

**BIOSAFETY IN UKRAINE
AS A SOCIALLY SIGNIFICANT NATIONAL INTEREST**

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Abstract: *The study considers approaches to defining the essence of the “national interest” concept, taking into account its genesis and the presence of two approaches to its understanding – idealistic and realistic. It is established that the national interest can be called the goals and objectives of state domestic and foreign policy, the implementation of which ensures progressive democratic development, as well as safe living conditions and welfare of its citizens. For constructive and detailed research of the specified object special methods were used: sociological interrogation, analysis and synthesis, generalization, forecasting and modeling, formal-logical, comparative-legal etc. With the help of a systematic approach, structural-functional, comparative and institutional methods the conclusions of the article were formed. As part of the creative team for research, a sociological study was conducted on the implementation of national interests in Ukraine, which allowed to establish that the least guaranteed among the national interests by respondents consider ecological and biological safety. A number of factors have been identified that make the provision of biosafety a matter not of single country but many countries. In pursuance of one of the items of the Decision of the National Security and Defense Council of Ukraine “On challenges and threats to national security of Ukraine in the environmental sphere and priority measures to neutralize them”, a functional basis for biosafety is proposed, and an algorithm to identify and respond quickly to potential biological threats.*

Keywords: public administration, environmental pollution, ecological sphere, biological risk, genetically modified organisms.

National interests play a key role in the development of each state. The realization of national interests ensures the functioning of the state as the main political institution, the preservation of territorial integrity and national unity, determines the development of all society spheres and the dynamics of foreign policy processes¹. The foundation of the development of national interests theories is the work of German scientist H. Morgenthau², he believes that the national interest is a universal law of foreign policy, so moral is only a policy that follows the requirements of national interest, as the law of gravity – the

¹Y. Glemarec, “Aligning national interests and global climate justice: The role of human rights in enhancing the ambition of nationally determined contributions to combat climate change”, in *Fudan Journal of the Humanities and Social Sciences*, 2019, vol. 12, no. 2, p. 309-327; M. Hanegraaff, “Whose side are you on? Explaining the extent to which national interest groups support states in global politics”, in *Journal of Common Market Studies*, 2019, vol. 57, no. 3, p. 563-579; B. Marceau, “Cardinal protectors and national interests. In: Ch.M. Bellitto (Ed.)”, in *Brill’s Companions to the Christian Tradition*, Brill, Leiden, 2020, p. 198-210

²H. Morgenthau, *In defense of the national interest: A critical examination of American foreign policy*, University Press of America, Lanham, 1982.

universal law of nature. He considers the national interest as the main category of political realism, and it is out of interest that he derives the essence and goals of politics. According to H. Morgenthau, the protection of national interests by the state is the main criterion for the correctness of foreign policy. He singled out the following interests:

– permanent (main) interests: protection of the territory, population and state institutions from external danger; development of foreign trade and increase of investments, protection of private capital interests abroad; relations with allies and the selection of foreign policy;

– temporary (intermediate) interests: interests of survival (threat to the very existence of the state); vital interests (the possibility of causing serious damage to the security and welfare of the nation); important interests (potentially serious damage to the country); peripheral, or small, interests (local interests).

H. Morgenthau can be considered a representative of a realistic approach to understanding national interests. Globalization of epidemic processes, climate change, development of biotechnology and genetic engineering, availability of scientific and technological preconditions for development of biological means of mass destruction, increase of threat of terrorism, deterioration of sanitary-epidemic, veterinary-sanitary, phytosanitary situation in the world gives a possibility of unknown non-endemic pathogens spreading; unauthorized use of modern advances in genomics, proteomics, genetic engineering for illegal purposes is actualized³. All this highlights the guarantee of such a social value as the health of the population, which includes not only the medical sphere, but also biological safety⁴. The Global UNEP-GEF BCH Capacity Building Project⁵ states “Modern biotechnology can bring many benefits, but there are concerns that it could also have adverse effects on biodiversity and human health”. Thus, the attention of the governments of the United Nations member states since 2008 is focused on the prevention of biological threats.

To realize these activities it is worth to take into account such moments: first, public administration in biosafety sphere is impossible without deep and

³ A.K. Zhumalina, B.T. Tusupkaliev, M.B. Zharlikasinova, I.S. Kim, K.B. Darzhanova, “Bone turnover markers in children and adolescents with environmentally determined short stature, living in the oil and gas processing region”, in *Environmental Science and Pollution Research*, 2020, vol. 27, no. 27, p. 33998-34004.

⁴ A.P. Getman, “Human life and health as an object of environmental law in the globalised world”, in *Journal of the National Academy of Legal Sciences of Ukraine*, 2020, vol. 27, no. 1, p. 189-200; K. Kairullaev, G. Kulmanova, B. Nurgazy, K. Nurgazy, F. Turganbayeva, “Biological features of sturgeon in breeding process in pond fish farms of Almaty region”, in *Ekoloji*, 2017, vol. 26, no. 99, article number e099001.

⁵The Global UNEP-GEF BCH Capacity Building Project, 2008. Available at <https://cutt.ly/3Ua9dKw>.

wide international cooperation (real, not declared) in modern global world; second, before starting these activities it should be noted that it will be more effective if public authorities will pay attention to public opinion and cooperate with public and non-governmental organizations; third, number organizations responsible to provide public administration activities in biosafety sphere should be determined as well as their functions⁶. Biosafety as a guarantee of the state to prevent the manifestation of certain biological threats, is complex and can not be achieved without the development of appropriate regulatory framework, analysis and risk management (ecological, biological, food and other risks). In this regard, public administration activities aimed at ensuring biosafety should be carried out within the framework of a holistic concept of sustainability of agriculture⁷, food safety and environmental protection, including the conservation of biological diversity⁸.

