



## Agroterrorism; Iranian Criminal Policy

Seyed Reza Ehsanpour\*<sup>1</sup>; Nafiseh Hashempour<sup>2</sup>

<sup>1</sup> Assistant Professor, Law Department, Shahed University, Tehran, Iran

<sup>2</sup> Ph.D candidate, Department of Agronomy, Islamic Azad University, Karaj Branch. Karaj.Iran

Email: Ehsanpour@gmail.com\*, Nafisehashempour@gmail.com

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### **Abstract**

**Background and Aim:** This article presents some perspective on bioterrorism by focuses on Agroterrorism cases. This study focuses attention on the issue of Agroterrorism and discusses criminal response against it in Iranian Criminal law.

**Materials and Methods:** A handful of studies and researches have been reviewed for preparing this study.

**Ethical Considerations:** Honesty in the literature and citation analysis and reporting were considered.

**Findings:** Agroterrorism attack may results in the agricultural and food industries, loss of confidence in government, and possibly human casualties. The fear of a bioterrorist attack in the world have changed public health in countries. Based on these facts, a sharp and quick response including criminal responses against this kind of terrorism to protect the safety of community as well as health policies is necessary.

**Conclusion:** Agroterrorism is a new form of terrorism which falls in the realm of bioterrorism. This kind of offence against the community attracts policy makers' high level of attentions. Iranian legislator amongst other policies prosecute offenders with article 286 of Penal Code: "Corruption on Earth". This question that this title is appropriate to combat Agroterrorism depends on the extent of the behaviors results. This title belongs to situation that vast geographic area or huge number of populations was affected due to terroristic attacks. The punishment of offender(s) is capital punishment.

**Keywords:** Agroterrorism; Bioterrorism; Criminal Policy; Safety; Health; Iranian Law

## **Introduction**

The word “*bioterrorism*” refers to biological agents (microbes or toxins) used as weapons to further personal or political agendas. Acts of bioterrorism range from a single exposure directed at an individual by another individual to government-sponsored biological warfare resulting in mass casualties.<sup>1</sup>

Bioterrorism differs from other methods of terrorism in that the materials needed to make an effective biological agent are readily available, require little specialized knowledge and are inexpensive to produce.<sup>2</sup>

Biological warfare has been used for centuries to sabotage and weaken the enemy.<sup>3</sup> This has been and still is a kind of terrorism that could potentially be used by various actors with different agendas.

The potential of terrorist attacks against agricultural targets (Agroterrorism) is increasingly recognized as a national security threat.

The availability of chemical, biological, radiological, nuclear, or explosive (CBRNE; weapons of mass destruction) agents and their unconventional manipulation pose a threat to any country’s critical infrastructure. Much of the public and international discussion over terrorist methods does not substantially weigh attacks on food and agriculture.<sup>4</sup>

Agroterrorism is a subset of bioterrorism, and is defined as the deliberate introduction of an animal or plant disease with the goal of generating fear, causing economic losses, and/or undermining stability.<sup>5</sup>

**Ethical Consideration:** Honesty and ethics have been observed in searching and referencing.

## **Materials and Methods**

The material and literature used for this article were limited to open-source information, such as scientific publications, reports, public web pages, and media, articles regarding cases of bioterrorism and agricultural terrorism. Several non–open-access bio crime databases exist, but these were not used for this article.

This study relied upon open-source literature and information from government and non-governmental reporting agencies available through the world-wide web, university web-based databases, and subject matter experts, including research institutions and scientific research laboratories.

## **Findings**

### *1- Definitions and Types*

Bioterrorism is a specific form of terrorism involving the deliberate environmental release of pathogens (viruses, bacteria, parasites, fungi, or toxins) causing illness or death in people, animals, or plants. Dissemination is accomplished through the release of aerosols, as an addition to an explosive, as a

food borne substance, through deliberate human interaction, through a vector, zoonotically, or through food and water contamination.<sup>6</sup>

Bioterrorism is the threat or use of biological agents by individuals or groups motivated by political, religious, ecological, or other ideological objectives.<sup>7</sup>

Another kind of bioterrorism is Biocrime. This terrorism focuses on the threat or use of biological agents for individual objectives such as revenge or financial gain.<sup>8</sup>

### **The environmental of pathogens causing illness or death in people are consisting:**

**Parasites:** Cysticercoids/taeniasis, trematodosis, echinococcosis/ hydatidosis, toxoplasmosis, and trichinellosis, which cause seizures, headaches, and many other symptoms.

