disparities can be especially challenging. One mechanism for promoting cooperation is through watershed groups, which can serve as powerful catalysts for improved management of water resources when provided with effective tools. Don Albrecht, in *Rethinking Rural*, emphasizes the need for collaborative efforts around water management as opposed to litigation and court rulings that usually render an unsatisfactory decision for one party or another (Albrecht, 2014).

“Ultimately, this process is an example of how taking an adaptive approach to rural watershed planning, based on cooperation among the University and local interests, can leverage the expertise of each group and engage with a broad cross-section of water users to help build resilient partnerships.”



PICTURED: GWP meeting gathering watershed history./K. E. Mott Lacroix

County Extension Agents in the Upper Gila Watershed in rural southeastern Arizona have been working for decades on watershed issues and water education. In 2012-2014 these efforts were amplified by a grant from the Desert Landscape Conservation Cooperative that enabled the University of Arizona Water Resources Research Center (WRRC) and Cooperative Extension to partner with the Gila Watershed Partnership (GWP) to work on watershed planning. The Upper Gila Watershed includes 15,000 square miles of forests and grasslands and is divided almost equally between Arizona and New Mexico. The federal government is by far the largest landholder in the region, managing vast acreages of forest and rangelands through the Forest Service and Bureau of Land Management. Significant farming, ranching, and mining activities occur in the watershed on private and leased lands. Ninety-one percent of the water used on the Arizona side of the watershed is for agriculture (predominately cotton farming), with five percent used for two mines, and four percent for municipal or domestic wells. Many of the challenges facing the watershed are similar to other rural watersheds: poverty, lack of resources for planning and infrastructure, and misunderstanding between different regions and water interests. Unique to this region is a complex and constricting set of groundwater and surface water laws that began in the 1930s and stretch to modern-day water settlements among water users, including tribes.

LOOKING TO THE PAST AND INTO THE FUTURE

The goals of the watershed planning project and grant were simple - establish baseline watershed conditions and build scenarios to help plan for the future of the watershed. The meandering path to accomplish those goals was, however, anything but straightforward. At the outset, the project team (WRRC, Cooperative Extension, and the GWP) met with local, state, and federal land and water managers to determine data availability for the watershed assessment. These informal meetings revealed the need for a formal gathering of professionals to share research and data, examine how to combine what were often overlapping efforts, and conversely fill data gaps. During the course of the two-day Science Coordination Workshop it became clear that one of the principal data gaps was a written record of watershed history; a history that was fading away. To fill this gap, the team hosted a special GWP meeting where participants wrote what they knew about the natural resource history of the watershed on the wall, and then each, in turn, told their piece of the history. Through this very social exercise the project capitalized on the wealth of history among the members of the GWP, and built a shared understanding of past events, mistakes, and triumphs. A transcribed version of this history became a key component of the Atlas of the Upper Gila Watershed and was converted to an interactive timeline that is available online. The final Atlas also included technical modeling through use of the

Automated Geospatial Watershed Assessment tool, and over a dozen maps, descriptions of watershed conditions, and the implications of those conditions (See Banister et al., 2014 and Lien, et al., 2014).

With the past and present setting the stage, during the second year of the project team members worked with stakeholders to build scenarios for the future of the watershed. Scenario planning is a process to identify and explore the forces that impact today's decisions in order to make better decisions for the future. The scenarios for the Upper Gila were created using a unique approach that developed key uncertainties in the watershed into four "meta-themes." (Mott Lacroix et al., 2015) The meta-themes for the Upper Gila Watershed included the price of cotton, the tamarisk leaf beetle, local versus federal control of resources, and New Mexico's decision to build infrastructure to divert water from Gila River headwaters. These meta-themes were then "tested"

through narrative descriptions against 12 possible stakeholder-identified drivers of watershed change, which included, among others, drought, fire, and collaboration (Figure 1). The narrative descriptions examined each meta-theme and drivers of change at 10-year intervals through 2055. At the end of each 10-year narrative, planning questions were proposed related to the events in the scenarios (See Mott Lacroix et al., 2014).

Many communities are familiar with 'visioning' processes that usually result in an ideal scenario, as articulated by the hopes and desires of community members. These processes are usually prefaced with the question, "What do you want your community to look like in X number of years?" Scenario planning, as used in these efforts, paints a more realistic picture of potential futures, based on uncertainties, drivers, and trends (Hatzilacou et al., 2007). Once a community has a better idea of what their potential

Scenario 2: Impacts from the Tamarisk Leaf Beetle

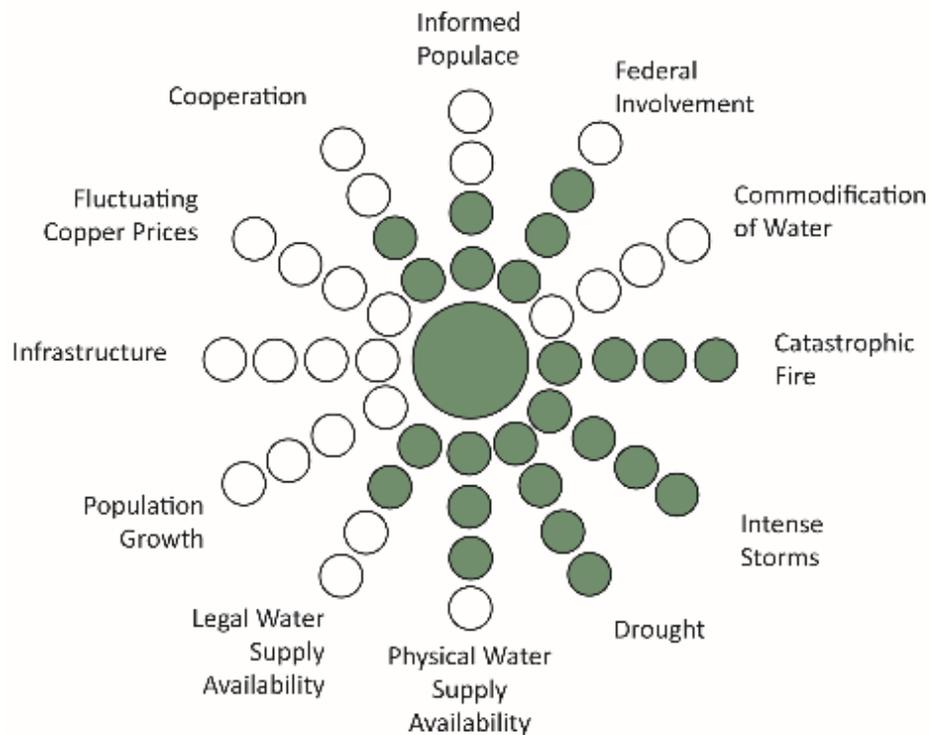


Figure 1. Major drivers for the Tamarisk Beetle Scenario. The more circles that are filled in the larger the role the driver plays in the scenario narrative.

futures could be, bad or good, they are in a better position for decision-making and planning for contingencies and resiliency.

