

6. Disaster Management and it's Effect on Agriculture Sector : The Case Study of Livestock and Poultry

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Abstract:

Developing countries are becoming increasingly aware of the importance of disaster management systems, and increasing efforts are being made to streamline preparedness, response and recovery mechanisms at all levels. It is well known that many developing countries, including India, are not always well-prepared to deal with disasters. A lack of well-developed disaster management plans results in a severe loss of human life, animal life and property, which could be saved if the necessary mechanisms were in place. A lot needs to be done to improve the situation, particularly in regard to livestock. This paper describes in detail, with particular reference to India, what can be done to care for animals when natural disasters occur. The authors review various types of natural disasters and their impact on livestock, and outline different preparedness, response, recovery, and mitigation strategies. The roles of different agencies, including veterinarians, are also considered.

Introduction

The World Health Organization defines disaster as 'any occurrence that causes damage, economic destruction, loss of human life and deterioration in health and health services on a scale sufficient to warrant an extraordinary response from outside the affected community or area'. It is an event, concentrated in time and space, which causes social, economic, cultural and political devastation and which affects both individual people and communities (23). No disaster is exactly the same as another, and the impact and consequen

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scale sufficient to warrant an extraordinary response from outside the affected community area'. It is an event, concentrated in time and space, which causes social, economic, cultural and political devastation and which affects both individual people and communities. No disaster is exactly the same as another, and the impact and consequences vary from region to region and community to community.

Research Methodology

The research paper is based on empirical study. It is a type of descriptive research paper.

Objectives of Study:

1. The first objective of the paper is to highlight the impact of disaster Management in Agriculture sector.
2. The second objective is to explain the working mechanism of disaster Management in India.

Importance of the Study:

1. The study will highlight the effect of disaster Management of Agriculture sector.
2. It will prove to be of great help to a common man to understand the concept the disaster Management.

Data Collection:

This paper is a descriptive paper based on secondary data collected from different books, news-paper articles and research journals.

Types of disasters

Disasters can be categorised, according to what causes them, as natural disasters, i.e. result of natural phenomena, or manmade disasters, i.e. the result of man's intervention or nonintervention. Natural disasters account for nearly 80% of all disasters that occur in the world. Disasters can also be classified, according to their impact, as localised, widespread, predictable or unpredictable, and also, major or minor.

Impact of disasters

The impact of a disaster can be categorised as direct, indirect or tertiary. Apart from the public health consequences of disasters, such as zoonotic diseases and the threat to the food supply, disasters also have negative economic consequences, particularly in developing countries. In these countries, not only do livestock provide milk, meat, traction power for farming and transport, dung, hides, wool, fibre, etc., animals also provide a relatively

investment option and give the owner social importance. Disasters affecting livestock can therefore have a negative impact on the infrastructure of a country, reducing an important source of income in rural areas and hindering the distribution of food and goods.

Disaster and livestock

When animals are affected by disaster, the main problems are, as follows:

- a) The spoilage of food and/or the water supply
- b) Zoonoses
- c) Animal bites
- d) The significant impact on public mental health due to the emotional involvement of the owners with the animals
- e) Reduced dairy and livestock production, due to the scarcity of feed and water, high livestock mortality rates, etc.
- f) The damage to both domestic and wild animal species, due to lack of feed and water and the diseases which spread during and after a disaster.

India and disasters

India is one of the top four most disaster-prone regions in the world. India, being a vast country with a tropical climate, experiences all types of natural disaster, except volcanic activity. The frequency of droughts, floods, earthquakes and cyclones is increasing every year. Of the thirty-two States and Union Territories in India, twenty-two are disaster prone. 28% of the total cultivable land is prone to drought; 58% of the total area is prone to earthquakes. Based on disaster affinity, the country can be categorised into five sub-divisions, as follows:

- a) The northern mountain region (including foothills): mainly prone to snow storms, leading to landslides and cold waves, heavy rainfall, and land and soil degradation. Massive snow avalanches occur in the Himalayan region, which have great destructive potential
- b) The Indo-Gangetic plains: floods are a common occurrence here
- c) The Deccan plateau: this area is prone to drought and has erratic rainfall. Earthquakes of varying intensities have also been reported in this area
- d) The western desert: this area, known as the Thar Desert, has limited and unreliable rainfall and is prone to drought

Phases of emergency management

There are four generally recognised phases of emergency management, namely, mitigation, preparedness, response, and recovery. The main features of these four phases of emergency management, as reported by the Emergency Management Institute (EMI). The same phases also apply to the management of animals, both livestock and pets, during disasters.

The loss of any form of livestock will have long-lasting effects on agriculture and the sustainable income of landless farmers in particular, who depend solely on livestock for their livelihood. 67% of small and marginal farmers, and landless people living on the edge of poverty, own 70% of the livestock in India. Small holders rear animals with virtually no capital resources or training, but they contribute significantly to the gross domestic product of developing countries. In India, these people produce 62% of total milk production. 70% of poultry are still reared in backyards. As such, it is the small, marginal and landless livestock owners who are most affected when natural disasters occur. Given these facts, it is essential to have a well designed and practical disaster management plan for livestock.

