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Dear Readers,

It is with great pleasure that I present the latest issue of *Politics & Security* (Vol. 9, No. 3, 2024), a collection of insightful research articles that explore critical topics at the intersection of global security, technological advancements, humanitarian efforts, and economic stability. This issue brings together a diverse range of studies that contribute to the ongoing discourse on contemporary political and security challenges worldwide.

One of the central themes of this issue is the evolving nature of security in the modern world. In his article on Decision Support Systems in the Contemporary Security Environment, Kostadin Yazov examines the increasing role of artificial intelligence and data-driven decision-making in security operations. His work highlights the importance of predictive analytics and digital transformation in shaping defense strategies, crisis management, and policy implementation.

The intersection of technology, ethics, and security is further explored in the thought-provoking study by Anis H. Bajrektarevic and Valentina Carvajal Caballero on Biohacking: Legal, Ethical, and Practical Considerations in Europe and Latin America. The paper discusses the challenges posed by DIY biology, regulatory gaps, and ethical concerns, offering valuable insights into the governance of emerging technologies in different geopolitical contexts. Their second contribution, Comparative Analysis on Data Protection in Europe, Asia, and Latin America-Caribbean, extends this discussion to the broader issue of digital privacy, analyzing how various regions regulate and manage data security in an increasingly interconnected world.

The humanitarian and social consequences of war are a major focus in this volume, particularly in the context of the ongoing Russo-Ukrainian conflict. Wojciech Pac presents two critical analyses: Humanitarian Assistance for War Refugees from Ukraine: A Case Study of the Podkarpacki Branch of the Polish Red Cross and Demographic and Social Consequences of the Russo-Ukrainian War for Ukraine. These articles provide an in-depth look at the immediate and long-term impacts of the conflict, addressing issues such as migration, humanitarian aid coordination, and the socio-economic challenges faced by refugees.

Economic stability and sustainability are also central to this issue, particularly in the agricultural sector. Janusz Kilar, Mateusz Kaczmarek, Wojciech Pac, Piotr Frączek, Magdalena Kilar, and Anna Turoń present an important study on The Impact of Implementing Agri-Environmental-Climate Commitments on the Economic Security of Polish Farmers from the Podkarpackie Region. This article evaluates the effectiveness of agricultural policies in enhancing economic resilience and environmental sustainability in rural Poland. Additionally, the same research team contributes an analysis of Food Security Control System in Poland, emphasizing the importance of regulatory frameworks in ensuring national food safety and supply chain stability.

As *Politics & Security* continues to serve as a platform for scholarly debate on pressing political and security challenges, we remain committed to fostering interdisciplinary and globally relevant research. I extend my deepest appreciation to our authors for their valuable contributions, our reviewers for their rigorous evaluations, and our editorial team for their dedication in bringing this issue to publication.

Enjoy your reading!

Igor Britchenko

Editor-in-Chief

Politics & Security

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DECISION SUPPORT SYSTEMS IN THE CONTEMPORARY SECURITY ENVIRONMENT

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Abstract: *The purpose of this study is decision support systems from a management perspective and their relationship to the modern security environment. The author believes that management as a process is a primary means of influence, and the successful decision-making process goes through several stages. This article expands the scope of the theoretical review and shows the relationship between information processes and decision-making systems through modern technologies for process optimization through decision-making systems. The study focuses on theoretical data on decision-making systems currently in use, without claiming to be complete. This may provide prerequisites for future research in the context of implementing new technologies and using artificial intelligence in the decision-making process in various sectors of the economy.*

Keywords: decision making; automatic information processing; decision making systems

INTRODUCTION

Every activity in the modern world requires development and achievement of increasingly better results. Achieving the expected good result in any activity can largely be viewed as a decision-making system. In practice, decisions are usually made to solve a specific problem. In cases where an individual lacks the necessary competence to solve a particular problem and/or does not know who could, a decision-making system is then applied.

What do decision-making and decision support systems represent in management decision-making?

Decision-making can be regarded as the essence of management and as its fundamental characteristic. Without managerial decisions, there is no true management. In the literature, numerous authors define management decision-making as the most important managerial function. Furthermore, in specialized literature, there even exists the so-called "decision-making school," whose adherents not only argue that decision-making is the most important act in management but also that the management process itself is reduced to the process of making managerial decisions.

Management as a process represents the primary means of influencing or a system of activities related to:

- changing the behavior of individuals and groups;
- changing the organizational structure of production and management;
- redistributing resources;
- changing the conditions for the functioning of the system and the relationships between its elements.

The successful decision-making process consists of three main stages: formulating the question, generating alternatives, and making the decision. (Mladenov, Yul., Terziev, V., 2011).

Until just a few years ago, methods based on individual creative thinking were primarily used. However, today, the use of large language models is becoming increasingly necessary, as they can assist at every step of the decision-making process. The development of information technologies helps to enhance the decision-making process.

"The Information Processes and Decision-Making Systems (IPDMS)" are the result of conducting scientific, applied scientific, and applied research in the field of modern information technologies aimed at optimizing processes and systems for decision-making (Institute of Information and Communication Technologies-Bulgarian Academy of Sciences, 2024).

A CONCEPT FOR DECISION-MAKING SYSTEM

Decision support systems are based on science management, research on operations, management theory, computer technologies, modeling technology, and information technologies as a means of semi-structured decision-making issues, i.e., activities of an intelligent person turned into systems. The system is capable of providing decision-makers with the necessary information, data, information and experience, in order to aid in decision-making and problem identification. (Vasilev, 2014). To create or modify the decision model, a variety of options as well as evaluation programs are offered.

A large portion of decision-making models, developed and evaluated through the consideration of numerous possible courses of action within one or another decision support system, are based on the examination of a large number of cases. It is evident that cases do not provide a solution in the form of an ideal answer for the specific decision-making situation. Instead, cases pose questions, provide frameworks for decision-making, and outline various options that can be used to train generative language models.

When discussing decisions in public organizations, it should not be forgotten that a number of requirements are presented, such as:

- Validity: Having complete and reliable information about the external and internal environment and acknowledging the fact that the decision will not be implemented in isolation but within a system with other previously made decisions.

- Timeliness: The timing of decision-making is crucial for overcoming any conflicts that arise within the public organization, but it is best when done early on.

- Cost-effectiveness: Objectives are achieved through various options, with costs varying in each option, necessitating the selection of the optimal one.

- Complexity: Decisions must consider not only changes in the economic aspect but also in the social, political, environmental, and other facets of the problem being addressed, continuously accounting for changes in any of these areas, which in turn affect the others. Therefore, when making decisions, these complex interrelationships must be considered, and the questions that arise must be addressed comprehensively.

- Specificity: Determining the exact composition and sequence of the planned activities, including deadlines for implementing decisions, methods for monitoring and evaluating the results of decision implementation.

There are also other fundamental requirements for decisions: timeliness, legality, flexibility, objectivity, and consistency (Mladenov & Terziev, 2011).

The dynamism and complexity of activities in various organizations necessitate making different decisions, which can be classified according to various criteria.

Decisions can be prospective, current, or operational depending on their duration of implementation.

Depending on the scope of the issues being addressed, decisions are categorized as general or specific.

Based on the nature of the issues being addressed, decisions can be classified as economic, technical, technological, financial, administrative, organizational, and social. In management practice, there are no purely technical or purely economic decisions.

METHODS RELATED TO MANAGERIAL DECISION-MAKING

Decision-making typically involves choosing among multiple alternatives. Higher levels in the management hierarchy require making more decisions, and the higher the level, the more equally balanced the pros and cons between alternatives become. Making important decisions is accompanied by opinions, and the leader relies not only on facts because, in many cases, one fact or another may be misleading or essential facts may be lacking.

When making managerial decisions, heuristic methods, also known as "heuristics," are widely used. (Mladenov & Terziev, 2011). They are intended to generate options for solving a particular problem based on the inherent human ability for creative thinking and generally for creative activity. This method is characterized by heuristic reasoning, which allows for practical options for problem solving. The creative decision-making process using heuristic methods is one of the important resources of organizations, ensuring their competitiveness. Heuristic methods help in decision-making in conditions of increasing complexity, dynamics, and uncertainty of the external environment, especially when dealing with unstructured management problems.

Depending on the subject who conducts the decision-making process, heuristic methods are considered in two main groups: methods of individual and methods of group creative thinking.

Over the years, the process of decision-making has gone through various stages and evolved to incorporate the use of artificial intelligence today (Futurist.bg, 2023).

It is interesting to retrospectively analyze decision-making methods and note the progress in this area, alongside the development of information technologies.

An important method of individual creative thinking is the "scenario development" method, which find application primarily in determining overall economic policies in a given area. A drawback of this method is the lack of alternative solutions to the problem.

The following methods, these are the so-called methods of "morphological analysis", which are characterized by the use of sequential thought activities. The analysis enables the selection of a solution.

The "brainstorming" method is among the most widespread methods of creative participation in decision-making. This method is characterized by the mutual exchange of ideas during a collective brainstorming session on the problem at hand.

One of the most widely advocated heuristic methods in management activity are expert assessment methods. They are applied in determining the goals for solving a given problem by discussing options and choosing based on a conclusion about the choice.

Another method is the *Delphi* method and its modifications, the most widely used out of the group methods.

The *Ringi* method – a low-level manager prepares a document to solve a problem that is not within his competence. The document then goes to the next level of managers who do support or do not support the proposal to solve the problem. (Mladenov & Terziev, 2011).

AUTOMATIZED SYSTEMS FOR INFORMATION PROCESSING AND MANAGEMENT

Over the past two decades automated systems have been increasingly integrated into the lives of modern individuals. They even change people's daily routines, and it is impossible today to imagine success in any field without the use of such automation systems. Information systems are developing as rapidly as possible, and information technologies are prioritized in their development for countries as they form the

basis of organizing electronic government and international and national projects, including business, management, economics, administration, education, culture, healthcare, national security, and defense system.

Hence, decision-making support based on information systems is of crucial importance. These processes need to be mastered and controlled, especially when it comes to strategic management. It is important to note that the decision-making process is a systematic approach in making choices based on a set of criteria and selecting the best option based on evaluation.

The decision-making required in a given situation aims to assist the organization in better resource allocation, time efficiency, and other factors to achieve the best outcome. Decisions are most commonly categorized as operational, tactical, and strategic. Decision-making is usually associated with achieving goals, problem-solving, efficiency, improved results, risk management, or personal growth.

Business Intelligence (BI) (BI systems, 2022) is a system that encompasses processes, tools, and technologies necessary for transforming data into information and information into knowledge and plans that imply quick and effective business actions supporting the decision-making process.

It is through Business Intelligence (BI) systems that users obtain secure, consistent, understandable, easy-to-process, and timely information, which creates conditions for informed decision-making.

Business analysis systems can also help identify market trends and uncover problems that need to be addressed.

Large language models can also help identify goals and preferences, evaluate decision circumstances, and select a decision mechanism. And here again the dialogue is a key point. By asking the right questions, we can better understand the context of a decision. Another system is ChatGPT (How can we use ChatGPT to make more effective business decisions? 2023), with which we can quickly find suggestions of what typical goals other companies have pursued in a similar situation. This system gives different perspectives. The generative language model has a number of advantages – it is not self-interested and is much cheaper than external management consultants. It also means that ChatGPT can make preparation and decision support cheaper, especially for small and medium-sized companies giving them more chances in the market.