In 2015, through additional funding from the U.S. Bureau of Reclamation, the watershed planning work continued through the development of water budgets that examined current and future water supplies and demands for the region. Much like the baseline assessment and scenario planning, this effort was driven by a combination of local and University expertise. The process of creating water budgets was not envisioned as a highly technical exercise. Rather, it was an opportunity for watershed stakeholders to explore the limits of what we know about water resources in the region and examine the water “situation” in a holistic way. Nonetheless, it was challenging given the size of the watershed and the variability in demand and supplies at the sub-watershed level. The most important finding of this exercise, much like that of the scenarios, is the inherent uncertainty in the water future, and the need to contemplate alternatives that are robust in the face of this uncertainty. Ultimately, the community determined that the most critical, near-term need is to increase awareness of regional water issues.

LEVERAGING LOCAL EXPERTISE

Many watershed planning efforts involve only a small cross-section of stakeholders, sometimes overlooking the interests that have the most at stake, such as agriculture. It is not always easy to get everyone to the table, so extra effort is required to try a variety of engagement methods such as focus groups, personal interviews, and well-designed surveys. Directed outreach and engagement efforts by a watershed group, like GWP, and leveraging the network of Cooperative Extension clientele, can go a long way to relationship-building and support for the overall mission of the watershed. In this case, personal ideologies and mistrust in ‘group efforts’ were put aside in favor of shared values and a common understanding of what the future could bring. The mission statement in itself reflects the deliberations and consensus of a very diverse group of interests in the Upper Gila River Watershed:

In the face of uncertain physically and legally available water supplies, we will:

- Provide reliable long-term water supplies for a resilient community;
- Preserve the ability for the watershed to produce food, fiber, and minerals;
- Maintain the rural lifestyle; and
- Sustain and enhance the health of the Upper Gila River Watershed

Not only was it important to leverage local expertise, but also to capitalize on the project team’s expertise. The University of Arizona’s WRRRC and Cooperative Extension brought the researched-based information, as is the purpose of land-grant universities, as well as process expertise. The Gila Watershed Partnership brought their local connections to the community and potential for networking with stakeholders not already involved. At the end of the day, it will be up to a convening body like the GWP or Cooperative Extension to carry the momentum of these relationships. The ensuing discussions and consensus among the variety of stakeholders, including agriculture, government agencies, water providers, consumers, elected officials, and conservation interests have created an important foundation for collaboration into the future.

The biggest challenge facing the watershed planning effort is how to formalize collaboration so as not to lose the momentum or interest achieved over the last few years. Formal memorandums of understanding, grant opportunities, cooperative agreements, municipal and county resolutions are a few of the tools at the disposal of this community to ensure continued collaboration. Ultimately, this process is an example of how taking an adaptive approach to rural watershed planning, based on cooperation among the University and local interests, can leverage the expertise of each group and engage with a broad cross-section of water users to help build resilient partnerships.●



Economic Evaluation of Variable Rate Irrigation Center Pivot Technology

By Brian Lee

Variable Rate Irrigation (VRI) is a relatively new technology in agriculture that has the potential to become an integral part of precision farming systems. VRI systems are attached to center pivot irrigation sprinklers, and allow producers to save resources, time, and money. The systems allow for the more accurate application of irrigation water within an agricultural field. The system uses an electrical conductivity (EC) map to determine maximum water holding capability of areas within the field. As the center pivot covers the field, water application varies each section of the field. This technology allows for variable, and more efficient, irrigation similar to already established types of precision agriculture such as fertilizer application.

The motivation behind VRI is the desire of agriculture producers to raise crops more efficiently. There are numerous benefits to a VRI system. The first is the ability to apply water to a field more accurately, ultimately producing a crop with less water waste. Some benefits associated with VRI, but beyond simply efficiently applying water, are that less nitrogen will leach out of the soil and erosion will be minimized due to less run-off. Another positive outcome is the economic benefit of cost savings from using less energy to apply the water to the field. This outcome is due to the need to pump less water. A VRI system theoretically should allow a producer to realize both of these benefits.

For the purpose of this research; however, only energy savings from pumping fewer gallons of water will be taken into consideration. No readily available onsite data exists to consider biological or soil benefits that may result from this technology. The Sustainable Agriculture Research and Extension Center (SAREC) in Lingle, Wyoming, installed a VRI system on a 67-acre half-circle pivot in May of 2014. The 67-acre area was previously under gravity irrigation that contains a very steep grade on about half of the field. This field was selected for the VRI system because of its water run off potential and steep grade. The pivot runs off of its own well that is roughly 40 feet deep.

No irrigation systems in the area were accessible to be used for comparison. Therefore, breakeven energy savings and returns needed over a range of kilowatt hour values and useful life values will be calculated. The bid cost to retrofit a 7 tower 67-acre pivot is \$29,513 dollars. (Valley Irrigation, 2014). A VRI system is assumed to have a useful life of approximately 15 years (Lu et al., 2003) with periodic maintenance.

RESULTS

A system costing \$29,513 dollars for a 67-acre pivot, considering a \$100 maintenance cost every five years with a 15-year useful life will have to have a return of \$2,167.60 per year compared to an average pivot. Again, remember this return can be in the form of energy savings, additional yield, and runoff control. Numbers listed below in Example 1 show a range of returns required given the useful life of the VRI system is five years less or five years more than 15. The values in Example 1 do not consider a maintenance cost.

EXAMPLE 1. RETURN NEEDED FOR RANGE OF USEFUL LIFE.

If a VRI system useful life is 10 years, the annual return required to pay for the system would be \$2,951. If the useful life is 15 years, the associated annual return required would be \$1,967.60. Lastly, if the useful life is determined to be 20 years, the associated annual return required would be \$1,475.65.

