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The Role of Material Stocks in the National Security System

Abstract: The article consists of two parts. The first part describes the essence of the national security system and its structure. Using the Ishikawa diagram and the value chain, the authors presented the shortcomings of the national security system and a sequence of actions that can improve it. The second part of the article is devoted to material stocks and their role in the analyzed system. The survey research presented in this part of the article confirmed the importance of material stockpiles in ensuring national security. In addition, the research highlighted the need for government organizations to cooperate in the continuous replenishment of material stocks during a crisis.

Keywords: *COVID-19, national security system, stocks of materials*

1. Introduction

We live in the 21st century, in a dynamically changing reality. On an everyday basis, we face various challenges of the modern world, which often surprises us with new situations. The risk of an economic crisis, a natural disaster, and currently also a pandemic is worsened by the military threat posed by our eastern neighbors, which does not sound optimistic.

So, what do we need to do to overcome danger and feel safe in our country and the world?

According to the authors, the answer to this question and the key to solving this problem is to effectively manage the national security system.

The problem is severe. For every person and in every aspect of life, the feeling of security is crucial, so it is worth presenting its essence to the readers.

Renowned scholars and the most important institutions representing this discipline have addressed the essence of security. That is how they see it.

In the 21st century, the most important value of humankind is security, which in its essence offers stabilization, development, order, and happiness. When Henry Kissinger, National Security Advisor of the President of the United States, took the floor in the International Institute for Strategic Studies in London, he said: ‘security is the foundation of everything we do’ (Pokruszyński, 2010).

In *Motivation and Personality*, Abraham Maslow (2014) described his theory of a hierarchy of needs, presented from the most basic ones, which result from life functions, such as physiological needs, to higher-order needs, which are activated when lower-order needs have been fulfilled (Fig. 1).

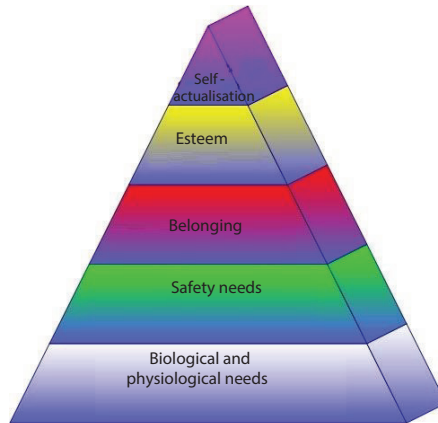


Fig. 1. A. Maslow's hierarchy of needs

Source: own work based on Maslow (2014).

It means that human needs have a relative order of priority and that safety needs are above physiological needs. Similarly to the group preceding them, they can completely dominate human life, because when a person is facing a complete lack of the feeling of safety, the fulfillment of this need may become more important than anything else. In some instances, safety may even take priority over physiological needs. According to Maslow, safety has three levels: economic (stable employment), physical (the lack of threats, such as armed conflicts, natural disasters, and epidemics), and related to health (free access to health care).

Stanislaw Koziej has adopted a pragmatic approach and has dynamically defined security as an area of a given entity's activity whose aim is to provide the possibility of surviving,

developing, and freely pursuing its own interests in specific conditions. According to Koziej (2006), the need for security is fulfilled by making use of favorable circumstances (chances), taking on challenges, reducing risk, and counteracting (preventing and opposing) any threats to the entity and its interests.

When it comes to the process approach, security should be understood as the continuous activity of individuals, local communities, countries, and international organizations, related to shaping the desired security situation.

The development of security studies has led to a detailed definition of this term and its systematization. The basic division with regard to the subject matter is that into national and international security (Majer, 2012). The next criterion in the typology of security is the division with regard to the object, which is auxiliary to the subject matter division. A literature review has shown the following types of security with regard to its object: military, social, cultural, ideological, maritime, political, environmental, economic, religious, external, and internal security, as well as food, sanitary, and legal security (Majer, 2012).

2. Research Methodology

The research conducted in the initial phase allowed us to get acquainted with the essence of national security and the regularities conditioning its functioning.

In the process of conducting the research used:

- Ishikawa diagram,
- value chain.

With the help of Ishikawa diagram, the advantages and disadvantages of the national security system were identified, and with the help of the value chain the basic processes and processes supporting the improvement of this system were determined. The analysis and evaluation of the research provided data on the performance, processes, and elements of the national security system and allowed the author to formulate the following thesis of the paper:

“The national security system is not fully effective and efficient and therefore requires improvement in selected areas of its management”.

The initial research was directed to analyze and evaluate, and then the role played by material stockpiles in the national security system.

The research methodology in the main part was devoted to the analysis of the survey results. The survey had an expert character because it was addressed to 200 experts representing: material services of the Inspectorate of Support of the Armed Forces of the Republic of Poland, the Material Department of the Logistics Board of the General Staff of the Armed Forces of Poland, specialists of the Governmental Material Reserves Agency and soldiers and academic teachers of the Military University of Technology. The limited

number of 84 respondents and their assessments resulted from limitations related to the COVID-19 pandemic, the form of the survey developed, and how it was sent remotely.

The survey results formed the basis for the research hypothesis:

“Optimal management of material stocks in the national economy during emergencies can improve the effectiveness and efficiency of the national security system”.

