



AGRICULTURAL CRIMES: A THREAT TO THE HUMAN RIGHT TO FOOD – THE CASE OF AGROTERRORISM

Benguettat Khadidja

Doctor of Law, Lecturer A, Faculty of Law and Political Sciences, University of Mostaganem, 27000, Algeria

✉ khadidja.benguettat@univ-mosta.dz

ORCID ID / 0009-0005-7624-1200

ARTICLE INFO

Article History:

Received 30.12.2024
Accepted 10.03.2025
Published 31.03.2025

Keywords:

Right to food, Agro-crimes,
Agro-terrorism, Agriculture,
Food security

ABSTRACT

Several biological terrorist incidents targeting the agricultural sector and food processing and distribution systems have significantly heightened global concerns about food security. This situation has intensified the focus on protecting the food supply chain, which has become an attractive target for bioterrorists. Such acts constitute a clear violation of the human right to food, particularly in countries that heavily depend on agriculture to meet their nutritional needs. The right to food is a fundamental human right, affirming that every individual is entitled to sufficient and nutritious food, free from discrimination. When agriculture is subjected to terrorist attacks, both the availability and the quality of food are jeopardized. Agro-terrorism can have severe repercussions on public health, the economy, and political stability, particularly in the absence of national policies and international legal frameworks imposing criminal penalties on biological attacks against non-human targets. This situation necessitates the establishment of an international monitoring system, the strengthening of preventive measures, and efforts to counter agricultural sabotage, all aimed at mitigating the negative impacts of agro-terrorism on the right to food and nutrition. Moreover, it is crucial to intensify efforts to ensure accountability and prevent the use of biological weapons, as human rights must be prioritized more than ever.

INTRODUCTION

Agro-crimes and agro-terrorism are two distinct terms. Agro-crimes refer to illegal activities that impact the agricultural sector, such as tampering with agricultural products, pesticide fraud, or deliberately damaging agricultural resources, all of which harm the agricultural economy or the environment. In contrast, agro-terrorism involves the use of biological weapons or deliberate attacks targeting crops or livestock to cause chaos or threaten food security. These attacks are often politically or socially motivated, seeking to exert influence by disrupting agriculture. In essence, agro-terrorism is a specific type of agro-crime but is characterized by its particular goals and methods. The threat of biological terrorism looms larger than ever, especially with growing concerns about anthrax, smallpox, and plague, as well as reports suggesting that some of the hijackers involved in the attacks on the World Trade Center and the Pentagon had a special interest in crop-duster planes, which could potentially be used to spread aerosolized diseases. This situation has led some countries to strengthen their defenses against biological terrorism.

Despite the seriousness of this issue, many nations have not paid sufficient attention to agricultural biological warfare or bioterrorism in general. There has also been little focus on the role and responsibilities of both the public and private sectors in deterring and responding to potential attacks. Few countries fully appreciate the dangers posed by biological terrorist attacks against the food and agricultural infrastructure, as attention is often directed solely toward terrorism targeting “civilian objectives”.

Agriculture is a critical infrastructure for many nations worldwide. As one of the most productive and vital sectors globally, agriculture has made officials recognize that the vast network of food and fiber production, processing, distribution, and retailing is a potential target for hostile actors using biological agents for political, economic, or criminal purposes. Even the mere threat of such an attack can undermine consumer confidence, disrupt commodity markets, and cause significant economic havoc.

This paper explores the nature and threat of

agro-terrorism and examines possible solutions for addressing this threat and mitigating the impact of biological attacks on food and agricultural infrastructure. The focus of this paper is particularly on agro-terrorism and its negative impacts on the human right to food.

Thus, the central research question is: To what extent can agro-terrorism affect the right to food? And could this impact extend to other areas?

To answer this question, the study employs a descriptive-analytical method by exploring agro-terrorism and the right to food, as well as examining the implications of agro-terrorism on food security and the right to food.

The study will be divided into two sections. The first section will cover the general framework of agro-terrorism and the right to food, while the second section will address the impacts of agro-terrorism on the right to food.

