Extension Disaster Education and Green Readiness, Response, and Recovery: Synergies and Partnerships

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In the early 1990s land grant universities worked with the U.S. Department of Agriculture (USDA) to develop a disaster education program to be coordinated via collaborations among U.S. state cooperative extension systems. Given that this Extension Disaster Education Network (EDEN) is funded directly and indirectly via USDA funding, and given that the Green Readiness, Response, and Recovery idea is an outgrowth of USDA Forest Service collaborations, there are numerous possibilities for green readiness, response, and recovery resources to be collaboratively developed with land grant partners and disseminated widely across the national land grant and cooperative extension networks. This chapter will describe the national EDEN network, in the context of disaster education and best practices dissemination, drawing attention to the utility of the network to widely circulate green readiness, response, and recovery materials, but more importantly, highlighting the potential to leverage the cooperative extension system's reputation as a credible and trusted source of evidence-based information towards broader understanding among U.S. citizens of the critical importance of integrating natural resources, or green infrastructure, into all phases of disaster management.

Origins and History of Extension Disaster Education and EDEN

The Cooperative Extension Service has been involved in helping families cope with disaster since it was founded in 1914, through the Smith-Lever Act, which formalized and established USDA's partnership with land grant universities to apply research and provide education in agriculture. Congress created the extension system to address rural, agricultural issues. Over the last century, extension has adapted to changing times and landscapes and it continues to address a wide range of human, plant, and animal needs in both urban and rural areas. Today, extension works to: (1) translate science for practical application; (2) identify emerging research questions, find answers, and encourage application of science and technology to improve agricultural, economic, and social conditions; (3) prepare people to break the cycle of poverty, encourage healthful lifestyles, and prepare youth for responsible adulthood; (4) provide rapid response regarding disasters and emergencies; and (5) connect people to information and assistance available online through eXtension.org.

There are many examples of cooperative extension's historical involvement in disaster. Shortly after Cooperative Extension's inception, World War I turned it into a disaster force, with Emergency Food Agents hired to encourage more food production—crops, victory gardens, and improved milk and poultry production (Danbom 1979). Extension agents in northern Minnesota and the Upper Peninsula of Michigan were commended for their heroism

during the forest fires in the cut-over North Country between 1916 and 1920 where between 400 and 1000 people lost their lives (Simons 1958). And Extension was visibly involved in disaster preparedness, response, and recovery during the Depression-era droughts on the North American Great Plains, a time and place known as the Dust Bowl era (McLeman et al. 2014). World War II saw heavy involvement of Cooperative Extension, and Cooperative Extension has been involved in multiple disasters in every decade since (see Simons 1958 for multiple additional examples).

The Cooperative Extension Service's ability to act in all phases of the disaster cycle evolved significantly in the 1990s. The conception, development, and growth of the EDEN were a direct result of the lessons learned by the land-grant system responding to the catastrophic Mississippi and Missouri river floods of 1993. The major lessons learned were:[1]

- Long-term community recovery efforts would rest with three key groups/agencies—local government, the faith community, and Extension. These three were in those communities long after the water receded and the disaster was no longer national news.

- Citizens looked to Extension for resources and expertise related to disaster recovery, mitigation, and preparedness, but the individual states lacked the capacity, research-based information, or expertise to address the multitude of issues/needs resulting from a major disaster such as this.

- The emergency management community discovered that the land-grant system could be a tremendous asset.

- Extension had a role related to emergency management, but the faculty was not technically prepared to play that role.

- There was a need for more coordination and standardization of recovery recommendations by the various emergency response agencies—Departments of Health, Extension, Red Cross, Salvation Army, Federal Emergency Management Agency, etc.

- The impacted states lacked the capacity and resources to effectively deal with the magnitude of requests for information, expertise, recommendations, technical assistance, community planning, recovery issues, etc.

1. Further description and examples of these lessons learned can be found at the following Website: https://eden.lsu.edu/

Based on these lessons learned, it became clear that the land-grant system would have an ongoing expectation to be involved locally and nationally in the emergency management arena.