3. The Essence of the National Security System

Since the article aims to present the position and role of stocks of materials in the national security system, this type of security will be shortly characterized later in the text.

Waldemar Kitler (2011) claims that national security is the most important value, the primary national need, and the top priority of the state, individuals, and social groups. At the same time, it is a process that includes specific means that guarantee the lasting functioning of society that is free from disturbances, the protection of goods and the natural environment against threats, and the national development of the state.

National security needs to be considered from a social and functional point of view. In the social sense, it expresses the basic need and value, as well as the purpose of acting at all organizational levels. When it comes to the functional sense, it is the primary national mission of our society, fulfilled by protecting and defending the value of national interests against potential threats and by creating conditions for free development in a changing environment.

The most important legal act which governs security-related matters in Poland is the Constitution of the Republic of Poland of 2 April 1997. What is important in this regard is Article 5 of the Constitution: ‘The Republic of Poland shall safeguard the independence and integrity of its territory and ensure the freedoms and rights of persons and citizens, the security of the citizens, safeguard the national heritage and shall ensure the protection of the natural environment pursuant to the principles of sustainable development’.

Regarding national security from a systemic point of view, M. Huzarski (2014) claims that: a ‘national security system is the collection of forces (entities), means and resources assigned by the state to fulfill security-related tasks, organized in a way which fits these tasks and maintained and prepared accordingly. It consists of a subsystem (system) of management and a range of subsystems (systems) of enforcement’.

A national security system should have certain characteristics, such as integrity, efficiency, comprehensiveness, and operability. They are shown in detail in Figure 2.

Figure 3 shows the structure of the national security system. The management subsystem plays the key role in this system, which guarantees that information on threats will be acquired and analyzed. It is also responsible for the planning and activities of operational and support subsystems and managing them in action. The management subsystem includes four strategic task areas:

- monitoring risks,
- counteracting risks,

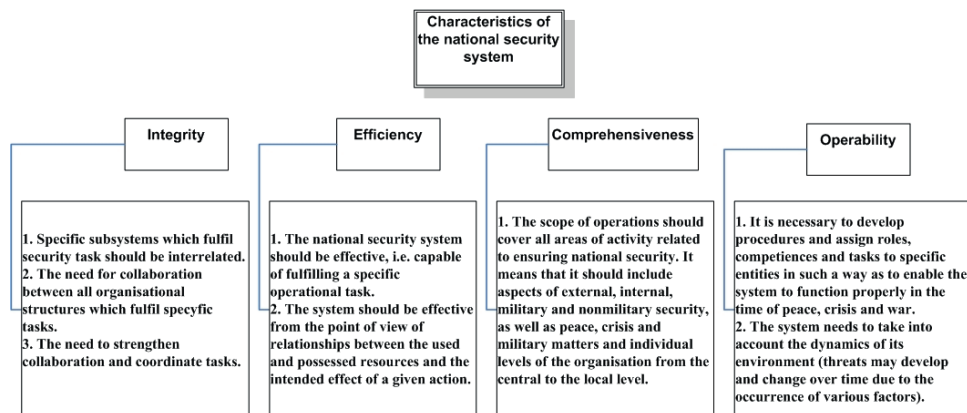


Fig. 2. Characteristics of the national security system

Source: own work based on Kitler (2011).

- dealing with the effects of risks,
- protecting the state in case of direct military aggression.

Operational and support subsystems are supposed to take on challenges, reduce risks, prevent and counteract external and internal threats, such as military, political, non-military (civil), social, and economic threats.

The Armed Forces of the Republic of Poland are responsible for implementing the Polish security policy, and their task is to protect security and safeguard the independence and integrity of the national territory.

Public security and civil protection are ensured by competent public authorities, which include courts, the Constitutional Tribunal, the State Tribunal, the public prosecutor's office, the prison service, intelligence services, the Internal Security Agency (ABW), the Foreign Intelligence Agency (AW), the Central Anti-Corruption Bureau (CBA), the police, the fire service, border services, customs services, etc.

Social security is associated with identity and national heritage. Factors that have a significant impact on this type of security include: research, education, and development, which affects the continuous improvement of national security and its potential.

The pillars of economic potential, which is the basis for determining the effectiveness and international position of a country, include financial security and its institutions, energy security and its entities, and strategic reserves.

The weaknesses of the national security system are presented in an Ishikawa diagram (Fig. 4) (Botezatu et al., 2019).

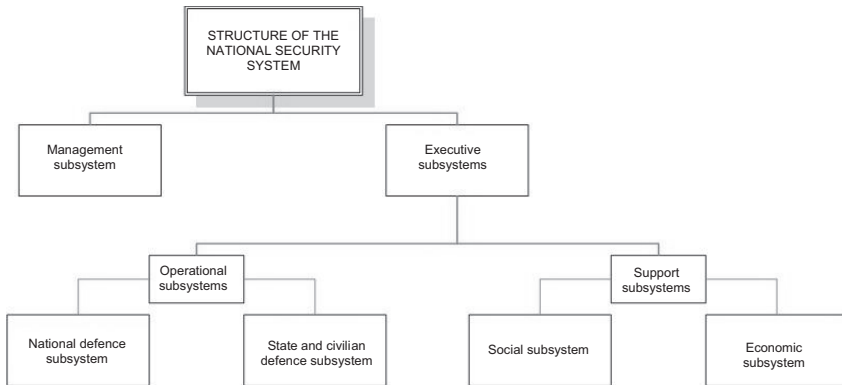


Fig. 3. Structure of the national security system

Source: own work based on 2022 Strategy for the Development of the National Security System of the Republic of Poland.