Systems are becoming more efficient because the economic incentive to make better business decisions is high and will drive the transition from today's ChatGPT to an even more powerful tool of the future, which we can tentatively call "DecisionGPT" (The future of business case solving, 2023).

The strength of ChatGPT and similar systems is in comparing and contrasting similar situations. This is perhaps the most important necessity in making many managerial decisions. Very few decisions that managers face to are unique. Thousands, sometimes millions, of managers before them have faced similar choices. The better it is described how the decision frameworks were formulated, the different options were evaluated and the corresponding decisions were made, the easier DecisionGPT will become a powerful tool for making more informed and correct decisions.

Another decision support system is DSS (Clinical Decision Support System, 2018), which is a computerized support system and is used to improve decision-making ability in a business organization as a significant part of its application is in the medical industry.

Of course, there are a number of other systems to support managerial decision-making, which we cannot consider here in substance.

All decision support systems must be protected, as well as the environment in which they operate. In the EU member states, a number of legal acts are applied, the main purpose of which is to guarantee the protection of consumers, not only EU consumers. In this sense, I will refer to one of the latest documents "Resolution of the European Parliament from 12 February 2020 on automated decision-making processes: ensuring the protection of consumers and the free movement of goods and services" (2019/2915(RSP) (European Parliament, 2020).

CONCLUSION

In the modern world, every person, especially in the role of decision-maker, is continuously faced with solving complex cases. It should not be overlooked how many factors influence decision-making. Making the right decision requires more practice and often help from outside. Then it comes the turn of decision support systems. In addition to learning from examples of decision-making, people need to improve on other leadership skills to make better choices, especially when faced with difficulties.

Responsible decision-making involves considering ethical, moral and long-term consequences when making choices, with examples including environmental awareness, ethical dilemmas, peer pressure and substance use, academic integrity, online behavior and cyberbullying, financial responsibility, health and well-being, social responsibility and civic engagement, conflict resolution and responsible use of technology.

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BIOHACKING. LEGAL, ETHICAL AND PRACTICAL CONSIDERATIONS IN EUROPE AND LATIN AMERICA

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Abstract. *Biohacking, a burgeoning movement within the realm of DIY biology, represents a significant intersection of technology, ethics, information systems and personal empowerment. This scientific article explores the multifaceted dimensions of biohacking, with a particular emphasis on its manifestations and implications in Europe and Latin America. By examining the regulatory frameworks such as the General Data Protection Regulation (GDPR) and their impact on biohacking practices, this study delves into the ethical considerations, technological advancements, and socio-political influences shaping the biohacking landscape. Through an in-depth analysis of grassroots innovations in Latin America and established biohacking hubs in Europe, this article underscores the potential and challenges of biohacking in fostering innovation, addressing local and global issues, and navigating the complex interplay between individual autonomy and regulatory oversight. This study highlights pressing concerns such as bio piracy, where indigenous genetic resources risk exploitation without equitable benefit-sharing frameworks, and cybersecurity vulnerabilities, particularly in Latin America. The article also examines biohacking's potential to drive sustainable innovation while emphasizing the need for harmonized global legal frameworks to protect indigenous knowledge and address environmental governance gaps.*

Keywords: Biohacking, GDPR, DIY biology, Biotechnology, Ethics, Latin America, Europe, Data Privacy, Information Systems.

INTRODUCTION

Biohacking, defined as the practice of DIY biology aimed at enhancing human capabilities through technological and biological interventions, has emerged as a significant trend intersecting critical discussions on ethics, technology, and regulation in the digital age (Hungers, 2020). For the purpose of this work, we will hereby operate with our own definition: externally induced, concealed gene (information hoovering, sequestering, doctoring and/or) intervention for non-transparent ends. This very definition underscores the clandestine and purpose-driven aspects of certain biohacking practices, highlighting the ethical complexities involved.

Biohacking encompasses a wide array of practices, from simple lifestyle modifications such as dietary changes and nootropic use to more complex genetic engineering and implant technologies. This diversity within biohacking reflects its underlying ethos of democratizing access to biotechnological tools and knowledge, enabling individuals to experiment with and optimize their own biology (Lebowitz, 2017). The movement's growth is fueled by advancements in biotechnology, increased accessibility to scientific information, and a growing community of enthusiasts who advocate for personal and collective empowerment through biological self-experimentation.

In Europe, biohacking has been bolstered by a supportive regulatory environment and a strong culture of innovation. Community laboratories and collaborative initiatives provide biohackers with the resources and networks necessary to pursue their experiments, fostering an ecosystem where scientific inquiry is accessible to non-professionals (Wyeth, 2020). Conversely, in Latin America, biohacking often emerges as a grassroots response to local challenges, such as limited access to healthcare and agricultural technologies. Here, biohackers leverage biotechnology to develop low-cost solutions tailored to the region's specific needs, highlighting the movement's potential to drive social and economic development (Mendes et al., 2022). Having this said, biohacking, when intersecting with indigenous genetic resources, exposes the lack of robust international protections. For instance, the biotechnological innovations in Brazil's Morfogenesis project leverage indigenous farming practices but face criticism for inadequate benefit-sharing agreements, highlighting the enforcement gap in frameworks like the Nagoya Protocol (Rodríguez & García, 2023). The lack of enforcement of international agreements like the Nagoya Protocol has allowed patents on indigenous plants, such as Guarana, to be filed without sharing the benefits with local communities. Addressing this enforcement gap requires stronger collaboration between governments, international organizations, and biohacking communities to establish equitable and enforceable benefit-sharing agreements. Similarly, cyber vulnerabilities in Latin America further compound the risks of exploitation and misuse, as many grassroots projects lack sufficient digital safeguards.

The intersection of biohacking with GDPR is particularly salient, as biohackers frequently engage with technologies that collect and utilize personal health data. The GDPR's stringent requirements on data protection, consent, and ownership pose both challenges and opportunities for biohackers, necessitating a nuanced understanding of regulatory compliance alongside innovative experimentation (Voigt & Bussche, 2017).

This article aims to dissect these dynamics, offering insights into how biohacking practices can align with ethical standards and legal frameworks while continuing to advance personal and societal well-being.

Core Components of Biohacking

Biohacking comprises several core components that collectively aim to optimize human performance and well-being. These components include:

Lifestyle Optimization

Lifestyle optimization involves making deliberate changes to daily habits and routines to enhance overall health and productivity. This includes practices such as meditation, exercise regimens, and biofeedback techniques aimed at improving mental and physical well-being (Smith, 2021).

Diet and Nutrition

Diet and nutrition-focused biohacking entails modifying dietary intake to achieve specific health outcomes. This may involve the use of nootropics, supplements, and personalized nutrition plans designed to enhance cognitive function, energy levels, and metabolic health (Lebowitz, 2017).

Sleep Optimization

Sleep optimization strategies aim to improve sleep quality and duration through various interventions. Techniques such as sleep tracking, environmental adjustments, and the use of sleep-enhancing technologies are employed to maximize restorative sleep and overall health (Kahn et al., 2019).

Physical and Cognitive Enhancement

Physical and cognitive enhancement involves the use of biotechnological tools and interventions to boost physical strength, endurance, and cognitive abilities. This includes the use of performance-enhancing drugs, neurostimulation devices, and genetic modifications to achieve superior physiological and mental performance (Hughes, 2020).

DIY Biology

DIY Biology, or biohacking in a biological sense, refers to the grassroots movement where individuals engage in biological experiments outside of traditional laboratory settings. This encompasses activities such as genetic engineering, synthetic biology, and the creation of bio-art, aimed at exploring and expanding the boundaries of biological science (Ford, 2015).

Transhumanism

Transhumanism is a philosophical and scientific movement that advocates for the transformation of the human condition through advanced technologies. Biohacking plays a crucial role in transhumanism by enabling enhancements that transcend natural biological limitations, thereby promoting the evolution of humans into a post-human state (Latour, 2018).

Understanding these core components provides a comprehensive framework for analyzing the diverse practices within the biohacking movement and their respective ethical and regulatory implications.

REGULATORY FRAMEWORKS AND DATA PRIVACY: THE IMPACT OF GDPR

Biohacking encompasses a diverse range of activities, from simple lifestyle modifications to complex genetic engineering, aimed at optimizing human biology (Lebowitz, 2017). The integration of biohacking practices with advanced technologies such as CRISPR gene editing and wearable health devices has heightened the relevance of data privacy and protection (Kahn et al., 2019).

The GDPR, enacted in 2018, provides a stringent framework for handling personal data, including sensitive health information, directly impacting biohacking activities reliant on data collection and analysis (Voigt & Bussche, 2017). However, in Latin America, where biohacking often intersects with indigenous knowledge systems, compliance with GDPR poses unique challenges. Under the GDPR, biohackers must navigate strict requirements regarding consent, data ownership, and the ethical use of personal health data, mandating transparency and accountability in data processing (European Union, 2016). While the GDPR offers robust protections in Europe, its absence in Latin America leaves biohacking projects vulnerable to data misuse and breaches due to a lack of encryption protocols and cybersecurity standards. This disparity highlights the urgent need for Latin American countries to adopt similar data protection frameworks, ensuring that biohacking innovations can flourish securely and ethically. Before the number of the UN ODC Forums, the Member states have started expressing their consolidated concerns already by mid 2010s. The accelerated collection and sharing of personal health records (data) kept raising cybersecurity risks, moral and business ethics considerations, as sophisticated hackers could target biohacking databases for malicious purposes, underscoring the need for robust encryption and secure data protocols.

For instance, biohackers conducting genetic modifications must ensure informed consent and secure data handling. The GDPR's emphasis on data minimization and purpose limitation requires biohackers to carefully consider the extent of data they collect and the specific objectives of their experiments, thereby fostering a culture of ethical responsibility and data stewardship within the biohacking community (Smith, 2021).

Furthermore, the GDPR's extraterritorial scope means that biohacking activities in Latin America may also need to comply with European data protection standards if they involve the processing of data from European Union citizens (European Union, 2016).

The stringent protections offered by GDPR in Europe serve as a benchmark for Latin American biohacking initiatives, which often collect sensitive health and environmental data. For instance, Colombian grassroots biohackers monitor water quality using biosensors that collect geolocated data. However, this process lacks robust encryption and secure data storage, leaving it vulnerable to exploitation. The absence of GDPR-like frameworks in the region underscores the need for transnational collaborations to enhance data protection. This global dimension of data regulation underscores the importance of international collaboration and harmonization of ethical standards in biohacking practices, ensuring that innovations are both legally compliant and ethically sound across different jurisdictions (Kahn et al., 2019).

Biohackers conducting genetic modifications, for instance, must ensure informed consent and secure data handling. GDPR's extraterritorial scope also affects Latin American biohackers processing data involving EU citizens. Compliance challenges underline the need for international collaboration to harmonize ethical standards across different jurisdictions.

DATA PRIVACY CHALLENGES IN BIOHACKING

The collection and utilization of personal health data in biohacking raise significant privacy concerns. Biohackers often gather extensive datasets, including genetic information, biometric readings, and behavioral metrics, which can be highly sensitive and personally identifiable (Kahn et al., 2019). Ensuring the privacy and security of this data is paramount to prevent unauthorized access, misuse, or discrimination based on genetic or health information (Voigt & Bussche, 2017).

One of the primary challenges is the anonymization of data. While biohackers may attempt to anonymize personal data to comply with GDPR requirements, the risk of re-identification remains, especially with the increasing sophistication of data analytics and machine learning techniques (Castelyn, 2020). Therefore, biohackers must adopt advanced data protection strategies, such as encryption and secure data storage solutions, to safeguard personal information and maintain the trust of participants (Smith, 2021).

