

**Information, Extension, and Disaster:
Current Efforts and Looking to the Future**

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Abstract

The Florida Cooperative Extension Service has developed a disaster information program called the Comprehensive Disaster Preparedness and Recovery Education Module. Module information is wide-ranging, available in several media, and suitable for many different audiences. The authors introduce the Extension Service, describe the work done to date on the Module (including three recently released video/book sets), and outline an information model for disaster intended to guide future efforts.

Introduction

Hurricane Andrew was the first in a series of wake-up calls in the 1990s which continued with the World Trade Center Bombing (Feb. 26, 1993), the Oklahoma City Bombing (April 19, 1995), and the Midwest Floods of 1997 to name but a few [Alexander 1997]. The National Oceanic and Atmospheric Administration (NOAA) lists 44 weather-related disasters that have caused more than 1 billion US dollars in damage in the period 1980-2000 [NOAA 2000]. Thirty-six of these disasters were in the 90s. Losses associated with these disasters were in excess of 130 billion US dollars and over 2000 deaths. While dollar damages in the 1980s were less, deaths were on the order of 15,000 to 20,000 due to two extended droughts/heat waves.

These events and the extensive news coverage devoted to them focused the attention of the public and professionals alike on the vulnerability of U.S. infrastructure to both natural and man-made catastrophes. Each one prompted additional planning and

funding in emergency management and disaster preparedness.

Whether disasters are getting worse, as some have speculated, patterns of U.S. settlement have put millions of homes, farms, and businesses on flood plains and in 'hurricane alleys.' Hurricane Andrew threatened the collapse of Florida's insurance industry through outright bankruptcy and the unwillingness of companies to insure properties in Florida. Hurricane Iniki struck Hawaii within days of Andrew, and the insurance industry there is still recovering [KHNL 1999].

Public awareness and compliance have increased steadily in disaster situations. In 1999, Hurricane Floyd threatened to deluge Florida. Evacuation of and return to coastal areas went very smoothly. The public's preparations emptied well-stocked stores of bottled water, batteries, canned goods, and disposables of various kinds. Because of these experiences, the public has become more sophisticated in its understanding of disaster preparedness. The Florida Cooperative Extension Service is attempting to respond to this increased sophistication with a more comprehensive range of information.

Brief History of Extension

Extension, along with the land-grant universities and research, comprises the agricultural extension system. Formally, the system is represented by the Cooperative State Research, Education, and Extension Service (CSREES), an agency of the United States Department of Agriculture (USDA), with state Extension services in every state and territory of the United States, and with agents in virtually every county. Though the Extension service is nearly 100 years old, there are still many who are unfamiliar with it. For their benefit, we include this brief history.

Like the United States itself, the roots of Extension go back to the age of Enlightenment. Extension reflects an attitude toward the roles of scientific knowledge and education in the lives of everyday people. The idea is that as new knowledge is developed at the research level, it is communicated (extended) through a network of agents to agricultural producers. Agents work closely with both subject matter experts in universities within their states and the producers. Increased agricultural production is the focus at all levels of the system.

The agricultural extension system was created through a series of acts of Congress, as follows:

1862 — Creation of Land-Grant Colleges — The Morrill Act granted federal lands to the states. Proceeds from sale of these lands were to be used to create at least one college per state "to teach such branches as are related to agriculture and the mechanic arts." (The Second Morrill Act of 1890 brought a number of traditionally

black colleges into the land-grant system. In 1994, the land-grant system was further extended to twenty-nine Native American colleges.)

1887 — Establishment of Agriculture Experiment Stations — The Hatch Act established agricultural research as a significant function of the land-grant colleges by providing for Agricultural Experiment Stations at each college.

1914 — Establishment of Cooperative Extension Service — The third and final piece of the system was set up by the Smith-Lever Act of 1914. The Act specified that the U.S. Department of Agriculture and land-grant colleges would cooperate on programs of agricultural extension work to consist of “instruction and practical demonstration in agriculture and home economics” to those who do not attend the colleges by various means including demonstrations and publications.

Extension thus acquired its dual identity of providing research results in useful form to local agricultural producers and as a kind of adult education. Perhaps Extension’s most well-known effort is 4-H, which engaged over 6.5 million American children in 1998 in programs ranging from applications of electricity and studies of urban wildlife to traditional farm-oriented subjects like horse training and dairy cows.

Extension has a presence in every county in America, and its agents have a long history of association with their communities. Extension is community oriented rather than agency oriented. Funds for this service are provided by federal, state, and county sources, with private enterprise participating in specific efforts.

Obviously, extension has evolved through the years. At first, it was the almost-exclusive intermediary between researcher and producer. Now that there are many connections between the producer’s community and the research (whether university or corporate), a new model has been proposed for Extension, the interdependence model [Bennett 1990]. This model envisions a much richer set of partnerships for Extension as it fulfills its unique role in a much more diverse culture.