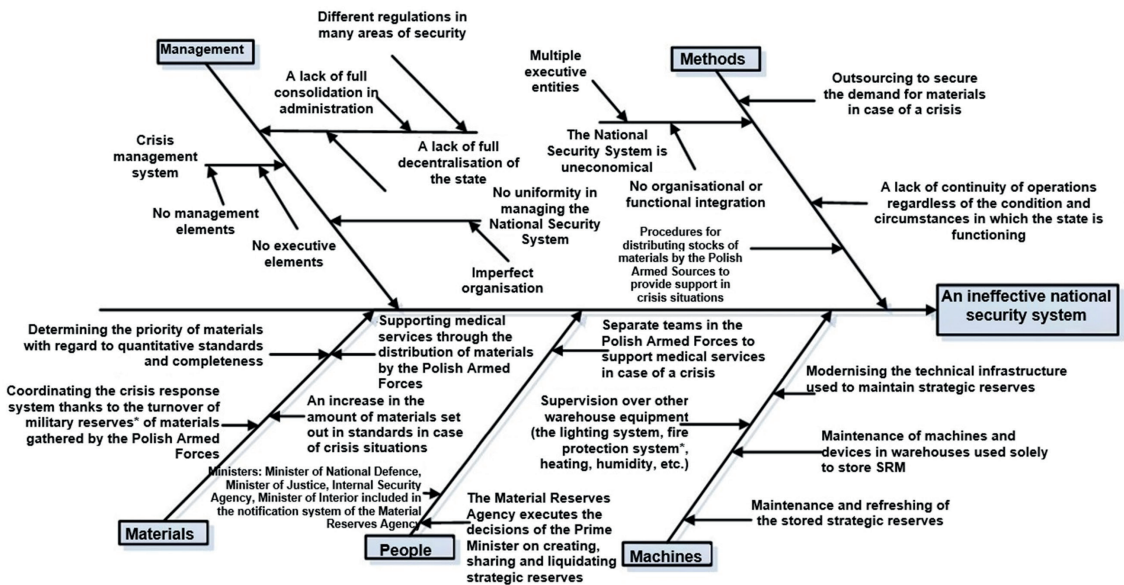


Fig. 4. Ishikawa diagram for the national security system

Source: own work based on: 1. 2022 Strategy for the Development of the National Security System of the Republic of Poland, as adopted by the resolution of the Council of Ministers of 9 April 2013.

4. White Book on National Security of the Republic of Poland, BBN, 2013

Conclusions drawn from the Ishikawa diagram concern mostly the area of managing the national security system and the methods related to it. The weaknesses of the system include a lack of elements related to management and execution, a lack of continuity regardless of the state and circumstances in which countries are functioning, and legal norms scattered in inconsistent sources of law. What is important from the point of view of national security is the joint responsibility of citizens with regard to the areas of the system, i.e., environmental, health, economic, political, public, military, and social security.

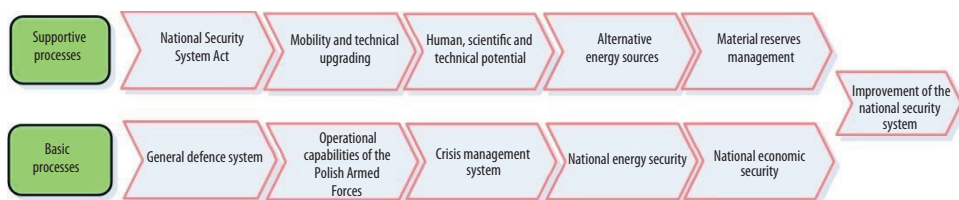


Fig. 5. Value chain in the national security system

Source: own work.

Figure 5 shows the value chain in the national security system (Shuai, 2020). It identifies basic processes and processes which support the improvement of the national security system.

One of the basic processes in the chain and an essential component of the system, which ensures the security and protection of the state, is the process of managing reserves (stocks) of materials maintained by the Government Strategic Reserves Agency, military resources of the Polish Armed Forces, and security reserves owned by national economy entities.

Nobody in Poland or around the world needs to be convinced of the need to keep stocks of selected goods. It has clearly been shown by the recent difficult time of the COVID-19 pandemic and the state of epidemic emergency introduced in Poland. Initial shortages of medical supplies protecting us against the spread of the virus, especially surgical masks, disinfectants, protective gloves, and ventilators, as well as the current vaccine distribution system, have demonstrated an urgent need to introduce systemic changes in the management of these supplies, starting from government entities to manufacturers and distributors responsible for it.

The survey results illustrate the understanding of mechanisms that accompany the management of material reserves. The survey was addressed to representatives of the Inspectorate for Armed Forces Support, Central Institutions of the Ministry of National Defense, and academic staff from the Faculty of the Security, Logistics, and Management

at the Military University of Technology, who deal with the studied issues on an everyday basis. What was analyzed were military reserves kept by the Polish Armed Forces.