1. THE GENERAL FRAMEWORK OF AGRO-TERRORISM AND THE RIGHT TO FOOD

In the main body of the text, the content of the issue is presented, where an important place is given to the description of the research and analysis of outcomes, the process of research itself, and coherent analysis, according to which theoretical conclusions, interim results and overall outcomes are shown. The main part of the text is divided into structures (chapter/subchapter, paragraph, etc.), which makes the article easier to understand.

Agro-terrorism, as a form of biological terrorism, poses significant risks to human life by causing the death or disease of livestock and crops and threatening the right to food. Agro-terrorism is closely tied to this fundamental human right, as it can lead to clear violations. Negative impacts on agricultural production can result in food insecurity, jeopardizing individuals' and communities' ability to access sufficient and nutritious food. Therefore, it is essential to study both agro-terrorism and the human right to food.

1.1. Agro-Terrorism

The risk of terrorism targeting plants and animals is heightened by the vulnerability and accessibility of agricultural sites, as well as the ease of obtaining and spreading infectious agents. This form of terrorism involves targeting agriculture through the use of harmful viruses or bacteria, leading to the destruction of agricultural production and environmental damage.

1.1.1. Historical Perspective on Agro-Terrorism

Biological warfare is not a modern phenomenon. Throughout history, there have been numerous examples of using lethal or incapacitating biological agents against enemies. Two thousand years ago, the Romans threw corpses into enemy wells to poison drinking water supplies.

During the Siege of Caffa in the 14th century, the Tatars catapulted plague-infested corpses into the city, possibly triggering the outbreak of the bubonic plague that swept across medieval Europe, resulting in 25 million deaths. Historians believe that the smallpox epidemic that devastated Native American populations during the French and Indian War was deliberately caused by the British, who distributed smallpox-contaminated blankets to tribes thought to be loyal to the French.¹

The term “biological terrorism” was coined in the late 19th century in the West. Initially, it referred to biological methods for waging war against agricultural pests, implying a metaphorical “war” rather than an actual conflict between nations. The term later evolved to encompass the use of, or plans to use, microbiology in both declared and undeclared wars.²

The idea of using biological weapons against crops or agricultural products is also not new. Since the 1920s, France, Great Britain, Germany, and Japan conducted research on biological weapons that included agricultural components, con-

tinuing through World War II. They studied plant and animal diseases, pests, and herbicides.³

During World War II, Germany planned to target British potato crops with Colorado potato beetles. According to some naturalists, the presence of these beetles in England indicated that a small-scale attack might have occurred in 1943, with the beetles released from aircraft. France’s biological warfare program, established in 1939, also focused on the Colorado potato beetle, studying its flight behavior at high altitudes. Almost all German biological research targeted England and the U.S., with an emphasis on diseases such as potato late blight (*Phytophthora infestans*), rice blast (*Piricularia oryzae*), and wheat rust (yellow and black) (*Puccinia striiformis* and *P. graminis*), along with pests like the cabbage seedpod weevil (*Ceuthorrhynchus assimilis*). Japan, meanwhile, explored the effects of fungi, bacteria, and nematodes on various crops in Manchuria and Siberia. Japan had begun stockpiling grain rust spores, intending to attack American and Soviet wheat fields if the war continued.⁴

By 1944, the United States had initiated biological warfare research targeting humans, animals, and crops. Several pathogens were tested in the field, and some were stockpiled. The primary target of the U.S. agricultural warfare program was wheat in Ukraine and Chinese rice fields. Between 1951 and 1969, the U.S. stockpiled over 30 tons of *Puccinia tritici* spores, the fungus responsible for wheat stem rust. While these weapons were not practically deployed, the U.S. considered attacking Japanese rice fields in the final months of the war. Research continued in the early Cold War years, driven by the need to balance Soviet and Chinese programs with deterrence policies. On November 25, 1969, President Nixon officially renounced the U.S. offensive biological weapons program, and all stockpiles were subsequently destroyed.⁵ Terrorist actions targeting agriculture persisted into the 1970s and 1980s, with incidents such as Sri Lankan tea leaves being laced with cy-

1 Suffert, F. (2002). Plant Epidemiology: A New War Discipline? Spotlight on Agricultural Bioterrorism, An Emerging Challenge for Agronomic Research. *Courrier de l’environnement de l’INRA*, No. 47, p. 57.