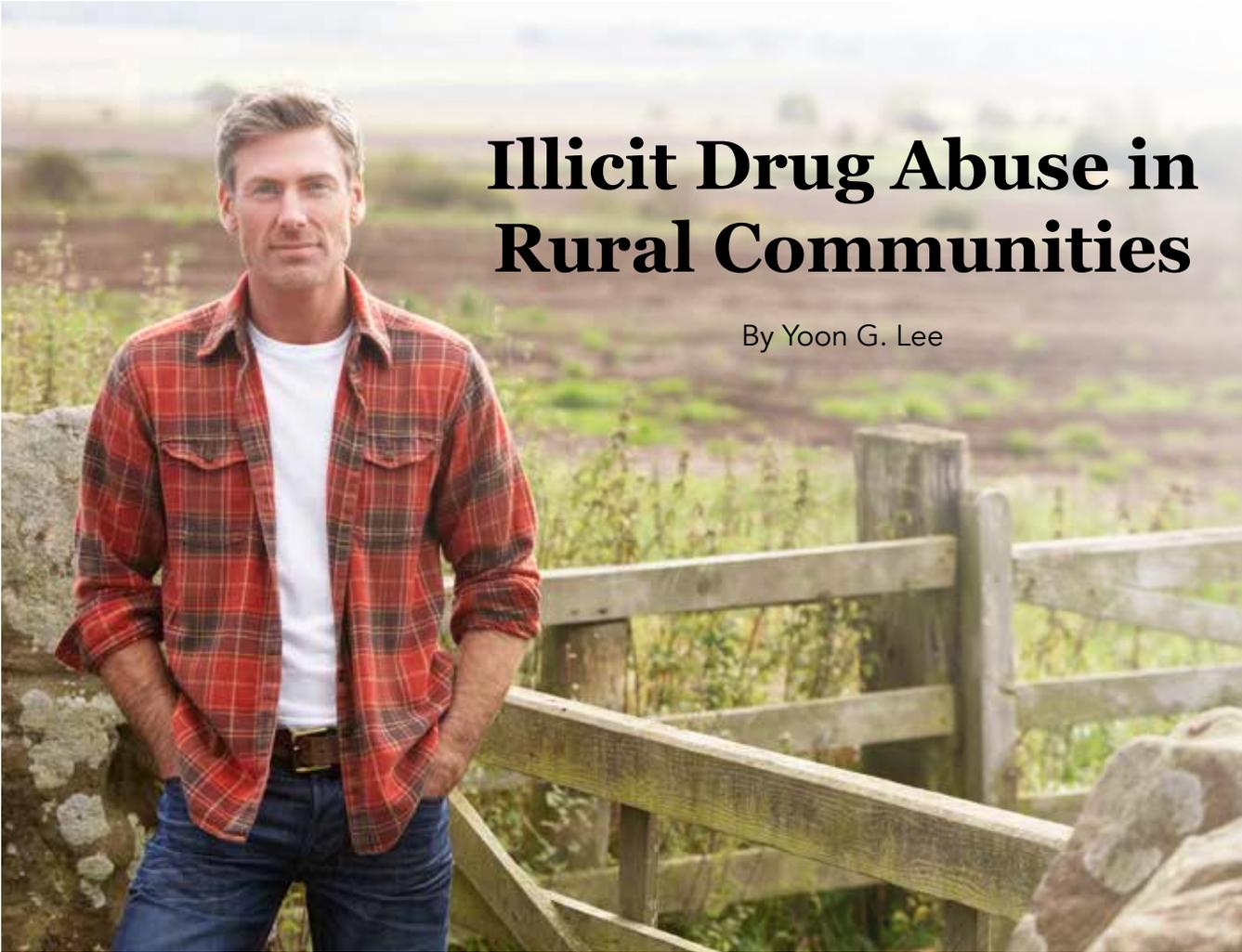
Few studies have been conducted that actually return a dollar amount that is associated with cost savings of a VRI system over irrigating when one part of a field needs it. One such study out of New Zealand suggests that producers could save NZ\$51 to NZ\$151 per hectare, per year with a VRI system. (Hedley et al., 2010). This equates to \$13.76 to \$40.47 US dollars per acre. This information will be used as a base to evaluate such a system in

Wyoming. The New Zealand study was conducted from 2004 to 2008, it also concluded that water savings ranged from eight percent to 21 percent over their test sites.

For a 67-acre pivot in Wyoming, the cost savings according to Hedley et al., could range anywhere from \$921.92 to \$2,711.49 per year. This range is partially within our dollars of annual return needed over the useful life of the system. So what would the NPV of such a system be, assuming the associated returns? The median of that range is \$1,816.71, so let's start there. With this average yearly return for a 67-acre pivot, the payback would be 16.25 years. The associated discounted Net annual savings for the average cost over the life of the VRI system is \$29,703.12. This is assuming a two percent discount rate and a 20-year useful life of the VRI system. This means if the VRI system averaged a savings of \$27.12/acre over the next 20 years, the investment is worth \$29,703 dollars to us today. The initial cost of the system we figured to be \$29,513, so, $\$29,703.12 - \$29,513.00 = \text{NPV } \190 . Again, remember this was assuming we had an average return per acre. A positive net present value means this would be a good investment all things considered.

Price for kWh can vary greatly year to year which will play a large part in determining cost savings for irrigation. Also, as mentioned before, there are many other positive biological benefits to the systems that can be hard to quantify. More information and research is needed to determine more accurately all of the savings involved with this technology. As mentioned before, there are benefits derived from reducing erosion and also nutrient leaching from applying the correct amount of water. Also, intuition would suggest that agricultural producers could produce a healthier crop from not over or under watering in parts of the field. These benefits are hard to quantify and therefore need some more research.●





Illicit Drug Abuse in Rural Communities

By Yoon G. Lee

OVERVIEW

Marijuana use has increased among most age levels and is the most abused illicit drug in America (National Institute on Drug Abuse, 2010). Marijuana has several known short- and long-term effects on the body (Narcon Fresh Start, 2010). Some of the short-term effects include: impaired short-term memory, attention, judgment, and other cognitive functions, increased heart rate, and sleep impairment. Long-term effects are known to include: possible addiction, chronic cough and bronchitis, anxiety, and depression. Cocaine use has also increased over the past decade. Cocaine is a powerfully addictive drug that stimulates the central nervous system. Emotional signs of cocaine abuse include: change in eating or sleeping patterns, withdrawal, depression, carelessness towards personal appearance, loss of interest, increased time away from family, stealing/lying/financial problems, thoughts of suicide, and paranoia (National Institute on Drug Abuse, 2013).

“There might be generational differences in substance use in rural communities. Individuals aged 30-49, who represent Generation X (born between 1965 and 1976), are the age group that most frequently used marijuana and cocaine in rural communities compared to other age groups such as Baby Boomers (born between 1946 and 1964) or Generation Y (born between the mid-1970 and the mid-2000s).”

The drug war costs American taxpayers billions of dollars every year (Drug Enforcement Administration, 2014). The government is spending nearly \$18 billion annually on agencies that work to research, control, and eliminate illegal drugs (Bush, 2010; DEA, 2010). Drug abuse in rural communities is a problem related to public health issues. There are several studies related to substance abuse, but they focus on youth and young adults and their use of substances such as methamphetamine and alcohol (Lambert et al., 2008; Gfroerer et al., 2007; Van Gundy, 2006; Botvin et al., 2000; Pettigrew et al., 2012). There are several studies that focus on addiction issues in urban areas, but not many that focus exclusively on rural areas (Young and Havens, 2012). Educators play a vital role in communities to recognize drug abuse before it becomes an addiction. Individuals in rural communities need to continue to be informed about drug abuse and its impact on their health and how to avoid these problems (Lenardson et al., 2012).

The objectives of this article were to explore to what extent rural residents were involved with illicit substance abuse such as marijuana and cocaine and to investigate factors associated with marijuana and cocaine consumption among individuals residing in rural communities. This study employed data from the 2012 National Survey on Drug Use and Health (U.S. Department of Health and Human Services, 2012). The 2012 survey was designed to provide information on the use of illicit drugs, alcohol, and tobacco among nearly 70,000 randomly selected study participants aged 12 and older. For the purpose of this article, individuals who resided

in non-metro rural areas were selected, resulting in 11,800 individuals. These rural residents were compared with 43,468 urban residents. Using logistic regression analyses, this study determined what socio-economic factors predict the probability of marijuana and cocaine uses among those residing in rural and urban communities.

FINDINGS

Marijuana and Cocaine Use in Rural Communities

Those with heavy drinking patterns (e.g., more than 15 days in a month) were more likely to be marijuana users than those with no alcoholic drinks in a month. This study found that 38.2 percent of the rural residents used marijuana, and that rural residents aged 30-49 were more likely to use marijuana than other age groups. Rural residents with poor health were more likely to use marijuana than those with good or excellent health. Male rural residents were more likely to use marijuana than females. Lower levels of education were positively related to the use of marijuana among rural residents, and income level was not associated with the use of marijuana. Blacks were less likely to use marijuana than their White counterparts, but there was no significant difference in the use of marijuana between White and Hispanic rural residents.