Care of animals in disaster

Care of livestock and horses Disaster preparedness is important for all animals, but it is particularly important for livestock because of the size of the animals and the requirements needed to transport them and shelter them. Livestock owners should follow the local construction regulations when building their barns and other buildings, these regulations vary from area to area, depending on the type of disaster prevalent in the region. According to The Humane Society of the United States of America (USA), the Maryland Emergency Management Agency and the EMI, in case of any emergency or disaster, the following should be the modus operandi for taking care of animals:

- a) a local emergency management committee should be formed involving local people
- b) a safe shelter for farm animals and a disaster plan to protect property, facilities, and animals, should be planned, ahead of time, in conjunction with the local community. Potential places include fairgrounds, other farms, etc.
- c) animals should be evacuated and taken to shelter as soon as there is news of an imminent disaster. Every animal must have some form of durable and visible identification, e.g. the animals should be branded or tagged

- d) the community should have arrangements for appropriate transport, suitable for specific animals
- e) a farm disaster kit should be prepared in advance so that supplies are readily available in the event of a disaster. The kit should be placed in a central location and everyone in the family or community should know where it is. The contents must be checked regularly to ensure fresh and complete supplies. The following items should be included in the kit, plus items that are used everyday.

Care of birds

Birds need special care during disasters. The EMI has made the following particular recommendations for birds:

- a) birds should have a sufficient supply of water. Adding chlorine to the water (ten drops of chlorine bleach per gallon of water) will prohibit the growth of bacteria. This chlorinated water should be stored in large containers, away from sunlight
- b) aviaries should be equipped with overhead sprinkler systems, which minimise smoke inhalation, cool the air and reduce the chances of burn injuries
- c) farms should have enough carriers to evacuate all birds during emergencies
- d) birds should not be left exposed to smoke and fumes, as they are very sensitive to smoke and fumes and succumb much more quickly than most other animals

Common disasters in India and their management

Drought

Drought is a condition of moisture deficit, sufficient to have an adverse effect on vegetation, animal, and man, over a sizeable area. There are four main categories of drought: meteorological, agricultural, hydrological and socio-economic. Meteorological drought is a period of abnormally dry weather sufficiently prolonged for the lack of water to cause serious hydrologic imbalance in the affected area. Agricultural drought is a climatic excursion involving a shortage of precipitation sufficient to adversely affect crop production or range production. Hydrologic drought is a period of below average water content in streams, reservoirs, groundwater aquifers, lakes and soils. Socio-economic drought occurs when the demand for an economic good exceeds supply as a result of a weather-related shortfall in water supply. It associates economic good with the elements of meteorological, agricultural, and hydrological

drought. It is different from the other definitions in the fact that it defines drought based on the process of supply and demand.

India's response to drought

India has developed numerous strategies to cope with droughts, e.g. harnessing water through medium reservoirs, developing traditional systems of tanks, exploiting groundwater, etc. In 1973 the Government initiated projects such as the Drought Prone Area Programme (DPAP) in 149 districts. The average annual investment on long- and medium-term irrigation projects rose from INR 750 million in the First Five Year Plan (the first five year economic plan in India, 1951- 52 to 1955-56) to INR 25,000 million in the Eighth Five Year Plan (1992-93 to 1996-97), thereby creating a total potential of 38 million hectares (ha) of land for irrigation. Alongside the DPAP, the Desert Development Programme started in 1977- 1978 and was initially implemented in 7 states. The aim of this programme was to control the process of desertification and mitigate the adverse effects of drought in desert areas through a combination of afforestation, sand-dune stabilisation, shelterbelt plantation, grassland development and soil moisture conservation. Other mitigation strategies currently being implemented include public and private sector efforts to address the highest priority problems, taking into consideration both ground and surface water flow (based on the United States Environment Agency Watershed Approach), with a budget of INR 22.6 billion (35), and the Command Area Development Programme, which aims to strengthen water management capabilities and enhance the effectiveness of irrigation programmes.

Earthquakes

An earthquake is a wave-like movement of the surface of the earth. The earth's crust and upper part of the mantle push and move against each other along the fault lines. When rock masses slip along the fault, the energy of an earthquake is released in the form of seismic waves. The damage caused by an earthquake depends on its magnitude and intensity. The Richter scale is widely used to measure the magnitude of earthquakes; it measures the energy released when large rock masses in the upper earth suddenly shift. A change of one full point in the Richter scale represents a difference of a factor of 30 in the energy released. For example, an earthquake of magnitude 8.0 is roughly 30 times as powerful in terms of energy release as one of magnitude 7.0.

