An Exercise Framework for Resilient Health, Food, and Agriculture Systems

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Background/Objectives. Protecting critical food and agriculture (FA) supply systems from natural disasters and other emergencies driven by climate change requires a coordinated effort anchored in established capabilities at the state and local levels. Typically, state, local, tribal, and territorial (SLTT) health, agricultural, emergency preparedness, and other response agencies intersecting the critical infrastructure sectors are resource and personnel limited. These limitations often create the conditions wherein cross-sector preparedness for cascading events is exercised infrequently and against scenarios lacking nuanced roles for many key players. Further, farmers, producers, and members of the FA supply chains are often excluded from exercises, or when they are included, their roles do not reflect the realities and vulnerabilities in emergencies. As a result, many communities in the United States are vulnerable to chronic and acute climate-related stressors to their FA security and health systems, and their ability to equitably administer government programming. The U.S. Department of Homeland Security's Health, Food, and Agriculture Resilience (HFAR) directorate is collaborating with industry, academia, and SLTT departments to safeguard the American food supply against catastrophic incidents.

In support of the HFAR mission, Sandia National Laboratories has developed a catastrophic FA exercise "playbook" and suite of ready-to-use exercise materials for SLTTs. The objective is to empower all levels of government to improve core capabilities in FA security, public health, and emergency preparedness and response. These tools challenge users to examine resilience and emergency response capabilities to a prolonged incident, leading to identification of critical gaps and development of mitigation strategies.

Recognizing that FA security is particularly vulnerable to climate change, we propose to present on how these tools utilize climate data and information, explore the challenges associated with climate change, and provide a means by which the information among emergency management and agriculture professionals can be used to explore mitigation strategies within the health, food, and agriculture sectors.

Approach/Activities. Utilizing a systems-based approach, the Sandia team identified several threats and hazards to the Nation's food and agriculture sector. Prioritized hazards were evaluated through open-source data collection and research. Scenarios were developed exploring the unique vulnerabilities, dependencies, interactions, and subsequent consequences on food and agriculture systems.

Results/Lessons Learned. This analysis resulted in an exercise playbook and off-the-shelf exercise material including fictional yet realistic scenarios that illustrate challenges caused by natural, technological, and human-made disasters impacting the FA systems. Utilized by SLTT partners, problem statements and discussion questions require participants to walk through the planning, procedures, decision-making processes, and best practices associated with the mitigating, preparing for, responding to, and recovering from catastrophic disasters and emergencies impacting FA systems.