4. Analysis of Survey Research on the Maintained Reserves

Research was conducted in a group of 84 respondents, including experts and decision-makers in military logistics, particularly people involved in the maintenance of stocks of materials. The survey had 14 questions divided into three sections, devoted to assessing the system, the possibility of using it in crises, and a summary.

The first section was devoted to the system's functioning which aim is to maintain stocks of supplies in the Polish Armed Forces and the possibility of providing support to civilians in case of a crisis. A scale with points, based on bipolar Likert scale, was used to evaluate the system. The scale makes it possible to assess the views on a given topic and detect even the smallest differences in the attitudes of respondents (Stanisz, 2016; 2007).

An analysis of answers has shown that the vast majority of respondents (59.5%) positively assess the functioning of the system and the procedures of maintaining and dispensing materials in case of a crisis. A negative opinion was expressed only by 11.9% of respondents, whereas 28.6% of respondents did not have any opinion on this issue (Table 1 and Fig. 6).

Table 1. Do you positively assess the procedures for dispensing the resources of the Armed Forces of the Republic of Poland in order to provide help in case of a crisis?

Answer	Number	Cumulative number	Percentage	Cumulative percentage
No	10	10	11.9%	11.9%
I don't know	24	34	28.6%	40.5%
Yes	50	84	59.5%	100.0%

Source: own work.

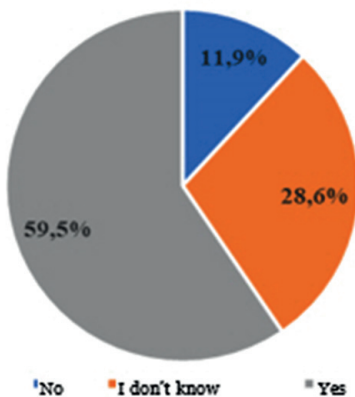


Fig. 6. Percentage distribution of answers to the question about the procedures for distributing resources

Source: own work.

Moreover, most respondents (78.9%) believe that the Military Property Agency and the Armed Forces of the Republic of Poland should collaborate more closely on processes related to gathering and storing material supplies. One in five respondents believes that the scope of their collaboration is right or has no opinion on this issue (Table 2 and Fig. 7).

Table 2. Do you believe that the Military Property Agency (AMW) and the Armed Forces of the Republic of Poland should cooperate closely to carry out processes related to gathering and storing material supplies?

Answer	Number	Cumulative number	Percentage	Cumulative percentage
No	6	6	7.1%	7.1%
I don't know	11	17	13.1%	20.2%
Yes	67	84	79.8%	100.0%

Source: own work.

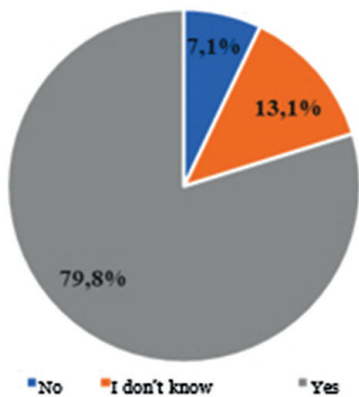


Fig. 7. Percentage distribution of answers to the question about collaboration between the Military Property Agency (AMW) and the Armed Forces of the Republic of Poland

Source: own work.

The next questions were devoted to the possibility of using the logistics potential of the Polish Armed Forces in the area related to stocks of materials in case of a crisis. A vast majority of respondents (94%) have expressed the opinion that it may be used to support civilians without limitations (46.4%) or in part (47.6%) (Table 3 and Fig. 8).

Table 3. Should the logistics potential of the Armed Forces of the Republic of Poland, i.e., its stocks of materials, be used to provide help in case of a crisis in our country (e.g., a natural disaster, catastrophe, breakdown, pandemic, etc.)?

Answer	Number	Cumulative number	Percentage	Cumulative percentage
No	5	5	6.0%	6.0%
Partially	40	45	47.6%	53.6%
Yes	39	84	46.4%	100.0%

Source: own work.

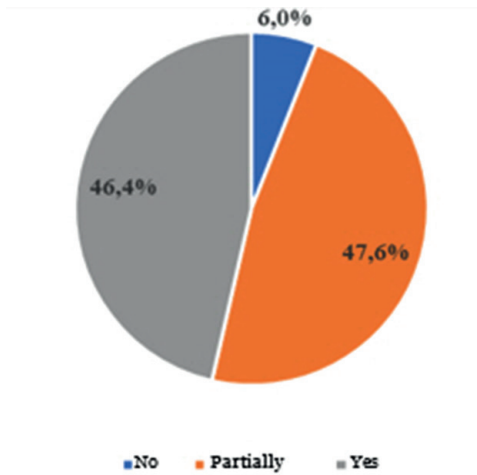


Fig. 8. Percentage distribution of answers to the question about the possibility of using the logistics potential of the Armed Forces of the Republic of Poland in crises

Source: own work.

The majority of respondents have had a positive attitude towards the possibility of providing help by making use of stocks of materials (76.2%). One in four respondents has given a negative answer, claiming that such stocks should be made available solely to the Armed Forces of the Republic of Poland and used only to secure their needs (Table 4 and Fig. 9).

