Natural Disasters: How to Manage Risks for Small Ruminant Producers?

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INTRODUCTION

There are several types of risks associated with operating a small ruminant production system for goats, and sheep. In agriculture, risk management is generally classified under five main areas, and they are marketing, financial, human, legal or production. Environmental factors such as pestilence, drought, disease, predators or natural disasters can have a profound effect on animal production, and therefore, increase your exposure to risks. Risk can be any condition that has a direct or indirect influence on the quality or quantity of products that are produced for production. Fortunately, there are several risk management tools that have been established to enable producers to mitigate the risks they face each day. This publication will primarily focus on the risks that livestock producers may encountered after a natural or man-made disaster as well as offer some practical solutions for reducing production and financial losses.

Natural Disasters (Uncontrollable Risks):

"You Respond to Emergencies – You Recover from a Disaster."

A disaster is an uncontrollable risk. It is defined as any incident either man-made or natural where individual, local and community resources are unable to deal with the event as an emergency. Unfortunately, disasters can pose a serious threat to life, health, property, the environment and the aftermath following a disaster can have a negative impact on the community for several years to come. Depending on the type of catastrophic event that has occurred, the response time to a disaster can be slow. When a disaster takes place in a rural area, it may take even longer to receive help because the resources of the community are usually meager and not enough to handle a full blown disaster (Cotton and Ackerman, 2004). Therefore as a farmer, you must make sure you have made ample preparations prior to an impending disaster for your farm and livestock to reduce your potential losses until help has arrived. The usual acceptable sequence for evacuating a community prior to an impending disaster is people first, pets next, then livestock and property. In the academic environment, disasters are often seen as the consequence of inappropriately assessing, monitoring and managing of risks on the farm. Therefore, while reading the next section of this publication, identify those risk’s that are prevalent in your area and began to think of a
plan for your farm to help lessen the risks you may encounter after a disaster.

**Hurricanes**

A hurricane is a severe tropical storm that forms over the warm ocean waters, usually starting in the Caribbean or off the west coast of Africa. There are four classifications of hurricanes and the higher the category of the expected storm the more damage the storm is expected to incur. The aftermath of the storm may lead to injuries to humans and animals or loss of life and severe property damage the community will have to deal with for several years (i.e., Katrina, Andrew, Frances, Rita).

Storms tend to brew in the Atlantic or Pacific Oceans from as short as one day to as long as a week or more before the tropical systems makes landfall. Make preparations early, and don’t wait until a hurricane has been spotted before developing an appropriate plan for handling a disaster. Hurricane season officially starts in June and goes through November in the U.S. each year. Since this is an annual event, producers that live along the coastal states (i.e., North Carolina, Texas, Florida, Louisiana, Mississippi) should always have a plan of action in place to deal with the impending danger.

**Plan of Action for Hurricanes**

The plan should include the place where your animals will be relocated during a storm (i.e., fairgrounds, at a friend’s farm, show arena, sales barn). Refer to Appendix 1 to review the list of items you may need to include in your evacuation kit for your goats or sheep. If you own guardian animals, refer to Appendix 2 to prepare an evacuation kit for your dogs. Make copies of registration information, veterinarian records, adoption papers, proof of purchase, tag numbers, and microchip information to store in your evacuation kit. List each one of your animals, and their species, breed, age, sex, color, and distinguishing characteristics. Most of this information should already be in your farm records. You can also place your current photographs of your animals in your evacuation kit for identification purposes. Include yourself in some of the

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**Table 3. Hurricane Classifications**

<table>
<thead>
<tr>
<th>Category</th>
<th>Winds (miles/hour)</th>
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<tbody>
<tr>
<td>1:</td>
<td>74-95</td>
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<tr>
<td>2:</td>
<td>96-110</td>
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<tr>
<td>3:</td>
<td>111-130</td>
</tr>
<tr>
<td>4:</td>
<td>131-155</td>
</tr>
</tbody>
</table>
photos to help you reclaim your lost animal(s). Send a copy of all of your records and photographs to a relative or friend that does not live in your area just in case the original ones get damaged during the storm.