**Fungi:** Dermatophytoses, sporotrichosis, which cause itching, redness, scaling, and hair loss

**Viruses:** Rabies, Avian Influenza, Crimean-Congo hemorrhagic fever, Ebola, and Rift Valley Fever, transmissible through bites from infected animals and leading to high mortality rates in animals and humans. Many viruses maintain short incubation period, 2 to 6 days, for example, and often reveal symptoms such as fever, headache, myalgia and backache. Other symptoms include diarrhea, vomiting, rash, and decreased functioning of the liver and kidneys. Some viral diseases are transmitted from animals to humans, often through insect or mosquito bites. Foot and mouth disease (FMD) is a severe, highly contagious viral disease which afflicts ruminants (e.g. cows, sheep, goats, deer, and swine). FMD affects the tongue, lips, mouth, mammary glands, and hooves, with vesicles, leaving weakened, lame livestock that is unable to produce milk or meat. Chronic wasting disease is a virus which affects the neurological system of wildlife and often leads to destruction of deer and elk herds.<sup>9</sup>

**Some bacteria causing illness and death in people are including:** Anthrax, brucellosis, Escherichia coli, plague, tularemia, salmonellosis, campylobacteriosis, shigellosis and leptospirosis, which cause fever, diarrhea, abdominal pain, malaise and nausea. Yersinia pestis may be transmitted to humans through a rat flea and rodents, and may take the form of a pneumonic, septicemic, and bubonic plague. The plague can also be transmitted when respiratory droplets of infected individuals or animals, including domestic cats, are inhaled.<sup>10</sup>

The lethality of the plague is between 50 percent and 100 percent of the infected population, when not properly treated.<sup>11</sup> The buboes (swollen, painful lymph nodes) may affect the groin area, armpits, or neck and progress to tissue bleeding, and gangrene. The WHO reported a 2014 bubonic plague in Madagascar, which injured 100 people and led to the deaths of 40 more, indicating a deficiency in security systems to control a centuries-old disease.<sup>12</sup>

**Brucellosis:** An epidemic of brucellosis in Northern Ireland peaked in 2002 when an average of 60 herds of livestock was destroyed to prevent further infections. However, in 2010, a fetus infected with brucellosis was found in a field among young heifers; it was covered in feed, obviously meant to attract cattle and cause infection.<sup>13</sup>

According to the World Health Organization, brucellosis “causes flu-like symptoms, including fever, weakness, malaise, (abdominal and back pain, cough, headaches, night sweats) and weight loss,” and in animals, it can “lead to decreased milk yields, infertility, weak calves and serious financial loss.” Its incubation period is between 5 and 30 days. Infections have reached persons from 100 countries throughout the world, often in Latin America, the Middle East, India, Greece, and Spain. Brucellosis is transmitted through eating or drinking unpasteurized dairy products from infected animals, unpasteurized cheeses, and contact with infected animals and meats.

There are some Unconventional agents. A kind of these agents is Bovine Spongiform Encephalopathy (BSE) (potential cause of Creutzfeldt - Jakob disease) leading to degenerative neurological disease and is inevitably lethal in humans.<sup>14</sup>

Plant pathogens are generally more technically difficult to manipulate. Some plant pathogens may require certain environmental conditions of humidity, temperature, or wind to take hold or spread.

Other plant diseases may take a longer time than an animal disease to become established or achieve destruction on the scale that a terrorist may desire.

## **2- Brief History**

### *2-1- A Brief History of Biological War and Conflict*

The use of chemicals, infectious diseases and other pathogens on crops, animals, and humans is not a new phenomenon. The early documented use of fomites as a biological agent to harm a population involves the plague. "During the siege of Kaffa (now Feodosia, Ukraine) in 1346, the attacking Tatar force experienced an epidemic of bubonic plague".<sup>15</sup> Attempting to turn the infection into a defeat for their enemies, the Tatars catapulted bubonic-diseased bodies of their fallen combatants into Kaffa, where Christians had received refuge.<sup>10</sup>

The military use of biological agents, where targets of agents are predominantly soldiers, governments, or resources, that might hinder a nation's ability to attack or to defend itself that this biological terrorism is called biological warfare.<sup>8</sup>

Those weapons that achieve their intended effects through the infectivity of disease-causing microorganisms including viruses, infectious nucleic acid, and prions. This biological terrorism is called biological weapons.<sup>16</sup>

Currently, epidemiologists agree that catapulted, diseased cadavers could not have transmitted the plague because the parasites require a living host.<sup>17</sup> In contrast to the beliefs at the time; the bubonic plague is now known to have been a natural occurrence, particularly given the environmental conditions upon which it propagated.