Extension and Disaster

Involvement with disaster preparedness and recovery is a natural ‘extension’ of the Extension mission: turning research into public information and education programs. The disaster-laden 1990s saw the formation of the Extension Disaster Education Network, a consortium of state Extension faculty and staff — “The mission of the Extension Disaster Education Network (EDEN) is to reduce the impact of natural and manmade disasters through coordinated interdisciplinary and multi-state research and education programs addressing disaster mitigation, preparation, and recovery” [<http://www.agctr.lsu.edu/eden/about.htm> accessed February 2000].

Extension is uniquely equipped to meet the public's information needs with respect to disaster, first, because of its educational focus, and second, because it has a history of interdisciplinary effort. Extension's subject matter specialists are experts in families, children, home economics, engineering, nutrition, mental health, safety, energy, etc. Also, Extension is not a static structure, but a dynamic organization whose know-how is the development of a culture of information sharing. With its rich interagency ties and focus on local communities, Extension is positioned to fulfill a unique role in disaster preparedness and recovery.

Comprehensive Disaster Preparedness and Recovery Education Module

In 1996, a committee of subject specialists and communicators was formed in the Florida Cooperative Extension Service (CES) to update a publication called "The Disaster Handbook." Previous editions of this book had been compilations of appropriate Florida CES fact sheets. Naturally, the focus of the book was hurricanes. Much of the material was prepared by the Home Economics Department and addressed salvaging and cleaning water-damaged household goods.

Floods, fires, windstorms, and terrorist activities in 1996 influenced the decision to expand the handbook to treat of a wider range of events, and to reconsider the book from the point of view of Florida's considerable urban populations. The disaster events to be included were selected on the basis of an event's potential impact on community services. With this criterion, the following list was developed: hurricane, lightning, flood, tornadoes, hazardous materials, radiological accidents, residential/farm fire, wildland fire, terrorism, extreme heat, drought, extreme cold, earthquake, and sinkhole. (Lightning may seem unusual in this list, however, Florida receives more lightning strikes than any other state, causing power outages and wildland fires.) Also included were numerous radio scripts for public service announcements. Some articles and scripts were available in Spanish.

In addition, the committee included a chapter on stress and coping, based on the knowledge gained by Extension professionals in the 1993 Midwest Floods [Baker and O'Neill 1993] and our own UF/IFAS Disaster Mental Health Team in Hurricane Andrew and the Midwest Floods of 1997.

With increased scope, the Handbook became the multimedia Comprehensive Disaster Preparedness and Recovery Education Module. Conceptually, the module would cover a wide range of disaster events, target audiences from the general public through business to government, and present disaster preparation, survival, and recovery. The module would be an ongoing effort, so that as the fields of emergency management, disaster response, and safety evolved, the Module could evolve with them. In this way, Extension professionals and emergency managers and staff would have a comprehensive and current set of materials at their disposal at all times.

The USDA helped fund production of the Module in 1998. At that time, we produced *The Disaster Handbook — 1998 National Edition*; this work contains over 350 articles and fact sheets spanning over 1000 pages of disaster information. The Handbook comes with a CD-ROM that contains the same information. We also established the Web site <<http://disaster.ifas.ufl.edu>>, where all the information is posted in Adobe PDF format. In addition, we conducted a nationwide satellite teleconference, and portions of this conference were released as a videotape. The Handbook, CD-ROM, Web site, and videotape make up the original module, which was distributed throughout Florida and to all state and territorial Extension services in the U.S. Several states adopted the Module for use by their county offices.

Our goal is to update these materials on a regular basis and to add new components. This year we have released three video/book sets that can be used as training tools by Extension staff in community settings or by emergency management professionals for their training activities.

The first in the series, "Surviving the Storm — Coordination, Communication and Cooperation," demonstrates the crucial role that teamwork and planning play in surviving and recovering from disasters. It covers a number of general topics such as Readiness, Basic Services, Partnering among Agencies, and Wildfire Precautions.

Second is "A Community Response to Managing Post-Disaster Stress." It is based on the experiences of University of Florida specialists Drs. Garret Evans and Samuel Sears in helping victims of disasters, including Hurricane Andrew and the Midwest Floods of 1997. This video should be especially useful to municipal workers and volunteer agencies who must aid the public during disaster events.

The third, "Helping Our Four-Legged Friends Survive the Storm," shares insights of veterinarians and others in providing relief to animals affected by disasters. It fills a gap in a much-needed and increasingly important subject--the needs of animals in disasters. Many groups should find this helpful. Emergency response personnel will learn what to do when they encounter animals abandoned during disaster situations. Animal lovers and animal owners in general will find this a very instructive video.

