RURAL COMMUNITY PREPAREDNESS FOR DISASTERS AFFECTING ANIMALS, AGRICULTURE, AND FOOD

Training Courses for Rural Communities Help Prepare and Plan for Ag-Related Disasters

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Introduction
Disasters that impact rural communities pose a significant risk to animals, agriculture, and the U.S. food supply. Rural regions have a high concentration of animals and agriculture and tend to have fewer resources to draw upon when natural or accidental disasters strike. Furthermore, these regions are vulnerable to intentional agroterrorism attacks. If natural, accidental, or intentional disaster events are not responded to sufficiently, the results can be severe economic loss, injury to humans and animals, environmental contamination, and sometimes death. Preparedness is essential for the coordination of an effective all-hazards disaster response. Many rural communities are not adequately prepared for disasters that would impact their agricultural and food resources. Training is needed to help them develop all-hazard response plans to address intentional or unintentional disasters.

To address this need, the Western Institute for Food Safety and Security (WIFSS) at UC Davis has completed the development of two training courses for rural communities to help them prepare and plan for disasters that may impact animals, agriculture, and food. The target audiences for these courses includes local emergency response teams, emergency planners, veterinarians, animal control officials, government and non-government agencies, and tribal representatives. This project was funded by a cooperative agreement with the Rural Domestic Preparedness Consortium (RDPC) which is funded through a Department of Homeland Security (DHS) training grant.

Curriculum Development Process
The curriculum development process was overseen by DHS's National Training and Education Division (NTED). All training developed under NTED undergoes a rigorous validation process prior to delivery and is continually assessed while training is delivered to the public. The NTED course development and review process uses the ADDIE model of Instructional Systems Design (ISD). The ADDIE model consists of five discrete phases of development: analyze, design, develop, implement, and evaluate and is designed such that the results of one phase are the beginning of the next phase.

**Analyze**
The Analyze phase is the foundation for the curriculum development project and identifies the problem as well as outlines possible solutions (McGriff, 2000). For NTED, this phase specifically involves conducting a needs assessment as well as environmental, job and task, content, learning, and media/delivery analyses. This phase also consists of overall project planning (NTED).

During this phase, we identified gaps in available training targeting rural communities and their abilities to prepare for and respond to disasters affecting animals, agriculture, and the food supply. We determined overarching course goals to meet this need that included:

**Goal 1**: Provide training that assists communities in preparing for disasters that involve animals.
**Goal 2**: Provide training that brings members of the community, including emergency planners and those from the agricultural community, together to plan for natural, accidental, or intentional disasters affecting the animal, agricultural, and food sectors of the community.

To address these goals, we decided to develop two courses – an awareness level course specifically targeting community preparedness for disasters involving animals, and a management level course specifically targeting whole community planning.

**Design**
During the Design phase, a strategy is created for developing the instructional materials (McGriff, 2000). For NTED, this phase specifically involves writing learning objectives, developing a content outline, determining course design and instructional strategies, determining the assessment strategy, and developing an evaluation plan. The result of this phase is a course design document that provides a roadmap for further development of the course.
During this phase, we decided to use a blended-learning and problem-based approach to these courses. In this approach, knowledge-based content is delivered in self-paced online training modules, followed by an instructor-led problem-solving workshop. We defined measurable learning objectives and created content outlines. Both courses were designed to have a pre- and post-test to assess student learning as well as course evaluations to assess effectiveness of course delivery.

**Develop**
The Development phase builds off the course design document and creates the instructional content. For NTED, this phase specifically involves the creation of storyboards for the web-based training (WBT) and PowerPoint presentations and instructor and participant guides for the instructor-led training (ILT).

During this phase, we used the original content outlines to break the course up into WBT and ILT material. We then further divided the content into learning modules and worked with subject matter experts to write the content. An important step in the development phase is creating a prototype – a module or lesson that is fully written and produced in the final format. Prototyping allowed us to test our design and the content by answering questions such as: Does the material meet the stated learning objectives? Is there too much or too little content? We also evaluated the selected media by asking: Are the videos used effectively? Do the graphics relay the correct information? Once the prototype was approved by DHS, we created the remaining modules accordingly.

**Implement**
Implementation is when the course is taken into the real world and delivered to the target audience (McGriff, 2000). Within the NTED process, this is first accomplished with a pilot delivery and a third-party review. Following any necessary revisions, the courses receive a final review, validation, and certification from DHS (NTED).

As part of the Implementation phase, we held pilot deliveries of the courses in Spring 2016. The third-party review of the awareness course required minor revisions. Then the course was ready for submission to DHS for final review, validation, and certification. The review of the management course indicated the need for substantial revisions. Based on the pilot delivery and the review, our ISD team decided this course would be more effectively delivered as an ILT and not as a blended course. Thus, the management level course went back to the design phase, the content was evaluated, reorganized, and rewritten. The new format was piloted in November 2016 and received a positive third party review. The course was submitted to DHS for final review, validation, and certification. The courses will be ready for delivery across the U.S. and territories in 2017.

**Evaluate**
This phase measures the effectiveness of the content and instruction. The evaluation phase actually happens throughout the ADDIE process at each step, as well as an evaluation of the final product (McGriff, 2000). For NTED, the course must be reviewed and evaluated every three years to ensure accuracy and relevancy of information.
As part of the Evaluation phase, our ISD team consistently evaluated the material as it was being developed to ensure that identified training gaps and learning objectives were being met. Both courses include evaluation mechanisms for the students to provide feedback. Student evaluations after the pilot deliveries were very positive regarding the need for the training, the impact of the training, and the effectiveness of the final teaching strategies used. The courses will receive another full DHS evaluation in 2020 for recertification.

Final Courses
The culmination of the above ADDIE process was the creation of two new courses to assist rural communities in preparing and planning for disasters. Course details are available at https://www.wifss.ucdavis.edu/courses/.

AWR 328: All Hazards Preparedness for Animals in Disasters:
This 12-hour awareness level course is designed to provide participants with tools to prepare for, respond to, and recover from disasters involving animals in rural communities. The course introduces participants to the unique considerations when animals are involved in an emergency such as safe animal handling, animal evacuation, animal sheltering, humane euthanasia and carcass disposal, inclusion of people with animal expertise into existing command structures, and federal support available during recovery. All content is presented in a blended learning style where introductory material is presented online and problem-solving activities are completed in small groups at the one-day instructor-led training (ILT).

MGT 448: All Hazards Planning for Animal, Agriculture, and Food Related Disasters:
This eight-hour course will provide emergency planners, community leaders, veterinarians, animal control personnel, government and non-government agencies, public health agencies and organizations, people working in transportation and law enforcement, emergency management staff, and tribal representatives with the background information needed to participate in the development of supplemental animal, agricultural, and food (AAF) related disaster response plans that could be included within the existing Emergency Operation Plan. The course will address the resources and information available to emergency managers for planning; the unique challenges that rural communities face in planning for and responding to AAF related disasters; and AAF related incidents that will require federal agency response, such as foreign/infectious animal disease (FAD/IAD) outbreaks or agroterrorism. All content will be presented at an ILT event that will include multi-media presentations, instructor-led class discussions, and review of case studies to explore “lessons learned” from historical and recent AAF related disasters.

Summary
The course development process used to create these courses was rigorous and thorough. Throughout this process, we were reminded that instructional system design is not a linear process, but one that requires flexibility, iterations, and perseverance. The value and importance of piloting the material, as well as developing prototypes, was clearly demonstrated with both courses. The result of this process is the availability of two new courses that will help rural communities prepare for disasters that impact animal, agricultural, and food industries.*