If evacuation is not possible, disconnect all electric power connected to the barns, fences or buildings to prevent death due to electrocution, and provide enough fresh water for your livestock to last for several days (7-14 days). Usually after a major storm the water supply can become contaminated. Open the gates on the facility, so the animals can escape flooded areas, seek shelter or escape from the storm. Stack bales of hay in the areas were the smaller animals will be staying. The hay can provide a place for the goats or sheep to stand on to get away from storm waters and to prevent them from drowning. Move grain and other feed sources to an area that is not likely to flood and have a first aid kit on hand to treat any injured or sick animals after the storm (refer to Appendix 3 and 4). Make sure all of your animals are ear tagged or inserted with a microchip, so when the storm is over, you can properly identify them if they happen to wander away from your property.

Floods

Generally during or after a hurricane, you can expect some flooding. Floods usually occur in areas where there has been excessive rainfall or water accumulating after a snowmelt, tornado or thunderstorm and the land is unable to absorb it at a reasonable rate.

Plan of Action for Floods

Most of the plans of action that apply for hurricanes should also be considered for flooding. As mentioned earlier, make sure your animals are properly identified and have a planned escape route for moving the animals to higher ground during a flood. Before the storm, find an alternate source of water for your animals and practice loading them on the trailer, so they can become accustomed to the trailer and won’t panic during a crisis, if they have to be relocated. Keep the feed in a clean, dry area where rising water cannot reach it (Cotton and Ackerman, 2004). You may also have to remove the barbwire from your fences on your facility to prevent your animals from becoming strangled on the wire after the storm.
**Tornados**

Tornados are one of nature’s most violent storms. The funnel-shaped cloud can have wind speeds that exceed 300 miles per hour, 2 to 3 times that of a hurricane. Sometimes after or before a hurricane, a tornado can be spotted. Typically, a tornado occurs for a short duration, accompanied by hail and/or heavy rainfall. A tornado can destroy everything in its path, which can be 50 to 60 miles wide. Livestock can generally hear and sense impending danger, but unlike hurricanes, you may only have a few minutes to prepare.

**Plan of Action for Tornados**

To reduce production losses, check your weather forecast periodically, especially in the spring when tornados are generally spotted. If your personal safety is not an issue, you may only have time to open the gates for your livestock to escape. After the storm, be prepared to do emergency fencing.

**Wildfires**

Wildfires are another form of disasters that can increase production as well as financial risks because more livestock are lost to fires (caused by lightning or an arsonist) than any other disaster. Wildfires are generally caused by a long period without rain, which can increase the risk of fire. In 2007, wildfires across Florida burned more than 436,000 acres of state lands and 200,000 acres of federal property. The most active wildfire season since 2001 in Florida was in 2007. The reason why most scientists speculate that 2007 was so active was due to the lack of hurricanes in 2006. Although tropical storms and hurricanes bring a lot of destruction and damage to the state, they also are the main source of rainfall for Florida during the summer and fall months of the year (Hanley, 2008).

**Plan of Action for Wildfires**

Some strategies that can be used to mitigate the risks of wildfires include removing vines from the walls of the barns, sheds and animal shelters,
These goats have resorted to eating the foliage from the trees since nothing is available on the ground to eat during the drought.

removing tree limbs at least 15 feet off the ground, thinning a 15 foot space between trees and installing fire extinguishers in key locations on the farm. Remove vegetation that has living or dead branches from the ground level up because they act as ladder fuels for the approaching fire. Clear the area of dry leaves, brush, evergreen cones, dead limbs and fallen trees. They are an excellent source of fuel for brushfires. Replace highly flammable vegetation such as pine, eucalyptus, junipers and fir trees with lower growing, less flammable plant species. Make fire breaks around your home, barn and other structures on your farm. Check all water sources periodically to make sure they work. Install lightning protection systems for fencing and ensure all of the wiring has been adequately installed. Inspect wiring, switches, motors and appliances for exposed wire and check with your local fire department, garden store or extension agent for more suggestions (Humane Society, 2009).

Droughts

A drought is an extended period of months of the year when a region notes a deficiency in its water supply. Generally, this occurs when a region receives consistently below average precipitation. Droughts can have a substantial impact on the ecosystem and agriculture of the affected region. Although droughts can persist for several years, even a short, intense drought can cause significant damage and harm to the local economy. The key elements to managing animals in a drought disaster are food, water and shelter. The lack of any of these factors, or a scarcity of one or more, can lead to a slow death for your livestock and increased production, as well as financial, risks for you.