2 Aucoeur, E. (2012). Justice and Ethics Seized by Biological Weapons. *Les Cahiers de la Justice*, 2012/3, No. 3, Dalloz, France, 2012, p. 127.

3 Suffert, F. (2002). Plant epidemiology: A new war discipline? Spotlight on agricultural bioterrorism, an emerging challenge for agronomic research. *Courrier de l’environnement de l’INRA*, No. 47, p. 57.

4 Raoult, D. (2003). How should France organize to face epidemics? *Mission Report*, France, pp. 35-36.

5 Suffert, F., *Ibid.*, p. 60.

anide in 1985 and Chilean grapes being tainted in 1989.⁶

Biological warfare in the agricultural sector is often a consequence of military, political, or ideological conflict.

1.1.2. Definition of Agro-Terrorism

The term “terrorism” does not appear in ancient dictionaries, likely because the concept of terrorism is a modern one, unknown in ancient Arab societies.⁷ However, as terrorist acts increased, defining the term became necessary. Terrorism is defined as “a set of acts carried out by certain groups in a specific state to achieve certain goals, whether political or economic, using various methods to instill fear in the opposing side, thereby forcing them to meet their demands”.⁸ This definition applies to international terrorism in general. Biological terrorism, specifically, is defined as “the deliberate use of microorganisms and their toxic by-products to cause disease or mass casualties among humans, or to damage human-held agricultural or livestock assets, contaminate water or food sources, or destroy the natural environment, potentially for years”.⁹ It is also described as “violent actions carried out by organized groups using biological weapons to achieve specific objectives”.¹⁰

Agro-terrorism is thus defined as “the intentional introduction of a biological agent or toxin, either targeting livestock or the food chain, with the aim of destabilizing society and/or generating fear. Depending on the pathogen or vector chosen, it is a tactic that can cause widespread socio-economic disruption or serve as a form of direct human aggression”. Another definition is “an act in which terrorists target livestock, crops, orchards, forests, fisheries, or food processing or distribution centers using biological agents or toxins to

further their political, economic, or social goals”.¹¹

Biological terrorism can take several forms, including direct attacks designed to kill as many people as possible, and attacks on the agricultural sector intended to cause economic chaos. Some security analysts view attacks on livestock and crops as ways to create economic turmoil without directly threatening human security. Others rank attacks on the agricultural sector among the most severe forms of biological terrorism.¹² There is no doubt that these attacks are highly dangerous, as they affect the fundamental right to food.

2.1. The Human Right to Food

The right to food is one of the fundamental human rights that has necessitated international intervention for its protection. It has been enshrined in numerous international and regional agreements and treaties. The right to food is interconnected with several key concepts, including food security, the food gap, and food sovereignty.

2.1.1. International Legal Foundation of the Right to Food

The Committee on Economic, Social, and Cultural Rights defines the right to food as follows: “The right to adequate food is realized when every individual, alone or in community with others, has physical and economic access at all times to adequate food or means for its procurement”.* Additionally, the UN Special Rapporteur on the right to food defines it as “the right to regular, permanent, and unrestricted access to food, either directly or through financial purchases. This food must be quantitatively and qualitatively adequate and sufficient, aligned with the cultural traditions of the people to whom the consumer belongs. It must also ensure a fulfilling and dignified life, both physically and mentally, for individuals and com-

6 Raoult, D., *Ibid.*, p. 35.

7 El-Kheshn, M.A.M. (2005). *Defining Terrorism Between Political Data and Objective Considerations*. Dar Al-Gama'a Al-Jadida, Egypt, p. 5.

8 Ayyub, M.M. (n.d.). *International Biological Terrorism*. *Journal of the Faculty of Law, University of Al-Nahrain, Iraq*, p. 128. Available at: <https://www.iasj.net/iasj?func=fulltext&ald=109235> [Last seen: 25.04.2024].

9 El-Kheshn, M.A., *Ibid.*, p. 42.

10 Ayyub, M.M., *Ibid.*, p. 128.

11 Hassler, L.K. (2003). *Agricultural Bioterrorism: Why it is a concern and what we must do*. USAWC Strategy Research Project, p. 3. Available at: <https://apps.dtic.mil/sti/pdfs/ADA415398.pdf> [Last seen: 23.04.2024].