A.J. Dye of the USDA Cooperative State Research, Education, and Extension Service (CSREES, reorganized as the National Institute for Food and Agriculture, or NIFA) asked Peter Bloome, University of Illinois; Jerry DeWitt, Iowa State University (ISU); and David Baker, University of Missouri, to develop a proposal for the use of special funds to build on the lessons learned and to position the region to more effectively prepare for and respond to future disasters.

The three leaders initially envisioned that one or more centers would be established in the North Central Region (NCR) where states could pool their technical and educational resources to more effectively respond in times of a disaster. During the 1993 disaster, the states did share some important human resources, but they thought that they could do better.

DeWitt submitted a multistate proposal for $80,000 to CSREES. Shortly after the project was funded, DeWitt changed jobs, and it was agreed that Illinois and Missouri would move forward with the proposal. The University of Illinois subcontracted with ISU, and Peter Bloome agreed to serve as the new principal investigator.

The NCR Extension directors were asked to designate one representative per state to serve on a regional committee and to attend a fall 1995 meeting in Kansas City. The main issues that surfaced during that meeting were:

- How can we share the resources we already have that apply to disasters?
- What resources are available or missing that would be used by the North Central states in the types of disasters that we typically experience?
- How can we provide training to Extension staff members in emergency management?
- How can we promote scholarly research and efforts that would support this area if Extension were to play a role in it?
- Where can we go to find funds that might support these efforts?

At a second meeting in Kansas City in May 1996, the representatives brought more ideas for collaboration. On the last day, participants agreed that the

"disaster reduction group" needed a name. The key driving principle was development of a network or collaboration between the 12 NCR states to respond as a system/region to future disasters. Four key words emerged that described that vision—"Extension... Disaster ... Education...Network," and from that the name and acronym of EDEN were born.

EDEN's growth beyond the NCR is a result of two factors. First, when Extension staff from outside the NCR took part in the 1997 annual meeting in New Orleans in conjunction with the National Housing Conference, EDEN began its growth trajectory of becoming a national rather than regional network. By 2005, all 50 states and three territories had institutions as EDEN members. Second, from July 2002 to June 2004, USDA CSREES special needs funds provided grants to 17 EDEN member states to provide disaster education/emergency management training for their Extension educators.

EDEN has responded to hundreds of emergencies and disasters since its founding, many of which were weather or climate related. Reports on these responses are available on the EDEN Website at http://eden.lsu.edu/Pages/default.aspx.

For a number of years NIFA (formerly CSREES) has provided EDEN with funding via a cooperative agreement with Purdue University to support EDEN coordination and communications, Web development and maintenance, curriculum development, training, and resources development.

Authorities

EDEN is one of four national agricultural homeland security networks that exist to protect the food supply and agricultural production: (1) the National Animal Health Laboratory Network [NAHLN], (2) the National Plant Diagnostic Network [NPDN], (3) the Extension Disaster Education Network [EDEN], and (4) the Pest Information Platform for Education and Extension [ipmPIPE] authorized by National Agricultural Research, Extension, and Teaching Policy Act of 1977 (NARETPA), Section 1472, 7 U.S.C. 3318., 7 U.S.C 3318.

Under this authority, EDEN is charged with the following:

- Provide a central point of programmatic, budgetary, social media, graphical, and other support for extension disaster education efforts in furtherance of diverse homeland security capabilities.

- Maintain an extension disaster education World Wide Web presence that targets EDEN delegates, cooperative extension personnel, cooperators, and the general public with the latest science-based homeland security information.

- Foster inclusive county-level agrosecurity planning that brings together local government, state government, federal government, industry officials, and other key stakeholders.

- Develop mechanisms to target small and/or underserved producers with timely agrosecurity messages that are in harmony with official information from state and federal government sources.

- Foster high impact national/regional issue leadership teams.

- Develop strategic partnerships, particularly those that can better incorporate cooperative extension into state and national response frameworks.

- Plan for extension's ability to continue disaster education functions in the wake of a regionally or nationally significant catastrophic event.

- Disseminate timely information on human, animal, and plant health threats, bolstered with linkages to existing science-based education.