Those consuming more alcohol within a month were more likely to use cocaine than those consuming no alcohol. This study found that about 10.3 percent of rural residents have used cocaine. Rural residents aged 30-49 were more likely to take up cocaine than residents of other age groups. Male rural residents

were more likely to try cocaine than females. Rural residents of more than one race were more likely to use cocaine than White residents. This study found that those with no college education were more likely to use cocaine than those with college education. Rural residents with poor health were more likely to use cocaine than those with excellent health.

RURAL AND URBAN DIFFERENCE IN ILLICIT DRUG USE

Figures 1 and 2 present the rural and urban differences in marijuana and cocaine use according to socio-economic characteristics of the respondents. Figure 1 shows that while 38.2 percent of the rural residents reported the use of marijuana, 40.8 percent of the urban residents have used marijuana. The reported cocaine use was also higher for urban residents (11.0 percent) than rural residents (10.3 percent). Males and females in urban communities were more likely to use illicit drugs than those in rural communities (Figure 2). Additionally, both rural and urban residents with annual incomes of \$20,000 - \$50,000 were most likely to use marijuana and cocaine. According to the results of regression analyses, socio-economic factors that predict the probability of marijuana and cocaine use among those residing in rural and urban communities were those aged 30-49, those with poor health, males, those with no college degree, those with less than \$20,000 in annual income, and those with alcohol dependence.

IMPLICATIONS AND CONCLUSIONS

Implications

According to the findings of this research, heavy drinking is strongly associated with marijuana and cocaine use by residents in rural communities. Alcohol abuse and dependence can have long term and lasting effects on individuals, couples, and the family dynamics (Mattiko et al., 2011; Martin, 2008). Alcohol education in early stages of life such as teens and young adults is important, but should not exclude older age groups (Center for Disease Control and Prevention, 2010). It is necessary to have consistent youth education in rural communities regarding illicit drug abuse and its negative impact

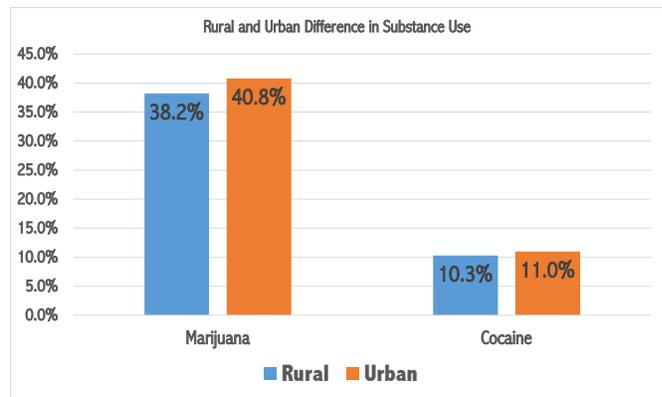


Figure 1. Rural and Urban Difference in Substance Use.

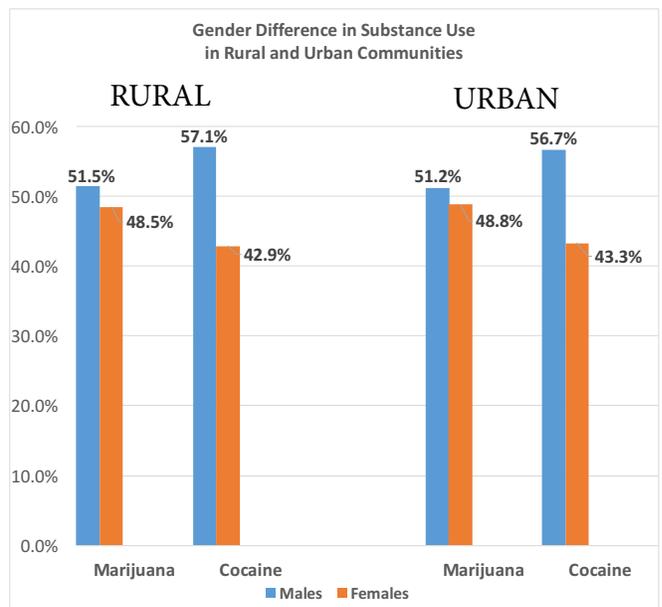


Figure 2. Gender Difference in Substance Use in Rural and Urban Communities.

on their health and later life. Community educators and program leaders might need to consider this issue in rural communities.

There might be generational differences in substance use in rural communities. Individuals aged 30-49, who represent Generation X (born between 1965 and 1976), are the age group that most frequently used marijuana and cocaine in rural communities compared to other age groups such as Baby Boomers (born between 1946 and 1964) or Generation Y (born between the mid-1970 and the mid-2000s). The age group (30-49) represents those

who could be in the labor force and could be raising young children, so understanding this generation's substance use is very important for productivity in work places and for family issues.

Poor health is positively associated with marijuana and cocaine use by residents in rural communities. If poor health is connected to illicit drug abuse, it is important to understand why. It is difficult to determine whether this is because illicit substance use causes poor health or if those with poor health are more drawn to these substances. Health practitioners in rural communities might need to understand the correlation between health and substance abuse. Thus, further investigation of this relationship and health education might be needed for residents in rural communities.

This study found that gender, education, and racial background were associated with both marijuana and cocaine use among residents in rural communities. For example, male, less educated, and White residents were more likely to be illicit substance users. Compared to Blacks, White residents were more likely to be both marijuana and cocaine users. However, residents of other races were more likely to be cocaine users than Whites. The findings imply that community-based education and intervention programs that target these categories of demographics could be designed and disseminated for healthy lives and its outcomes such as increased worker productivity, family wellbeing, and community sustainability in rural areas.

In comparing rural and urban communities, a slightly higher proportion of urban residents reported use of marijuana and cocaine than in rural communities. However, marijuana is more of an issue in rural than urban communities, whereas cocaine problems could be more of an issue in urban than rural communities. It was found that middle age adults were the age groups who most frequently used illicit drugs in both regions. In both communities, as the level of education decreases so does their likelihood of using illicit drugs. Blacks in urban communities were two times more likely to use marijuana than Blacks in rural communities. Lower income groups were more likely to use marijuana and cocaine in rural communities;

however, in urban communities, those with an annual income of \$20,000-\$50,000 were most likely to use marijuana and cocaine. Overall, the rates of marijuana and cocaine use were higher for urban residents with poor health than those with good health. However, marijuana and cocaine use is higher in rural communities among those in the poor health category than urban residents.

Conclusions

This research concludes that individuals aged 30-49, males, Whites, and alcohol dependents are important predictors of illicit drug abuse in both rural and urban communities. Thus, drug abuse prevention programs could be designed to target the middle age working group. It should also focus on the link between alcohol drinking patterns and illicit drug use. Since the types of drug abuse were different among those with different ethnicities (e.g., Whites were more likely to abuse marijuana, while residents of other races were more likely to abuse cocaine), this information might need to be included in drug abuse intervention programs. While there was no association between income level and illicit drug abuse in rural communities, other economic variables such as wealth or debt levels of individuals and families residing in rural communities could be considered in understanding illicit drug abuse in rural communities.●



County Economies 2015

The Uneven Geography of Opportunity in Rural Western Counties

By Brian Knudsen



2015 was a year of continued improvement for the U.S. economy, prompting the Federal Reserve to raise its key interest rate for the first time in almost a decade. Unemployment fell to five percent, half the rate from the recession (U.S. BLS, 2016a). The economy added over two and a half million jobs (U.S. BLS, 2016b). Furthermore, for the second straight year, U.S. economic output (GDP) grew by 2.4 percent (U.S. BEA, 2016). These national economic trends, however, mask a more diverse reality that county economies are experiencing on the ground.