Literature review

W. Wilson is a representative of the idealistic approach to the interpretation of national interest. In his opinion, when making decisions, politicians should proceed not just from political but from moral principles. He points to the danger of defining foreign policy in terms of national interest. In fact, there are two foreign policies: based on national interest and morality. Action based only on national interest is immoral. Policies based on national interests do not take into account the country's public opinion, as they do not take into account the moral attitudes and values that people express in opinion polls⁹. In modern political science, the essence of the national interest phenomenon remains a debatable issue. The American researcher R. Niebuhr emphasized the dual nature of the national interest, given that it follows, on the one hand, from the peculiarities of the political situation, and on the other – from the essence of humans. The needs and aspirations of human communities have always been correlated with the peculiarities of the

⁶ N.V. Hlushchenko, “Modern issues of administrative law”, in *Legal Horizons*, 2021, vol. 14, no. 2, p. 124-129; I. Bondarenko, O. Kutniashenko, A. Toporov, L. Anishchenko, O. Ziuz, I. Dunayev, A. Krakhmalyov, O. Yavorovska, O. Kostina, O. Aleksieieva, “Improving the efficiency of equipment and technology of waste briquetting”, in *Eastern-European Journal of Enterprise Technologies*, 2020, vol. 6, no. 10-108, p. 36-52.

⁷ S.I. Strapchuk, O.P. Mykolenko, “Factors of sustainable intensification in agriculture of Ukraine: Evidence from the enterprises of the Kharkivska oblast”, in *Scientific Bulletin of Mukachevo State University. Series “Economics”*, 2021, vol. 8, no. 3, p. 9-17.

⁸ R. Kazak, “Periodization of nature protection in Ukraine in the latter half of the 20th century: Legal aspect [Periodización de la protección de la naturaleza en Ucrania en la última mitad del siglo XX: Aspecto legal]”, in *Espacios*, 2018, vol. 39, no. 19, p. 1-7.

⁹ G.F. Kennan, “Morality and foreign policy”, in *Foreign Affairs*, 1985, vol. 64, no. 2, p. 205-218.

environment¹⁰. When it was favorable, their needs materialized in formally expressed interests, and conversely, interests could not be formulated in an unfavorable environment¹¹.

Another American researcher, geopolitician N.J. Spykman, viewed national interests as a criterion of geopolitical power – the more powerful state is, the more important its national interests are. According to N.J. Spykman, if the result of assessing the geopolitical capabilities of a state is low, it should enter into a geostrategic alliance with another state (s), but lose some or all of its sovereignty and yield the national interests. Conversely, a state determines its priorities and strategic positions independently if it has a high total result of its geopolitical capabilities¹². A well-known researcher, J. Rosenau¹³, believed that the definition of national interest is a system of conclusions based on the analytical and value base of policy. That means, the national interest is a category of abstract and subjective, because its parameters are determined by the point of view on the world and the value system that prevails in this society, state. The reality of national interests is revealed in the process of their realization.

J. Rosenau, a severe critic of the national interest, found the reasoning of the objectivists “essentially erroneous”. He recalled that the national interest is rooted in values and that different states do in fact pursue different ends. The objectivists’ assumption that “statesmen think and act in terms of interest defined as power” is thus an imposition of their own values to one’s own course of action. He further argued that Morgenthau’s formulation lacked a method for determining what a nation’s relative power is. Furthermore, he noted, the task of calculating the “power of a nation” inevitably necessitates the introduction of values; that is, assessing of the relative importance of each power component. As such, analysts will not necessarily arrive at similar results of what a nation’s power dictates its national interest to be. In short, there may be an “objective reality,” J. Rosenau concluded, but “neither predictively nor retrospectively can its contents be clearly demonstrated”. French researcher R. Aron¹⁴ considered the concept of national interest too ambiguous and

¹⁰ V. Moroz, Y. Nykytiuk, “Current state of pineries in Zhytomyr Polissia under the influence of environmental factors”, in *Scientific Horizons*, 2021, vol. 24, no. 8, p. 37-46; G.O. Sandul, O.G. Sandul, A.O. Bulgakov, “On the nuclear decision-making theory [К вопросу о теории принятия решений в ядерной энергетике]”, in *Nuclear and Radiation Safety*, 2018, vol. 4, no. 80, p. 58-64.

¹¹A. Colonos, “The national interest and global justice: Contradictory terms, incomparable and non-commensurable goods, yet compatible?”, in *Fudan Journal of the Humanities and Social Sciences*, 2019, vol. 12, no. 2, p. 233-253.

¹²A. Holmila, “Re-thinking Nicholas J. Spykman: From historical sociology to balance of power”, in *The International History Review*, 2020, vol. 42, no. 5, p. 951-966.

¹³J. Rosenau, *Along the domestic-foreign frontier: Exploring governance in a turbulent world*, Cambridge University Press, Cambridge, 1997.

¹⁴R. Aron, *Paix et Guerre Entre les Nations*, Calmann-Levy, Paris, 2004.

therefore not useful enough to analyze the goals and means of international relations. At the same time, his theses about the “eternal goals” of the state actually coincide with the traditional understanding of the national interest inherent in the school of political realism. From the point of view of R. Aron, eternal goals can be manifested both in abstract and concrete ways. In the first case, they appear as a desire for security, strength and glory, and in the second, expressed in the desire to expand space (territory occupied by political unit), increase the population and spread the ideology and values of the political actor.