Additionally, the decentralized nature of biohacking poses unique challenges for data governance. Unlike traditional research institutions, biohackers often operate independently or within small community labs, lacking the formalized data management protocols and oversight mechanisms that institutional researchers typically employ (Castelyn, 2020). This decentralization can lead to inconsistencies in data handling practices, making it difficult to ensure compliance with GDPR and other data protection regulations. Developing standardized guidelines and best practices for data management in biohacking is essential to address these challenges and promote responsible data stewardship (Voigt & Bussche, 2017).

ETHICAL RESEARCH PRACTICES IN BIOHACKING

Ethical considerations in biohacking extend beyond data privacy to encompass broader issues of consent, autonomy, and the responsible use of biotechnological tools. Biohackers must ensure that their experiments do not infringe upon the rights and well-being of participants, maintaining transparency and accountability in their research practices (Castelyn, 2020). This involves obtaining informed consent, providing clear and comprehensive information about the potential risks and benefits of participation, and respecting participants' autonomy to withdraw from experiments at any time (Kahn et al., 2019).

Moreover, biohackers have a responsibility to consider the societal implications of their work, particularly in areas such as genetic engineering and human enhancement. The potential for unintended consequences, such as the creation of genetically modified organisms or the augmentation of human capabilities, necessitates a cautious and reflective approach to biohacking practices (Hughes, 2020). Engaging with ethicists, policymakers, and the broader community can help biohackers navigate these complex ethical landscapes, ensuring that their innovations align with societal values and ethical standards (Smith, 2021).

For example, in the Amazon Basin, biopiracy remains a critical issue, as companies often exploit plants with medicinal properties traditionally used by indigenous communities. For instance, patents on genetic modifications derived from the Guarana plant have been filed without benefit-sharing. Similarly, biohacking projects in Latin America, such as those working with genetically modified crops, risk replicating these patterns if legal safeguards like the Nagoya Protocol are not enforced.

Overall, GDPR significantly influences biohacking practices by imposing strict data protection requirements that necessitate ethical and responsible data management. By adhering to these regulations, biohackers can foster a culture of trust and accountability, ensuring that their innovative pursuits do not compromise individual privacy or societal well-being. The intersection of biohacking and GDPR underscores the need for ongoing dialogue and collaboration between biohackers, regulators, and ethicists to navigate the evolving challenges of DIY biology in the digital age.

ADDITIONAL REGULATORY CONSIDERATIONS

Beyond the General Data Protection Regulation (GDPR), several other regulatory frameworks significantly impact biohacking practices by setting standards for clinical trials, medical devices, and genetically modified organisms (GMOs). EU Regulation No 536/2014 governs clinical trials on medicinal products, directly intersecting with biohacking activities that involve human trials. This regulation ensures that any biohacking experiments involving human subjects adhere to strict safety and ethical standards, safeguarding participants' health and rights.

Similarly, the Medical Device Regulation (MDR) - Regulation (EU) 2017/745 establishes rigorous standards for medical devices, affecting biohackers who develop implantable devices or health monitoring technologies. Compliance with MDR is crucial for biohackers to ensure that their devices are safe, effective, and legally marketable within the European Union.

Furthermore, the Biotechnology Directive regulates the use of genetically modified organisms (GMOs), which directly impacts biohacking projects involving genetic modifications. This directive mandates thorough risk assessments and labeling requirements to prevent potential environmental and health risks associated with GMOs. On an international level, the Oviedo Convention on Human Rights and Biomedicine emphasizes human rights in biomedicine, setting ethical standards for genetic research and modifications that biohackers must follow to respect individual rights and societal values.

In the Americas, the American Charter of Fundamental Rights outlines fundamental rights that influence ethical considerations in biotechnology and biohacking, ensuring that practices align with broader human rights principles. Understanding and navigating these regulatory frameworks is essential for biohackers to maintain compliance, uphold ethical responsibilities, and promote the safe and responsible advancement of DIY biology.

THE ROLE OF TECHNOLOGY IN BIOHACKING

Technological advancements are the cornerstone of biohacking, enabling individuals to manipulate biological systems and enhance their physiological and cognitive functions (Ford, 2015). Tools like CRISPR-Cas9 exemplify the power of biohacking to redefine personal and collective empowerment, yet they also raise ethical dilemmas about access, misuse, and societal implications. Balancing these opportunities and risks requires transparent discussions among biohackers, ethicists, and policymakers to ensure that the benefits of such technologies are equitably distributed and responsibly managed. Tools such as CRISPR-Cas9 for gene editing, biosensors for real-time health monitoring, and open-source biotechnological platforms have democratized access to scientific experimentation, allowing non-professionals to engage in sophisticated biological research (Latour, 2018). This accessibility has transformed biohacking from a niche hobby into a global movement with significant implications for personal health, environmental sustainability, and technological innovation.

TECHNOLOGICAL ADAPTATIONS IN EUROPE

In Europe, the biohacking movement benefits from greater access to funding, infrastructure, and regulatory support. European biohackers often operate in community laboratories, such as La Paillasse in France and BioCurious in Germany, which provide the tools and space necessary for sophisticated experimentation. These well-established labs offer opportunities for collaboration between biohackers, scientists, and entrepreneurs, creating an environment where innovation can flourish.

A notable example of technological adaptation in Europe is the use of CRISPR gene-editing technology by biohackers to explore genetic modifications that could enhance human health. In Germany, biohackers at Open BioLabs have conducted experiments using CRISPR to modify yeast strains for more efficient biofuel production. This type of experimentation not only showcases the technological capabilities of

European biohackers but also highlights the potential for biohacking to contribute to broader societal goals, such as renewable energy development.

Additionally, European biohackers are leveraging wearable technology to optimize human performance. Projects focused on developing implants that monitor biometric data are becoming increasingly popular. In Sweden, for instance, biohackers have implanted RFID chips that allow users to perform everyday activities, such as unlocking doors or making payments, without the need for physical devices. This integration of technology into the human body reflects a broader trend in European biohacking towards enhancing human capabilities through seamless technological interfaces.

The regulatory landscape in Europe also plays a critical role in shaping biohacking practices. The implementation of GDPR has set a high standard for data privacy and protection, which European biohackers must navigate carefully. This regulation has led to the development of innovative data management solutions, such as encrypted data storage and decentralized data networks, ensuring that personal information collected during biohacking experiments is handled ethically and securely. The emphasis on data privacy in Europe not only protects individuals but also enhances the credibility of the biohacking movement, fostering public trust and encouraging broader participation.

TECHNOLOGICAL ADAPTATIONS IN LATIN AMERICA

Biohacking in Latin America has adapted to address socio-economic challenges through innovative technological applications. The movement in Latin America is characterized by its grassroots nature, focusing on accessibility, affordability, and community involvement. Biohackers in the region are utilizing technology to address pressing issues, such as public health, food security, and environmental sustainability, which are often exacerbated by limited access to resources and formal healthcare infrastructure.

One significant example of technological adaptation is found in Brazil, where biohackers use synthetic biology to create low-cost diagnostic tools for diseases like Zika and Dengue, which are prevalent in the region. The Morfogenesis project, for instance, employs synthetic biology to develop crops resistant to pests and climate change, directly targeting the needs of rural communities that face significant challenges in maintaining agricultural productivity. By focusing on crop resilience, these initiatives aim to reduce reliance on chemical pesticides and enhance food security. The impact of such biohacking activities has been significant, as it has led to an increase in crop yields and reduced costs for farmers, demonstrating the tangible benefits of grassroots biohacking initiatives.

In Colombia, biohackers have developed biosensors to monitor water quality, which plays a crucial role in addressing the issue of water contamination in rural areas. These biosensors, while utilizing microorganisms to detect pollutants, provide real-time data that empowers communities to take immediate action in safeguarding their water supplies. This innovation helps to protect public health but also encourages community engagement in environmental governance. By making technology accessible to those outside of traditional scientific circles, biohackers are enabling local populations to participate directly in solving issues that affect their daily lives.

Venezuela presents another compelling case of technological adaptation, particularly in the face of economic challenges and food shortages. Biohackers in Venezuela have pioneered urban hydroponic systems and genetically modified crops to enhance food production within urban environments. These efforts are critical in a country where access to fresh produce is limited due to the ongoing economic crisis. By establishing small-scale urban farms, biohackers are improving food security and empowering urban residents to take control of their food sources. The positive impacts of these urban agricultural initiatives include increased food availability, community resilience, and the promotion of sustainable farming practices that require fewer natural resources compared to traditional agriculture.

Another example is the use of wearable technology for healthcare monitoring in Ecuador. Local biohackers have developed low-cost wearable devices that track vital signs such as heart rate, blood

pressure, and oxygen levels. These devices are particularly impactful in underserved regions where access to healthcare is scarce. By providing real-time health monitoring, these wearables enable early detection of potential health issues and facilitate timely medical intervention. These devices monitor vital signs like oxygen saturation and heart rates, providing real-time data to patients and healthcare workers. By integrating indigenous practices, such as using natural remedies alongside technological interventions, these biohacking initiatives bridge systemic gaps while fostering local resilience. These grassroots efforts highlight the adaptability and resilience of biohacking communities, proving that local innovations can address systemic challenges when supported by appropriate technologies and collaborative frameworks. However, without robust cybersecurity measures, these technologies remain vulnerable to misuse. The adoption of such technology not only improves individual health outcomes but also reduces the strain on public healthcare systems, which are often overburdened.

A deeper analysis of these initiatives reveals that biohacking in Latin America is driven by necessity and creativity, leveraging limited resources to create impactful solutions. Unlike in Europe, where biohacking often takes place in well-equipped community labs, Latin American biohackers frequently operate with minimal infrastructure. This disparity necessitates a high degree of innovation, as biohackers must adapt existing technologies or develop new ones from scratch to suit their specific needs. The focus on low-cost, scalable solutions is a defining feature of Latin American biohacking, allowing communities to address systemic challenges in a sustainable manner.

COMPARATIVE ANALYSIS: LATIN AMERICA VS. EUROPE

While both Latin America and Europe have thriving biohacking communities, the motivations, challenges, and technological adaptations in each region differ significantly. In Latin America, biohacking is largely driven by necessity—addressing issues such as healthcare access, food security, and environmental sustainability in the face of economic and infrastructural limitations. The focus on low-cost, locally adapted solutions is a defining characteristic of Latin American biohacking, which often operates without the support of formal institutions or regulatory frameworks.

In contrast, European biohacking is characterized by its access to resources, infrastructure, and regulatory support. Community laboratories in Europe are well-equipped and often receive funding from governmental and private entities, enabling biohackers to pursue ambitious projects that push the boundaries of biotechnology. The focus in Europe is often on enhancing human capabilities and exploring the ethical implications of new technologies, with a strong emphasis on regulatory compliance and data privacy.

Despite these differences, there are valuable lessons that each region can learn from the other. Latin America's emphasis on grassroots innovation and community involvement could inspire European biohackers to engage more directly with local communities and address pressing societal issues. The adaptability and resourcefulness of Latin American biohackers demonstrate the potential of biohacking to create impactful solutions even in resource-constrained environments.

