

**ANNEX 1.**

**Table 1.** Risk of natural disasters in Central American countries. Risks are on a scale from 0 (negligible) to 5 (very important).

<b>Disaster Type</b>	<b>Guatemala</b>	<b>Honduras</b>	<b>El Salvador</b>	<b>Nicaragua</b>	<b>Costa Rica</b>	<b>Panama</b>
<b>Earthquakes</b>	1	3	1	1	3	5
<b>Floods</b>	3	1	2	2	1	1
<b>Droughts</b>	0	4	3	5	5	4
<b>Landslides</b>	2	2	4	4	2	2
<b>Volcanic Eruptions</b>	4	0	5	3	4	0

Adopted from: CEPREDENAC summary presentation on the Regional Plan for the Reduction of Natural Disasters in Central America.

**ANNEX 2.**

**POTENTIAL ROLES FOR VETERINARIANS IN DISASTER MANAGEMENT  
AND HUMANITARIAN ASSISTANCE**

**Sebastian E. Heath B.Sc., MVetSci, VetMB, MRCVS, Dipl. ACVIM  
Assistant Professor, Purdue University, Indiana  
President, American Academy on Veterinary Disaster Medicine**

**Roscoe M. Moore, Jr. DVM, MPH, Ph.D.  
Assistant Surgeon General, USPHS**

*The following is a summary of the presentation to be given at the First Humanitarian Support Operations Conference, September 17-23, 1995, Honolulu, Hawaii*

Fundamental to the relationship between humans and animals is the improved quality of life that results for both species from improved food supply, economic gain and mutual affection. The benefits from this relationship manifest themselves with great diversity throughout the world, and are often unique to a country. For example, in many countries agricultural and domestic animal husbandry systems contribute significantly to a country's cultural heritage and identity. Also, sustainable agriculture often depends heavily on traditional livestock husbandry systems.

Large scale disasters threaten the continuance of the beneficial interactions between humans and animals, and, therefore, also potentially affect the fundamental social structure of a community or country. Animal related issues that may result from large scale disasters are the disruption and contamination of a safe food and water supply, and a breakdown of social structures that are maintained through traditional animal care systems. From every day experience, veterinarians have the potential to address many of these issues in a practical and effective manner.

The potential role of veterinarians in international disaster reduction is during the planning, education and response phases of disasters. In each of these phases, appropriate and culturally sensitive veterinary care of animals may support the unique ways in which humans and animals relate to each other. These support functions are humanitarian in nature, because they aim to restore and maintain a country's economic and social structure, as well as its cultural identity. The focus of this presentation will be to describe experiences of working in disasters affecting animals in North America and to compare how that may relate to other countries.

**ANNEX 3. Indicators of the high risk and costs of natural disasters to agriculture in Central America.**

Table 1. Indicators of most likely populations affected by natural disasters in Central America.

Approximate average proportion of human population living in rural areas	54%
Approximate proportion of human population employed in agriculture	27.5%
Proportion of agriculture in livestock	approx. 34.4%
Proportion of children with nutritional deficiencies	up to 30% in some countries
<b>Distribution of farm ownership</b>	
Farm owners	6.6%
Farm Labor	24.8%
Dependent families	11.8%
<b>Type of farm</b>	
Subsistence	27%
Small holding	29.7%
Family operation	25.7%
Medium size	9.5%
Large size	2.8%
<b>Distribution of agricultural land</b>	
Cultivated	2.5%
Improved pastures	64.2%
Natural pastures	33.3%
<b>Distribution of agricultural land ownership</b>	
Owned	87.5%
Leased	1.8%
Mixed	10.4%

**Interpretation:**

- By number of people affected the most likely affected populations are: rural communities; farm laborers and dependent families.
- By farm type these are: subsistence and small farms, which are owned and have improved or natural pastures.
- Livestock agriculture is likely to suffer considerable damages resulting in decreased availability of local food supply.
- Children are likely to suffer first from the effects of an impaired food supply.