Materials and methods

The study focused on national interests as a holistic concept and guaranteeing biosafety as one of the most important interest. For constructive and detailed research of the specified object special methods were used: sociological interrogation, analysis and synthesis, generalization, forecasting and modeling, formal-logical, comparative-legal. With the help of a systematic approach, structural-functional, comparative and institutional methods the conclusions of the article were formed. Law of Ukraine No. 2469-VIII “On National Security of Ukraine¹⁵” sets out the official definition of the term “national interests”. It marks that “the national interests of Ukraine are the vital interests of individuals, society and the state, the implementation of which ensures the state sovereignty of Ukraine, its progressive democratic development, as well as safe living conditions and welfare of its citizens”. To provide safe living conditions the decision on challenges and threats to the national security of Ukraine in the ecological sphere appeared, it implemented by the Decision of the National Security and Defense Council of Ukraine “On challenges and threats to national security of Ukraine in the environmental sphere and priority measures to neutralize them”¹⁶, which in particular states: to improve the system of biological safety and biological protection:

1. Submit a draft law on biological safety and biological protection to the Verkhovna Rada of Ukraine within three months.

2. Develop and approve within six months:

- the procedure for conducting biological risk assessment and management;

- the procedure for registration, storage, issuance, transportation, disposal, import to Ukraine and export of microorganisms strains, toxins and

¹⁵Law of Ukraine No. 2469-VIII “On National Security of Ukraine”, 2018. Available at <https://zakon.rada.gov.ua/laws/show/2469-19#Text>

¹⁶ Decision of the National Security and Defense Council of Ukraine “On challenges and threats to national security of Ukraine in the environmental sphere and priority measures to neutralize them”, 2021. Available at <https://zakon.rada.gov.ua/laws/show/111/2021#Text>.

poisons of animal and plant origin;

– list of priority biological pathogens;

3. Ensure the development and approval within three months:

– the procedure for conducting exercises on biological safety and biological protection;

– the order of informing the population on issues of biological safety and biological protection.

High mentioned decision appeared in March 2021, but two international documents in biosafety sphere – Convention on access to information, public participation in decision-making and access to justice in environmental matters¹⁷ and Cartagena protocol on biosafety to the Convention on biological diversity¹⁸ – were ratified more than 20 years ago. For example, in Convention on access to information, public participation in decision-making and access to justice in environmental matters¹⁹ stated that the parties will: “... promote broad informing the public about the state of environmental elements, such as air and atmosphere, water, soil and land, landscape and natural objects, biological diversity and its components including genetically modified organisms (GMOs), the interaction of these elements, the impact on the environment, as well as public participation in decision-making in relation to realize above measures”. In Decision of the National Security and Defense Council of Ukraine “On challenges and threats to national security of Ukraine in the environmental sphere and priority measures to neutralize them²⁰”, task “the order of informing the population on issues of biological safety and biological protection” was mentioned²¹.

It is worth to mention, that in this paper, the essence of biosafety is investigated, based on the its narrow understanding provided by the Cartagena protocol on biosafety to the Convention on biological diversity, where it is considered only in relation to animals and plants as modified due to modern biotechnology that can have a negative impact and to create a threat to the

¹⁷ Convention on access to information, public participation in decision-making and access to justice in environmental matters, 1998. Available at <https://unece.org/DAM/env/pp/documents/cep43e.pdf>.

¹⁸ Cartagena protocol on biosafety to the Convention on biological diversity, 2000. Available at <https://cutt.ly/1UaE60x>.

¹⁹ Convention on access to information, public participation in decision-making and access to justice in environmental matters, 1998. Available at <https://unece.org/DAM/env/pp/documents/cep43e.pdf>.

²⁰ Decision of the National Security and Defense Council of Ukraine “On challenges and threats to national security of Ukraine in the environmental sphere and priority measures to neutralize them”, 2021. Available at <https://zakon.rada.gov.ua/laws/show/111/2021#Text>.

²¹ R. Kazak, S. Hotsuliak, “Features of sanitary legislation in Ukraine in the mid-20th century: Historical overview”, in *European Journal of Sustainable Development*, 2020, vol. 9, no. 3, p. 257-266.

preservation of biological diversity and its stable use, as well as food products that can contain modified organisms obtained on the basis of recombinant deoxyribonucleic acid (DNA), and therefore, create a negative impact on human health²². That means, the study does not consider such aspects of biological safety as the effects of the use of biological weapons, protection against new and existing strains of microorganisms, consequences of possible environmental disasters, dissemination of foreign species in stable biocenosis.

Results and discussion

In Cartagena protocol on biosafety to the Convention on biological diversity the most important for research points are:

- to carry out organizational and technical support of the procedure for preliminary substantiated consent on the transboundary movement of genetically modified organisms intended for deliberately releasing to natural environment (Articles 6-10 and 12);

- to provide an assessment of risks associated with genetically modified organisms before deciding on their internal use, including selling in the domestic market (Articles 5 and 11);

- to establish norms for the use of genetically modified organisms in closed systems (Article 6);

- to control the producing, packaging, transportation and identification of GMOs with the observance of safety conditions and taking into account the relevant international rules and norms (Article 18);

- to appoint one National Coordination Center, which on behalf of the state will be responsible for communicating with the Secretariat of the Cartagena protocol on biosafety to the Convention on biological diversity (Part 1 of Article 19);

- to appoint one or more competent national authorities that will be responsible for the administrative functions provided by the protocol (part 1 of Article 19);

- to provide cooperation with other countries regarding the preparation of scientific and technical personnel on the proper and safe use of biotechnology, assessment of risks and risk management in the interests of biosafety, as well as expanding technological and organizational capabilities in the field of biosafety (Article 22);

²² D. Sannikov, V. Kovtun, M. Kovtun, T. Terekhova, K. Ohanova, “Agricultural land use in Ukraine: Ensuring and implementing the right to a safe environment”, in *Scientific Horizons*, 2021, vol. 24, no. 9, p. 86-92; A.K. Zhumalina, E.Z. Bekmukhambetov, B.T. Tusupkaliev, M.B. Zharlikasinova, “Development of scientifically justified proposals on the prevention and treatment of environmentally determined constitutional growth delay in children in the West Kazakhstan region”, in *Environmental Geochemistry and Health*, 2019, vol. 41, no. 3, p. 1251-1265.