Conversely, Latin American biohackers could benefit from the structured regulatory environment and community laboratory model found in Europe. The establishment of more community labs in Latin America, with support from both local governments and international organizations, could provide the infrastructure needed to expand biohacking initiatives and ensure that experiments are conducted safely and ethically. Additionally, adopting data protection standards similar to GDPR could enhance the credibility of Latin American biohacking and build public trust, facilitating greater community involvement and support.

In conclusion, while the biohacking landscapes of Europe and Latin America differ in their approaches and contexts, both regions contribute significantly to the global biohacking movement. In Europe, biohackers benefit from structured environments such as La Paillasse in France, where GDPR compliance ensures data protection and ethical oversight. Conversely, in Latin America, grassroots

innovations like Venezuela's urban agriculture projects adapt to resource constraints, addressing food insecurity. By fostering knowledge exchange, European regulatory rigor could inform scalable frameworks for Latin America, enhancing the global biohacking ecosystem. By learning from each other's strengths—whether it be grassroots innovation or regulatory rigor—biohackers in both regions can continue to push the boundaries of DIY biology, creating solutions that are innovative, ethical, and impactful.

OPEN-SOURCE BIOTECHNOLOGY AND COLLABORATIVE INNOVATION

Open-source biotechnology platforms play a crucial role in the biohacking movement, promoting collaborative innovation and the free exchange of knowledge (Peters & Gärdenfors, 2019). These platforms provide biohackers with access to genetic sequences, protocols, and software tools, facilitating the replication and modification of experiments across different communities and regions (Ford, 2015). The open-source ethos aligns with the principles of democratization and inclusivity, ensuring that advancements in biotechnology are accessible to all, regardless of geographical or economic barriers (Latour, 2018).

In Europe, organizations like the Hackteria Network exemplify the power of open-source collaboration in biohacking. Hackteria brings together biohackers, artists, and scientists to explore sustainable biotechnologies and creative applications of biology (Hackteria, 2021). Open-source platforms enable biohackers to develop innovative solutions for local challenges, such as affordable diagnostics and environmental monitoring tools, tailored to their communities' specific needs. Through workshops, hackathons, and collaborative projects, Hackteria fosters an environment where interdisciplinary collaboration drives innovation and addresses societal needs (Wyeth, 2020). By fostering knowledge-sharing and accessibility, these platforms empower underserved regions to address pressing issues, bridging the gap between grassroots innovation and broader societal impact. This approach not only accelerates technological advancements but also encourages the ethical and responsible use of biotechnology by integrating diverse perspectives and expertise (Hughes, 2020).

Similarly, in Latin America, open-source biotechnology initiatives enable biohackers to develop and share solutions tailored to local challenges. Projects such as the Morfogenesis project in Brazil utilize synthetic biology to create affordable agricultural tools, while the Biohackers Club in Argentina focuses on developing low-cost diagnostic tests for public health issues like Chagas disease (Mendes et al., 2022; López et al., 2021). These collaborative efforts demonstrate how open-source platforms can facilitate the dissemination of knowledge and resources, empowering communities to address their specific needs through innovative biotechnological solutions (Rodríguez & García, 2023).

ETHICAL AND SAFETY CONCERNS IN BIOHACKING

Conversely, the unregulated nature of biohacking raises critical ethical and safety concerns that must be addressed to ensure the responsible advancement of DIY biology (Castelyn, 2020). One of the primary ethical issues is the potential for biohacking practices to infringe upon individual autonomy and informed consent. Without proper oversight, biohackers may conduct experiments that carry significant risks to participants, including unintended biological consequences and long-term health effects (Kahn et al., 2019). Ensuring that biohackers adhere to ethical standards and obtain informed consent is essential to protect the rights and well-being of individuals involved in DIY biology projects (Smith, 2021).

Safety is another major concern associated with biohacking, particularly when dealing with genetic modifications and the manipulation of biological systems (Castelyn, 2020). The lack of formal regulatory frameworks and oversight mechanisms in many biohacking communities can lead to reckless experimentation, resulting in unintended environmental or public health hazards (Smith, 2021). For example, the accidental release of genetically modified organisms into the environment could have far-

reaching ecological impacts, highlighting the need for stringent safety protocols and responsible practices within the biohacking community (Hughes, 2020).

Additionally, the potential for biohacking to be exploited for unethical purposes poses significant risks. The misuse of biotechnological tools for harmful ends, such as the creation of biological weapons or the unauthorized modification of human genetics, underscores the importance of establishing comprehensive ethical guidelines and regulatory frameworks (Voigt & Bussche, 2017). Ensuring that biohacking practices are conducted responsibly and ethically requires a concerted effort to promote accountability, transparency, and adherence to established standards within the DIY biology movement (Castelyn, 2020).

BALANCING INNOVATION AND REGULATION

Balancing the innovative potential of biohacking with the need for ethical and safety oversight is a complex but essential task. While regulation can help mitigate the risks associated with DIY biology, overly restrictive measures may stifle innovation and hinder the democratization of biotechnology (Smith, 2021). Therefore, it is crucial to develop regulatory frameworks that strike a balance between fostering creativity and ensuring responsible practices within the biohacking community (Voigt & Bussche, 2017).

One approach to achieving this balance is the establishment of clear ethical guidelines and best practices tailored to the unique nature of biohacking (Castelyn, 2020). These guidelines should emphasize the importance of informed consent, data protection, and the responsible use of biotechnological tools, while also providing flexibility to accommodate the diverse range of biohacking activities (Kahn et al., 2019). Collaborative efforts between biohackers, ethicists, policymakers, and regulatory bodies can facilitate the development of adaptive and inclusive frameworks that promote both innovation and safety (Smith, 2021).

Education and training are also critical components in ensuring the responsible practice of biohacking. By providing biohackers with access to knowledge about ethical research practices, safety protocols, and regulatory compliance, the biohacking community can cultivate a culture of accountability and responsible innovation (Hughes, 2020). Community laboratories and collaborative initiatives play a pivotal role in this regard, offering training programs and resources that empower biohackers to conduct their experiments ethically and safely (Wyeth, 2020).

In conclusion, while biohacking offers significant opportunities for personal and societal advancement, it also presents substantial ethical and safety challenges that must be addressed through thoughtful regulation and responsible practices. By fostering a culture of ethical responsibility and collaboration, the biohacking community can harness its innovative potential while safeguarding individual rights and public health.

BIOHACKING OUTSIDE OF INSTITUTIONAL OVERSIGHT

Despite the supportive infrastructure, the rapid evolution of biohacking presents challenges in regulatory oversight. The decentralized and diverse nature of biohacking activities complicates the enforcement of ethical standards, potentially resulting in unsafe practices that could undermine public trust in biotechnology (Castelyn, 2020). Ensuring consistent compliance across various biohacking communities requires adaptive regulatory frameworks that can accommodate the dynamic and innovative nature of DIY biology (Voigt & Bussche, 2017).

One significant challenge is the need for regulatory bodies to stay abreast of technological advancements and emerging biohacking practices. Traditional regulatory frameworks may not be sufficiently agile to address the novel and rapidly evolving nature of DIY biology, necessitating the development of flexible and responsive regulations that can effectively oversee biohacking activities without stifling innovation (Smith, 2021). Collaborative efforts between regulators, biohackers, and

ethicists are essential to create regulatory guidelines that are both protective and permissive, allowing for safe experimentation while preventing misuse of biotechnological tools (Castelyn, 2020).

Another challenge is fostering a culture of accountability and ethical responsibility within the biohacking community. While regulatory frameworks provide a foundation for ethical biohacking, the voluntary nature of compliance within decentralized communities means that enforcement relies heavily on self-regulation and peer accountability (Hughes, 2020).

Promoting ethical education, establishing clear codes of conduct, and encouraging community-driven oversight mechanisms are critical strategies to ensure that biohackers adhere to responsible practices and uphold the integrity of the movement (Peters & Gärdenfors, 2019).

Europe stands as a testament to the potential of biohacking to drive innovation and address societal challenges. The synergy between community initiatives and regulatory frameworks has created a dynamic environment for biohackers, fostering both technological advancements and ethical responsibility. However, the ongoing evolution of biohacking necessitates continuous dialogue and collaboration to address regulatory challenges, ensuring that the benefits of DIY biology are realized without compromising safety or public trust. By navigating these complexities, European biohacking communities can continue to lead the way in responsible and impactful DIY biology.

SELF-EXPERIMENTATION AND PERSONAL AUTONOMY

Biohacking often operates outside traditional institutional oversight, empowering individuals to conduct self-experimentation and pursue personal autonomy in their biological enhancements. This grassroots approach allows biohackers to tailor interventions to their specific needs and goals without the constraints of institutional regulations. However, this autonomy comes with significant ethical responsibilities, as self-experimentation can carry unforeseen risks and consequences (Kahn et al., 2019).

Personal autonomy in biohacking emphasizes the right of individuals to control their own bodies and biological data. This includes making informed decisions about genetic modifications, implanting devices, and other biotechnological interventions. While personal autonomy is a fundamental ethical principle, it must be balanced with considerations of safety, informed consent, and the potential societal impacts of individual biohacking practices (Castelyn, 2020).

BIOHACKING, BIOPIRACY, AND ORGANIZED CRIME

The unregulated nature of biohacking also raises concerns about its potential misuse in activities such as biopiracy and organized crime. Biopiracy involves the unauthorized use of biological materials and knowledge, often exploiting indigenous resources and intellectual property without fair compensation or acknowledgment (Rodríguez & Garsia, 2023). Biohackers with access to advanced biotechnological tools could potentially engage in biopiracy by extracting and manipulating genetic information from natural organisms for commercial gain.

Moreover, the clandestine aspects of biohacking practices, especially those involving genetic modifications and synthetic biology, could be exploited by organized crime groups for illegal activities such as smuggling genetically modified organisms (GMOs) or trafficking in unauthorized biological materials. The ability to engineer organisms with specific traits or resistances poses significant biosecurity risks, as these organisms could be used in harmful ways if they fall into the wrong hands (Smith, 2021).

Addressing these concerns requires robust ethical guidelines, comprehensive regulatory frameworks, and effective oversight mechanisms to prevent the misuse of biohacking technologies. Collaborative efforts between biohackers, law enforcement agencies, and regulatory bodies are essential to mitigate the risks associated with biopiracy and organized crime while preserving the innovative potential of biohacking (Voigt & Bussche, 2017).

COMMUNITY LABORATORIES AND COLLABORATIVE SPACES

Projects such as Open BioLabs in Germany and BioCurious in California exemplify Europe's commitment to fostering collaborative environments where biohackers can access resources and engage in innovative projects (Wyeth, 2020). These laboratories provide essential infrastructure, including laboratory space, equipment, and technical expertise, enabling biohackers to conduct experiments that would otherwise be inaccessible due to high costs or regulatory barriers (Hackteria, 2021). By offering a shared space for experimentation and collaboration, community laboratories facilitate the exchange of ideas and knowledge, driving collective advancements in biotechnology and DIY biology (Hughes, 2020).

In addition to providing physical resources, European community laboratories often host workshops, seminars, and hackathons that promote continuous learning and skill development among biohackers (Hackteria, 2021). These educational initiatives equip participants with the necessary technical skills and ethical awareness to conduct responsible and innovative research (Peters & Gärdenfors, 2019). Furthermore, collaborative projects undertaken within these labs often address pressing societal issues, such as environmental monitoring, sustainable agriculture, and public health, demonstrating the practical impact of biohacking on community well-being (Wyeth, 2020).