Cyclones

Due to the low-depth ocean bed topography and the coastal configuration, the Indian sub-continent is affected by cyclones more than any other area in the world. The Indian Ocean is one of the six major cyclone-prone regions of the world. India has a long coastline of 7,516 km which is exposed to tropical cyclones arising mainly in the Bay of Bengal and the Arabian Sea. The states most exposed to tropical cyclone surges are West Bengal, Orissa, Andhra Pradesh and Tamil Nadu along the Bay of Bengal, and Gujarat and Maharashtra along the Arabian Sea. The frequency of the tropical cyclones in the Bay of Bengal and the Arabian Sea is greater than anywhere else in the world: on average, about five cyclones occur there every year. They produce great disruption to normal life and business by causing damage to human and animal life and property, failure of power transmission and communication lines, and flooding of roads and residential areas.

Flood

Floods have become a regular annual event in India, causing extensive damage to agricultural production, loss of property and livestock and loss of human life. In addition, in the aftermath of a flood, the environment, rivers and drinking water become contaminated. Animals standing in contaminated floodwater for long periods become susceptible to infections of their hooves and skin. In addition, the cuts acquired from disaster debris make animals more vulnerable to tetanus and toxins contained in the floodwater. Common animal illnesses caused by sewage-contaminated water include tetanus, hepatitis, dysentery, and food poisoning. In addition to this, pathogenic viruses, bacteria, and other organisms present in floodwater can enter the body through openings in the body.

Landslides and mudflows

Landslides are characterised by down slope movement of rock, soil or other debris. They can be triggered during earthquakes, volcanic eruptions, storm-generated ocean waves, or other landslides, freeze-thaw cycles, shrink-swell cycles, natural erosion or deposition, etc. Landslides cause disruption to utility and transportation systems, loss of revenue for affected communities, loss of animals and damage to, or loss of, buildings that house people and animals. Associated dangers include damaged electrical, water, gas, and sewage lines. Damaged electrical wires and gas lines may start fires. Other long-term dangers include the continuous threat of landslides due to unstable land.

Government responsibilities

The main responsibility for disaster relief lies with the state governments, and the Government of India supplements the efforts of the state governments by offering logistic and financial support. As per the recommendations of the Eleventh Finance Commission, two schemes, namely, the Calamity Relief Fund (CRF) scheme and the National Calamity Contingency Fund (NCCF) scheme have been established for the period 2000-2001 to 2004-2005. Both these funds are available for meeting the cost of providing immediate relief to the victims of natural disasters. Each state has a CRF, and when disaster occurs 75% of the total budget for disaster management is provided by the central government and the remaining 25% by the state government. The NCCF provides assistance to the states in the event of severe natural calamities where the expenditure on relief exceeds the prescribed norms and cannot be met by the existing funds in the CRF of the state concerned. The state governments have a state cabinet and a state Crisis Management Group (CMG), headed by a chief secretary.

Role of veterinarians in disaster

During disasters, the role of veterinarians is to ensure high standards of animal health and to reduce mortality among animals. Veterinarians can play a major role in promoting local pre-disaster planning at community level, which places a high priority on facilitating livestock and pet evacuation. Heath suggests that an 'all hazards' approach would facilitate the integration of veterinarians into disaster management efforts. This approach is based on the concept that regardless of the impact of different types of disasters, the socio-economic consequences, including the economic impact on animal agriculture, are similar. Veterinarians have a role to play in all stages of disaster mitigation and management, but it is during relief efforts that they can play a crucial role in increasing the survivability of animals that are victims, and of those that are deployed in rescue teams. The contribution of veterinarians will be most effective if they integrate their expertise with other local, national and international groups and agencies involved in disaster management.

Conclusion

In developing countries, like India, disasters are a common phenomenon every year. The most badly affected are the poor and marginalised communities in India, who suffer most in terms of human and property loss when disaster strikes. Not only are they the worst hit, but also their capacity to recover from disaster is limited by the social, economic and political conditions in which they live. In many developing countries the institutional mechanisms for facing disaster

are not sufficient to meet the challenge. This results in the severe loss of human and livestock life which could be saved. to a greater or lesser extent, if preparedness, response and recovery mechanisms were in order. In terms of disaster preparedness, developing countries are well behind the developed nations. Thus, the measures for the care and rehabilitation of livestock suggested in this article are drawn from the experiences of developed countries.

Protecting and saving human life is the first priority in disaster relief and protecting property (which includes animals) is the second. Because of this, emergency management officials in India are not trained to deal with animals or to restore animal related business. This is something that requires more attention from the National Crisis Management Committee and the state CMGs, and livestock relief after natural disasters needs to be given greater emphasis. The disaster-prone states of India should also develop disaster mitigation and management plans for livestock. Experience has shown that disaster management to date has been reactionary rather than proactive and preventative. Livestock relief plans should be developed as a part of preparedness activities and not during a natural disaster.

Disaster management should be integrated with long-term development planning, and a holistic approach, rather than a segmented approach, should be taken, with popular participation involving local communities. Development and disaster management planning should go hand-in-hand and development models must have in-built components for disaster reduction, mitigation and preparedness.

The findings, interpretations, and conclusions presented in this paper are entirely those of the authors and should not be attributed in any manner to the organisations to which they belong.

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