– to support and promote informing public, education of people, their participation in the organization of safe GMOs transportation, producing and using to preserve biodiversity, taking into account human health risks (Article 23);

– to use the necessary internal measures aimed at prejudice illegal transboundary displacements and, in appropriate cases, punishment for transboundary movement of genetically modified organisms that are carried out in violation of the implementation of the Protocol provisions (Article 25);

– to take other measures aimed at prejudice, preventing or reducing potential risks associated with genetically modified organisms that do not contradict the provisions of the protocol within the national regulatory framework and to promote the effective implementation of the Cartagena protocol on biosafety to the Convention on biological diversity.

Ukraine signed and ratified the Convention on access to information, public participation in decision-making and access to justice in environmental matters²³ and the Cartagena protocol on biosafety to the Convention on biological diversity (2000), adopted the Law of Ukraine No. 1103-V “On the state system of biosafety at the time of creating, testing, transporting, and using genetically modified organisms” (2007), organizational and legal principles of creating a network of GMO identification network. But mostly these steps have a surface-declarative character, since the vast majority of the provisions of Convention on access to information, public participation in decision-making and access to justice in environmental matters (1998) and Cartagena protocol on biosafety to the Convention on biological diversity (2000) did not find its reflection in the domestic legislation, not taken into account a significant number of European Union (EU) requirements in this area, its own researches of the effects of releasing live modified organisms or their consumption are not taken into account. That is, in Ukraine should be built a holistic and effective mechanism for public administration in biosafety sphere, which can be determined as a set of interconnected methods, public authorities, certain guarantee means of biological safety, equal access to environmental information for all stakeholders.

The timeliness of Decision of the National Security and Defense Council of Ukraine “On challenges and threats to national security of Ukraine in the environmental sphere and priority measures to neutralize them” (2021) is confirmed by a sociological study conducted in January-February, 2021 by research team which examined assurance the realization of national interests in Ukraine (Figure 1). The problem that caused this study was the lack of relevant, objective, scientifically substantiated sociological information on the

²³ Convention on access to information, public participation in decision-making and access to justice in environmental matters, 1998. Available at <https://unece.org/DAM/env/pp/documents/cep43e.pdf>.

implementation of national interests in Ukraine taking into account modern globalization conditions. The survey was conducted by questioning representatives of various spheres. The total number of respondents is 650 people. The current state of providing national interests in Ukraine 70% of respondents was evaluated as unsatisfactory. Positive grades provided only 25% of respondents. More than half of the respondents (61%) do not feel personally safety in the present. Only fifth of respondents feel themselves safety (22%). According to research, the lowest level of ensuring the national interests in state respondents say in the ecological sphere and biosafety (70%), economic (59%), social (57%), domestic policy (54%) and state security (52%). Respondents gave positive assessments of the level of ensuring the national interests of Ukraine in the information sphere (49%), military and security of the state border of Ukraine (33%), as well as scientific and technological (31%). At Figure 1 it can be saw answers on the question “How do you think, what the level of national interests guarantee in following spheres is?” in percents.

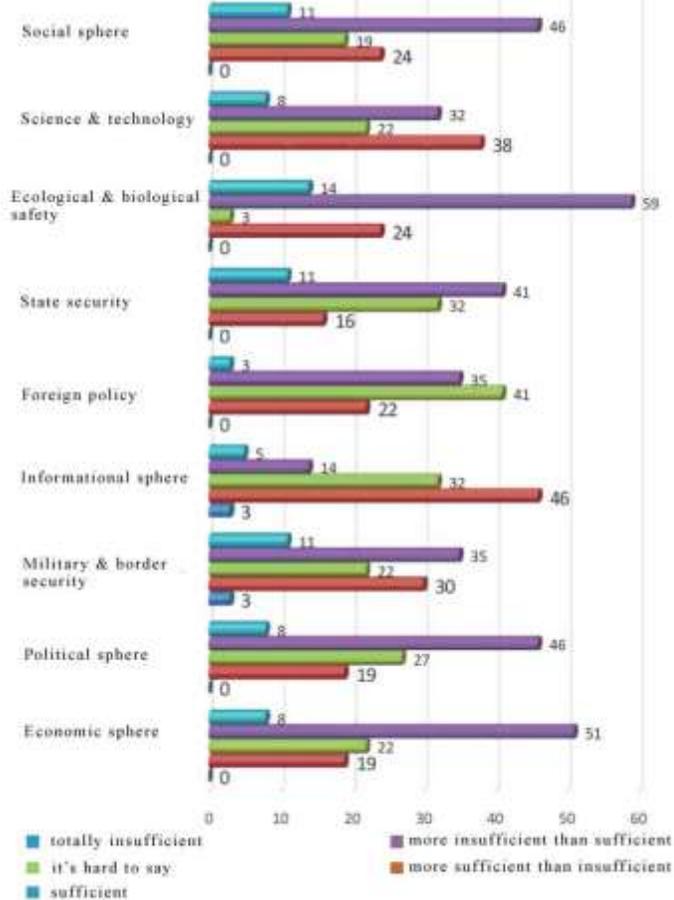


Figure 1: Answers on the question “How do you think, what the level of national interests guarantee in following spheres is?”, %