The collaborative ethos of European biohacking communities extends beyond national borders, with networks like Hackteria fostering international partnerships and knowledge sharing (Hackteria, 2021). These global connections enhance the exchange of diverse perspectives and expertise, promoting a more inclusive and comprehensive approach to biohacking (Hughes, 2020). By facilitating cross-cultural collaborations, European biohacking initiatives contribute to the global advancement of DIY biology, addressing universal challenges through localized and context-specific solutions (Peters & Gärdenfors, 2019).

GRASSROOTS INNOVATIONS IN PUBLIC HEALTH & INITIATIVES

In Brazil, the Morfogenesis project exemplifies how biohacking can contribute to public health by developing low-cost biotechnological solutions for agriculture and disease diagnostics (Mendes et al., 2022). By employing synthetic biology techniques, Morfogenesis aims to create crops that are more resistant to climate change and pests, thereby enhancing food security and reducing dependency on chemical pesticides (Mendes et al., 2022). This project not only addresses critical agricultural challenges but also demonstrates the potential of biohacking to drive sustainable development and resilience in the face of environmental and economic pressures (Rodríguez & Garsia, 2023).

The Biohackers Club in Argentina has been pivotal in promoting DIY biology and community engagement, bringing together students, professionals, and enthusiasts to explore biotechnology applications in various fields, including medicine and agriculture (López et al., 2021). One of their notable projects involved developing a low-cost diagnostic test for detecting Chagas disease, a significant public health concern in the region (López et al., 2021). By utilizing local resources and knowledge, the club not only provides a practical solution to a widespread health issue but also fosters a sense of community and collaboration among participants, empowering them to take an active role in improving public health outcomes (Martínez et al., 2023).

In Ecuador, biohacking initiatives are emerging as a means of addressing healthcare disparities by developing low-cost wearable devices that monitor vital signs, aimed at providing affordable healthcare solutions to underserved populations (Martínez et al., 2023). These devices enable real-time health monitoring and data collection, facilitating early detection and intervention for various health conditions (Martínez et al., 2023). By making healthcare more accessible and affordable, biohacking projects in Ecuador contribute to reducing healthcare inequities and improving overall population health (López et al., 2021).

Also in Ecuador, the government is integrating biohacking initiatives into public health strategies by supporting local biohackers developing diagnostic tools for rural healthcare (Martínez et al., 2023). This collaboration aims to enhance healthcare accessibility and reduce the burden on traditional health systems by leveraging low-cost and innovative biotechnological solutions (Martínez et al., 2023). By partnering with biohackers, the government can tap into community-driven innovations that address specific health challenges, such as the development of affordable diagnostic tests for prevalent diseases (López et al., 2021).

Similarly, in Brazil, government support for biohacking projects like Morfogenesis underscores the role of DIY biology in addressing public health and agricultural issues (Mendes et al., 2022). By investing in biohacking initiatives, the Brazilian government aims to enhance food security, improve disease diagnostics, and foster sustainable agricultural practices, thereby contributing to broader public health and economic stability (Rodríguez & Garsia, 2023). This integration of biohacking into public health initiatives demonstrates the potential for DIY biology to complement traditional healthcare systems and drive community health improvements (Martínez et al., 2023).

Biohacking's impact extends beyond individual and community levels, influencing political discourse and government policies. Governments in Latin America are increasingly recognizing the potential of biohacking to contribute to public health, environmental sustainability, and food security, leading to collaborative efforts and policy integrations (Martínez et al., 2023). This section examines how biohacking intersects with politics and government in Latin America, highlighting the opportunities and challenges of integrating grassroots biohacking initiatives into public policy.

ENVIRONMENTAL POLICIES AND CITIZEN SCIENCE

Colombian policymakers have engaged with biohacking groups to incorporate citizen science into environmental monitoring and policy formulation (Rodríguez & Garsia, 2023). By leveraging community-driven biotechnology, the government aims to achieve sustainable development goals and improve environmental governance (Rodríguez & García, 2023). Biohackers developing biosensors for water quality monitoring provide valuable data that informs environmental policies and interventions, enhancing the government's capacity to manage natural resources and address environmental challenges (López et al., 2021).

The collaboration between biohackers and policymakers in Colombia exemplifies how citizen science can be integrated into formal environmental monitoring frameworks, fostering a more participatory and data-driven approach to environmental governance (Martínez et al., 2023). By incorporating community-generated data into policy decisions, the government can develop more effective and responsive environmental strategies, addressing issues such as water pollution, climate change, and biodiversity conservation (Rodríguez & Garsia, 2023). This partnership between biohackers and policymakers highlights the potential for DIY biology to contribute to sustainable development and environmental stewardship (López et al., 2021).

NEED FOR EVOLVING REGULATORY MECHANISMS (NORM SETTING)

As biohacking rapidly advances, it is imperative that regulatory mechanisms evolve to address the unique ethical and safety challenges posed by this decentralized and innovative movement. Traditional regulatory frameworks often fall short in accommodating the dynamic nature of biohacking, necessitating the development of adaptive regulations that can swiftly respond to technological advancements and emerging practices. Key recommendations include establishing clear legal definitions to distinguish between personal enhancements and high-risk activities, fostering international collaboration to harmonize standards across jurisdictions, and creating innovation sandboxes that allow biohackers to experiment within controlled environments. Additionally, implementing comprehensive ethical training

programs and introducing certification systems can ensure that biohackers are well-versed in best practices and regulatory compliance.

Enhanced oversight mechanisms, such as dedicated regulatory bodies and regular inspections, are essential to monitor activities and enforce ethical standards. Furthermore, promoting public engagement through stakeholder forums and educational campaigns will foster transparency and build trust, while stringent controls on biotechnological tools and robust legal frameworks are necessary to combat biopiracy and organized crime. By addressing these areas, regulatory bodies can support the innovative potential of biohacking while maintaining rigorous ethical and safety standards, ensuring that biohacking contributes positively to societal development and technological progress. (Bajrektarevic - Caballero, 2024)

To effectively balance innovation with responsibility, regulatory frameworks must incorporate flexibility and proactive measures that anticipate future biohacking trends. This includes periodic policy reviews, stakeholder involvement in regulatory processes but also the norm setting.

It surely calls for the international bodies like the United Nations (UN), the specialised segments of its Secretariat such as the Vienna-based Office on Drugs and Crimes (ODC) or programs (UN World Food Program) as well as the UN Specialised Agencies (SA) such as the World Health Organisation (WHO), the Food and Agricultural Organisation (FAO), the World Intellectual Property Organisation (WIPO), the UN Industrial Development Organisation (UNIDO), as the monitoring of compliance mechanisms but also as the supranational norm setting authorities.

Further on, involvement of all societal stakeholders is crucial: Clearly, an open dialogue between researchers (biohackers), policymakers, ethicists (social scientists), consumers, governments and private sector ensures that regulations reflect diverse perspectives, interests while preserving the societal values. Additionally, combating illicit activities through stricter controls, advanced surveillance, and enhanced legal measures will mitigate biosecurity risks and prevent the misuse of biotechnological advancements. By fostering a collaborative and informed regulatory environment, stakeholders can create a supportive infrastructure that not only safeguards public health and ethical integrity but also encourages responsible innovation.

This balanced approach will enable the biohacking community to thrive sustainably, driving meaningful advancements while protecting individual rights and societal well-being.

CONCLUSION

Biohacking stands at the intersection of technology, ethics, and personal empowerment, offering transformative potential for individuals and communities alike. The vibrant biohacking landscapes in Europe and Latin America illustrate the movement's capacity to drive innovation, address local and global challenges, and foster a culture of scientific engagement. However, the rapid evolution of biohacking necessitates robust ethical frameworks and regulatory oversight to mitigate risks and ensure responsible practices.

In Europe – as the most multilateralised and supranational institutions' covered part of the globe, the synergy between community initiatives and regulatory frameworks has created a dynamic environment for biohackers, fostering both technological advancements and ethical responsibility. European biohacking communities serve as exemplars of how DIY biology can thrive within a supportive and ethically conscious ecosystem, balancing innovation with public safety and trust (Wyeth, 2020). The adherence to GDPR and the integration of ethical guidelines underscore the importance of responsible data management and ethical research practices in sustaining the credibility and impact of biohacking initiatives (Kahn et al., 2019).

Conversely, Latin America's biohacking landscape is characterized by grassroots innovation and local solutions addressing region-specific challenges (Mendes et al., 2022). The movement's focus on public health, agricultural sustainability, and environmental monitoring demonstrates its potential to contribute

to sustainable development and community resilience (López et al., 2021). However, the absence of comprehensive regulatory frameworks in many Latin American countries highlights the need for ethical guidelines and responsible practices to ensure the safe and effective application of biohacking innovations (Rodríguez & Garsia, 2023).

By learning from each region's successes and challenges, stakeholders can develop frameworks that promote responsible practices and ensure that the benefits of biohacking are accessible to all. The implementation of GDPR serves as a guiding framework for ethical and responsible biohacking, emphasizing data protection and individual rights (Voigt & Bussche, 2017). Moreover, governments' growing interest in supporting biohacking initiatives underscores the need for collaboration, regulation, and community engagement to ensure that biohacking fulfills its potential as a force for positive social change (Smith, 2021).

A balanced approach to biohacking regulation can empower innovators while safeguarding indigenous rights, biodiversity, and ethical integrity, ensuring that biohacking's transformative potential is harnessed for global good. This requires harmonized international frameworks, robust enforcement mechanisms, and inclusive collaborations that prioritize both innovation and sustainability.

As we navigate this evolving landscape, future research should focus on developing adaptive regulatory models, fostering international collaborations, and exploring the socio-economic impacts of biohacking to fully realize its potential as a transformative and ethical movement. By addressing the ethical and regulatory challenges inherent in biohacking, society can harness the innovative power of DIY biology to drive meaningful advancements in health, sustainability, and human empowerment, ultimately benefiting individuals and communities on a global scale.

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COMPARATIVE ANALYSIS ON DATA PROTECTION IN EUROPE, ASIA, AND LATIN AMERICA-CARIBBEAN

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Abstract. *The General Data Protection Regulation (GDPR), implemented by the European Union (EU) in May 2018, represents one of the most significant regulatory frameworks for the protection of personal data in the digital era. This paper explores GDPR's impact on global data governance, its relevance to growing digital economies, its implications for the rights of citizens in future generations; particularly its role in inspiring regions such as ASEAN, Latin America, and countries like Indonesia, to adopt similar frameworks. GDPR's influence extends beyond Europe, shaping how data privacy, security, and individual rights are perceived and protected globally. This study examines the regulation's core elements, including the right to be forgotten, cryptography, and data minimization, to analyze its far-reaching implications for the global digital economy. Additionally, it evaluates the challenges and opportunities posed by GDPR, offering a roadmap for countries aiming to create a safer and more secure cyberspace.*

Keywords GDPR; data protection; digital economy; privacy laws; cross-border data flows.

INTRODUCTION

In today's interconnected world, data has become an invaluable asset. What was once intangible, now drives the global economy, powering various industries from artificial intelligence and e-commerce. However, the collection, processing, and commodification of personal data have led to concerns about privacy and individual rights, as corporations and governments amass unprecedented amounts of information. The increasing monetization and weaponization of personal data raise fundamental questions about how to protect individuals in a rapidly evolving digital landscape. Recognizing this critical need, the EU introduced the General Data Protection Regulation (GDPR) in May 2018 as a comprehensive framework to regulate the use of personal data, establishing privacy as a fundamental right, setting a global standard for how personal data should be collected, processed, and stored (European Union, 2018).