However, the first recorded biological agent "weaponized" for a nefarious purpose was the smallpox virus, transferred to blankets then given to Native Americans in North America during the French and Indian Wars (1754-1767).<sup>10</sup>

Several religious groups and individuals, including Al-Qaida, have shown interest in acquiring biological weapons. According to Al-Qaida, it is a duty to acquire weapons to fulfill their mission. In addition to acquiring biological weapons, the group has tried to acquire other CBRNE weapons, including uranium and the chemical warfare agent VX, among other.<sup>18</sup> An example of the use of biological weapons is the actions by the Rajneeshee cult in July, August, and September 1984 using the bacterium *Salmonella typhimurium*.<sup>19</sup> It has been reported that Osama bin Laden also attempted to acquire biological weapons in Sudan and Afghanistan in 1999.<sup>1</sup> At the beginning of 2012, 2 issues (Nos. 8 and 9) of the radical Islamic magazine *Inspire* were published.<sup>20</sup> The first includes an article written by Sheikh Anwar Al Awlaki aimed at providing advice and guidance on questions submitted by readers. The article is *inter alia* devoted to justifying the use of poison and biological and chemical agents to carry out attacks against

population centers in countries that are in conflict with Muslims; the United States, the United Kingdom, and France are mentioned specifically. Al Awlaki states, “The use of poisons or chemical and biological weapons against population centers is allowed and is strongly recommended due to its great effect on the enemy.”<sup>20</sup>

## *2-2- A Brief History of Agroterrorism*

Ecoterrorists and animal rights activists have directed their attacks against the agriculture infrastructure, and these attacks have involved violence and vandalism rather than biological agents.<sup>21</sup>

Attacks against agriculture are not new, and have been conducted both by nation-states and by substate organizations throughout history.<sup>22</sup>

At least nine countries had documented agricultural bioweapons programs during some part of the 20<sup>th</sup> century (Canada, France, Germany, Iraq, Japan, South Africa, United Kingdom, United States, and the former USSR). Four other countries are believed to have or have had agricultural bioweapons programs (Egypt, North Korea, Rhodesia, and Syria).<sup>23</sup>

British commanders wanted to reduce the size of the Native American tribes due to their perceived hostilities to the British, so they transferred the virus through the linens they gifted. It is not known how effective the blankets were in killing the intended targets, but there were no known cures for smallpox at the time, and the dousing of cold water on the pox, a Native American ritual believed to control the disease, had no healing effect. Nonetheless, complications to the epidemiological investigation exist because there were outbreaks of the measles in 1759, as well as dysentery and flu, also potentially fatal. Importantly, the smallpox virus is more effective when dispersed through respiratory transmission, and the virus may not live more than 7 days under the conditions prevalent in 1754.<sup>24</sup>

Despite extensive research on the issue, however, biological weapons have been used rarely against crops or livestock, especially by state actors.<sup>25</sup>

Much later, during the Cold War, biological warfare programs, capable of reaching food and agriculture industries within any country, were present in many advanced and developing countries.<sup>10</sup>

## ***Discussions***

**An important dimension of agricultural terrorism is Food terrorism.** It is an act or threat to deliberately contaminate food for human consumption with biological, chemical, or physical agents or radio nuclear materials for the purpose of causing injury or death to civilian populations and/or disrupting social, economic, or political stability.<sup>26</sup>

The U.S. and Russia are believed to have stockpiled wheat stem rust spores, capable of destroying an entire wheat crop. Likewise, China’s biological weapons (BW) activities were reportedly extensive and often multipurpose, aimed at multiple potential targets. In recent times, China’s compliance with international conventions against biological and chemical weapons involved the destruction of about 350,000 chemical munitions left on its soil by Japan after WWII.<sup>27</sup>

The zoonotic diseases used by the military were typhus, cholera, plague, anthrax, typhoid fever, glanders, and dysentery.<sup>10</sup>

Thus, in recent decades, using biological weapons against agricultural targets has remained mostly a theoretical consideration. With the ratification of the Biological and Toxin Weapons Convention in 1972, many countries, including the United States, stopped military development of biological weapons and destroyed their stockpiles.<sup>28</sup>

Terrorists can choose from a large menu of bio-agents, most of which are environmentally hardy, are not the focus of concerted livestock vaccination programs, and can be easily smuggled into the country. The food chain offers a low-tech mechanism for achieving human deaths. Many animal pathogens cannot be transmitted to humans, which make them easier for terrorists to work with.