Table 4. Should material help provided to civilians by the Armed Forces of the Republic of Poland be organized based on the possessed and maintained stocks of materials?

Answer	Number	Cumulative number	Percentage	Cumulative percentage
No	20	20	23.8%	23.8%
Partially	48	68	57.2%	81.0%
Yes	16	84	19.0%	100.0%

Source: own work.

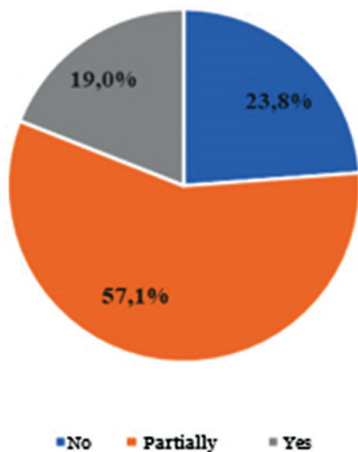


Fig. 9. Percentage distribution of answers to the question about help for civilians

Source: own work.

The respondents who gave a positive answer to the question about the possibility of using stocks of materials gathered by the Armed Forces of the Republic of Poland to help civilians in case of a crisis were asked an additional question about their opinion on the percentage of these resources which could be devoted to the above task (without lowering the combat readiness of the army). On average, respondents claimed that allocating 28% of the maintained supplies would not negatively affect combat readiness. The graphic representation of the division of answers is shown in Fig. 10.

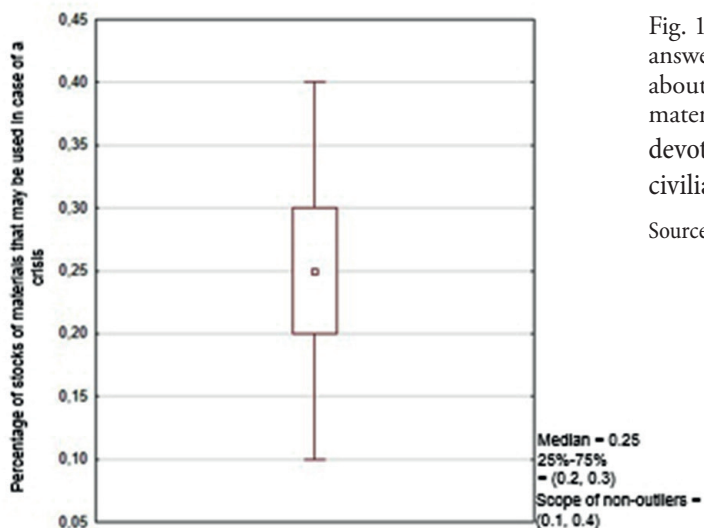


Fig. 10. Box plot chart with answers to the question about the percentage of materials that could be devoted to the needs of civilians

Source: own work.

In the next research stage, text answers were converted into a numerical scale (5 – yes, 4 – partially, 3 – I don't know, 2 – not really, 1 – no), and the basic values of descriptive statistics were calculated. Moreover, answers were presented in a graphic form based on the box plot chart (Fig. 11). The chart below confirms positive opinions on the functioning of the stocks maintenance system and the possibility of establishing closer cooperation between the Military Property Agency and the Armed Forces of the Republic of Poland. It also confirms partial approval of the allocation of forces and resources from the logistics potential of the Armed Forces of the Republic of Poland helping civilians in case of a crisis.

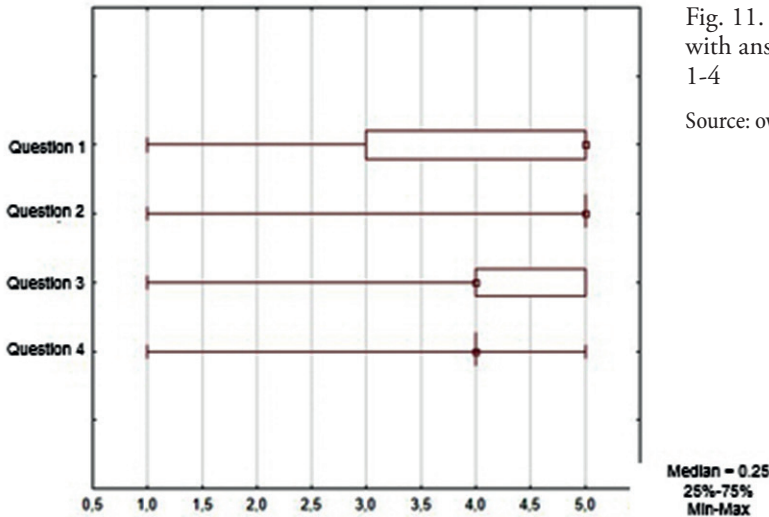


Fig. 11. Box plot chart with answers to questions 1-4

Source: own work.

The last question from this section was devoted to the possibility of outsourcing services in order to secure the demand for materials in case of a crisis or a war. A vast majority of respondents (63.1%) have concluded that this option is acceptable only with regard to selected classes of materials, whereas 13% of respondents expressed a negative opinion on this solution (Table 5 and Fig. 12).

Table 5. Do you think outsourcing is a good way to secure the demand for materials in case of a crisis or a war?