#### ANNEX 4.

**Table 1.** Distribution of the risks of the cattle industry to natural disasters. (Based on data from Costa Rica).

<b>Disaster Type</b>	<b>Typical areas</b>	<b>Proportion of Industry at Risk</b>			
		<b>Beef</b>	<b>Dairy</b>	<b>Dual</b>	<b>All</b>
<b>Floods</b>	Charotege, Atlantic, North	45.05	5.13	13.75	<b>63.94</b>
<b>Droughts</b>	Central, Charotege	35.86	8.16	13.72	<b>57.74</b>
<b>Earthquakes</b>	Central, Brunca, North	30.95	11.85	12.31	<b>55.12</b>
<b>Volcanoes</b>	Central, North	22.67	10.85	10.87	<b>44.39</b>
<b>Landslides</b>	Central, Brunca	19.25	8.74	8.07	<b>36.06</b>

**Table 2.** Relative distribution of risks to natural disasters by cattle industry. (Based on data from Costa Rica).

<b>Disaster Type</b>	<b>Typical Areas</b>	<b>Proportion of Each Industry at Risk</b>		
		<b>Beef</b>	<b>Dairy</b>	<b>Dual</b>
<b>Flood</b>	Charotege, Atlantic, North	70.06	36.99	63.01
<b>Drought</b>	Central, Charotege	55.76	58.86	62.85
<b>Earthquakes</b>	Central, Brunca, North	48.14	85.47	56.42
<b>Volcano</b>	Central, North	35.26	78.23	49.78
<b>Landslides</b>	Central, Brunca	29.94	63.01	36.99

## **ANNEX 5.**

**Table 1. Summary of costs related to animals in natural disasters.**

**Direct costs:**

- Replacement of killed, drowned, lost and stolen animals
- Replacement of feed that was destroyed, swept away or stolen

**Indirect costs (estimated to be 3 - 10 times greater than direct costs):**

- Transport of animals to safe sites
- Extra labor to care for animals in new environment
- Rental costs for new pastures and housing for displaced animals
- Weight loss due to stress, changes and decreases in nutrition
- Loss in production, such as milk

**Intangible costs (estimated to be 10 - 200 times greater than direct costs)**

- Loss of income for animal owner
- Loss of social status for animal owner
- Destruction of grazing in fragile environments due to increased grazing
- Decreased supply of food from animals for people
- Increased disease among animals
- Increased risk of zoonotic disease transmission
- Loss of human life and injuries to humans related to rescuing animals
- Increased social pressures and crime

## **ANNEX 6.**

**Contacts in Emergency Management in Central America (founding member organizations of CEPREDENAC).**

### **Costa Rica**

Comision Nacional Emergencia (CNE)  
Observatorio Vulcanologico y Sismologico de Costa Rica (OVSICORI-UNA)  
Escuela Centroamericana de Geologia, Universidad de Costa Rica (ECG-UCR)

### **El Salvador**

Comite de Emergencia Nacional (COEN)  
Centro Investigaciones Geotecnicas (CIG)  
Centro de Recursos Naturales (CENREN)

### **Guatemala**

Comite Nacional Emergencia (CONE)  
Insituto Nacional de Sismologia, Vulconologia, Metereologia, e Hidrologia  
(INSIVUMEH)

### **Honduras**

Comite Permanente de Contigencias (COPECO)  
Universidad Nacional Autonoma de Honduras (UNAH)  
Direccion General de Recursos Hidricos (DGRH)  
Oficina de Pronosticos Atmsophericos  
Direccion General de Aeronautica Civil

### **Nicaragua**

Estado Mayor Nacional de la Defensa Civil (EMNDC)  
Instituto Nicaraguense de Estudios Territoriales (NETER)

### **Panama**

Sistema Nacional de Proteccion (SINAPROC)  
Instituto de Geociencias, Universidad de Panama (IGC)  
Facultad de Ingenieria, Universidad Technologica de Panama (UTP)

## **ANNEX 7.**

**Suggested format and contents for a First Central American Conference on Disaster Reduction for Livestock.**

### **Program goals:**

**To heighten the awareness of the need for Disaster Reduction Programs for Livestock in Central America.**

### **Audience**

**Senior decision makers in Central America in the fields of  
Government officials (Presidents, Vice ministers)  
Animal and Plant Health (Directors, OIRSA supervisors)  
Ministers of Public Health  
Emergency Management (Annex 6)**