The original plan of the Module resulted in the compilation of a great deal of information. Hopefully, its organization and its availability through a number of media will make it more useful, and the inclusion of radio scripts and information on stress and coping are unique features for such a collection. Nevertheless, two or three years of experience with these materials together with much discussion with county Extension staff and others has led us to think more critically about how these materials are used and how to target them to specific audiences and needs.

An Information Model for Disaster

To guide future efforts, we wanted a model of how people might access and use information during a disaster. Clearly, this depends on exactly what the disaster is. The type of disaster dictates how we will respond to it. We use the word disaster loosely, yet it can mean many different things. In understanding the information people need and when they need it, we have to think more precisely about the variety of events that can be called 'disasters.' This question has been the subject of a recent book [Quarantelli, 1998], which offers a platform for various experts to debate the subject.

Practitioners and theoreticians might argue about why a definition is needed. However, those who are waiting for a presidential declaration that will release federal funds to assist victims of some catastrophe are hanging on this very definition. Until relatively recently, the U.S. federal government has responded to disaster strictly on an ad hoc basis, providing disaster relief in the aftermath of specific events. At the turn of the century, many local jurisdictions would have found any federal charity "stigmatizing" [Barnett 1999]; there was, therefore, no general outcry for federal assistance as we might hear today. However, in the thirties, "when the federal approach to problems became popular" [FEMA 1999], the Reconstruction Finance Corporation was established to provide funds to rebuild public facilities after earthquakes. The RFC was later empowered to assist after other disasters.

Over the years, additional agencies were given authority to supply various kinds of aid to disaster victims. The result was a patchwork of efforts so that any one or more of a hundred federal agencies could be active in a particular situation. In 1979, President Carter created the Federal Emergency Management Agency, now well-known as FEMA, to rationalize federal disaster efforts, and gave it a mandate to work "to reduce risks, strengthen support systems, and help people and their communities prepare for and cope with disasters regardless of the cause." This mandate reflects more modern thinking in that it includes a note of prevention.

One tragic irony of the Midwest floods of the 1990s was the revelation that over the previous decades, many farmers had been subsidized to live and work in the flood plain. They were a 'disaster' waiting to happen. 'Reducing risk' in this situation meant new federal policy that would discourage people from settling in flood-prone areas rather than supporting risky choices.

This points to a broader, yet more specific definition: 'Disaster' is not just the aftermath of a catastrophe, it is a socioeconomic situation waiting for a precipitating event. More such events can be expected as "U.S. populations shift towards inland waterways, coastal zones, and earthquake-prone areas" [Barnett 1999].

Even with the existence of FEMA, how people are served in disaster is still a product of the definition of disaster used by specific agencies. Because of the high standard of living in the U.S., its rich material culture, and its highly developed infrastructure, 'disaster' is probably more an economic construct in that disaster impacts personal, local, and possibly regional economies. An example of this is Hurricane Andrew, which destroyed 125,000 homes just south of Miami. Miller and Simile [1992] examine these issues in the context of Hurricane Hugo (1989, South Carolina) as several layers of relief organizations respond to a rural population whose standard of living is uncharacteristically low. Whatever you have to begin with, losing everything has very much the same impact on the victim; however, preparation and response in these situations differ significantly.

Lastly, we should address the issue of focused versus diffuse events. As destructive as hurricanes have been in the last 20 years in the U.S., they do not come close in loss of life to drought/extreme heat, through which 15,000 to 20,000 Americans have died. The hurricane is a fairly discrete event with a period of development and a warning period. The hurricane passes in a few days at most, and then there is a return to weather norms. This is not to minimize the destructive power of the hurricane nor the extent of clean-up that may be required, just to contrast that event with a drought, which develops over weeks and lasts weeks or months, gradually destroying and killing.

Disasters can be characterized by their geographical extent, length of warning period, duration of the event, and areas of impact. The Oklahoma City Bombing was a relatively small 'disaster': destruction of the Murrah Federal Building, some insurance claims, and lawsuits. The physical extent was one city block; there was no warning period; and the duration was a few moments to a few hours. Nevertheless, the emotional and political impact were felt throughout the United States for months, first with the continuous news reports, then the manhunt, then the investigation, then the hearings. A single event touched the national psyche very powerfully. People watched television, listened to radio, and read to find out what happened, to evaluate future risks, and to decide on appropriate levels of wariness or alertness.

What can be done to prepare the public for an isolated act of terror like the Oklahoma City Bombing? A focused disaster such as a bombing, which is over before anyone is really aware it is happening, demands that a community has the training to respond in a coordinated way to the needs presented by such an event. The best way to prepare the public and emergency response community is through review of case studies and drills. Simulated events help a community ask questions about the availability and response capability of its resources.

What Do People Need to Know When Faced with a Disaster?