12 Centre for Strategic and International Studies. (2006). *The biological weapons threat and non-proliferation options: A survey of senior U.S. decision makers and policy shapers*. Carnegie Endowment for International Peace, Washington, DC, p. 20.

munities, free from anxiety”.¹³ These definitions highlight three essential elements of the right to food: food availability, accessibility, and adequacy.

The right to food is a fundamental human right, protected by various international agreements and conventions. The Universal Declaration of Human Rights of 1948 explicitly recognized for the first time the right to food in international law in Article 25.¹⁴ Similarly, the 1966 International Covenant on Economic, Social, and Cultural Rights guarantees the right to food within the broader framework of the right to an adequate standard of living in Article 11.¹⁵ To implement the provisions of this article, the Committee on Economic, Social, and Cultural Rights adopted General Comment No. 12 in 1999, titled *The Right to Adequate Food*.¹⁶

The United Nations did not limit the protection of the right to food to general human rights instruments. It also ensured this right in specialized human rights agreements. For instance, the Convention on the Elimination of All Forms of Discrimination against Women recognizes the right to food for women in Articles 12 and 14.¹⁷ The Convention on the Rights of the Child also guarantees the right to food for children in Articles 24 and 27.¹⁸ Likewise, the Convention Relating to the Status of Refugees protects the right to food for refugees in Articles 20 and 23,¹⁹ and the Convention Relating to the Status of Stateless Persons extends this right to stateless persons in Articles 20 and 23.²⁰ Indigenous peoples are granted this right in the Convention concerning Indigenous and Tribal Peoples, particularly in Articles 14 and 19.²¹ All these international legal texts

demonstrate the importance of the right to food and the necessity of its protection.²²

2.1.2. Legal Mechanisms for Protecting the Right to Food During Crises

The Syracuse Principles, adopted by the UN Economic and Social Council in 1984, and the general comments issued by the UN Human Rights Council regarding emergencies and freedom of movement, provide reliable guidelines for government responses that restrict human rights for reasons of public health or national emergencies. These principles assert that any measure taken to protect the population and restrict individual rights and freedoms must be legal, necessary, and proportionate. Furthermore, emergencies must be time-bound, and any limitation of rights should account for disproportionate impacts on specific or marginalized groups.²³

During crises, human rights must be prioritized more than ever. States have clearly defined obligations under international law, including duties to respect, protect, and fulfill human rights. These obligations also entail non-discrimination and international cooperation.

States also have a general obligation to make progress, as quickly as possible and even with “limited available resources”, in implementing the right to food and other economic, social, and cultural rights.²⁴ This includes a primary prohibition on regression, meaning that if states adopt retrogressive measures, they must demonstrate that such measures are necessary, reasonable, and proportionate.²⁵

The Committee on World Food Security adopted the Framework for Action for Food Security

13 Office of the United Nations High Commissioner for Human Rights. (n.d.). Right to food. Available at: <http://www.ohchr.org/AR/Issues/Food/Pages/FoodIndex.aspx>.

14 United Nations. (1948). Universal Declaration of Human Rights.

15 United Nations. (1966). International Covenant on Economic, Social, and Cultural Rights.

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17 United Nations. (1979). Convention on the Elimination of All Forms of Discrimination Against Women.

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19 United Nations. (1951). Convention Relating to the Status of Refugees.

20 United Nations. (1954). Convention Relating to the Status of Stateless Persons.

21 International Labour Organization. (1989). Convention Concerning Indigenous and Tribal Peoples.

22 Benguettat, K. (2018). The Right to Food in the Framework of International Human Rights Law. *Al-Ustadh Al-Baheth Journal of Legal and Political Studies*, 12, University of M’sila, Algeria.

23 FIAN International. (2020). Legal Toolkit: COVID-19 and the Right to Food: A List of International Legal Obligations. Available at: https://www.fian.org/files/files/Legal_toolkit_Covid19-FR1.pdf [Last seen: 15.05.2024].