Almost three times more small western county economies recovered on home prices in 2015 than the previous year, while about twice as many returned to their pre-recession unemployment lows. Job growth was robust, with 83 percent of small county economies in the West posting employment gains in 2015. At the same time, however, economic output (GDP) recovery almost stalled. By 2015, only 45 percent of small western county economies had recovered to their pre-recession levels on economic output (GDP). Slower economic output (GDP) growth in 2015 was the main reason. Economic output (GDP) even fell in 32 percent of small county economies in this part of the country.

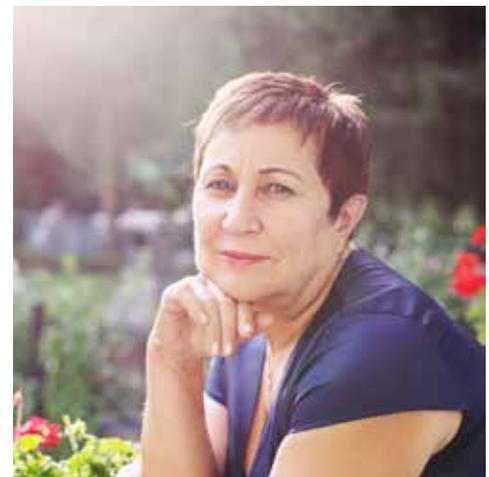
Nevertheless, full economic recovery is spreading throughout the West and the entire U.S. By 2015, 214 county economies nationwide had recovered to their pre-recession levels on all four indicators analyzed (economic output (GDP), unemployment rate, jobs and home prices), close to a three-fold increase over 2014. Likewise, 17 small western county economies fully recovered by 2015, up from only 10 the year before. In western states, however, these numbers still represent only six percent of all small county economies. Thirteen of these fully recovered county economies are in Montana. In contrast, over a fifth of the small county economies of the 13 western states have not closed their recessionary gaps on any of the indicators analyzed. Thus, full economic recovery has not been spreading evenly.

Looking at wages, the *County Economies 2015* report finds that the recovery is creating an uneven geography of opportunity. In 2014, wages increased for about two-thirds of county economies nationally, when taking into account the cost of living and inflation. A similar share of small western county economies witnessed growth in their adjusted wages. Moreover, 40 percent of small western county economies saw real wage increases alongside productivity gains over the five-year span from 2009-2014. However, wages did not keep up with productivity gains everywhere between 2009 and 2014. Twenty-three percent of county economies in the West had falling wages, in spite of productivity increases over the five-year period. The report examines the average of real wages in all the industry in a county economy, not just those of county government employees.

This uneven recovery across county economies contributes to the challenges that counties confront. Counties already face a triple threat from uncertainty around federal policy, from tax and entitlement reform and from appropriation cuts not accompanied by reductions in unfunded mandates. Nevertheless, counties are doing their part to invest in economic development, infrastructure, and providing services.

County Economies 2015 highlights that it is on the ground, at the local level, where Americans feel the national economy. The economic recovery and growth continued to spread in 2015, but unevenly

“[In 2015] job growth was robust, with 83 percent of small county economies in the West posting employment gains in 2015. At the same time, however, economic output (GDP) recovery almost stalled. By 2015, only 45 percent of small western county economies had recovered to their pre-recession levels on economic output (GDP).”



around the country. These opportunities and challenges point to the continuing need for a strong local-state-federal partnership to secure a strong economy.

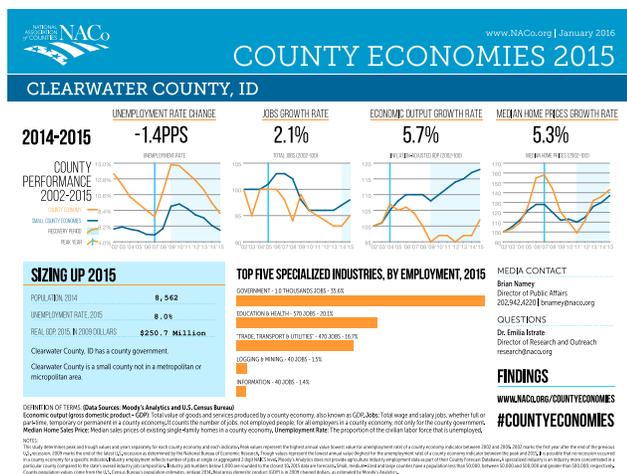
ABOUT COUNTY ECONOMIES 2015

When trying to understand national and local economic trends, sometimes a picture is worth a thousand words. County leaders now have access to an interactive visual tool to help assess the economy of their county thanks to NACo. Find it online at www.naco.org/CountyEconomies. NACo's *County Economies 2015: Opportunities and Challenges* is a nationwide analysis of economic recovery at the county level, and it was the source of the information cited in the adjacent article. Individual counties are assessed on four key indicators:

- Economic output (gross domestic product/GDP)
- Jobs
- Unemployment rates
- Home Prices

The result is a color-coded interactive map of the 3,069 counties in the United States, showing the progress of economic recovery for each county. (See map on first page of this article.)

Also available are one-page PDF profiles for each county economy showing the latest growth rates of the four economic indicators, the trends since 2002, and the top five specialized industries. (Pictured below.)



County Economy One-Page Profile. Available at naco.org/CountyExplorer.

NACO'S COUNTY ECONOMIC TRACKER — KEY TERMS

County Economy: The economy of a county with a county government.

Economic Output (gross domestic product - GDP): Total value of goods and services produced by a county economy, also known as GDP (Data Source: Moody's Analytics.)

Jobs: Total wage and salary jobs, whether full- or part-time, temporary or permanent in a county economy. It counts the number of jobs, not employed people, for all employers in a county economy, not only for the county government. (Data source: Moody's Analytics.)

Median Home Sales Prices: Median sales prices of existing single-family homes in a county economy. (Data source: Moody's Analytics.)

Peak: The highest annual value of a county economy indicator (or, the lowest for the unemployment rate) between 2002 and 2009. 2002 is the first year after the end of the previous U.S. recession and 2009 marks the end of the latest U.S. recession. The National Bureau of Economic Research (NBER) determines the end of U.S. economic recessions.

Recession: The period between the peak and the trough years for an indicator for a county economy during the latest U.S. economic downturn. This research counts a recession only when the difference between the peak and the trough value is larger than one percent of the peak value. It is possible that no recession occurred for an indicator in some county economies during the latest U.S. economic downturn.

Recovery: Trough year to 2015 for an indicator for a county economy. If a county economy had no recession on a specific indicator, the recovery period is from 2009 to 2015. It is possible that a county economy underwent recession and has not yet entered the recovery period for a specific indicator.

Trough: The lowest annual value of a county economy indicator (or, the highest for the unemployment rate) between the peak and 2015.

Unemployment Rate: The proportion of the civilian labor force that is unemployed in a county economy. Persons are classified as unemployed if they do not have a job, have actively looked for work in the prior four weeks and are currently available for work. (Data source: Moody's Analytics.)

West: As defined by the Western Rural Development Center, this region includes counties in 13 states: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, and Wyoming.