However, Ukraine, as a Party to the Cartagena protocol on biosafety to the Convention on biological diversity (2000), must take the necessary and comprehensive measures to fulfill its international obligations under this document. At the same time, it should be taken into account that biosafety issues are increasingly becoming a matter not only of an individual country (basic level), but also of all countries of the world due to the influence of such factors:

- globalization and increasing dependence of countries in the implementation of effective biosafety measures;
- new technologies transfer (medicine sphere, agricultural production and food processing);
- expansion of territorial boundaries in trade in food and agricultural products;
- acceptance of legal obligations by the parties to the relevant international agreements;
- expansion of cross-border passenger traffic and increase of migration process;
- progress in communication and facilitation of access to biosafety information at the global level;
- increasing public attention to the problems of biological diversity and the environment conservation;
- increasing of some countries dependence on food imports due to lack of necessary resources.

The system of global governance in the environmental sphere, biological and food safety is more complex than the system of interstate cooperation, although does not yet claim global governance with broad powers and coercion. However, even today formation of such global government raises controversy about the need to take certain steps towards greener order of the day in world politics. Impossibility to get a clear answer to the question: “Who manages and in whose interests?” – does not allow to form a clear position on who should lead and in whose interests. These issues remain open; therefore, measures of public administration in national biosafety sphere are being developed in conditions of increasing uncertainty. Global governance in the environmental sphere, biological and food safety is ensured by a large number of supranational entities and regional organizations. The core of this governance is determined by United Nations policy, as well as a network of transnational policies that includes corporations, lobby groups and non-governmental organizations. In the formation of biosafety system, first of all, government agencies responsible for its specific sectors are interested, but industrial enterprises, research institutes, stakeholders, non-governmental organizations and the general public also plays a very important role in this issue. Executive bodies responsible for sectors typically associated with

biosafety – food safety, health, agriculture, forestry, fisheries, and the environment problems – play a key role in building a strong biosafety system²⁴. However, depending on the circumstances, other government agencies responsible for trade, customs, transport, the financial system, tourism enterprises, may take part in this work.

Nowadays, much attention is paid to the need for systematic approach to biosafety. Countries are encouraged to establish national control systems, in accordance with relevant international standards. Joining together efforts in biosafety sphere can be achieved in practice can deliver significant benefits at both the national and international levels. An example of achieving significant results in the field of biosafety is to increase the accuracy of risk analysis; creation of conditions for comprehensive consideration of governments' actions directions; development of measures to overcome new diseases; rationalization of the control system²⁵; increasing the readiness of special services in case of emergencies and the speed of their response; formation of integrated systems of sanitary and epidemiological surveillance and monitoring of the efficiency of the available resources using (UN Environment Program, 2021). It is worth to note, that the issue of biosafety in Ukraine has been receiving considerable attention since 2009, but no significant results have been achieved in this area. For example, as noted in the Decision of the National Security and Defense Council of Ukraine “On Biosafety of Ukraine” (2009): “Counteracting the negative impact of biological factors and biothreats is complicated by the imperfection of the legal framework, lack of certified research methods and standards in this area etc. The issues of genetically modified organisms (GMOs) treatment, state support of genetic engineering research, scientific and practical developments in the field of biological and genetic safety, mechanisms of safe practical use of genetically modified organisms are insufficiently regulated, executive authorities in the field of management of genetically modified organisms and genetic engineering activities are lacking”.

An academician of the National Academy of Sciences of Ukraine (NAS), secretary of the Department of Biochemistry, Physiology and Molecular Biology, a member of the Presidium of the National Academy of Sciences of Ukraine and director of the O.V. Palladin Institute of Biochemistry S.V. Komisarenko (2009) said about the state of the biosafety system in Ukraine: “It turns out that today in Ukraine there is no such national system. There is separate sanitary-epidemiological service of the Ministry of Health, there is a

²⁴ T.T. Barakbayev, K.S. Nurgazy, N.S. Badryzlova, E.V. Fedorov, S.Z. Assylbekova, “Variability of biological traits and fish capacity groups of three years old Russian sturgeons hatched in ponds”, in *Journal of Animal and Veterinary Advances*, 2015, vol. 14, no. 6, p. 175-181.

²⁵ N.G. Sinyavskii, “Reducing the uncertainty through analysis of the system structure”, in *Financial Analytics: Problems and Solutions*, 2019, vol. 2, no. 348, p. 128-149.

State Committee of Veterinary Medicine, which takes care of diseases and especially dangerous infections. There are sanitary and epidemiological services in different departments, such as the Ministry of Home Affairs, but there is no effective interaction and coordination between these agencies. The aim is to create in Ukraine a holistic system of interaction between existing laboratories with standard methods of research, data analysis and response approaches – a network of laboratories for the detection of biohazards, which does not even require large additional funds to create biosafety systems”. Without such cooperation, Ukraine is unable to implement the obligations of the Cartagena protocol on biosafety to the Convention on biological diversity (2000), which requires each Party to take the necessary legal, administrative and other measures to fulfill its obligations under this document. Ukraine's fulfillment of international obligations under the Cartagena protocol on biosafety to the Convention on biological diversity (2000) requires not only the definition of state regulation priority areas in the field of biosafety, but also the creation of mechanisms for its implementation, defining tasks and functions that would contribute to the formation of a biosafety system. According to this, it is important for biosafety system functional basis to satisfy above-listed conditions (Figure 2).