24 United Nations. (1966). International Covenant on Economic, Social, and Cultural Rights. Article 2(1).

25 FIAN International. (2020). Impact of COVID-19 on the Human Right to Food and Nutrition: Preliminary Monitoring Report. Available at: https://www.fian.org/files/files/Rapport_de_suivi_preliminaire_-_Impact_du_COVID19_sur_le_DHANA.pdf. [Last seen: 15.06.2024].

and Nutrition in Protracted Crises in 2015, a policy guideline aimed at ensuring food security during prolonged crises. This framework represents the first global consensus on supporting the progressive realization of the right to adequate food during extended crises. It emphasizes the need for consistency between humanitarian, developmental, and peacebuilding efforts that address the root causes of food insecurity and malnutrition through a human rights-based approach.²⁶

In addition, many countries are striving to integrate the right to food into their national legislation, which strengthens local legal frameworks to ensure individuals' access to food. Humanitarian and developmental programs, both international and local, play a vital role in promoting the right to food by providing food aid and support to affected nations and communities. The effective realization of the right to food requires sustained international cooperation and comprehensive policies aimed at ensuring food security, with a particular focus on the needs of the most vulnerable populations. Despite these efforts, the right to food remains subject to numerous violations. The impacts of agro-terrorism range from direct disruptions in food supply to significant health, economic, and social consequences, all of which threaten the human right to food.

3. THE IMPACTS OF AGRO-TERRORISM ON THE RIGHT TO FOOD

Agriculture is the primary source of food products, which is why agro-terrorism threats are predominantly directed at food. Such threats can have devastating consequences, as food-related risks are of utmost concern to the population. Food terrorism refers to the act or threat of deliberately contaminating food intended for human consumption with chemical, biological, or radiological agents to cause injury or death to civilians and/or disrupt social, economic, or political stability. Terrorists can attack our food supply at various stages along the food chain, targeting livestock and crops during production, harvesting, storage, or trans-

portation (this is known as agricultural or biological agro-terrorism). They can also target processed foods during manufacturing, processing, storage, transportation, distribution, or serving (this is referred to as terrorism targeting processed foods).²⁷

3.1. Risks of Agro-Terrorist Acts on Food Security

Terrorist attacks can lead to widespread destruction of crops, resulting in reduced food production and threatening the essential food supply. With declining food supplies, food prices can rise significantly, making it inaccessible to the most vulnerable populations and increasing the risk of hunger and malnutrition. Such acts also erode trust between consumers and farmers, potentially affecting market behavior, causing price fluctuations, and leading to inefficient storage strategies.

The 1996 World Food Summit, through the Rome Declaration on World Food Security and the *World Food Summit Plan of Action*, acknowledged the need to develop coordinated efforts to ensure food security at individual, family, national, regional, and global levels. However, the tragic events of September 11, 2001, in New York fundamentally changed the way the world views the risks associated with the deliberate contamination of food supplies. Many countries' agriculture and food processing and distribution systems have become targets for biological terrorism. A terrorist attack on food supplies can have serious public health and economic consequences, eroding public trust in the safety of the food consumed. Therefore, the term "food security" has expanded to include the protection of food from biological and chemical attacks.²⁸

Agriculture is a critical national infrastructure, serving as the driver of food availability and safety in any country—both of which are central to

26 FIAN International. Legal toolkit: COVID-19 and the Right to Food: A List of International Legal Obligations. Ibid.

27 Johns Hopkins Centre for Public Health Preparedness. (n.d.). Bioterrorism and Food Safety. Available at: https://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-public-health-preparedness/tips/topics/food_security.html [Last seen: 21.06.2024].

28 Badrie, N. (2004). Threat of Bioterrorism on Food Safety and Food Security to Caribbean Countries. Paper presented at the CAES: 25th West Indies Agricultural Economics Conference, Suriname, p. 126.

food security. There are five potential targets for agricultural biological terrorism: field crops, livestock, food products during processing or distribution, food products ready for wholesale or retail markets, agricultural facilities such as processing plants, storage facilities, wholesale and retail outlets, transportation infrastructure, and research laboratories.²⁹