Plan of Action for Droughts

To reduce risks, monitor the weather forecast daily to know when to start planning for drought. If a drought should occur, try to have a dependable water source or a plan to get water to the livestock. Provide plenty of shade for the herd or flock. If you are relying on trees to provide most of the protection against the searing heat of the summer sun, there may not be any foliage on the trees to provide shade. Therefore, you will need to build or purchase some shelters for your animals. To keep production losses to a minimum, cull all poor performing
animals and make plans to purchase mineral blocks, feed and stock up on hay. Try to buy your hay earlier in the year. If a drought does occur, there may be a shortage of hay, and the price per bale will more than likely be higher than normal at that time.

Delay breeding your herd or flock during this period. Pregnant does and ewes will require lots of water and high quality forages during gestation which may not be available during a drought and feeding grain or concentrate to pregnant does or ewes can be quite expensive. Also, try not to overgraze your pastures. Practice rotational grazing to prevent soil erosion and to prolong the availability of your forages. If it should rain, the forages will quickly regrow if the leaves and roots of the plant have not been completely destroyed.

Federal Government Programs for Disasters

As mentioned in the earlier passages of this publication, there are several types of disasters that can occur in the U.S. Therefore, you should know what type of assistance the federal government will provide for you and your community following a catastrophic event. A major disaster declaration usually follows these steps:

- **Local Government Responds** – The local government, neighboring communities, and volunteer agencies will provide assistance to disaster victims. If overwhelmed they will turn to the state for further assistance.

- **State Responds** – The state will respond by using their resources, such as the National Guard and state agencies to respond to disasters.

- **Assessment of Damage** - The local, state, federal, and volunteer organizations will determine losses and recovery needs.

- **Disaster Declaration** - The governor will declare a major disaster declaration based on the damage assessment, and an agreement to commit state funds and resources to the long-term recovery.

- **FEMA Evaluation** – FEMA (Federal Emergency Management Agency) will evaluate the request and will recommend the necessary actions to the White House based on the disaster, the local community and the state's ability to recover.
• **President’s Approval** - The President will approve the request or FEMA informs the governor the request has been denied. This decision process could take a few hours or several weeks depending on the nature of the disaster (FEMA, 2009).

If the request for assistance has been approved, there are three major categories of disaster aid that may be provided which are listed on the next below.

**Individual Assistance**

After the declaration has been approved, disaster workers will arrive in the community to set up a central field office to coordinate the recovery effort. A toll-free telephone number will be published for use by the disaster victims and business owners to register for assistance. Disaster Recovery Centers also are opened where disaster victims can meet with program representatives and obtain information about available aid and the recovery process (FEMA, 2009).

Disaster aid to individuals generally falls into five main categories and they are the following:

• **Disaster Housing** – Housing for disaster victims may be available for up to 18 months, using local resources, for displaced persons whose residences were heavily damaged or destroyed. Funding also can be provided for housing repairs and replacement of damaged items to make the homes habitable.

• **Disaster Grants** – There is also grant money available to help meet other serious disaster related needs and necessary expenses not covered by insurance and other aid programs. These may include replacement of personal property, and transportation, medical, dental and funeral expenses.

• **Low-Interest Disaster Loans** – Loans are available after a disaster for homeowners and renters from the U.S. Small Business Administration (SBA) to cover uninsured property losses. Loans may be for repair or replacement of homes, automobiles, clothing or other damaged personal property. Loans are also available to businesses for property loss and economic injury.
Other Disaster Aid Programs - Other aid that is available include crisis counseling, disaster-related unemployment assistance, legal aid and assistance with income tax, Social Security and Veteran's benefits. Other state or local help may also be available.

Assistance Process -- After the application is taken, the damaged property is inspected to verify the loss. If approved, an applicant will soon receive a check for rental assistance or a grant. Loan applications require more information and approval may take several weeks after application. The deadline for most individual assistance programs is 60 days following the President's major disaster declaration.