While GDPR was crafted within the EU, its influence has extended far beyond Europe, affecting regions such as ASEAN, Latin America, and others. Countries like Indonesia are increasingly recognizing the need for similar frameworks to balance economic growth with privacy protection. In Latin America, GDPR has inspired new data protection laws in countries such as Brazil, Argentina, Mexico, and Colombia, driving the region toward stronger regulatory standards (Marini & Figueiredo, 2019). This paper examines GDPR's spillover effects on these regions and highlights its potential as a global model for data governance.

THE GLOBAL INFLUENCE OF GDPR

Since its implementation, GDPR has redefined data privacy regulation not only within Europe but across the globe. Its extraterritorial reach mandates that any organization processing the data of EU citizens, regardless of location, must comply with its regulations (European Union, 2018). This characteristic has made GDPR a de facto global standard for data protection, as businesses and governments worldwide adapt to its strict compliance requirements. In an increasingly globalized world, cross-border data flows are a daily reality, making it necessary for countries outside the EU to adopt GDPR-compliant practices to maintain their access to the EU market (Hoofnagle, van der Sloot, & Zuiderveen Borgesius, 2019).

Several non-EU countries, such as Japan, have formally aligned their data protection laws with GDPR to facilitate smoother trade and data exchanges with the EU. Japan's adaptation of its own data protection law to mirror GDPR led to the EU's recognition of Japan's privacy framework as "adequate," allowing free data flows between the two regions (Greenleaf, 2019). This alignment with GDPR underscores the regulatory and economic benefits of adopting high privacy standards.

Yet, GDPR's impact is not limited to developed economies. In Latin America, the influence of GDPR is increasingly evident. Brazil's Lei Geral de Proteção de Dados (LGPD), which came into force in 2020, is modeled closely on GDPR and includes provisions for data subject rights, data portability, and significant penalties for non-compliance. The LGPD has already been tested with major data breach cases, including a 2021 incident involving the exposure of sensitive information from over 200 million Brazilians (Braga, 2021). Similarly, Mexico, Argentina, and Colombia have either updated or are in the process of revising their data protection laws to reflect GDPR's framework (Reding, 2021; García, 2021). These efforts aim to align Latin America's data protection standards with those of the EU, allowing the region to integrate more seamlessly into the global digital economy.

LATIN AMERICA AND THE CARIBBEAN: THE GDPR'S EXPANDING INFLUENCE

Latin America and the Caribbean have made significant strides in data protection, with many countries aligning their legal frameworks with global standards such as the GDPR. However, the region remains diverse in terms of implementation, with some nations, like Brazil, Mexico, and Argentina, leading the charge, while others continue to develop their data protection regimes. The influence of GDPR can be seen in how countries across the region are addressing both personal and business data contexts, requiring companies to adapt to new privacy norms in order to maintain competitiveness in the global market (SYDLE, 2022).

Brazil, with its Lei Geral de Proteção de Dados (LGPD), exemplifies the most advanced GDPR-inspired framework in Latin America. LGPD imposes strict requirements on businesses to protect personal data and includes provisions for transparency, consent, and data subject rights. Companies that fail to comply face significant fines, a clear signal of Brazil's commitment to data protection as a pillar of its digital economy (Marini & Figueiredo, 2019). Furthermore, businesses operating in sectors like e-commerce and fintech are particularly affected, as they must now integrate LGPD-compliant practices to continue operating in the region's rapidly growing digital economy (SYDLE, 2022).

Argentina and Mexico have similarly robust frameworks that align closely with GDPR. Mexico's Federal Law on the Protection of Personal Data has been regularly updated to include new provisions for data portability and consent, emphasizing the need for businesses to protect both personal and commercial data. Argentina, recognized for its early adoption of privacy protections, continues to revise its data laws to maintain adequacy with GDPR, ensuring smooth cross-border data flows with the EU (Belli, 2021). For businesses operating in these markets, compliance with these regulations is not only a legal necessity but also a strategic advantage in an increasingly privacy-conscious global economy (SYDLE, 2022).

Meanwhile, countries like Colombia and Ecuador are rapidly catching up. Colombia's Law 1581 provides a comprehensive framework for data protection, enforced by the Superintendence of Industry and Commerce (SIC), while Ecuador's Organic Law on Data Protection (OLDP) represents a significant step forward for privacy in the region (García, 2021; Sánchez, 2021). These developments underscore the region's growing emphasis on data governance, driven by both global trends and local demands for greater transparency and trust in digital transactions.

For the broader Latin American and Caribbean regions, aligning with global standards such as GDPR presents both opportunities and challenges. While countries with more advanced economies, like Brazil and Mexico, are well-positioned to adapt quickly, others must invest in building the legal and institutional infrastructure needed to support robust data protection (SYDLE, 2022). The SYDLE report highlights that businesses across the region must now adapt their practices, not only to comply with the law but also to maintain the trust of increasingly privacy-conscious consumers. The growing awareness of data protection in personal and business contexts reflects a broader global shift towards greater accountability in the digital age.

As these countries continue to refine their data protection frameworks, the benefits are clear: enhanced consumer trust, smoother trade relations with Europe and the United States, and increased competitiveness in the global digital economy. However, governments must also invest in public education and enforcement mechanisms to ensure these laws are effectively implemented. This approach will be crucial for ensuring that data protection not only meets global standards but also addresses local challenges, such as cybersecurity risks and the digital divide (SYDLE, 2022).

1. Brazil: Leading The Charge with LGPD

Brazil is the largest economy in Latin America and a key player in the region's digital landscape. Its digital economy has grown exponentially, driven by e-commerce, fintech, and a vibrant startup ecosystem. With the exponential rise in internet usage and digital services, data privacy became a significant concern for both citizens and businesses. In response to these challenges and inspired by GDPR, Brazil enacted the Lei Geral de Proteção de Dados (LGPD) in 2020.

The LGPD mirrors many of GDPR's core principles, including data minimization, transparency, and the rights of individuals to access, correct, and delete their personal data. It also mandates that organizations implement robust data security measures, such as encryption and pseudonymization, to protect sensitive information (Marini & Figueiredo, 2019). The law applies not only to Brazilian companies but also to foreign entities processing the data of Brazilian citizens, much like GDPR's extraterritorial reach.

One of the most significant cases that tested LGPD's effectiveness was the 2021 data breach, which exposed the personal information of over 200 million Brazilians. This breach included names, tax identification numbers, and other sensitive data, highlighting the urgent need for strict enforcement of LGPD provisions. Brazil's Autoridade Nacional de Proteção de Dados (ANPD) launched an investigation, showcasing the role of the newly formed data protection authority in ensuring compliance and addressing privacy violations (Braga, 2021). The case underscored the importance of GDPR-inspired frameworks in protecting citizens' data in an increasingly digital world.

Brazil's adoption of LGPD also reflects its aspirations to strengthen international trade relations, particularly with the European Union. By aligning its data protection standards with GDPR, Brazil has positioned itself as a more attractive partner for EU companies seeking to do business in Latin America. This harmonization not only facilitates smoother data flows between the two regions but also enhances Brazil's global competitiveness in the digital economy (Marini & Figueiredo, 2019).

2. Mexico: A Strategic Approach to Data Protection

Mexico is another Latin American country that has made significant strides in data protection, influenced by GDPR's principles. Mexico's Federal Law on the Protection of Personal Data Held by Private Parties,

initially enacted in 2010, laid the groundwork for data privacy in the country. However, as the digital economy expanded and global data flows became more complex, Mexico recognized the need to update its legal framework to align more closely with international standards like GDPR (Reding, 2021).

In recent years, Mexico has introduced several updates to its data protection law, focusing on data portability, the right to be forgotten, and more stringent requirements for obtaining consent. These updates are particularly relevant as Mexico seeks to strengthen its position as a hub for tech investment and digital innovation in Latin America. Like GDPR, Mexico's laws now grant individuals the right to access, correct, and delete their personal data, empowering citizens to take control of their digital identities.

Mexico's National Institute for Transparency, Access to Information and Personal Data Protection (INAI) plays a central role in enforcing these laws and ensuring compliance across sectors. INAI has been instrumental in raising awareness about data privacy, conducting public campaigns, and providing guidance to companies on how to comply with data protection regulations. However, as Mexico's digital economy continues to grow, INAI will need to expand its capacity and technical expertise to address new challenges, such as the rise of AI and big data (Reding, 2021).

Mexico's alignment with GDPR-like standards also strengthens its trade relations with the EU and other international partners. By adhering to global data protection norms, Mexico is better positioned to attract foreign investment, particularly in the tech and e-commerce sectors. As more multinational companies expand their operations in Mexico, the country's robust data protection framework will be critical for ensuring trust in digital transactions and protecting citizens' privacy.

3. Argentina: A Pioneer in Data Protection

Argentina has long been recognized as a pioneer in data protection in Latin America. Its Personal Data Protection Act (PDPA), enacted in 2000, was one of the first comprehensive data protection laws in the region. The PDPA grants individuals the right to access, rectify, and delete their personal data, and it established Argentina's National Directorate for the Protection of Personal Data as the regulatory authority responsible for enforcing the law (Belli, 2021).

In 2018, Argentina began revising its data protection framework to align more closely with GDPR standards. These revisions include strengthening the requirements for obtaining consent, enhancing data security measures, and expanding the rights of individuals to control how their data is used. Argentina's efforts to modernize its data protection laws have been driven by its desire to maintain its "adequate" status with the European Union, allowing for the free flow of data between Argentina and EU member states (Belli, 2021). This alignment is critical for Argentina's integration into the global digital economy, as it facilitates smoother trade and investment opportunities with the EU.

Argentina's leadership in data protection has also set a precedent for other Latin American countries, many of which have looked to Argentina's PDPA as a model for developing their own legal frameworks. As Argentina continues to update its laws to meet the challenges of the digital age, it remains a key player in shaping the future of data governance in the region.

4. Colombia: Strengthening Data Protection for A Growing Digital Economy

Colombia's digital economy has grown rapidly in recent years, with significant advancements in e-commerce, fintech, and digital services. In response to these developments, Colombia enacted Law 1581 in 2012, also known as the "Habeas Data Law," which provides a comprehensive framework for protecting personal data. The law grants individuals the right to access, correct, and delete their data, similar to GDPR, and establishes strict requirements for how companies must handle personal information (García, 2021).

Colombia's Superintendence of Industry and Commerce (SIC) is responsible for enforcing data protection regulations and ensuring compliance across sectors. In recent years, the SIC has taken an active role in investigating data breaches and imposing penalties on companies that fail to protect personal data.

For example, in 2019, the SIC fined a major telecommunications company for failing to comply with data protection laws, demonstrating Colombia's commitment to enforcing privacy regulations (García, 2021).

Colombia's digital economy is expected to continue growing, particularly in sectors such as fintech and smart cities. As the country becomes more reliant on data-driven technologies, it will need to strengthen its data protection framework further. The government is already exploring updates to Law 1581, with a focus on addressing emerging challenges such as artificial intelligence, data portability, and cybersecurity (García, 2021). By aligning its laws with GDPR-like standards, Colombia can ensure that its digital economy remains competitive while protecting the rights of its citizens.