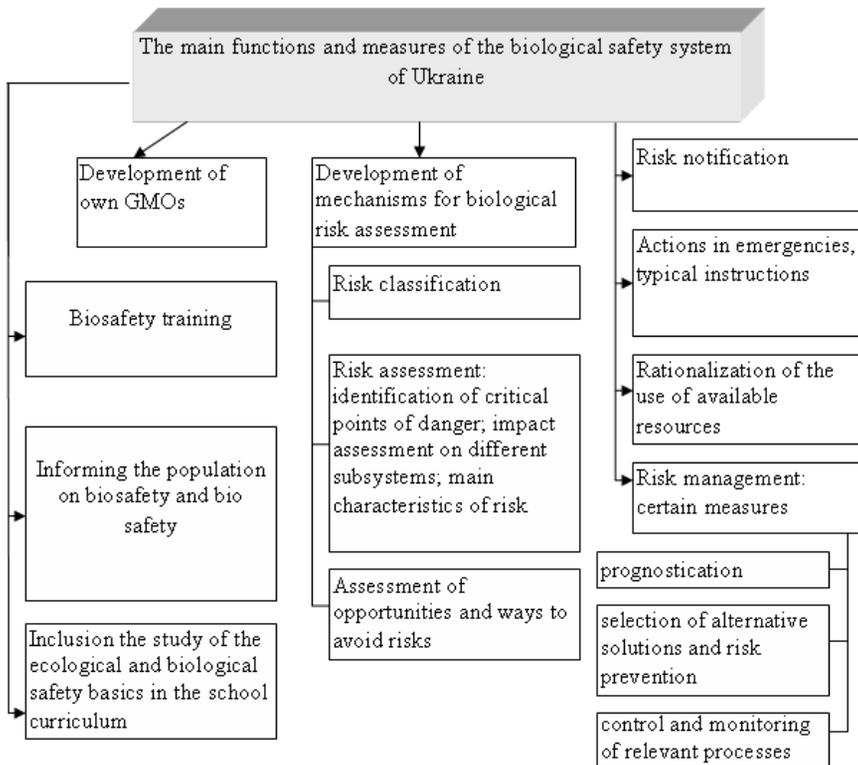


Figure 2: Functional basis of biological safety in Ukraine

The function of creating Ukrainian own GMOs can be implemented on the basis of the Institute of Cell Biology and Genetic Engineering of NAS of Ukraine, Institute of Molecular Biology and Genetics of NAS of Ukraine, Institute of Plant Physiology and Genetics of NAS of Ukraine, O.V. Palladin Biochemistry Institute and Ukrainian Agrarian Academy of Science units both at public expense and at the expense of investors (taking into account the interests of Ukraine). Risk assessment functions should be entrusted to the Commission on Biosafety and Biological Protection under the National Security and Defense Council of Ukraine. The implementation of other measures can be ensured by the cooperation of a number of institutions – the National Security and Defense Council of Ukraine, the Ministry of Environmental Protection and Natural Resources of Ukraine, the Ministry of Agrarian Policy and Food of Ukraine, the Ministry of Health of Ukraine, the State Emergency Service of Ukraine and other central executive bodies. Successful implementation of an integrated approach to biosafety depends on the development of a clear policy and the availability of a coherent regulatory framework; an appropriate institutional framework that defines the roles and responsibilities of the relevant actors; adequate scientific and technical potential; functioning of the risk analysis system; development of testing and control infrastructure, as well as an appropriate communication and information exchange system²⁶.

Non-governmental organizations are already significant in the implementation of the public administration in biological safety sphere. Experience of democratic countries shows that when the organizations of civil society have a real impact on the process of state regulation and public administration, then the state and society have more stable development with lack of disputes and confrontations within (contradiction gets down and system homeostasis rises) (Parente, 2019). Moreover, the involvement of civil society institutions allows to overcome a certain isolation of power from society. Therefore, public ecological control is a form of constitutional right realization of every citizen to have safe environment, reliable information about its state, for compensation any harm that has been caused by his/her health or property through environmental pollution (Constitution of Ukraine, 1996). However, it should be noted that the “public control” concept does not have enough clear definition, and because of this there is real opportunity to manipulate this term. Optimal from existing definitions are: “Public control is a carefully thought-out and planned public institutions activity on various levels and orientation, designed to influence the decision-making process of

²⁶ I.I. Vinichenko, N.V. Trusova, L.M. Kurbatska, M.A. Polehenka, V.O. Oleksiuk, “Imperatives of quality insuring of the production cycle and effective functioning process of the enterprises of agro-product subcomplex of Ukraine”, in *Journal of Advanced Research in Law and Economics*, 2020, vol. 11, no. 4, p. 1462-1481.

public authorities and policy making in order to increase their openness and social responsibility". Public control can contribute to the full compliance with environmental requirements, normative legal provisions in the field of biological safety by such measures:

- provision of general and wide access to information on biological safety;
- assessment of environmental indicators of enterprises functioning and products biosafety;
- establishment of a constant dialogue between enterprises, public administration authorities and citizens;
- attraction of attention to the activities of enterprises, indicators of which are much worse than similar sectoral indicators;
- influence on organization in order to implement environmental measures and raising product safety standards, as well as a more thorough implementation of the current requirements in these areas.