Answer	Number	Cumulative number	Percentage	Cumulative percentage
It depends on the class of materials	53	53	63.1%	63.1%
No	11	64	13.1%	76.2%
I don't know	8	72	9.5%	85.7%
Yes	12	84	14.3%	100.0%

Source: own work.

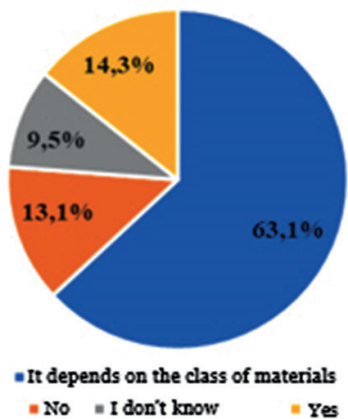


Fig. 12. Percentage distribution of answers to the question about the possibility of outsourcing services

Source: own work.

The **second** section of answers in the survey was devoted to opinions on modifying the functioning of the maintenance system for stocks of materials in the Armed Forces of the Republic of Poland, so that it could effectively react to crises. The majority of respondents have concluded that it is justified to increase the amount of maintained materials (67.9%), which could be used to provide help in case of natural disasters, catastrophes, breakdowns, and pandemics (Table 6 and Fig. 13).

Table 6. Is it justified to increase the amount of materials set out in standards and maintained by the Armed Forces of the Republic in Poland in case of crises?

Answer	Number	Cumulative number	Percentage	Cumulative percentage
No	27	27	32.1%	32.1%
Yes	57	84	67.9%	100.0%

Source: own work.

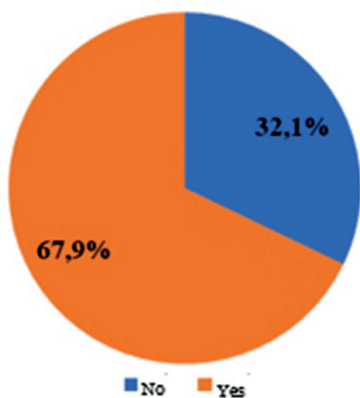


Fig. 13. Percentage distribution of answers to the question about the justifiability of increasing the amount of stocks

Source: own work.

Moreover, 71.4% of respondents have claimed that using material supplies gathered as military stocks to secure the coordination of the crisis response system may be an important element in the turnover of stocks and may have a positive impact on the maintained supplies (Table 7 and Fig. 14).

Table 7. Do you think that using military stocks of materials maintained by the Armed Forces of the Republic of Poland to coordinate the crisis response system would be an important element in the turnover of stocks?

Answer	Number	Cumulative number	Percentage	Cumulative percentage
No	14	14	16.7%	16.7%
I don't know	10	24	11.9%	28.6%
Yes	60	84	71.4%	100.0%

Source: own work.

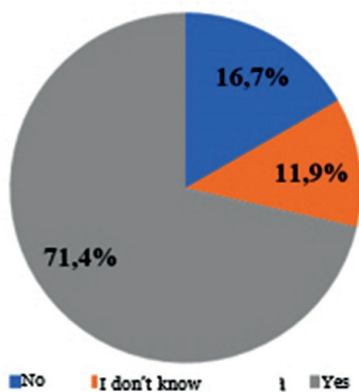


Fig. 14. Percentage distribution of answers to the question about the turnover of stocks

Source: own work.

At the same time, most respondents (69%) have concluded that it is unreasonable to maintain an increased amount of materials for the needs of civilians in case of a crisis (Table 8 and Fig. 15).

Table 8. Should the material help of the Armed Forces of the Republic of Poland for civilians be organized solely based on materials increased and maintained especially for this purpose?

Answer	Number	Cumulative number	Percentage	Cumulative percentage
No	58	58	69.0%	69.0%
Yes	26	84	31.0%	100.0%

Source: own work.

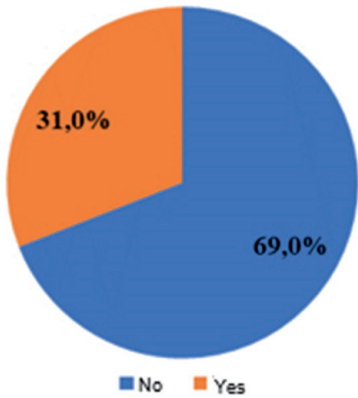


Fig. 15. Percentage distribution of answers to the question about the need to maintain additional materials

Source: own work.

Moreover, the respondents who gave a positive answer to the possibility of maintaining additional material reserves in case of a crisis, were asked about the class and group of resources that should be increased. Over half of respondents (53.3%) have concluded that it is mainly stocks of food and medical supplies that should be increased (Table 9 and Fig. 16).

Table 9. Specify which stocks of materials should be increased in the following services: uniformed, food, fuel and grease or other services?

Material	Number	Cumulative number	Percentage	Cumulative percentage
food	13	24	28.9%	28.9%
medical supplies	11	11	24.4%	53.3%
fuel and grease	4	33	8.9%	62.2%
uniforms	3	27	6.7%	68.9%
biosecurity measures	3	36	6.7%	75.6%
none	3	45	6.7%	82.2%
infrastructure resources	2	29	4.4%	86.7%
medical vehicles	2	38	4.4%	91.1%
all services	2	42	4.4%	95.6%
water treatment equipment	1	39	2.2%	97.8%
power generators	1	40	2.2%	100.0%

Source: own work.