First, in terms of traditional safety issues or potential disasters, people evaluate risk differently from professionals. It is much riskier to drive to the grocery store than it is to fly to London, but the perception of risk is exactly the opposite. People "often perceive risk by their ability to control dangerous situations" [Braus 1994]. In a car, the driver is the actor and therefore has an illusion of control, whereas an airplane passenger is completely passive. For many people, the moments of terror that may precede a highly unlikely airplane crash are much more persuasive than the weeks or months of healing that may be required after an automobile accident. Also, people are very likely to regard a common activity as less risky than an uncommon one.

Every year, *Money* magazine rates the best places to live in America. It does this by rating various urban areas against a scale of prioritized factors. The factors are developed by polling a "statistically representative sample" of *Money* magazine readers. In 1996, the seventeenth factor was "low risk of natural disasters." The top five that year were: 1) Low crime rate, 2) Clean water, 3) Clean air, 4) Plentiful doctors, and 5) Many hospitals.

We must take the broader view of disaster given above. It is just as unreasonable to consider discouraging tens of millions of people from living on and around the fault lines of Southern California as the tens of millions who live in the Ganges Delta. Both situations are significant potential earthquake or flood disasters. So we must consider what people exposed to the potential hazards should do to prepare.

Second, we must see risks as the general public views them or find ways to modify their perception. Disaster policy and resulting efforts are likely to be shaped by the public or business community's perception of risk, rather than by the 'experts.'

Information Needs and Disaster

Initially, we set disaster information in the Module into two categories: general disaster information and specific event information. The 1998 edition of the Disaster Handbook fell neatly into two volumes, with Volume One supplying general resources and three extensive chapters for Before, During, and After the disaster; Volume Two contained chapters on a number of specific disasters, radio scripts for public service announcements, and a chapter on stress and coping.

The general public gets a variety of information from a variety of sources, with considerable overlap and omission. We could organize the information the public needs by thinking of a disaster event as having six information phases:

Phase 1: long-range preparedness

Phase 2: warning period

Phase 3: duration I

Phase 4: duration II

Phase 5: immediate aftermath

Phase 6: long-range aftermath.

In Phase 1, long-range preparedness, the public needs to know what to do if the event ever occurs. They are continually schooled by sensational programming on how to prepare for highly unusual threats. Emergency managers should work with media to inform the public about which events are likely, and focus on preparedness. The public is likely to evaluate risk based on perception of control rather than actual probability of occurrence; this can actually motivate preparedness activities. Against this is the general tendency toward procrastination and an impression that preparation of any kind will be futile. All these factors should be taken into account in motivating the public to act well in advance of a disaster event.

In Phase 2, a disaster event is imminent. The public is receiving warnings and updates via radio, television, World Wide Web, and other means. At this point, the public may need to realize that communications will be interrupted by the disaster. They need to know where to go if forced to evacuate, and what to do if the disaster strikes while they are sheltered in place. If the disaster strikes, they need to know what to do immediately after it is over, between the time of the disaster and the time that communications can be restored.

In Phase 3, the disaster has struck. For example, a family is awakened at 3 A.M. by rumbling. They realize an earthquake has begun. Parents gather up children and take them to a predetermined safe place in the home. During a focused disaster, there is no time to read the handbook, and there has been no "Phase 2" during which to prepare people with information. This family's ability to survive the disaster depends on what they have learned in long-range preparedness.

Mental health services and support skills among volunteers are critical in phases 3-6. People will experience the disaster with different coping skills; their reactions can complicate the situation for service providers and for fellow victims.

In Phase 4, the initial strike is over, but the disaster event continues. In a more diffuse disaster, such as a drought, people know they must stay hydrated and not waste water. Daily media reports on the progress of the drought remind them to remain alert and continue their precautions. Most people would be surprised to realize that drought/heat wave causes more loss of life than any other natural disaster in the U.S.

In Phase 5, the event is over, and people begin to assess what has happened. They survey damage. Mental health professionals should be available. Disaster supplies may be exhausted, and people need to know how to get the basics. Shelters may close and victims may need housing and supplies of food and water. Initial appraisals of damage begin. Salvage information can be especially helpful at this time in that it gives people some hopefulness and provides another focus besides loss.

In Phase 6, people must develop plans to move on with their lives. They may need counseling, and will certainly need good information about the maze of agencies and programs that are available to them and how to acquire the resources/services that these agencies provide.

Conclusion

The Cooperative Extension Service has a special set of resources and a unique role to play in preparing the public for disaster and thereby mitigate loss of life, injury, and property destruction. Development of the Comprehensive Disaster Preparedness and Recovery Module gives the Extension service and other emergency response agencies a wide range of standard materials for use in training and conducting programs for the public. Our future efforts will update and expand these standard materials and add to them with a series of more targeted products. We expect to develop our information model to help guide these efforts.

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