Consequently, it can be argued that one of the main priorities regarding the implementation public administration measures mechanisms in the sphere of biological safety is to establish interaction with the public and its representatives – non-governmental organizations. Another priority can be considered to provide openness and transparency of information on the state of ecological and biological safety and decision-making process in this area that can directly affect the interests of each citizen. But before involving the public in the decision-making process, it is necessary to identify public opinion and provide the opportunity to access the necessary information to all stakeholders. Public opinion is a set of diverse views, ideas and thoughts on a certain problem that may affect each (not only a limited number of persons), which is presented in a peculiar synthesis of views and interests of various interest groups. In this case, each evaluates the existing problem in its own way, although, as a rule, the overwhelming majority of the population perceives information with previously ready-made assessment (sometimes biased, engagement). In order to establish interactions between the state and the public, formation of its own public opinion would be useful to post such information reviews on the sites of the relevant public authorities:

- current legislation in the field of biological safety, registration of new plant varieties, phytosanitary and veterinary issues, genetic engineering activities;
- current international agreements of Ukraine regarding biosafety;
- existing biotechnologies and evaluation of their development prospects;
- existing structure of biosafety providing and state regulation in this area;

- system of biosafety guarantee and fundamental regulatory acts of the EU and the United States;
- system for ensuring biological safety in mass consciousness (sociological and expert surveys);
- risk management in the field of biological safety.

Named priorities of biosafety state regulation will promote the development of public movement and comprehensive information to all stakeholders can be considered as a social aspect of state regulation in the field of biological safety. Another important aspect is the development of legislation governing toward using of new biotechnology products to protect consumers, it should be proactive, as all food market participants, based on different interests, are dependent on the level of its regulation. In general, all actors in the food market can be divided into four groups, which are characterized by different interests in production regulating and trade of potentially dangerous products of genetic engineering. The first group represented by scientific institutions. They are interested in: research, patenting, international cooperation, research funding, and identification of those responsible for potential environmental pollution. The second group includes producers who are interested in: access to seed material of genetically modified crops, clear and transparent rules of product labeling, adequate certification procedure, acceptable amounts of production costs and product promotion. The third group is represented by trade and catering organizations. Their interests are: transparency of product information, overcoming consumer distrust of genetically engineered products, changing the structure of demand, an acceptable level of advertising costs. Last but not least – the fourth group includes end consumers. They are primarily interested in: product safety, sufficient and clear information about the product, labeling, reasonable prices, compliance with environmental requirements in the production of the product.

The set of available requirements of end consumers can be summarized as follows: completely prohibit the production and use of genetically modified organisms in food; ensure the identification of food products on the market. As biotechnology-based food production is unlikely to be banned, given the inability to provide a growing Earth population with traditional food, consumer demand to identify genetically modified products in the market by labeling them is more relevant today²⁷. According to all high mentioned moments, the main tasks of the biosafety system can be considered as:

- development of mechanisms and methods for assessment and prevention of biological risks;

²⁷ D. Bhattacharya, “The MasterChef journey to brain through stomach: Food as transnational capital”, in *Rupkatha Journal on Interdisciplinary Studies in Humanities*, 2020, vol. 12, no. 1, article number v12n137.

– comprehensive study of the properties of existing GMOs and the introduction of Ukraine's own researches in this area;

– avoidance of emergencies related to the action of any biological threats or elimination of their consequences²⁸.

Therefore, the purpose of establishing a biosafety system is, firstly, to preserve biodiversity and human health, and secondly, to ensure the creation of their own achievements in the field of genetic engineering, which would meet upper-listed requirements and which could have a significant economic effect²⁹. A key element of the biosafety system is the assessment of potential risks and their management, as the main purpose of such system is to prevent risks and manage them in order to save lives and health. The first step in assessing the potential risk is to establish a critical control point (CCP), the detection of which can be represented as such algorithm (Figure 3).

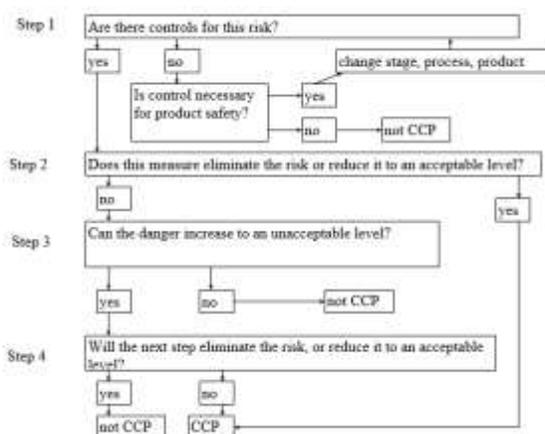


Figure 3: Critical control point for risk management

It worth to emphasize that in carrying out the above actions it is necessary to use as widely as possible the methods of state indirect influence on entities that pose a potential danger (setting quality standards, certification,

²⁸ V.G. Andrieiev, L.B. Anisimova, A.O. Burlakova, O.K. Tiapkin, Y.S. Kravtsov, “Geoinformation support of effective water resources management of coal mining regions of south eastern Ukraine”, in *18th International Conference on Geoinformatics: Theoretical and Applied Aspects, Geoinformatics 2019*, European Association of Geoscientists and Engineers, EAGE, Kyiv, 2019, article number 15648.