Preparing Youth for Today's Economy

A Multidisciplinary Extension Concern

By Harriet Shaklee,
Kathe Tiftt,
and Katie Hoffman

Access to higher education is a top issue for the nation, and a focal concern of many states as well. Today's information-based economy needs educated employees, with more and more jobs requiring undergraduate or higher diplomas. Only 29 percent of U.S. working aged adults (25+ years old) today have this level of training, with considerable variation in the extent to which each state meets these goals (WICHE: Western Interstate Commission for Higher Education, 2016).

The thirteen member states of the Western Rural Development Center reflect these educational challenges. Rates of new high school graduates in 2014 who enrolled as college freshmen within a year ranged from 44.6 percent (UT) to 67.8 percent (CA). Of those enrolled, 2014 program completion rates ranged from 20.5 percent (NM) to 43.1 percent (WY) for AA degrees, and from 25.3 percent (NV) to 61.5 percent (WA) for four-year diplomas (WICHE, 2016).

“Despite recent educational gains among rural residents, rural college attainment remains 10 percent below the national average.”



Localities also vary substantially in access to post-secondary education, with rural communities especially challenged. Despite recent educational gains among rural residents, rural college attainment remains 10 percent below the national average (Player, 2015). Many factors likely contribute to that difference, including weaker college-going traditions among rural parents, lower family incomes, and early marriage and childbearing among rural residents (Carson and Mattingly, 2014). Additionally, much of the recent growth in college attendance has been among commuter students – a limited option in rural communities (Kim and Rury, 2011; McLaughlin and Shoff, 2014).

These concerns have implications for many aspects of community life. For communities, the problem is one of human capital – how will we build a workforce ready for today’s economy? For families the challenge may be cultural – how can we make college-going a norm in our family? Families’ concerns may be financial – how can we recruit the funds for our children to be adequately trained? Finally, the youth themselves face a life challenge – how can I develop the personal skills, educational foundation, and financial resources required for adult independence?

These multiple perspectives on higher education suggest the potential of a multidisciplinary approach, including fields of community development, youth development, family development, and family financial management (Shaklee et al., 2014). Fortunately, these are all areas of strength for Extension, with long roots in many communities. In fact, few other organizations and agencies have

expertise in this diverse set of concerns. The present discussion considers ways for Extension to bring the resources of its several relevant disciplines to bear on the problem of higher education access and attainment.

COMMUNITY DEVELOPMENT

A trained workforce is vital to a community’s economic base, and essential for development, recruitment, and retention of new and established businesses. Communities can support post-high school education for their youth in several ways.

Teenagers work to fund future college expenses, but youth wages have shrunk in value in recent decades. Summer employment rates for teens have also dropped significantly in the last 40 years, down to 31.3 percent in 2014 (Goo, 2015). Local businesses can address this issue by developing options for part time and summer work in their hiring structure. They can also design apprenticeships and internships during scheduled breaks in academic calendars to help youth develop workplace skills. Such workforce training builds relationships with community youth, opening their eyes to the careers possible with post-secondary training.

Communities can help develop a norm of post-high school education for their youth through forums and discussions on college options, funding, and campus life (Devol and Krodell, 2010), as well as programs about alternative training routes. Young people involved in higher education can serve as peer counselors to help youth adapt to life away from home, providing guidance and support as the new students develop support networks of their own.

Many communities offer multiple scholarships for higher education. Communities can facilitate access to those funds through a single application process for the various scholarships, including a common application form and due date. Donor groups may want to coordinate award decisions, so funds are distributed optimally among the many deserving students.

FAMILY DEVELOPMENT

Families are a major force in shaping the aspirations of their children. Post-high school training is a family norm for many community residents, but others don't share the tradition. Parents without a college degree (or high school diploma) may consider college to be out of reach, and may be unaware of other training options. However, youth in these families need to prepare for today's job market in order to take on adult roles in the community.

Years of research demonstrate family practices that help youth develop the skills needed for success at school and work. For example, a habit of reading to children from an early age prepares young children for the first years of school. A regular family mealtime promotes communication among family members and reduces youth risk taking. Parenting styles built on limit setting and reasoning are associated with positive traits for children like problem solving, persistence, and resilience (Eisenberg et al., 2005; Prevatt, 2003). These are all core aspects of parenting programs taught by university Extension that can help parents raise children prepared for success in high school and post-secondary programs.

In addition, Extension can employ their extensive community connections to actively engage marginalized families in programs relevant to higher education. After-school programs, summer camps, and 4-H events are good venues to connect families with programs about the variety of post-high school educational options as well as viable funding schemes.

FAMILY ECONOMICS

Extension Family Consumer Science professionals have worked for decades with families on managing

financial resources. Programs on retirement planning, for example, promote early saving towards financial security in the senior years. Post-high school training is another long term goal for families to fit into their savings plan. Research shows that even small savings accounts dedicated to education increase the higher education attainment of youth in low and moderate income families (Elliott et al., 2013).

Extension professionals can help families develop a funding base for higher education expenses, apprise them of affordable options for training, and counsel about educational loans. Programs can also target employed teens, helping them put aside funds for post-high-school training. Excellent publications are available in Extension on preparing for college, college expenses, loan programs, and savings strategies that Extension educators can use in developing programs to meet local needs (see search.extension.org or www.cyfernet.org). Successful Extension programs are available to support young adults in these critical transitions (e.g., Hines et al., 2011; Royer et al., 2005; Tifft, 2013).

YOUTH DEVELOPMENT

Extension's 100 years of 4-H has a proven record of training youth in the life skills required for adult roles. Recently, 4-H programs have broadened their reach to a more diverse client base through day camps, projects in day programming, and after school programs (Bunnell and Pate, 2006; Hoffman, 2011; Lerner, et al., 2009).

Activities of 4-H are designed to build foundational skills that will enable success in education and career, including personal responsibility, record keeping, problem solving, critical thinking, wise use of resources, decision making, planning, and communication (Hendricks, 1998). Entrepreneurship and leadership programs allow youth to work hands-on in program and business development, providing valuable experience for college and career. Youth in these programs can develop relationships with local leaders and business owners, opening opportunities for internships, apprenticeships, and jobs. Youth may fear the unknown when exploring colleges or moving outside of the home – a particular

problem for families new to college. Through 4-H, youth can travel outside of their home county, experiencing independent living while attending regional, state, and national youth conferences. Often such events take place on college campuses, providing an opportunity for a close look at college life.

Many state and county 4-H programs offer college scholarship programs to help youth and families fund post-secondary education. Experiences and community service offered in 4-H programs also strengthen youth applications for other financial assistance. In these many ways, 4-H provides tools, connections, and experiences necessary for post-secondary success.

CONCLUSION

The long history of work by Extension in these several areas make them a natural leader on community initiatives to increase post-secondary training for their youth. In many communities Extension is the sole organization with such a broad range of relevant expertise and experience.