Counter-crop warfare, which involves the use of biological agents and herbicides, can lead to devastating famines, severe malnutrition, the collapse of agricultural-based economies, and food insecurity. There are documented cases of using potato late blight, anthrax, yellow and black wheat rust, and insect infestations such as the Colorado potato beetle, rape seed weevil, and corn borer during the First and Second World Wars. Similarly, substances were widely used in the Vietnam War as counter-crop agents.³⁰

Food insecurity can also be considered a hidden form of economic biological warfare. Human health, food security, and environmental management are continuously threatened on both regional and global levels through the deliberate contamination of food with herbicides, pesticides, or heavy metal residues. Emerging and new plant diseases also affect food security and agricultural sustainability, exacerbating malnutrition and increasing human vulnerability to emerging diseases. The deliberate release of harmful pathogens, which can kill cash crops and destroy enemy reserves, is a potent weapon for biological warfare and agro-terrorism.³¹ Agro-terrorism can also be perpetrated through imported food products, increasing the risk of introducing foodborne infectious agents.³²

Rapid advancements in the genetic engineer-

29 World Health Organization. (2003). Bioterrorism – The Threat in the Western Hemisphere. Paper presented at the 13th Inter-American Ministerial Meeting on Health and Agriculture, Washington, DC, p. 6.

30 DaSilva, E.J. (1999). Biological Warfare, Bioterrorism, Bio-defense, and the Biological and Toxin Weapons Convention. *Electronic Journal of Biotechnology*, Vol. 2, No. 3, Universidad Católica de Valparaíso, Chile, p. 112. Available at: <http://www.ejb.org/content/vol2/issue3/full/2/1> (<http://www.ejb.org/content/vol2/issue3/full/2/>) [Last seen: 02.09.2024].

31 Dasilva, E.J. (1999). Biological Warfare, Bioterrorism, Bio-defense, and the Biological and Toxin Weapons Convention. *Ibid.*

32 Raoult, D. *Ibid.*, p. 34.

ing of commercial crops have raised the possibility of developing genetically modified plant pathogens, pests, or weeds that are resistant to conventional control methods. This possibility has already become a reality, with the development of a genetically engineered “super weed” that is said to resist current herbicides. According to research, these superweeds were allegedly designed to target large-scale corporate monoculture and genetically modified crops. Distinguishing a biological terrorist attack from a natural outbreak of animal or plant disease can be challenging, which may inadvertently protect the terrorist and delay an effective response by authorities.³³

Based on the above, it is clear that agro-terrorism poses significant risks to the safety and availability of food, undoubtedly threatening food security and the right to food. Moreover, the negative impacts of food terrorism extend beyond food safety, reaching into the economic, political, and health domains.

3.2. The Potential Impacts of Agricultural and Food Bioterrorism

Agro-terrorism, which targets the agricultural sector, has potential consequences for human health, often causing negative effects on the economy and disrupting political stability.

3.2.1. Impact on Public Health Services and Human Health

Foodborne diseases, whether intentional or unintentional, can severely strain public health services. Many countries cannot respond to emergencies of this nature, where public health systems are forced to deal with food terrorism incidents. While many nations have some form of emergency response plan, these plans often do not account for food safety. This lack of preparedness can result in misdiagnosis, improper laboratory investigations, and a failure to identify and prevent the spread of contaminated food, thereby weakening or even

33 Parker, H. S. (2002). *Agricultural Bioterrorism: A Federal Strategy to Meet the Threat*. McNair Papers, 65, Institute for National Strategic Studies, National Defense University. pp. 13-14. Available at: <https://www.hsdl.org/?view&did=472>.

preventing an effective response to achieve food security.³⁴

Compared to attacks on humans, attacks on agriculture are less dangerous for the perpetrators. Agricultural agents are generally safer to handle than human pathogens, and public reaction may be less intense—unless the target is ready-to-eat food. However, some livestock and poultry diseases are zoonotic, meaning they can be transmitted to humans, leading to the spread of human diseases.³⁵

3.2.2. Economic and Trade Impacts

Intentional food contamination can have enormous economic repercussions. Economic disruption is often a key motivator behind intentional acts targeting a specific product, factory, industry, or country. Widespread losses are not always necessary to achieve substantial economic damage and disrupt trade. Extortion threats directed at particular organizations, especially in the commercial sector, are common in these instances.³⁶