Finally, because livestock are the primary vector for pathogenic transmission, there is no weaponization obstacle to overcome.<sup>29</sup>

A subset of bioterrorism, defined as then deliberate introduction of animal or plant pests with the goal of generating fear, causing economic damage, and/or undermining social stability.<sup>30</sup>

Agroterrorism is a subset of the more general issues of terrorism and bioterrorism. People more generally associate bioterrorism with outbreaks of human illness (such as from anthrax or smallpox), rather than diseases first affecting animals or plants. Agriculture has several characteristics that pose unique problems for managing the threat.<sup>28</sup>

Agroterrorism is a subset of bioterrorism whose goal is agricultural sabotage, and an Agroterrorism group may choose to use biological weapons for their purposes.<sup>31</sup>

Biological attacks on crops and livestock may not be immediately apparent.

Therefore, existing frameworks for detecting, identifying, reporting, tracking, and managing natural and accidental disease outbreaks are being applied to combating Agroterrorism. Appropriate responses are being developed based on specific pathogens, targets, and other circumstances that may surround an attack.<sup>28</sup>

It is relatively easy to acquire these kinds of biological agents directly from the environment. A group or an individual does not necessarily have to go through laboratories to acquire these agents, and many are not pathogenic for humans. At the same time, small groups of terrorists or even lone wolves could, in theory, acquire and use this kind of agent more easily than other biological agents that are pathogenic to humans. In addition, the risk of being caught in this kind of operation is low, and it has sometimes been difficult to distinguish a naturally occurring epidemic from an attack using biological weapons.<sup>32</sup>

Researchers and policy analysts define the global food supply chain as the aggregate of agricultural production, industrial processing, and wholesale or retail distribution. Also, the full complexity of the global supply chain is appreciated when additional links and stages are considered, such as “arable land, water and genetic resources (a limited biodiversity)”.<sup>33</sup>

Despite the ease and implications of a successful attack, Agroterrorism is unlikely to constitute a primary form of terrorist aggression because it lacks a single, highly visible point of focus for the media (a primary consideration in any terrorist attack).<sup>29</sup>

Attacks against agriculture are not new, and have been conducted or considered by both nation-states and substate organizations throughout history.<sup>28</sup>

However, disrupting the food sector could well emerge as a viable secondary modus operandi to further destabilize an already disoriented society after a conventional terrorist campaign. Being able to use cheap and unsophisticated means to undermine a state's economic base gives this form of aggression a high cost/benefit payoff that would be very useful to groups faced with overcoming significant power asymmetries.<sup>29</sup>

When a foreign pathogen is introduced into the food and agriculture sector, plant and animals may be infected, but epidemics may follow, particularly if the environmental conditions allow it. "Historically, (the conditions for an epidemic, or pandemic, if localized to a particular global region) favor an isolated environment with animal or insect carriers, unsanitary conditions, and large human populations".<sup>34</sup>

"For countries with agriculture as a significant portion of their gross domestic product, disruptions anywhere along the food chain can lead to food insecurity and national instability".<sup>35</sup>

Some examples of bioterrorist incidents in which political groups used biological agents include:

Dark Harvest, which spread dirt contaminated with *B. anthracis* spores (October 10 and 14, 1981, UK), 47,51 the Red Army Faction (1980s, Germany),<sup>1</sup> and the Minnesota Patriots Council (1992, USA).<sup>47</sup> Actions in which medical waste marked with swastikas was found at Temple Beth El in Stamford, CT (August 17, 1999, USA), and Temple Beth El in Norwalk, CT (August 18, 1999, USA), were probably actions by unidentified right-wing groups.<sup>19</sup>

Agricultural production is geographically disbursed in unsecured environments (e.g., open fields and pastures throughout the countryside). While some livestock are housed in secure facilities, agriculture in general requires large expanses of land that are difficult to secure from intruders.<sup>28</sup>

The costs of the preparation of bioweapons are often much less than what it would cost, for example, to use nuclear bombs of various types. "Experts have estimated that for a terrorist group to develop a nuclear weapon could cost them a billion dollars...But to develop a very good biological arsenal you would need about ten million dollars and a very small lab and a master's degree in chemical engineering."<sup>36</sup>

Because of the relatively low cost and amount of effort required in Agroterrorism, some terrorist groups may direct their attacks more frequently toward agricultural production in the future. In addition, globalization, with increased importation of food, global food trading, and transportation of animals, have made modern societies more vulnerable to terrorist attacks.<sup>37</sup>