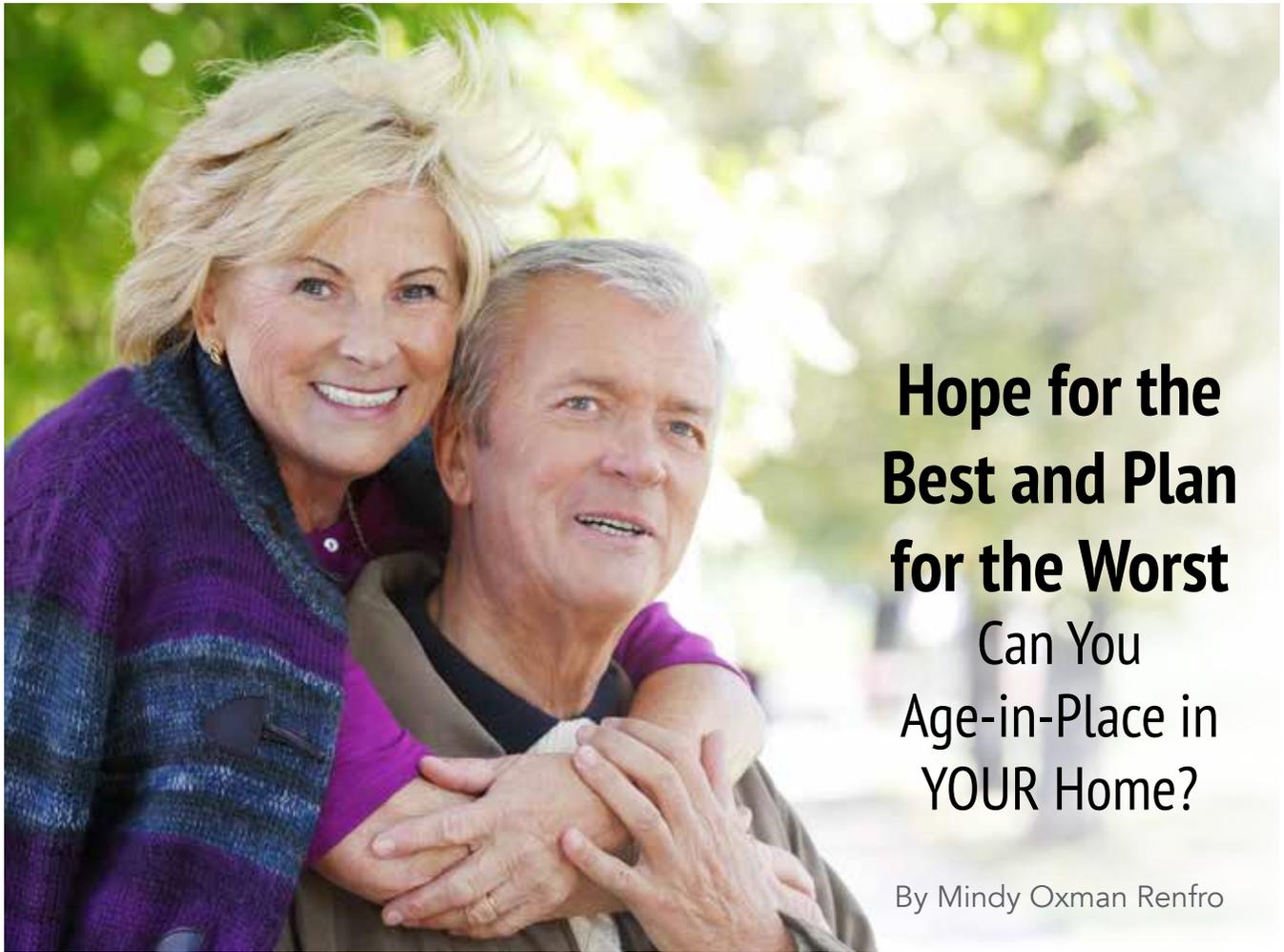
Extension can draw on strong relationships with organizations, businesses, and families to build collaborations to strengthen the path to post-high school training for local youth. Engagement with area educational programs will also be important for program effectiveness.

Program success requires consideration of local norms and resources in strategy development. Extension's strong presence in small towns and rural areas will be especially useful, considering the underrepresentation of rural youth in higher education. Sensitivity to local concerns and family traditions can help communities build programs to reflect their own values and priorities, while moving forward to engage young people in the training required for success in today's economy.

Engagement of university Extension programs in the issue of higher education access can demonstrate agility in addressing contemporary concerns. As the front door to the university in communities across the nation, Extension is a particularly appropriate leader for these concerns.●

“Extension’s strong presence in small towns and rural areas will be especially useful, considering the underrepresentation of rural youth in higher education. Sensitivity to local concerns and family traditions can help communities build programs to reflect their own values and priorities, while moving forward to engage young people in the training required for success in today’s economy.”





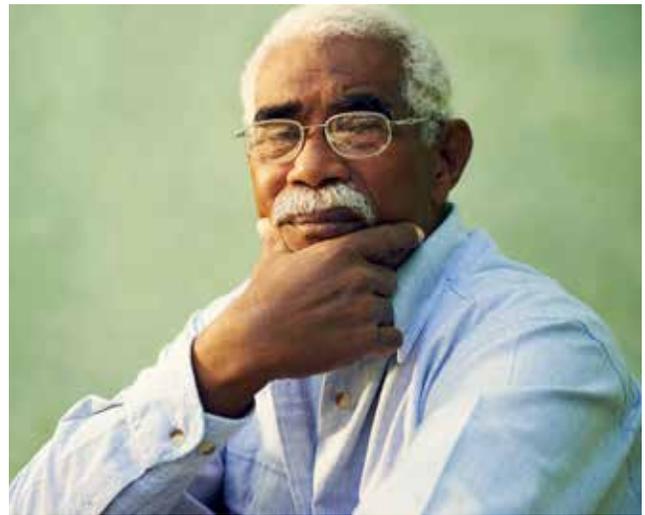
Hope for the Best and Plan for the Worst Can You Age-in-Place in YOUR Home?

By Mindy Oxman Renfro

The Western Rural states are aging. It is expected that by 2025, Montana's population will be the fourth oldest state in the union. It's also estimated that by 2030, Montana will be one of ten states in the country to have more people over the age of 65 than under the age of 18, and it will be one of only six states to have 25 percent of its population aged 65 and older.

Policy makers are reshaping Medicare; politicians are trying to protect Social Security... but what are each of us doing to be sure that we can age-in-place in our own homes? Each day, 10,000 Baby Boomers (born between 1946 and 1964) are celebrating their 65th birthday and joining the ranks of "older adults."

“Most of us work towards maintaining our health and extending our independent years, but we must also recognize that injury and illness may impose limitations on our mobility without warning. Our environment must also be ready to meet our needs to allow for ongoing independence.”



Accessible housing with universal design features is critical to our ability to house and care for this large aging demographic while protecting individuals' wishes for dignity, control, and independence. If we want to maintain control of our lives, we need to look ahead and plan. Most of us work towards maintaining our health and extending our independent years, but we must also recognize that injury and illness may impose limitations on our mobility without warning. Our environment must also be ready to meet our needs to allow for ongoing independence.

If you fell or required surgery today and needed to use a walker or wheelchair, could you safely go home during and/or after your rehabilitation?

What are the costs of NOT going home?

The national average monthly costs of staying in a nursing home in a double occupancy room for one person are about \$6,692.00 and are expected to increase 3.53 percent in the next five years. This does not include the costs of physician care, rehabilitation, supplies or equipment.

Are you or your parents "empty nesters"?