#### **Potential Responders (donors)**

**Organization of American States  
Pan American Health Organization  
United Nations  
Office of Foreign Disaster Assistance (OFDA/USAID)  
International Red Cross  
Other active Non-Governmental Organizations (NGOs) in Central America  
International Development Bank, World Bank, other potential sponsors  
Others**

#### **Potential Responders (educators)**

**National Emergency Management officials  
Federal Emergency Management Agency (USA)  
Center for Disease Control (USA)  
US Department of Agriculture  
Center for Disease Control  
Others**

#### **Potential Responders (field team)**

**Veterinarians of OIRSA  
Emergency Management personnel  
Others**

**Universities**

### Informational agenda

- Why are livestock an important consideration in disasters?
- What is Emergency Management?
- What is the size and scope of the population at risk?
- Examples of disasters where livestock contributed significantly to major disasters
- The role of livestock in improving humanitarian assistance in disasters
- What resources are available to prepare an effective disaster reduction program for livestock?

### **SUGGESESTED LECTURE SCHEDULE FOR CONFERENCE**

#### **Day 1: Lectures and information**

*Morning*

<b>Topic</b>	<b>Speaker</b>
1. Welcome, introduction to speakers and topics	Dr. Celio Humberto Barreto, Executive Director, OIRSA
2. The importance of animal issues in disasters	Dr. Sebastian Heath, President of the American Academy on Veterinary Disaster Medicine
3. The mission and goals of the Center for Cooperation for the Prevention of Natural Disasters in Central America (CEPRENAC)	Dr. Luiz Diego Morales, Executive Director, CEPREDENAC
4. The magnitude and populations at risk of livestock and their owners in Central America to natural disasters including epidemics, epizootics and foreign animal diseases	Dr. Ernesto Calderon, Director Animal Health for OIRSA
<b>LUNCH</b>	
5. An investigation of the Mount Hudson eruption in Chile and its impact on the sheep industry of Patagonia, Argentina	Dr. Linda Robins, Center for Disease Control
6. Animals losses experienced in droughts and floods in Central America and their impact on human health and well being	Holger Nauhimer, United Nations consultant on livestock raising
7. The importance of animal issues in providing humanitarian assistance in Somalia	Dr. Eric de Waal, London School of Economics



*Late afternoon (day 1)*

**8. Discussion Panel**

**Opportunity for audience to ask questions and make statements**

**Presentation of draft resolution for Ministers of Health and Agriculture to support the development of a disaster reduction program for livestock in Central America**

**Day 2:**

*Morning only*

**Lecture:**

**1. Vision for the future: the integration of existing resources into a disaster reduction program for livestock and their owners in Central America**      **Ernesto Calderon and Luiz Diego Morales**

**2. Round table discussion to refine the principle and general content of an resolution by the Ministers of Agriculture and Health to support the development of a disaster reduction program for livestock in Central America.**

**3. Determination of follow up meeting to agree upon and sign a resolution to develop a disaster reduction program for livestock in Central America (or even better signing ceremony of resolution at conference).**

**LUNCH and CLOSE.**

**ANNEX 8. Selected contacts and information on organizations that have programs or interesting emergency management in Central America.**

Organizations that are involved in disaster reduction programs and who should be contacted for participation and advice.

**1. Organismo Regional internacional de Salud Agripecuaria (OIRSA)**

Oversees health of agricultural plants and livestock in Central America  
Wants to develop disaster preparedness program for Central America, which can be used as a model for the rest of the Americas to follow.

Contacts:

Dr. Celio Humberto Barreto  
Executive Director

Dr. Ernesto Calderon M.  
Director Technico de Salud Animal  
OIRSA  
Calle Ramon Bellosa  
Pasaje Isolde  
Col. Escalon  
San Salvador, El Salvador  
Phone: 503. 23 2391  
Fax: 503.98 2119

Action plan:

Appoint supervisor/contact person at OIRSA to take lead role in communications and execution of strategic plan for disaster reduction for livestock in Central America.