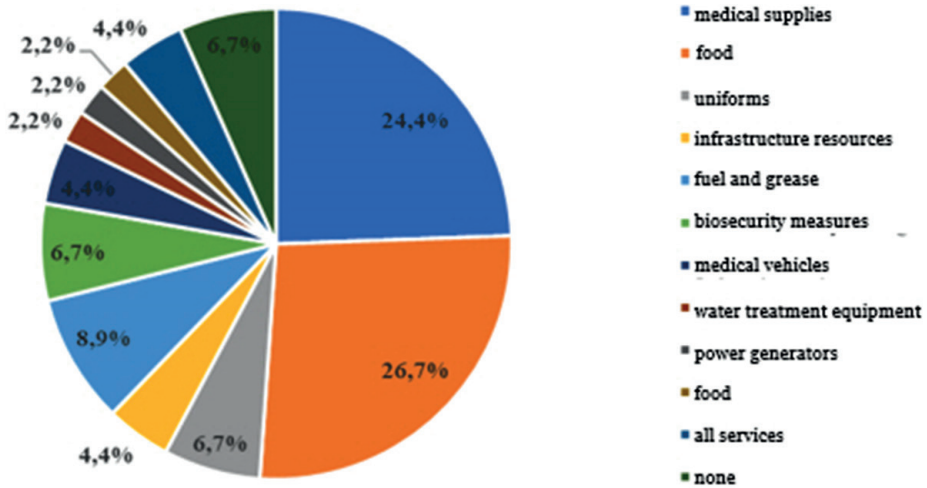


Fig. 16. Percentage distribution of answers to the question about the types of materials which should be increased

Source: own work.

A vast majority of respondents (81%) have concluded that we should draw from our current experience and modify the system of stocks of materials and the logistics potential in order to increase the stocks of medical supplies and the availability of qualified medical staff in order to support medical services in our country (Table 10 and Fig. 17).

Table 10. Based on our current experience of the pandemic, do you think that the Armed Forces of the Republic of Poland should have separate stocks of materials and teams of people to support medical services in our country?

Answer	Number	Cumulative number	Percentage	Cumulative percentage
No	9	9	10.7%	10.7%
I don't know	7	16	8.3%	19.0%
Yes	68	84	81.0%	100.0%

Source: own work.

The **third** section of questions in the survey was supposed to sum up it up. Respondents had to choose which group of materials should be given priority when it comes to its completeness. Moreover, they assessed the possibility of making a structural change in the functioning of the system of maintaining stocks by the Armed Forces of the Republic of Poland, and assessed the opinion-forming value of the research.

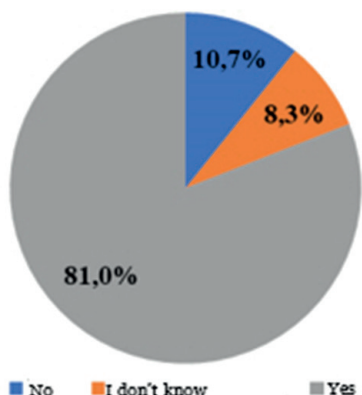


Fig. 17. Percentage distribution of answers to the question about increasing medical supplies

Source: own work.

In response to the question about which group of materials should be given priority to determine its quantitative standard and completeness, respondents usually chose medical supplies (23% of all choices). Moreover, respondents have concluded that it is justifiable to prioritize uniforms and equipment (20.4%) and lodging equipment (20.1%) – Table 11.

Table 11. In your opinion, which group of materials should be given priority when it comes to quantitative standards and completeness (you may choose more than one answer)?

Group of materials	Number	Percentage of answers	Percentage of cases
Food	55	18.1%	65.5%
Medical supplies	70	23.0%	83.3%
Uniforms and equipment	62	20.4%	73.8%
Fuel and grease	56	18.4%	66.7%
Lodging equipment	61	20.1%	72.6%
In total	304	100.00	361.90

Source: own work.

The next question was devoted to the possibility of introducing changes to the structure of the system of maintaining stocks of materials in the Armed Forces by turning the Material Reserves Agency into an executive body in that system and by including representatives of the Central Logistics Authority of the Armed Forces of the Republic of Poland and the Support Inspectorate of the Armed Forces in the system in order to ensure the possibility of quickly coordinating tasks in case of a crisis, without the need for additional decisions to be made by the Chief of the General Staff or the Minister of National Defense. The majority of respondents (50.6%) have expressed their approval of the proposed solution, whereas one in five respondents (20.2%) has had a negative attitude towards the proposed modification of the system (Table 12 and Fig. 18).

Table 12. Do you think that the Material Reserves Agency should become the executive body in the crisis response system, which should also include the Central Logistics Authority of the Armed Forces of the Republic of Poland and the Support Inspectorate of the Armed Forces, in order to carry out tasks without the need for decisions to be made by the Chief of the General Staff or the Minister of National Defense?