This is the best time to make changes in home location and/or structure. Before we consider the structure of your home itself, what about your community? An aging-friendly community is safe, accessible, includes level and well-lit sidewalks, provides many transportation alternatives if driving

becomes difficult, and has good medical care locally. In some areas, you might find there may be Village networks, cohousing neighborhoods and other creative housing solutions for elders as well. You may also opt to look for or promote a "Blue Zone Project." This project is a community well-being improvement initiative designed to make healthy choices easier through permanent changes to environment, policy, and social networks. This may include greater disability access at outdoor activities, acquisition of easily accessible bus lines, multi-generational community centers, and others.

Once you decide where to live, this is a perfect time to make sure that your home will serve your needs as you age. Considerations and changes should occur LONG before they are needed. Modifications to your existing home may or may not be feasible or affordable. At times, it becomes more realistic to move into a new home. It is recommended your home meet basic requirements of Universal Design. In addition to supporting you later, universal design will make your home "visitable" to others with disabilities such as aging parents or neighbors.

When my husband and I bought our last home, we found that living far out of town with a lot of land, limited home and community-based services, and dark roads was not a reasonable choice as we approached retirement. Although our current home does not include all aspects of Universal Design,

the needed changes are simple and affordable. Our second floor is a wonderful addition now, but our home would also allow us to live on the entry or main floor if we were not able to negotiate or adapt steps later.

What questions should I ask?

Basic questions and discussion starters should include:

1. What Assistive Technology (AT) and/or home modifications are needed now and what may be needed in the foreseeable future?
2. Can this home allow for all of the needed modifications?
3. Is it better to modify or move?
4. Who can plan the modifications?
5. Who can make the needed changes?
6. How can we afford the modifications and AT that we need?

Who can help you?

As always, working with a knowledgeable therapist, architect, contractor, and/or builder is key to ultimate success. When available, try to select a Certified Aging-in-Place Specialist (CAPS) who has specific training in this area. If you are working with an occupational or physical therapist, you might inquire if they have completed the Executive Certificate in Home Modifications. Although these certificates are not mandatory, they may be a key to someone who is more experienced in providing these services.

What would we like to see happen?

According to AARP, nearly 90 percent of seniors want to stay in their own homes as they age, oftentimes referred to as "aging-in-place." AARP, the National Association of Home Builders, and MetLife Mature Marketing Institute have all defined parameters of the ideal home to support aging-in-place and workbooks are available on their websites. (See Resources.)

What do I need at a minimum?

Basic building parameters for an accessible and safe home include accommodations such as:

- Safety features including non-slip floor surfaces

- Bathroom aides such as grab bars
- A personal alert system that allows people to call for help in emergencies
- Entrance without steps or "zero entry" and a covered entry
- Wider doorways
- Lever-handled doorknobs
- Higher electrical outlets
- Lower electrical switches

Assistive Technology used within an accessible home environment can further allow for independence and safety. These items vary in price, technology needed in the home such as wireless communication, and level of cognition and physical abilities needed to utilize the product. AT that supports aging-in-place falls within one or more of the following categories:

- Physical activity monitors to facilitate healthy lifestyles
- Fall sensors and alarms or Personal Emergency Response Systems (PERS)
- Medication management technology
- Sensors to alert caregivers of elopement, out of bed, etc.
- Mobility assistive devices
- Adaptive equipment for self-care, cooking, dressing, bathing, and toileting
- Home health monitoring technology for blood pressure, diabetic care, sleep patterns, etc.
- Vast amounts of apps for phones, tablets, laptops, and home computers to enhance:
 - Organization
 - Schedule maintenance
 - Memory games and cognition improvement
 - Simple access to communication with family and friends
 - Control of home functions such as lighting, door locks, etc.

Meet your state's Assistive Technology Program!

Every state has a federally-funded Assistive Technology Program and you can find the location of yours by visiting: <http://esnaprojects.org/allcontacts/statewidecontacts.html>. These programs are supported by the Assistive Technology (AT) Act of 1998 which provides funding for education, demonstrations, training, and loans of assistive technology to support independent living and a better quality of life. The staff of these programs can help you determine the best AT to meet your needs and may have items in inventory for loan to allow you to "try before you buy." To learn about the law visit <https://www.disability.gov/assistive-technology-act/>. Demonstrations and loans are free to state residents.

How do I keep up with the newest technology?

One outstanding website for non-commercial, evidence-based assessment of new technologies is found online at Tech Enhanced Life. This website will help you learn about reviews of many devices to support successful and affordable aging-in-place. (See Resources.)

Planning ahead to successfully age-in-place should begin with looking for that perfect home or updating your current home. Failing to plan may result in time spent in nursing homes at a great financial and emotional cost to you and your family. You maintain health insurance for your body. Now take steps to insure that your environment will support you as well!●



RESOURCES FOR AGING IN PLACE

Assistive Technology Program

resnaprojects.org/allcontacts/statewidecontacts.html

Blue Zones

bluezones.com/about-blue-zones/

CAPS Builder

[nahb.org/en/find/directory-designee.aspx#sort=%40lastname40069%20ascending&f:@fdesignationsheldabbreviation40069=\[caps\]](http://nahb.org/en/find/directory-designee.aspx#sort=%40lastname40069%20ascending&f:@fdesignationsheldabbreviation40069=[caps])

Census Data

www.census.gov/prod/2014pubs/p25-1141.pdf

Executive Certificate in Home Modifications

nahb.org/en/learn/designations/certified-aging-in-place-specialist.aspx and/or homemods.org/online-courses/legal/certificate.shtml

MetLife Aging in Place Workbook

metlife.com/assets/cao/mmi/publications/studies/2010/mmi-aging-place-workbook.pdf

MetLife Aging in Place 2.0

metlife.com/mmi/research/aging-in-place.html#insights

Montana Population information

worldpopulationreview.com/states/montana-population/

National Association of Home Builders

nahb.org/

Nursing Home Costs by State

skillednursingfacilities.org/resources/nursing-home-costs/

Promoting Aging in Place PowerPoint

aarp.org/home-garden/livable-communities/info-11-2011/solutions-forum-aging-in-place.html

Residential Design for Aging in Place

ageinplacebook.com/

State Survey of Livability Policies and Practices

aarp.org/home-garden/livable-communities/info-11-2011/Aging-In-Place.html

Tech Enhanced Life

techenhancedlife.com/

Toolkit for Local Governments

aarp.org/content/dam/aarp/livable-communities/plan/planning/aging-in-place-a-toolkit-for-local-governments-aarp.pdf

Universal Design

universaldesign.com/what-is-ud/ and <http://www.udeworld.com/visitability.html>

Village Networks

agingincommunity.com/

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2012 Year the policy center was established.	7 Educational webinars delivered.	36 Rural policy briefs published.
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STRENGTHENING ECONOMIC DEVELOPMENT

Stronger Economies Together is a partnership between the Centers and USDA Rural Development. **SET** helps rural regions build their strategies on broad-based partnerships that are grounded in regional cooperation rather than regional competition. Visit srdc.msstate.edu/set

<div style="background-color: #00A0C0; border-radius: 50%; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center; color: white; font-weight: bold; font-size: 24px;">26</div> <p>States</p>	<div style="background-color: #00A0C0; border-radius: 50%; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center; color: white; font-weight: bold; font-size: 24px;">50</div> <p>Multi-county Regions</p>	<div style="background-color: #00A0C0; border-radius: 50%; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center; color: white; font-weight: bold; font-size: 24px;">\$112M</div> <p>Leveraged to support their work</p>
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