Recent Activities in Green Readiness, Response, and Recovery

Among the many lessons of Hurricane Katrina was that in a time of disaster, state Extension Services can serve as "local beacon(s) of recovery while working side-by-side with others in the community" (Cathey et al. 2007). As described above, roles for extension in disaster education and response had already begun to be explored as early as 1993 (Koch 1999), and within little more than a decade, a Deputy Administrator with USDA's Cooperative State Research, Education, and Extension Service stated plainly that "extension plays a significant role in enabling families, communities, and businesses to enhance resiliency, reduce risk, and minimize loss due to impacts from critical events... the U.S. should adopt a sustainable hazards mitigation perspective... [and] extension can enhance community resiliency and significantly reduce adverse effects" (Boteler 2007). Evidence of this emerged in the aftermath of three recent hurricanes.

In about a year's time, the state of New York experienced back-to-back tropical storm related disasters. Hurricanes Irene and Lee devastated portions of upstate New York in the early autumn of 2011 and Hurricane Sandy

caused historic damage to New York City and Long Island in the autumn of 2012. During this period, the New York State Extension Disaster Education Network (NY EDEN) was experiencing resurgence due to strategic decisions among Cornell Cooperative Extension (CCE) administrators and a change of focus, emphasis, and leadership in the NY EDEN program. It was an ideal time for NY EDEN to explore and attempt to highlight how Cooperative Extension could catalyze ways that community stewardship can help revitalize neighborhoods and restore nature, and to best prepare for, respond to, and recover from disturbances.

Hurricanes Irene and Tropical Storm Lee

In 2011, during Irene and Lee, wind and surge effects along the Atlantic coast, while significant, were generally less than expected. The high-population centers were spared. Inland rain, however, was responsible for the greatest destruction and loss of life—with the most devastating effects being felt in New Jersey, Vermont, and New York. The principal impacts of Hurricane Irene were felt miles from the coast, where torrential rains fell on already saturated soils and in the hills.

In New York, disaster declarations were in place for 28 counties. CCE, having a presence in each of the disaster declared counties, immediately set out to understand what assistance they could provide. Consistent with the mission of CCE, it was quickly understood that NY EDEN would be critically useful as a purveyor of evidence-based information for recovery. Leveraging its relationship with the State's land grant university and USDA, NY EDEN developed and disseminated a host of fact sheets addressing topics such as dealing with flooded soils and vegetables, assisting woodland owners and maple producers, and riparian/watershed response and recovery measures. These, and many, many more resources were collated on a "Hurricane Irene and Tropical Storm Irene" Website where they were made available as printable PDFs (see http://eden.cce.cornell.edu/disasters/Pages/Irene-Lee.aspx). As communities began to take stock of their situations, these educational resources, and the cooperative extension offices involved in disseminating them, became critical nodes of community organizing and stewardship for recovery efforts in the hard hit Adirondack and Catskill communities.

Hurricane Sandy

Unlike Hurricane Irene and Tropical Storm Lee, Hurricane Sandy unleashed an enormous amount of damage upon New York City and Long Island. Seventy-two deaths in the Northeast were directly attributed to the storm, and it was

the second costliest storm in U.S. history at more than $50 billion (Blake et al. 2013). In late October of 2012, CCE NY EDEN initiated its standard operating procedures for major disasters several days before Hurricane Sandy made landfall in the New York City area on October 29, 2012. Outreach to statewide extension associations and staff included phone calls and emails to association executive directors and a message to all system staff providing basic instructions on safety and preparedness. Situation reports were filed by most county associations within 2 days. Direct linkages to the National Weather Service, the New York State (NYS) Emergency Operations Center via NYS Department of Agriculture and Markets, and other state government agencies allowed for close monitoring of the hurricane's path and intensity. During this lead-up period, anticipated communications and disaster education resource needs were identified and compiled for rapid dissemination via Facebook, Twitter, email list serves, the CCE and NY EDEN Websites, and the Cornell University press office.

The emerging picture that upstate New York's agricultural sector had been largely spared was made possible early on by CCE's extensive connections in every corner of the State. The focus then quickly shifted to Long Island, the Lower Hudson, and New York City, and resources were tailored for more urban environments. A special Hurricane Sandy resource page was rapidly developed and posted on the NY EDEN Website. With the help of Cornell faculty, new resources were gathered and packaged and others were verified. Social media figured prominently in the response. A new NY EDEN Facebook page was created and achieved 319 page views on Oct 29th, which were "liked," shared, or otherwise viewed by 1,921 individuals (Facebook metric "viral"). NY EDEN also utilized Twitter and sent out 288 "tweets," with many followers receiving "tweets" and "re-tweeting."

