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Agro-terrorism: A New Peril towards Global Food Security

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Abstract

In most of the countries, agricultural systems are the backbone of main economic sectors contributing to political stability. In a country, like India, whose economy is largely dependent on agriculture produce and exports, any such malicious attack can grossly destabilise the socio-economic structure. In many countries food price are kept very low due to production efficiencies and disease controls. So, the concept of "Agro-terrorism" or agricultural terrorism starts to assume vital importance since a disease outbreak in an agricultural system could lose billions of dollars, cause poor production efficiency, drive higher food prices, exports of valuable commodities will be stop, and so create economical instability. What is really needed is to treat the agro-terrorism menace at par with that of other kinds of terror and evolve a well-conceived strategy to deal with it. For this, anti-agro-terrorism models from other countries can be studied and adapted to the Indian situation. Such an effort is worth it even if the threat perception ceases to exist. A constant surveillance against pests and diseases of crops and animals will help combat even natural epidemics that often take a heavy toll on crop and livestock output.

Introduction

In the last few decades, Government leaders, media, Scientists, scholars and national security analysts have all called attention towards the potential threats of terrorism as a result of political instability (Stack *et al.*, 2010). After analysis of various facts and figures it is presumed that terrorists will use weapons of mass destruction (WMD), particularly biological and chemical, to cause widespread diseases and destructions (Cameron and Pate, 2001). Although biological agents have received significant attention, analyses have focused on the use of these agents to harm or injure mankind. The intentional contamination of crops by biological agents has got very less attention in agricultural systems. In most of the countries, agricultural systems are the backbone of main economic sectors contributing to political stability. In many countries food price are kept very low due to production efficiencies and disease controls. So, the concept of "Agro-terrorism" or agricultural terrorism starts to assume vital importance since a disease outbreak in an agricultural system could lose billions of dollars, cause poor production efficiency, drive higher food prices, exports of valuable commodities will be stop, and so create economical instability. So the global food chain supply is a main target for anyone who wants to cause, fear, panic, death, destruction, or economic disruption. Efforts to recognize that terrorist who want to harm our homeland security consider a wide array of methods to inflict damage, so they persistently seek information and intelligence. This manuscript accounted the plant and animal

possess threats to food security and agriculture, the effect of disease outbreak on the food supply chain, and the economic impact of perilous plant and animal pathogens.

Types of terrorism

There are several components of terrorism. Bio-terrorism, often defined as the use of biological agents that target humans, plants or animals. Agro-terrorism is defined as the use of biological (to include toxins), chemical, or radiological agents targeting agriculture or its components and its adverse impact on livestock, fish, the food supply, crops, industry, workers, the consuming public, and our economy. There are other components such as conventional, radiological, nuclear, chemical and cyber terrorism that are typically directed at the human population.

Dangers from Exotic Pests and Diseases

In case of crops, the important diseases include bunchy top in banana, potato wart, downy mildew in sunflower, chickpea blight, San Jose scale in apple, coffee berry borer, the invasive weed *Lantana Camara* and more recently the biotype 'B' of whitefly *Bemisia tabaci* (most efficient vector of the tomato leaf curl virus).

Agro-Terrorist Weapons

Diseases that have the potential to be used as bio-weapons by agro-terrorists are listed below:

- Bacterial and fungal pathogens- Fire blight in apple and pear, Black pod in cocoa, Powdery rust in coffee, Sudden death in oak.
- Virus, viroid and phytoplasma- Barley stripe virus, Coconut cadang-cadang, Palm lethal yellowing.
- Parasitic nematodes- Pine wood nematode, Red ring nematode in coconut.
- Insect pests- Mediterranean fruit fly, Cotton boll weevil, Russian wheat aphid.

Threat to Food Supply Chain

Advancements in technology and globalization have enhanced the ability of any country's food supply or agricultural products to local, nearby regions, and faraway lands. Agriculture as a significant portion of their gross domestic product, disruptions anywhere along the food chain can lead to food insecurity and national instability (Flory, 2015). The global population expected to reach 9.6 billion by 2050, the challenge of optimum nutrition is compounded by the potential threat to any part of the supply chain (Ades et al., 2013). Thus, the farm, as well as processing and packaging of products, movement to distribution centers, transport to retailers and wholesalers, and lastly conveyance

to the consumer all comprise the global food supply chain. At any moment within the supply chain, there is always the risk of threat for an attack, destruction, disruption, and contamination and introduction of pathogens into the food or animal products, including the integrity of the food itself.

Economic Impact

It could threaten public health and cause farmers to lose animals and crops. Businesses and consumers will pay the large price. Small towns could be wiped out, and the food supply could be in peril for a long time. The government and export market could be destabilized.

Integrated Pest Surveillance System

To deal with the agro-terrorism, an organized system dedicated to carry out pest risk analysis against identified quarantine pests need to be established which will perform field inspection and pest survey activities for the detection, delimitation or monitoring of established pests, detect new pests, establish specific systems for identification, establishment and maintenance of -pest-free areas according to international standards.

Prevention and Early Detection

To prevent Agro-terrorism, Villagers should be properly educated and sensitized to ward off intentional attacks by suspected agro-terrorists on their crops/ animals/ livestock. If possible equip them with emergency curative measures to cope up with such a situation. DDMA should ensure that there is enough stock of disinfectants and vaccines for animals and chemicals, bio-pesticides and bio-control agents to save crops from any suspected attack. For imports, the quarantine network needs to be stringent especially at land frontiers of the country through which agro-terrorists can easily bring in exotic pests.

Need of Bio-security

Biosecurity is nothing but is a developing field which focused on preparing for and responding to bioterrorism. It comprises surveillance, bio-detection, early warning systems, planning and preparedness, and consequences management. Biosecurity attempts to ensure that ecologies sustaining either plants or animals are maintained. In general, bio-security involves the policies and measures taken to protect human, natural resources, plants and animals against potentially harmful agents and diseases from foreign countries. Biosecurity protects heritage and economy.

Conclusion

Food is essential for life. However, its regular supply is at stake due to attack of imperious pathogens and pests. The pathogens nature, manner of dissemination, the

efficacy of surveillance systems, and the competency of first responders serve as critical indicators to the lethality of the attacks. Thus, the key to the effective defense against an attack using biological agents is to have in place highly functioning public health surveillance and education systems and an appropriate healthcare infrastructure to mitigate the consequences in the event that an attack takes place. Food supply chain inherently possesses substantial concerns. Several weather effects like global warming and inclement weather, water conditions, aquaculture, and its effect on food and livestock production, population growth and a demand for more food and animal products. Also, renewable agriculture and food systems, increasing homogeneity of world food supplies, fertilizer efficacy, greenhouse gas emissions, and the protection of valuable ecosystems represent some of the

greatest challenges. With the growth in global population and the significance of food and agricultural needs, greater attention must be placed on the threats to crops, livestock, and byproducts within our food supply chain. Therefore, effective surveillance, improved knowledge, and early responses are needed to protect the food supply and economic growth.

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