**2. Center for the Coordination of Natural Disaster Prevention in Central America (CEPREDENAC)**

In May 1995 the Congresses of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama ratified agreements with the Center for the Coordination of Natural Disaster Prevention in Central America (CEPREDENAC) to develop a Regional Disaster Reduction Plan. This brings together ministries, emergency management organizations, universities and scientific institutions to draft disaster reduction plans for the energy, communication, agriculture and education sectors among others.

## Action Plan

1. Contact CEPREDENAC to confirm interest to enter into an agreement with OIRSA as the lead agency of animal health in disasters.
1. Prepare an annex to the Regional Disaster Reduction plan of CEPREDENAC that defines the roles of OIRSA

## Contact:

Mr. Luiz Diego Morales  
Executive Secretary  
Center for the Coordination of the Natural Disaster Prevention in Central America  
7 Avenida 14-57 Zona 13  
Guatemala City, Guatemala  
Phone: 502.2.348318  
Fax: 502.2.348317

## 3. Organization of American States (OAS) (Organization Estados Americas (OEA))

Represents and coordinates political and military liaisons between countries of the Americas

Oversees the activities of several agencies. Relevant to disaster management are the Inter-American Institute for Cooperation in Agriculture and the coordination of European sponsors to develop disaster reduction programs in the Americas.

OAS has sponsored to initiation of the development of the Disaster Reduction Program for Livestock in Central America.

### *Inter-American Institute for Cooperation in Agriculture (IIAC)*

Works together with American Development Bank and PAHO to implement the "Declaration of Principles". The Declaration of Principles is a plan of action outlining a partnership for development, prosperity, democracy, free trade and sustainable development. The three main areas for activities are: agricultural modernization, and competitiveness; agriculture and sustainable development, and equity in rural development. (Sustainable development and equity in rural development are of particular importance in disaster reduction for livestock farmers using subsistence farming methods).

Large program of IIAC is the "Agro Americas" program, which is committed to bring state of the art electronic communication linkages between many agricultural groups throughout the Americas. An example of how electronic communications would benefit livestock agriculture is to retrieve and disseminate early notice of pestilence warnings.

Further, OAS supports "*Partners of the Americas*", the largest volunteer organization in the Western Hemisphere. Partners is a cultural and sociologic exchange network between North American states and Central and South America states or countries. There are several examples within Partners where Emergency Management and Public Health specialists have exchanged knowledge.

#### Action Plan

1. Maintain liaison with OAS on all developments and progress related to the further development of the Disaster Reduction Program for Livestock. The potential future role of OAS is to endorse the further development and implementation of the disaster reduction plan for livestock through agreements with other participants and to act as a sponsor of the First Central American Conference on Livestock Issues in Disasters.
2. Contact Partners of the Americas to determine interest and existing programs in Emergency Management between the US and Central America and to determine whether there is an interest in incorporating these into the disaster reduction program for livestock in Central America.
3. Establish contact with IIAC with intention of joining the Agro Americas information network.

#### Contact

Stephen Bender  
Organization of American States  
Washington DC, USA

Bill Reese  
President, Partners of the Americas  
Washington, DC, USA

#### **4. Pan American Health Organization/ World Health Organization (PAHO/WHO)**

For nearly ninety years PAHO has supported health care in the Americas. Included in this mission are extensive Emergency Preparedness and Disaster Relief Coordination Programs.

For practical dissemination and intervention in disasters PAHO publishes "*Disasters - Preparedness and Mitigation in the Americas*". This is a quarterly journal that summarizes developments in the area of disaster reduction programs in the Americas. PAHO has also developed "SUMA" (Supplies Management),

which is one of the most comprehensive database software for use in disasters. Over 1,000 people have been trained by PAHO in its use in the Americas.

In the past PAHO has sponsored educational programs, in both Spanish and English, which can be taken towards a degree in Disaster management at the Disaster Management Center, University of Wisconsin-Extension, Dept. of Engineering and Applied Science.

PAHO has a strong vested interest in disaster reduction programs in the Americas and should be approached as a collaborator in any program development.

#### **Action plan 1**

Establish contact with PAHO in both Central America and Washington, DC. Confirm interest of PAHO in agricultural disaster reduction programs and identify how they see their role in the development of such a program. The likely role of PAHO would be to enter into agreements with other organizations to endorse the development of the Disaster Reduction Program of livestock and to sponsor the training of OIRSA livestock disaster responders.