Audits are later conducted to ensure that aid was provided to only those who were eligible and that disaster aid funds were used only for their intended purposes. These federal program funds cannot duplicate assistance provided by other sources such as insurance (FEMA, 2009).

Federal Disaster Assistance Programs: Advantages and Disadvantages

There are several advantages to applying for federal assistance after a disaster. If approved, you will receive a payment on your claim, it is an additional form of support and FEMA provides assistance to farmers with the same needs it provides to all citizens. However, there are also some disadvantages to applying for federal disaster assistance. There may be a delay in receiving your payment after a claim, there are serious repercussions to fraud, record keeping can be a burden, there will be periodic spot checks, FEMA does not help farmers with needs related to farming, and the program is really not designed for small farmers, market vendors and specialty crops. Other disadvantages to federal assistance programs are the loans are not provided for production agriculture and it can be hard to access disaster programs if you have not been previously involved with the USDA. The federal government (USDA) cannot help you if they are unaware that you exist, therefore, register your farm with FSA (Farm Service Agency) and obtain a farm number and then you will be added to the FSA mailing list (Krueger, 2009).
Other Federal Aid Programs

If you also grow crops, you are eligible to purchase crop insurance or FSA’s policy for Noninsured Crop Disaster Assistance Program (NAP). The purpose of NAP is to provide crop loss assistance to producers for crops not normally eligible for crop insurance. NAP provides a level of protection equal to catastrophic risk (CAT) coverage for these uninsurable crops, guaranteeing 50% or historical yield at 55% of expected market price. No higher levels of coverage are available (Hayes, 2009). Federal programs such as NAP provide some help to producers and are generally necessary to be enrolled in to access other federal assistance.

The Livestock forage program (LFP) is administered through FSA. This program provides financial assistance to eligible producers who suffered grazing losses due to drought or fire on or after January 1, 2008, and before October 1, 2011, during the calendar year in which the loss occurred. Eligible livestock are those owned or leased at least 60 days prior to the beginning date of a qualifying drought. To be eligible for the LFP program, if and when the program is enacted, you must purchase a Non-insured Crop Disaster Assistance Program (NAP) grazing policy. This policy must have been purchased by September 30, 2009 for Grass, Rye, Wheat, Mixed Forage, or Clover to meet the 2010 crop year deadline (Barber, 2009).

The “Food, Conservation, and Energy Act of 2008” authorized the Livestock Indemnity Program (LIP) to provide benefits to livestock producers for livestock deaths in excess of normal mortality caused by adverse weather that occurred on or after Jan. 1, 2008, and before Oct. 1, 2011, including losses because of hurricanes, floods, blizzards, disease, wildfires, extreme heat, and extreme cold. The livestock death losses must have also occurred in the calendar year for which benefits are being requested. The provisions provided by this program are similar to other livestock indemnity programs implemented by FSA in recent years except that an owner or contract grower’s livestock do not have to be located in a county or contiguous county designated a natural disaster by the President or declared by the U.S. secretary of agriculture. Under the current LIP, an owner or contract grower’s livestock payments will be based on individual producers’ losses. To be eligible for LIP, a livestock producer must have legally owned the eligible livestock on the day the livestock died. Owners of sheep, goats, cattle, swine, poultry, deer, elk, equine, reindeer and emus are eligible for this program (USDA/FSA, 2009).
A FINAL NOTE

There are several types of disasters that can occur in the U.S. Disasters can be the form of tornados, drought, wildfires, floods or hurricanes. Prior to a disaster, you should already have a plan in place to protect your property, your facilities and your animals. The plan should include emergency phone numbers, the address and phone numbers of the federal disaster assistance programs, a copy of evacuation procedures, and a list should be prepared on all of your animal’s identification numbers. If the animals are left on the property, make sure they are ID, they have access to water, food and shelter after a storm and a first aid kit is available in case of an emergency. Even after you have made all of the proper and necessary arrangements, there is still a chance that you will experience some financial losses after a disaster. However with the proper preparations before a cataclysmic event, your financial risks will hopefully be minimal.
APPENDIX 1

Small Ruminant Evacuation Kit

- A 7 to 14 day supply of feed, hay, supplements and water.
- Copies of veterinary records, farm records (i.e., health, breeding) and proof of ownership.
- Duct tape
- Emergency contact list
- First aid kit
- Flashlight and batteries
- Radio and batteries
- Fly spray
- Grooming brushes
- Heavy gloves (leather)
- Hoof knife
- Knife (sharp, all-purpose)
- Maps of local area and alternate evacuation routes (in case of road closures)
- Non-nylon halters and leads (leather/cotton)
- Paper towels
- Plastic trash cans with lids (can be used to store water and feed)
- Rope or lariat
- Shovel
- Trash bags
- Water and feed buckets
- Wire cutters
- Latex gloves
- A vehicle and trailer for relocating the animals.