²⁹ L.V. Korolchuk, “Decoupling of economic growth from environmental damage: A theoretical aspect”, in *Scientific Bulletin of Mukachevo State University. Series “Economics”*, 2021, vol. 8, no. 1, p. 37-45; R. Kazak, “Development of legal norms on biodiversity protection reflecting EU trends”, in *Environmental Policy and Law*, 2017, vol. 47, no. 3-4, p. 147-152; I. Deineha, A. Maslov, N. Potryvaieva, U. Berezhnyska, L. Verbivska, O. Koliadych, “Institutional Environment Tools for Small and Medium-Sized Enterprises Development”, in *Estudios de Economia Aplicada*, 2021, vol. 39, no. 3, article number 4798.

concluding government contracts for preferential lending, concessional lending). Prohibitions, permits, quotas for certain activities, requirements for the maximum content of certain substances and food labeling, which belong to the methods of direct impact on regulation object, may have low effectiveness due to limited use. In view of this, special attention needs to be paid to product certification, which is becoming one of the important tools for guaranteeing product quality and the norm of trade relations at any level. If at the stage of certification implementation only the producer and the consumer were interested in its implementation, now the state, scientific, technical and research institutions and international organizations are also involved in solving the problems of certification. The problem of national interests is quite common among scientists in Ukraine and post-Soviet countries, although fundamental work in this direction belongs to American and European scientists: R. Aron (1962), G.F. Kennan (1985), H. Morgenthau (1982), J. Rosenau (1997). The relationship between national interests and morality is one of the problems of scientific substantiation of national interests concepts. National interests together with the states must change, improve in accordance with modern requirements. This is especially true in today's information society. This leads to further research on this issue.

Human safety is a vital national interest both for representatives of the realistic approach and for those who express the opinion of the idealistic school. S.V. Komisarenko (2009) emphasizes the need to create a full-fledged system of ensuring biological safety – from the detection of biothreats to measures of global biological risk management. It is the direct measures to counter the risks in the field of biosafety at the state level that can be the subject of further research. Given the globalization processes in the world, ensuring biological safety is becoming a common cause of all states. In particular, among the Sustainable Development Goals (2015) for 2030 (17 goals), 9 out of 17 goals are in one way or another related to ecological problems, biosafety and human health, which clearly raises these issues. The “national interest” can be seen as the goals and needs of the state, which must be realized in the international arena and within the country, the purpose of which is both the full development of the state and the state power formation. The need to guarantee people's and environment's safety due to the presence of risks associated with the rapid development of biotechnology, in particular genetic engineering activities, forced the attention of authors to develop the principles of public administration in this sphere. Those principles are:

1. The principle of regulation transparency involves not only informing the public about already taken decisions, but also the involvement of civic organizations and individual citizens to the process of making managerial and administrative decisions.

2. Principle of warning. The absence of scientifically substantiated data or certainty relative to the safety of a certain activity type gives the competent

public authority to reject applications for the implementation of such activities, if this can be threatened with biological safety, ecosystems and humans.

3. The principle of manufacturer's responsibility. The manufacturer is liable for losses caused by specific persons or property, as well as the environment and biological diversity in connection with using of biologically hazardous substances, and must compensate for the costs associated with the elimination of such use consequences³⁰. Compliance with this principle is due to the fact that certain changes may have an irreversible nature and the situation can not be corrected by any offsetting.

4. Principle of "polluter reimbursement". In the case of large-scale environmental pollution and a decrease in biological diversity in any territory for damages and rehabilitation, not only direct guilty of the disaster, but also indirect (developers, manufacturers, sellers of a certain dangerous substance) may be involved in any territory.

5. Principle of social responsibility. Traditionally social responsibility is understood as a voluntary contribution of business exceeding the minimum established in the development of social, economic and environmental spheres related to the main activities of certain company. Charitable activities and sponsorship (which, incidentally, are often used as public relations (PR)-tools) can not be identified as social responsibility, which is broader concept and the primary basis of which is respect for the consumer and society, comprehensively taking into account their interests.

6. Principle of regulation process continuity. That means, the need to perform actions on a clear scheme that does not allow "to release" a certain stage. For example, adjusting with help of critical control points' detection.

These principles maximally complied with the provisions of the European system of biological safety issues regulation, and therefore their use will contribute to the further integration of Ukraine to the European Community. Moreover, they do not contradict with Ukrainian national interests.

Conclusions

National interests are basic category of national security and one of the main concepts in international relations. Their implementation leads to the effective development and full existence of both individuals and society and the state as a whole. Taking into account the assessment by Ukrainian citizens and experts about ecological and biological safety as a socially significant

³⁰ A. Bobkova, N. Andryeyeva, L. Verbivska, V. Kozlovtsseva, V. Velychko, "Environmental Responsibility in the Development of Green Entrepreneurship", in *Estudios de Economía Aplicada*, 2020, vol. 38, no. 4. Available at <https://ojs.ual.es/ojs/index.php/eea/article/view/4003>

national interest, the guiding document – the Decision of the National Security and Defense Council of Ukraine “On challenges and threats to national security of Ukraine in the environmental sphere and priority measures to neutralize them”, and taking into account global challenges related to accelerating scientific and technological progress and rapid development it can be argued that there is an urgent need to take necessary economic, legal, administrative and other measures to create an appropriate biosafety system, fulfill international obligations of Ukraine in this area, as well as pay attention to creating a system of biological risk assessment and development of anti-epidemiological, genetic engineering activities in Ukraine.

The functional basis of biosafety guarantee proposed by the author's team and the algorithm for detecting critical control points in biological risk management are developed. Realizing functional basis of biosafety guarantee allowed to achieve the goal of public administration activity in biological safety sphere, that can be considered firstly, the creation of conditions that would allow to make most of the achievements of modern biotechnology and contributed to the development of genetic engineering activities, and secondly, safety guaranteed for people and the environment (including preservation biological diversity) during gene-engineering activity, introduction of biotechnological achievements, consumption and utilization of products obtained by the latest methods of biotechnology.