#### **Contacts**

##### **Headquarters**

Dr. Hugo Prado and Dr. Claude de Ville de Goyet  
PAHO  
525 23<sup>rd</sup> Street NW  
Washington DC 20037-2895, USA  
Phone: 202.861 4326  
Fax: 202.775 4578

##### **Central American Region**

Dr. Luiz Jorge Perez  
PAHO  
San Jose, Cost Rica  
Phone: 506.257 2141

##### **Local Region for El Salvador**

Dr. Luiz Jorge Prospero  
San Salvador, El Salvador  
Phone: 503.298 3491 or 298 3306  
Fax: 503. 298 1168

#### **Action Step 2**

Establish and maintain contact with the editor of "Disasters: Preparedness and Mitigation in the Americas". Inform them of all progress, and solicit that they publicize reports.

**Contact:**

The Editor  
Disasters: Preparedness and Mitigation in the Americas  
PAHO  
525 23<sup>rd</sup> Street NW  
Washington DC, 20037, USA  
Phone: 202.861 6096  
Fax: 202.775 4578

**5. United Nations (UN)**

**Sponsor of the UN International Decade for Disaster Reduction (INDNR)**

The 1990's has been declared as the International Decade for Disaster Reduction by the United Nations. The mission of the UN in this decade is to make significant advances in disaster reduction programs in all countries of the world. Several distinct programs have focused on this mission, such as the UN Disaster Assessment and Coordination teams (UNDAC). UNDAC focuses on the effective implementation of disaster response.

*United Nations Disaster Assessment and Coordination (UNDAC)*

The mission of UNDAC is to foster the interaction between donor response teams and affected countries to improve:

Objectivity and credibility of the information by including donor representatives in the initial damage assessment  
Experience by forming assessment teams consisting of both donor and affected country representatives  
Assessment standards by using local information of the conditions before the disaster and to apply appropriate measures that are culturally sensitive  
Knowledge of local power structures, which relied on the knowledge and systems of the affected communities.

**Action plan**

Establish contact with UN in both Central America and Switzerland. Confirm interest of UN in agricultural disaster reduction programs and identify how they see their role in the development of such a program. A potential role of UN would be to endorse the development of the Disaster Reduction Program of livestock and to sponsor public education programs and the training of OIRSA livestock disaster responders.

## **6. US Office of Foreign Disaster Assistance (OFDA/USAID)**

Coordinates all levels of immediate response to international disasters for the US government

Provides grants for program development and implementation

### **Action plan**

Contact Central American representative to identify potential interest and role in development of disaster reduction program of livestock in Central America

### **Contact**

Paul Bell  
Embassy of the United States  
PO Box 825-1200 Pavas  
San Jose, Costa Rica  
Phone: 506.220 4545 or 506.231 6805  
Fax: 506.231 4111

## **7. Center for Disease Control and Prevention**

The Center for Disease Control in Atlanta Georgia, is the main source of Public Health of surveillance, monitoring and investigation in the United States. It has a growing concern for international health issues, especially those that arise in disasters, zoonotic epidemics and new emerging diseases. CDC has both an International Health Programs Office and an Epidmiologic Intelligence Service that have expertise in public health investigation and training.

### **Action plan**

Contact representative of CDC to seek potential interest and involvement in the development of a disaster reduction program for livestock. The likely role of CDC would be to educate representatives from OIRSA in epidmiologic survey methods and control of healthy water supply. Dr. Linda Robins in Epidemiologic Intelligence Service is a veterinarian who investigated the massive sheep death problem following the eruption of Mount Hudson in Chile. She would be a valuable source of practical information on how animal related issues can be investigated.