Food contamination due to agro-terrorism not only affects human health but also erodes consumer confidence in the safety of national food supplies.³⁷ Once an act of agro-terrorism is discovered, it can quickly halt the movement and export of affected livestock or crops, resulting in severe economic consequences for producers, shippers, and consumers alike.³⁸

A 1994 study estimated the economic impact of an outbreak of African swine fever on the U.S. pork industry. The authors concluded that the cost over 10 years would be approximately \$5.4 billion, a figure that could be three to five times higher today.³⁹

Molds and mycotoxins cause economic losses at every stage of the food chain: farms suffer crop

losses, poultry or livestock are poisoned, and food industries producing food for humans and animals are affected. In addition, chronic poisoning from mycotoxins compromises consumer health. These characteristics make mycotoxins and the fungi that produce them effective agents in both agro-terrorism and biological terrorism more broadly.⁴⁰

3.2.3. Social and Political Impacts

Terrorists may be motivated, ranging from revenge to political destabilization. They can target civilian populations to incite panic and threaten public order. Fear and anxiety can contribute to a decline in public trust in political systems and governments. When agro-terrorism results in economic impacts, specific sectors of society may lose income, exacerbating political instability. While it is unlikely that an entire food supply would be contaminated, the deliberate contamination of food can worsen existing food shortages, further affecting social and political stability.⁴¹

Given the relative ease of agro-terrorism and its low risk to terrorists, along with the instability in international relations between many countries, the world is likely to see more national or international agro-terrorism incidents. This reality calls for intensified efforts to combat these threats. Despite the economic, political, and health consequences of food-related agro-terrorism, the sanctions for agricultural biological warfare and bioterrorism remain unclear.

CONCLUSION

Agro-terrorism, particularly when orchestrated by hostile nations, constitutes a criminal act. It aligns with the broader strategy of agricultural biological deterrence, equating it with biological warfare or environmental crimes. Agro-terrorism is primarily aimed at causing severe economic damage, destabilizing political systems, and inflicting significant human losses. Eliminating agro-terrorism poses a substantial challenge for societies and

34 World Health Organization. *Ibid.*, pp. 8-9.

35 Parker, H.S., *Ibid.*, p. 14.

36 World Health Organization. *Ibid.*, p. 8.

37 Parker, H.S., *Ibid.*, p. xii.

38 National Academy of Engineering and National Research Council of the National Academies in cooperation with the Department of Homeland Security. (2004). *Biological Attack: Human Pathogens, Biotoxins, and Agricultural Threats: What is it?* National Academy of Sciences, Washington. Available at: https://www.dhs.gov/xlibrary/assets/prep_biological_fact_sheet.pdf [Last seen: 15.09.2024].

39 Parker, H.S., *Ibid.*, p. xii.

40 Clauzon, L. (2009). *Biological Warfare and Bioterrorism or How Nature Becomes a Weapon*. Doctoral thesis. Université Henri Poincaré – NANCY 1, p. 98.

41 World Health Organization, *Ibid.*, p. 9.

governments worldwide, necessitating firm actions and clear regulations. This form of terrorism not only violates the right to food but also infringes upon other fundamental human rights.

Based on the findings of this study, several recommendations can be proposed to address the issue:

- Reduce dependence on imports of seeds and plants due to the potential biological risks they may carry, which could trigger food crises;
- Expand research capabilities related to animal and plant health, as well as food safety, with a particular focus on scientific research aimed at combating agro-terrorism;
- Provide increased funding for internal research in laboratories and universities to better equip them to handle biological threats;
- Establish an effective monitoring system through coordination among concerned countries. It would be beneficial to create an international surveillance system in this field and implement measures to contain the negative effects of agro-terrorism on the right to food and nutrition;
- Adopt stringent legal frameworks that impose punitive sanctions on those responsible for terrorist attacks targeting the agricultural sector;
- In the context of food governance and the growing threat of biological terrorism, states must recognize that the Committee on World Food Security is the most inclusive platform for international food governance. Therefore, it should play a leading role in coordinating responses to ensure food security and the realization of the right to food, working closely with other specialized agencies such as the World Health Organization (WHO).

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