Agro terrorism may include the use of any pathogen to contaminate a nation's food supply, the supply chain, or the spread of contagious diseases through the food supply.<sup>10</sup>

The terrorism agenda has changed through time and so have the instruments of terrorism. An attack with biological weapons would result not only in disease and death, but, depending on the society, also in panic, fear, disruption of economic activity, and more. Recent outbreaks, even though their origin was natural, have shown us the enormous effects of such an incident on society. The effects of an outbreak will not be limited to the direct economic impact on agricultural production but will also incur indirect economic losses, including disruption of trade. And experience has shown that the costs of recovery from an outbreak could be higher than those of the outbreak itself.<sup>38</sup>

Several factors affect the classification of biological agents. They include the ease of transmission, their effect on mortality and the potential for a major public health impact, the level of social disruption and panic, and the manner of response needed by public health and emergency personnel. Category A agents, the most dangerous, includes smallpox, anthrax, plague, clostridium botulinum toxin (botulism), tularaemia, and viral hemorrhagic fevers, such as Ebola. Category B agents are moderately easy to disseminate, cause moderate morbidity and low mortality, and require enhanced disease surveillance.

Examples include ricin toxin, salmonella species, and other agents. Category C pathogens are emerging strains which may be engineered for mass dissemination and future consequences; they include nipah virus, hanta virus, and tuberculosis.<sup>10</sup>

**Biosecurity Policies** is a strategic and integrated defense approach that encompasses the policy and regulatory frameworks... (Which) analyze and manage risks in... food safety, animal life and health, and plant life and health, including associated environmental risk”.

It includes efforts to control plant and animal pests and disease, zoonoses, the use of genetically-modified organisms and their products in an environment, and the introduction of invasive alien species and genotypes.<sup>39</sup>

Increased knowledge, awareness, and effective responses to food and agricultural threats can be attributed to the improved public health signal detection, such as PulseNet, the regulatory reporting requirements for food products in the U.S.<sup>10</sup>

Amongst others, **one of the most important strategic ways to combat Agroterrorism is criminalizing these behaviors.** Iranian Criminal law has no specific provisions to make a punishment for these acts but one can prosecute the offenders based on general criminal titles like “Corruption on Earth” (Ifsad Fil Arz).<sup>40</sup>

According to Art 286: “ *Any person, who extensively commits felony against the bodily entity of people, offenses against internal or international security of the state, spreading lies, ... , distribution of poisonous and bacterial and dangerous materials, ... , [on a scale] that causes severe disruption in the public order of the state and insecurity, or causes harsh damage to the bodily entity of people or public or private properties, ... , shall be considered as **mofsed-e-fel-arz** [corrupt on earth] and shall be sentenced to death.*”

The focus in this article is especially on the sentence: “*distribution of poisonous and bacterial and dangerous materials*” which punishes agro terroristic acts by death penalty. Article 286 belongs to situation that vast geographic area or huge numbers of populations were affected due to terroristic attacks.

## Conclusion

Attacks against people and the infrastructure of their societies through the release of pathogens directed at food and agriculture are a compelling threat because food products are essential to sustain life. The global food supply chain inherently possesses substantial concerns. Several include the effect of 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, increasing rural development, greenhouse gas emissions, and the protection of valuable ecosystems represent some of the greatest challenges.



Agroterrorism has not been a serious problem in the period from 1945 to 2012. This might be the result of a lack of empiric data. In addition, the open-source information and the reliability of the references vary in quality.

The attackers had various motives for the attacks, but all are related to political interests, including sabotage for economic gain. Atypical biological weapons or non-high-risk agents were used in these attacks. The lessons learned from this study should be used to improve future preparedness planning and the development of countermeasures.

Integrating agriculture and food safety measures would also reduce jurisdictional conflicts and eliminate unnecessary duplication of effort.

To compound this complex system, there is a growing threat of unorthodox terrorist acts and disrupting any part of the food supply chain may bring a devastating economic problem to a global region. 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 their byproducts within our food supply chain. Thus, effective surveillance systems, improved knowledge of pathogens, and efficient responses are needed to protect the food sources which sustain our lives.

One of the most important strategic ways to combat Agroterrorism is criminalizing these behaviors. Iranian Criminal law has no specific provisions to make a punishment for these acts but one can prosecute the offenders based on general criminal titles like “Corruption on Earth” (Ifsad Fel Arz) with death penalty.

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