5. *Ecuador: Emerging as A Key Player in Data Protection*

Ecuador is one of the latest countries in Latin America to enact a comprehensive data protection law, with the introduction of the Organic Law on Data Protection (OLDP) in 2021. Inspired by GDPR, the OLDP establishes clear rules for how personal data must be collected, processed, and stored, and it grants individuals the right to request access to their data and demand its deletion under specific circumstances (Sánchez, 2021).

Ecuador's move toward GDPR-like legislation reflects the country's growing digital economy and its desire to attract foreign investment. The law applies to both domestic and foreign companies that process the data of Ecuadorian citizens, much like GDPR's extraterritorial reach. This alignment with global data protection standards is expected to enhance Ecuador's competitiveness in sectors such as e-commerce, telecommunications, and digital services (Sánchez, 2021).

The implementation of the OLDP is particularly timely, given Ecuador's experience with one of the largest data breaches in Latin America. In 2019, the personal information of over 20 million people, including deceased individuals, was exposed in a major security breach. This incident highlighted the urgent need for stronger data protection measures in Ecuador and accelerated the government's efforts to pass the OLDP (Sánchez, 2021).

With the OLDP in place, Ecuador is poised to become a key player in the region's digital transformation. However, like other countries in Latin America, Ecuador will need to invest in building the capacity of its data protection authority and raising public awareness about privacy rights to ensure the law's success.

6. *The Broader Implications for Latin America and The Caribbean*

The adoption of GDPR-like regulations across Latin America and the Caribbean has far-reaching implications for the region's digital future. By aligning their data protection frameworks with global standards, countries in the region are better positioned to attract foreign investment, facilitate cross-border data flows, and foster trust in digital services. This is particularly important as the region's digital economy continues to grow, with increasing reliance on data-driven technologies such as artificial intelligence, fintech, and e-commerce.

Furthermore, robust data protection laws help to protect citizens' privacy rights in an era of rapid digital transformation. By granting individuals the right to control their personal information, GDPR-inspired frameworks empower citizens to participate more fully in the digital economy while safeguarding their privacy. This is especially relevant in the context of rising internet penetration and digital connectivity across Latin America and the Caribbean, where more people are coming online for the first time and engaging with digital services.

At the same time, the adoption of GDPR-like frameworks underscores the region's commitment to international cooperation and global data governance. By harmonizing their laws with GDPR, countries in Latin America and the Caribbean are signaling their readiness to engage with the global digital economy while ensuring that data flows are secure, transparent, and respectful of individual rights.

PRIVACY, DATA PROTECTION IN THE DIGITAL ECONOMY AND CONNECTIVITY

The global digital economy is expanding at an unprecedented pace, and data has become one of the most valuable commodities within this system (Ford, 2019). The collection and analysis of personal data underpin nearly every aspect of the digital economy, from targeted advertising to artificial intelligence. However, the widespread collection of personal information has also led to growing concerns about the erosion of privacy and individual control over data. GDPR addresses these concerns by creating a legal framework that puts the rights of individuals at the center of data processing activities (Hoofnagle et al., 2019).

In Latin America, countries have recognized the importance of protecting privacy as their digital economies grow. Brazil's LGPD, for example, not only enhances individual rights but also strengthens the legal foundations for the country's e-commerce and tech industries, encouraging greater trust in digital transactions (Marini & Figueiredo, 2019). Argentina, long a leader in privacy protection with its 2000 Personal Data Protection Act, is updating its legal framework to more closely align with GDPR standards, a move that will likely improve Argentina's competitiveness in the global market (Belli, 2021).

Moreover, in Colombia, Law 1581 (2012) has laid the groundwork for data protection, granting individuals the right to access, rectify, and delete their data. The Colombian Superintendence of Industry and Commerce (SIC) plays an active role in enforcing these laws, as seen in its 2019 action against a major telecommunications company for violations of data protection regulations (García, 2021). Ecuador, too, has entered the field with its new Organic Law on Data Protection, marking a significant step toward modernizing its approach to data governance (Sánchez, 2021). These developments in Latin America showcase how GDPR is inspiring reforms that ensure personal data is handled responsibly and transparently.

The rise of global connectivity poses new challenges for data governance. Cross-border data flows have become essential for everything from international trade to scientific research. Yet, they also raise concerns about data sovereignty and the ability of nations to protect their citizens' privacy in an interconnected world. GDPR addresses these challenges by ensuring that data transferred outside the EU is subject to the same protections as within its borders (European Union, 2018). As Latin America and the Caribbean adopt similar provisions, these regions will be better positioned to participate in the global digital economy while safeguarding their citizens' data.

THE RIGHT TO BE FORGOTTEN AND DATA PORTABILITY

One of the most significant innovations introduced by GDPR is the right to be forgotten, which allows individuals to request the deletion of their personal data when it is no longer necessary for the purposes for which it was collected (European Union, 2018). This right reflects a growing recognition of the need for individuals to have greater control over their personal information in the digital age. The right to be forgotten is particularly relevant in the context of social media, where vast amounts of personal data are shared and often misused without the knowledge or consent of the individual (Zimmerman, 2020).

The right to data portability is another key feature of GDPR, allowing individuals to transfer their personal data from one organization to another. This provision empowers individuals by giving them greater control over their digital identities and ensuring that they are not locked into a single service provider (Ford, 2019). In Indonesia, the adoption of similar provisions could address growing concerns about data misuse and empower citizens to take control of their personal data (Ariadno & Bajrektarevic, 2019).

Latin American countries, particularly Brazil and Mexico, have adopted similar provisions under their respective data protection laws. Brazil's LGPD provides for the right to be forgotten, empowering

individuals to control how their data is used, particularly on digital platforms. Mexico's data protection laws grant similar rights, allowing individuals to request the deletion of their personal data and ensuring that organizations comply with these requests (Reding, 2021).

The right to be forgotten and data portability are mechanisms that provide individuals with greater agency in the digital economy. These rights are not only about protecting privacy but also about safeguarding human dignity by ensuring that individuals are not subject to undue surveillance or exploitation (Zimmerman, 2020). As countries like Indonesia continue to develop their data protection frameworks, incorporating these rights will be essential for ensuring that individuals are protected from the long-term consequences of data misuse.

ASEAN'S PATH TOWARD COMPREHENSIVE DATA PROTECTION

ASEAN nations are at a critical juncture in their digital transformation. As the region becomes increasingly integrated into the global digital economy, the need for robust data protection frameworks becomes more urgent. GDPR provides a valuable model for balancing privacy with the legitimate interests of businesses and governments, offering a roadmap for how countries can create a legal environment that fosters innovation while protecting individual rights (Greenleaf, 2019).

Indonesia's efforts to strengthen its data protection laws serve as an important example for the region, highlighting the benefits of comprehensive privacy regulations. By aligning its data protection framework with GDPR, Indonesia can enhance its competitiveness in the global digital economy and ensure that its citizens are protected from the risks associated with data exploitation (Ford, 2019). Moreover, as ASEAN nations work toward greater regional integration, harmonizing data protection laws across the region will be essential for facilitating cross-border data flows and ensuring that individuals' privacy rights are respected (Hoofnagle et al., 2019).

LATIN AMERICA'S PATH TOWARD COMPREHENSIVE DATA PROTECTION

Latin America is rapidly moving toward comprehensive data protection frameworks that mirror GDPR's principles. Brazil stands out with the implementation of LGPD, but Argentina, Mexico, Colombia, and Ecuador are also making strides in enhancing their legal frameworks to protect personal data. As these countries continue to refine their laws, they are not only ensuring stronger protections for individual rights but also positioning themselves as key players in the global digital economy. Colombia, with its forward-thinking Law 1581, and Ecuador, with its new Organic Law on Data Protection, demonstrate the region's commitment to robust data governance (Sánchez, 2021; García, 2021).

The ongoing developments in Latin America highlight how GDPR has set a global benchmark that regions worldwide are increasingly adopting. This shift toward GDPR-like regulations reflects a growing awareness of the need to balance privacy rights with economic growth, particularly in an era where data flows across borders and industries at unprecedented rates.

DATA PROTECTION, CLIMATE CHANGE, AND SUSTAINABLE DEVELOPMENT

Data protection also plays a critical role in addressing broader global challenges such as climate change and sustainable development. Digital technologies have the potential to drive solutions for mitigating climate change, from smart grids to environmental monitoring systems. However, these technologies also rely on massive amounts of data, raising concerns about how personal information is being used in the pursuit of environmental goals.

GDPR provides a framework for ensuring that data used in climate-related initiatives is handled transparently and ethically. By promoting data minimization and ensuring that individuals' data is only collected for specific, legitimate purposes, GDPR helps strike a balance between innovation and privacy (European Union, 2018). As Latin America and the Caribbean increasingly adopt GDPR-like regulations,

these regions can leverage digital technologies to address environmental challenges without compromising citizens' privacy (Reding, 2021).

Moreover, as the global population continues to grow, the need for sustainable development will become even more pressing. Data protection laws can help ensure that digital solutions aimed at addressing issues like resource management, urban planning, and renewable energy are developed in a way that respects individuals' rights and promotes transparency.

RECOMMENDATIONS FOR GOVERNMENTS: BUILDING A SECURE DIGITAL FUTURE

As we move further into the digital age, governments around the world must grapple with the challenge of balancing privacy, innovation, and economic growth. The General Data Protection Regulation (GDPR) has provided a robust framework for protecting personal data, but its success will depend on the actions governments take to implement, enforce, and build upon these principles. Countries in Latin America, the Caribbean, and beyond have already made significant strides by adopting GDPR-inspired frameworks. However, to fully leverage the benefits of data protection laws, governments must go beyond regulation to foster a culture of transparency, accountability, and trust in the digital space.

Here are several critical areas where governments can improve data protection efforts and contribute to a more secure, transparent, and private digital environment for individuals and families:

1. *Strengthening Data Protection Authorities (Dpas)*

A cornerstone of effective data protection is the establishment of independent, well-funded, and capable Data Protection Authorities (DPAs). DPAs are tasked with enforcing data protection laws, investigating breaches, and ensuring compliance by both public and private organizations. Without robust DPAs, even the most comprehensive laws, such as GDPR or Brazil's LGPD, risk being ineffective.

Governments should allocate sufficient resources to their DPAs to ensure they have the necessary staff, technical expertise, and financial support to carry out their mandate. Countries like France, through the Commission Nationale de l'Informatique et des Libertés (CNIL), have demonstrated how a well-funded DPA can successfully manage large-scale compliance efforts and maintain public trust (European Union, 2018). In Brazil, the newly formed Autoridade Nacional de Proteção de Dados (ANPD) is still developing, but the government must ensure that it becomes a fully operational body with the capacity to handle the complexity of data protection issues in a country with a fast-growing digital economy (Braga, 2021).

In Latin America and the Caribbean, countries like Mexico and Argentina must continue investing in their DPAs to keep up with increasing digitalization. Mexico's National Institute for Transparency, Access to Information and Personal Data Protection (INAI) plays a critical role in ensuring compliance with Mexico's data protection laws. However, as digital services grow and become more complex, Mexico will need to increase its investment in INAI to keep pace with new threats and data flows (Reding, 2021).

2. *Encouraging Public Awareness and Digital Literacy*

Laws are only effective when individuals understand their rights and how to exercise them. Public awareness campaigns are essential to educating citizens about their data protection rights, including how to request access to their data, demand its correction, or invoke the right to be forgotten. Citizens should also be informed about the risks of sharing personal data online, especially as digital platforms and social media become more pervasive.