The CCE NY EDEN listserv was used to send out more than 50 emails containing important updates, talking points, and fact sheets, as well as instructions for associations on how to rapidly add Hurricane Sandy content to their Websites and links back to NY EDEN for their stakeholders.

News media outputs by NY EDEN staff both before and after the hurricane included NBC News (blog), USA Today, Huffington Post, Morning Ag Clips, NY Farm Bureau, Food & Farm Show/Foodstuffs Web radio, multiple local radio and newspapers outlets, The Cornell Chronicle, and others.

NY EDEN transitioned into a period of regular contact with CCE associations in counties most impacted by Hurricane Sandy. Educational and informational resource needs of constituents of those counties were assessed, and current recovery issues and future needs were discussed and coordinated with neighboring states and the national EDEN organization.

In surge-impacted areas, public community spaces such as community

gardens played a role in supporting the recovery of residents and the neighboring communities after Hurricane Sandy (Chan et al. 2015). In the end, much of the NY CCE EDEN response revolved around the issues faced by those involved in community greening, community gardening, and stewardship of urban forests. Fact sheets generated by Cornell faculty and disseminated by extension educators via NY CCE EDEN included topics such as crop damage assessment (garden scale and large scale), how to deal with flooded vegetables, reclaiming flooded soils, and tree response/chainsaw safety.

At the conclusion of response activities, as transition into recovery got underway, CCE EDEN was recognized by the New York State Commissioner of Agriculture and by staff at the New York State Emergency Operations Center. CCE EDEN is now integrated into the disaster response capability of the state's multi-agency disaster response framework, serving as a liaison to the State's land grant university and the expertise therein. CCE EDEN is most often and most heavily involved when agriculture, wildlife, forestry, or other natural resources interests are under threat.

It should be noted that the above procedures are not unique to New York or Cornell Cooperative Extension. In fact, there are similar sorts of arrangements in other state cooperative extension systems, and where such systems do not exist, our hope and intent is that these systems are "off-the-shelf" ready to be adapted and replicated as appropriate in other states and territories.

Conclusions

Given that (1) this book has as its genesis the work of the urban forestry professionals of the USDA's Forest Service, and (2) the National Extension Disaster Education Network is overseen in part by staff at a sister agency within the USDA, the National Institute for Food and Agriculture (NIFA), and (3) both the USDA Forest Service and USDA NIFA have a long history of collaboration with land grant universities, it seems natural that there be existing collaboration upon which to build. But unfortunately, this is not yet the case; an opportunity exists to build the capacity of all partners via this book.

As noted in an earlier chapter, at the time when the Forest Service was established, 80 percent of U.S. residents lived in rural areas—areas potentially affected by degraded landscapes. Now, 83 percent of the U.S. population lives in urban areas, where conservation and restoration is also greatly needed. As stated in the Background chapter (Hines et al. 2019), "The mission statement of the Forest Service remains unchanged, but as demographic shifts occur, the Forest Service understands that 'caring for the land and serving people' must also occur where the majority of those people live. Just as the Forest Service restored the degraded landscapes and watersheds of a century ago,

so it also seeks to enable restoration and stewardship in urban areas." As such, this volume makes the case that natural resource stewardship takes on special meaning in the urban environment, made more urgent by the implications of climate change.

Thus, this chapter points to an existing, yet underdeveloped and underleveraged network that could potentially further the efforts of agencies such as the USDA Forest Service and the communities they support when natural disasters and other hazards threaten landscapes, especially those found and/or cultivated in urban contexts. A partnership among the state and national EDENs with the Forest Service, especially their efforts in urban contexts threatened by climate change, could lead to targeted educational products and programs, as well as a nimble and responsive communication system with which to disseminate them. Hopefully, one outcome among many from the publication of this volume is a formalized relationship between these entities with the USDA that furthers efforts to document the role that green design and community engagement and empowerment can play in helping communities prepare for, respond to, and recover from hazards and other disturbances.

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