(Adapted from the AVMA, 2009)
APPENDIX 2

Guardian Dog(s) Evacuation Kit

- A 7 to 14 day supply of food, supplements and water.
- Copies of veterinary records, and proof of ownership.
- Duct tape
- Emergency contact list
- First aid kit
- Flashlight and batteries
- Radio and batteries
- Fly spray
- Grooming brushes
- Knife (sharp, all-purpose)
- Maps of local area and alternate evacuation routes (in case of road closures)
- Non-nylon halters and leads (leather/cotton)
- Paper towels
- Plastic trash cans with lids (can be used to store water and feed)
- Rope or lariat
- Shovel
- Trash bags
- Water and feed buckets
- Wire cutters
- Large kennel or cage to transport animals if needed.
- Water and food bowls.
- Can opener (manual for opening canned foods)
- Leash and collar or harness (for each animal)
- Muzzles
- Latex gloves
- Spoon (for canned food)
- Stakes and tie-outs

(Adapted from the AVMA, 2009)

Note: Many of the items on the evacuation kit for guardian animals are also on the list for small ruminants. To save money, don’t duplicate the same items unless needed.
APPENDIX 3

Small Ruminants First Aid Kit

Consult your veterinarian when developing the first aid kit. The items below serve only as examples of what may be included in an first aid kit for goats or sheep.

- Antibiotic ointment (for wounds)
- Antibiotic eye ointment
- Antibiotic for treating infections such as foot rot.
- Bandage scissors
- Bandage tape
- Betadine® (povidone-iodine) or Nolvasan® (chlorhexidine), scrub and solution
- Cotton bandage rolls
- Cotton-tipped swabs
- Elastic bandage rolls
- Eye rinse (sterile)
- Gauze pads and rolls
- Isopropyl alcohol/alcohol prep pads
- Latex gloves or non-allergenic gloves
- Medications (minimum 2 week supply, with clearly labeled instructions)
- Non-adherent bandage pads
- Saline solution (for rinsing wounds)
- Sterile lubricant (water-based)
- Thermometer (digital)
- Tincture of green soap
- Tourniquet
- Towel and washcloth
- Tweezers
- Needles and syringes
- Scalpel with blades
- Dewormer and coccidiostat
- Iron and vitamin B-complex
- Electrolytes
- Anti-diarrheal liquid or tablets

(Adapted from the AVMA, 2009)
APPENDIX 4

Guardian Dog(s) First Aid Kit

- Activated charcoal (liquid)
- Anti-diarrheal liquid or tablets
- Antibiotic ointment (for wounds)
- Antibiotic eye ointment
- Bandage scissors
- Bandage tape
- Betadine® (povidone-iodine) or Nolvasan® (chlorhexidine), scrub and solution
- Cotton bandage rolls
- Cotton-tipped swabs
- Elastic bandage rolls
- Eye rinse (sterile)
- Flea and tick prevention and treatment
- Gauze pads and rolls
- Isopropyl alcohol/alcohol prep pads
- Latex gloves or non-allergenic gloves
- Liquid dish detergent (mild wound and body cleanser)
- Measuring spoons
- Medications and preventatives (such as heartworm prevention), minimum 2-week supply, with clearly labeled instructions. Provide veterinary and pharmacy contact information for refills.
- Non-adherent bandage pads
- Saline solution (for rinsing wounds)
- Sterile lubricant (water based)
- Styptic powder (clotting agent)
- Syringe or eyedropper
- Thermometer (digital)
- Tourniquet
- Towel and washcloth
- Tweezers

(Adapted from the AVMA, 2009)
REFERENCES


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