**Note if similar organizations exist in Central America they must also be contacted.**

### **Contacts at CDC**

Dr. Joe Davis  
Director, International Health Program Office

Dr. Eric Noji  
Chief, Emergencies and Populations in Transitions Activities

Dr. Linda Robins  
Epidmiologic Intelligence Service

Mailstop K-01  
4770 Buford Highway NE  
Atlanta, GA, USA  
Phone: 404.488 1089  
Fax: 404 488 1003

#### **8. Latin American Parliament (PARLATINO)**

Members of PARLATINO's Working Group on Disaster Reduction and Health Commission and representatives of PAHO/WHO meet with Ministers of Health to discuss ways to

- Encourage national legislatures to adopt standards on disaster prevention and mitigation
- Support political consensus already reached among lawmakers in geographically vulnerable regions to implement programs and projects
- Promote legislation to provide the necessary financial backing for disaster reduction activities
- Stimulate the creation of working groups or commissions charged with monitoring disaster reduction programs and their results, keeping disaster reduction issues visible in legislatures, and encouraging research on how effective local disaster reduction programs are.

#### **Action Plan**

Contact PARLATINO representative to seek interest and identify potential for endorsement of a disaster reduction program for livestock in Central America.

#### **9. US Department of Agriculture (USDA/APHIS)**

The US Department of Agriculture has an extensive program to protect and enhance North American agriculture. As part of that program the Animal and Plant Health Inspection Service (APHIS) cooperates with foreign ministries and animal health and other agricultural agencies, such as OIRSA, to coordinate the control of foreign animal disease. Exotic animal diseases pose a significant threat to all animal agricultures in the Americas, and the risk of the introduction and spread of foreign animal disease is increased because of disasters. Cooperation with USDA/APHIS should constitute an important component of the disaster reduction program for livestock in Central America.



**Action plan**

Contact USDA/APHIS to identify interest and potential to coordinate approach to the diagnosis and control of foreign animal disease as a category of disaster management.

**Contact:**

Dr. John Shaw  
Veterinary Attaché  
USDA/APHIS International Service  
4a Avenida 12-62 Zona 10  
01010 Guatemala, C.A., Guatemala  
Phone: 502.2.312 036 or 322 037  
Fax: 502.2.335 446

**10. Federal Emergency Management Agency (FEMA)**

The Federal Emergency Management Agency coordinates disaster preparedness and response programs in the United States. Their primary role is in response to federally declared disasters, but they also play a significant role in the development of state plans and responder and public education in disaster preparedness. FEMA offers many courses in disaster management, which may be suitable for adaptation in Central America. FEMA has an extensive training program which may be beneficial to responders to disasters in Central America.

**Action plan**

Contact FEMA to identify interest and the potential to cooperate in the training of disaster responders in Central America.

**Contact**

James Lee Witt  
Director, Federal Emergency Management Agency  
Washington, DC, USA

**11. University of Wisconsin, Disaster Management Center**

Since the 1980's the University of Wisconsin, has provided education and qualification in disaster management for responders to natural disasters in the Americas. With sponsorship from PAHO, courses and a degree are available from the Center for Disaster Management in English and Spanish. Currently all of the courses focus on the human aspects of disaster management, but there is now also an interest in expanding the program to include animal related issues.

**Action plan 1:**

Inquire about courses and degree program in Disaster Management. Determine the suitability of this material for education of disaster responders for livestock. Discuss potential sponsorship for course development.

**Action Plan 2**

Inquire about the interest at the Center in developing a course on livestock issues in natural disasters.

**Contact:**

Contact Dr. Don Schramm  
Director, Center for Disaster Management  
University of Wisconsin, Extension  
Dept. Engineering Professional Development  
432 North Lake Street  
Madison, WI 53706, USA  
Phone: 608.262 2061

**12. Non-Governmental Organizations (NGOs)**

Non-Governmental Organizations are playing an increasingly large role in the resolution of disasters. From years of experience of working in disasters, many of them are sympathetic to needs are livestock owners and their need to restore normal agriculture in order to reestablish a disaster affected country's independence from disaster aid. The support for livestock owners is seen by many as a humanitarian support function. Some of the most notable contributors to disaster assistance are the International Red Cross and World Vision. The Central American representatives of these and other similar organizations should be contacted to identify their interest, experience and potential input into the development of the disaster reduction program for livestock.

**This list is not comprehensive, therefore, other potential interest groups in disaster management, especially those in Central America need to be identified. Their input must be sought, because they likely have expertise and resources specific for Central America.**