Answer	Number	Cumulative number	Percentage	Cumulative percentage
No	17	17	20.2%	20.2%
I don't know	24	41	28.6%	48.8%
Partially	23	64	27.4%	76.2%
Yes	20	84	23.8%	100.0%

Source: own work.

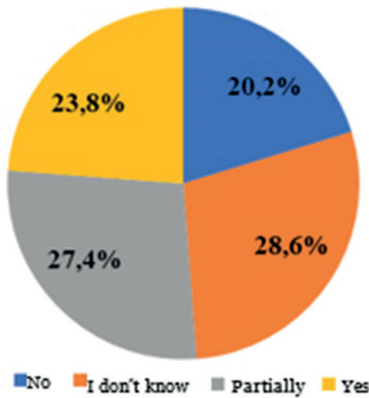


Fig. 18. Percentage distribution of answers to the question about the possibility of modifying the system

Source: own work.

The last question in the survey was devoted to its opinion-forming value and added value regarding the possibility of using the proposed solutions to improve the logistics system of the Armed Forces of the Republic of Poland in the area related to stocks of materials and their use in crises. 97% of respondents have fully or partially agreed with the proposed changes and their positive impact on the system's functioning (Table 13 and Fig. 19).

Table 13. In your opinion, does this survey have an opinion-forming value and adds value to the core of the matter, which is making use of the logistics potential of the Armed Forces of the Republic of Poland, i.e., its stocks of materials, in crises?

Answer	Number	Cumulative number	Percentage	Cumulative percentage
No	2	2	2.4%	2.4%
Partially	29	31	34.5%	36.9%
Yes	53	84	63.1%	100.0%

Source: own work.

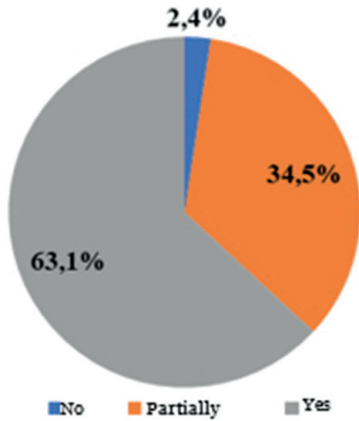


Fig. 19. Percentage distribution of answers to the question about increasing medical supplies

Source: own work.

To sum up the survey, answers given in the last section were converted into a numerical scale, and a graph with their distribution was developed based on the box plot chart (Fig. 20).

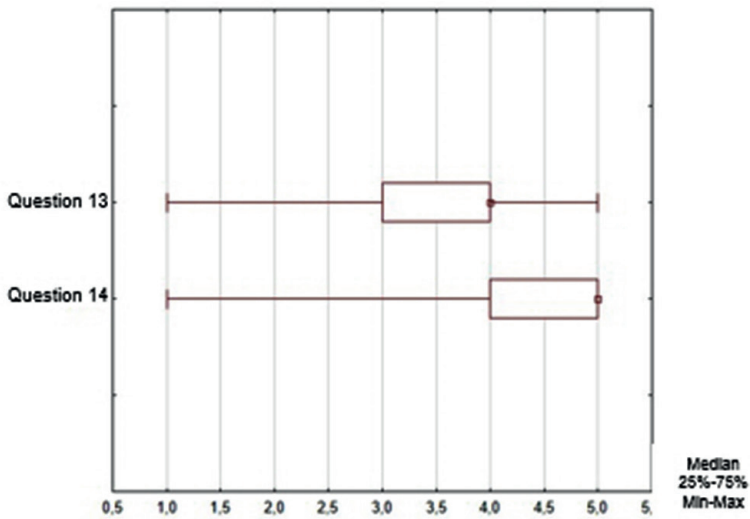


Fig. 20. Box plot chart with the distribution of answers from the summarizing section

Source: own work.

The chart shows that most respondents have a positive attitude toward the questions, i.e., the possibility of changing the system's functioning, and toward the high opinion-forming value of the research. The responses are distributed on the right side of the chart, and the median is 4 (partially agree) and 5 (fully agree), respectively.

Conclusions

The authors of this article intended to draw attention of relevant services in the state to the use of material reserves in emergencies. The key issue seems to be the need for cooperation and integration of relevant national economy entities from the point of view of rational use of accumulated material reserves to maintain continuity of supply and secure society's needs in situations of economic crisis, natural disaster or military threat. Conducted literature studies and own survey research led the article's authors to formulate general conclusions. According to them, government entities responsible for the organization of the national security system could consider the following issues:

1. It is expedient to develop and publish a law on the national security system.
2. There is a need to integrate the basic subsystems of the national security system (general defense, crisis management, energy, and economic).
3. Attention should be paid to ensuring the continuity of supply of materials and products in the supply, production, and distribution processes in crises (mainly in the situation of a complete halt of production and trade) and the effective implementation of waste management.
4. It is advisable to secure the needs of society in material resources necessary for functioning under crisis conditions (food, medical, water, and other resources).
5. There is a need to ensure the availability of material reserves in the warehouses of the Strategic Reserve Agency of the Government, the Armed Forces of the Republic of Poland, and the national economy in the event of military threats, economic, epidemic, and other crises and the allocation of reserves, e.g., in the system of their rotation from the war reserve warehouses of the Armed Forces of the Republic of Poland to secure the needs of society.

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