The European Union has prioritized raising public awareness, with GDPR mandating that organizations provide clear, concise information about how data is being collected and used (European Union, 2018). Similar efforts must be expanded in Latin America and the Caribbean. For example, Colombia's Superintendence of Industry and Commerce (SIC) has made efforts to increase public

awareness through outreach campaigns. However, the digital literacy gap remains a challenge, particularly in rural areas where access to information is limited (García, 2021).

Governments should launch national public awareness campaigns, targeting schools, businesses, and local communities, to promote digital literacy and explain how citizens can take advantage of the protections provided by GDPR-like laws. Such efforts can also reduce the spread of misinformation about privacy rights and foster a more secure digital environment.

3. Harmonizing Data Protection Laws for Global Interoperability

Data does not respect borders, and with the rapid rise of global connectivity, cross-border data flows have become central to everything from international trade to cloud computing. Governments must work to harmonize their data protection frameworks, ensuring that individuals' rights are protected regardless of where their data is processed.

The European Union set a precedent with GDPR, which mandates that personal data transferred outside of the EU must be subject to the same protections it receives within the EU. Latin American countries such as Argentina and Brazil are taking similar steps by aligning their data protection laws with GDPR, allowing for the free flow of data between their countries and the EU (Belli, 2021; Marini & Figueiredo, 2019). This harmonization not only strengthens citizens' privacy rights but also facilitates smoother trade and collaboration with the EU and other regions.

Looking forward, Latin American and Caribbean countries should pursue regional cooperation to harmonize data protection laws. Organizations such as the Organization of American States (OAS) could play a key role in fostering collaboration between countries and creating region-wide data protection frameworks that are consistent and aligned with global standards. Such regional efforts could ease cross-border data flows, enhance business opportunities, and improve privacy protections for citizens.

4. Striking A Balance Between Innovation and Privacy

While data protection is critical, it must be balanced with the need for innovation in sectors such as artificial intelligence (AI), fintech, and smart cities. Governments should work with the private sector to develop clear guidelines for how emerging technologies can be used responsibly, ensuring that privacy and data protection are integrated from the outset of technology development.

One way to achieve this balance is through the concept of "privacy by design," which GDPR promotes. This approach requires that data protection be considered during the initial design stages of any new technology or service (European Union, 2018). Governments should incentivize companies to adopt privacy by design practices and incorporate data protection into the lifecycle of product development.

Latin American countries, particularly Brazil and Mexico, are at the forefront of fintech innovation. By adopting privacy by design principles, these countries can ensure that their rapidly expanding digital economies are built on a foundation of trust and transparency (Marini & Figueiredo, 2019). Governments should offer incentives such as tax breaks or grants to companies that demonstrate a commitment to integrating privacy by design into their operations.

5. Ensuring Sustainability and Privacy in Digital Solutions for Climate Change

The intersection of data protection and sustainability is increasingly important as digital solutions are developed to combat climate change. Smart cities, renewable energy systems, and environmental monitoring all rely on vast amounts of data to optimize performance and reduce environmental impact. However, the collection and processing of personal data within these systems raise privacy concerns.

GDPR's principles of data minimization and purpose limitation are essential for ensuring that environmental data solutions respect individuals' privacy (European Union, 2018). Governments should develop regulations that require companies working in the environmental sector to adopt stringent data

Bajrektarevic, A. H., & Carvajal Caballero, V. (2024). Comparative Analysis on Data Protection in Europe, Asia, and Latin America-Caribbean. *Politics & Security*, 9(3), pp.25-35. Doi: 10.54658/ps.28153324.2024.9.3.pp.25-35 protection measures. By doing so, they can ensure that smart solutions for combating climate change do not compromise citizens' privacy rights.

Colombia and Mexico are exploring the use of smart city technologies to reduce energy consumption and improve urban planning. These countries should ensure that data protection regulations extend to environmental initiatives, safeguarding personal data while promoting sustainability (García, 2021). Governments should also collaborate with international organizations such as the United Nations Framework Convention on Climate Change (UNFCCC) to develop global standards for data protection within climate initiatives.

6. *Investing in Digital Infrastructure to Close the Connectivity Gap*

While GDPR and similar laws focus on protecting data privacy, governments must also address the significant digital divide that persists in many parts of the world. Ensuring that individuals have access to reliable internet connectivity is essential for enabling them to exercise their data protection rights. Governments should invest in digital infrastructure, particularly in rural and underserved areas, to close the connectivity gap and promote digital inclusion.

Countries like Ecuador and Peru are taking steps to expand broadband access in rural areas, but more needs to be done to ensure that all citizens can participate fully in the digital economy (Sánchez, 2021). Governments should prioritize investments in telecommunications infrastructure, while also ensuring that data protection laws apply equally across all regions. This will help build a digital future where citizens can exercise their rights securely and privately, regardless of their location.

CONCLUSION

The GDPR has set a new global standard for data protection, offering a blueprint for countries around the world to safeguard individual privacy in the digital age. Its influence has extended far beyond Europe, inspiring countries in regions such as Latin America and Southeast Asia to adopt similar frameworks that balance the rights of individuals with the interests of businesses and governments. As digital economies continue to grow, the adoption of GDPR-like regulations will be essential for ensuring that cyberspace remains a space for innovation, freedom, and trust. Latin American countries, including Brazil, Argentina, Mexico, Colombia, and Ecuador, are leading the way in adopting comprehensive privacy protections that align with international standards, securing both their citizens' privacy rights and their place in the global economy.

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HUMANITARIAN ASSISTANCE FOR WAR REFUGEES FROM UKRAINE: A CASE STUDY OF THE PODKARPACKI BRANCH OF THE POLISH RED CROSS

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Abstract. *The phenomenon of refugees has been a consistent feature of human history for centuries, and in the era of globalization and widespread armed conflicts, it has gained increasing significance. This article examines the definition and status of refugees in the context of international law, with particular emphasis on the 1951 Geneva Convention and relevant domestic regulations. The role of non-governmental organizations (including the Polish Red Cross) and state structures in the refugee assistance process was also presented. The article presents an example of the actions taken by the Podkarpacki Branch of PCK in response to the influx of refugees from war-torn Ukraine in 2022. The authors examine the significance of international cooperation and a multi-level legal framework in safeguarding the basic rights and security of individuals forced to flee their homeland. Finally, the article presents conclusions regarding the necessity of long-term integration programs and sustainable humanitarian efforts.*

Keywords: refugeehood, international law, Polish Red Cross, humanitarian aid, armed conflict, integration

INTRODUCTION

The aim of this article is to present and analyze selected humanitarian actions undertaken by the Podkarpacki Branch of the Polish Red Cross (PCK) in support of war refugees from Ukraine. The article considers the historical, social, and legal (Nowak, 2022) context and provides an overview of the key forms of material and non-material support. The analysis was conducted based on available reports from international organizations (including UNHCR, EASO, WHO) (UNHCH, 2022), statistical data from local authorities, and interviews with volunteers and PCK employees. The conclusion discusses the main organizational and systemic challenges, while also pointing out potential directions for the future development of humanitarian initiatives in the Podkarpackie region (Górny, 2022).

The phenomenon of refugees has been a part of human history for centuries and remains one of the greatest challenges of the modern world. Refugees are individuals who have left their homelands due to political, religious, racial, or economic persecution. Refugees seek refuge in other countries where they can receive protection and assistance. One of the main challenges refugees face is the lack of acceptance and recognition from local communities. Refugees are often perceived as foreign, unfamiliar, and disconnected from the society they arrive in. Since the 20th century, we have observed key actions in international cooperation and the work of non-governmental organizations for refugees and migrants (Balicki & Trojanowska-Strzęboszewska, 2020). As the number of migrants and refugees increased in many countries during the 20th century, the establishment of a unified and effective system of international cooperation became essential (Marcinkowski, 2019). Many countries have taken collective actions to provide support for refugees and migrants, aiming to ensure they have a safe and dignified quality of life. These actions include measures aimed at ensuring better access to support, as well as efforts to address the underlying causes of the crisis. Not without reason, it was after World War II that the scale of violations

against human rights and freedoms was recognized. These actions have largely led to the recognition of the refugee issue in international legal documents and the domestic laws of individual countries, which has positively influenced the development of human rights related to this specific group of society. Over the years and through natural phenomena, this group has grown, creating increasingly larger refugee populations traveling around the world (Pak, 2022).

The definition of a refugee was established in the 1951 Convention Relating to the Status of Refugees and serves as the foundation of international refugee law. However, there are numerous definitions of a refugee across different legal instruments and political contexts (Kun-Buczko, 2007).

The 1951 Convention defines a refugee as a person who is outside their country of residence due to a well-founded fear of persecution on account of race, religion, nationality, political opinion, or membership in a particular social group. This definition also encompasses situations where a person is unable to, or unwilling to due to this fear, seek protection in their own country. However, in practice, individual countries may have their own definitions of a refugee, which may vary from the definition established in the Convention. Some countries broaden the definition of a refugee to include individuals fleeing violence related to armed conflicts or natural disasters, which are not directly linked to the reasons covered by the Convention. Other countries may adopt narrower definitions that are more closely tied to specific causes, such as political, religious, or ethnic persecution.

It is important to note that the definition of a refugee does not encompass individuals migrating for economic reasons. People who leave their countries in search of better living conditions are not recognized as refugees in a legal sense, although they may face similar difficulties and challenges.

Furthermore, various international and regional organizations have their own definitions of refugees, which may differ from the definition provided in the 1951 Convention. For example, the United Nations High Commissioner for Refugees (UNHCR) adopts a broader definition that includes individuals fleeing general violence, armed conflicts, or deteriorating living conditions, even if they do not meet the criteria outlined in the 1951 Convention. UNHCR applies this broader definition to provide protection and assistance to all individuals in need, regardless of whether they meet the traditional criteria for refugee status (Stawicki, 2019).

The concept of a refugee is also dynamic and subject to change, depending on evolving global circumstances. For example, the term "war refugee" is used to refer to individuals who are forced to leave their homes due to armed conflict or war. War refugees face additional risks and needs related to violence, loss of property and loved ones, and are often more reliant on humanitarian assistance.

The purpose of this article is to demonstrate how international law, national law (using Poland as a case study), and the activities of non-governmental organizations interact in providing protection to refugees. Special attention has been given to the situation of war refugees from Ukraine, who have been arriving in Poland in large numbers since 2022, including in the Podkarpackie Voivodeship. From the outset, refugees have been provided with care and support. This article examines the actions of the Polish Red Cross (PCK), with particular emphasis on its Podkarpacki Branch, which was tasked with providing rapid humanitarian assistance in response to the Russian-Ukrainian conflict.

The introduction provides a general overview of the refugee issue and the origins of the most important international documents. The subsequent sections outline the following:

- Definition of a refugee in light of the 1951 Convention and other legal instruments,
- Polish law regarding refugees, including the Act of June 13, 2003, on Granting Protection to Foreigners in the Territory of the Republic of Poland,
- Role of non-governmental organizations (NGOs), including PCK and international organizations, along with their legal framework.
- Case Study: activities of the Podkarpacki Branch of PCK in the context of the mass influx of refugees from Ukraine,

- Conclusions regarding the challenges, perspectives, and necessary long-term actions in the field of refugee assistance.

The primary objective is to present and analyze selected humanitarian actions undertaken by the Podkarpacki Branch of the Polish Red Cross (PCK) in support of war refugees from Ukraine. The article considers the historical, social, and legal context and provides an overview of the key forms of material and non-material support (Nowak, 2022). The analysis was conducted based on available reports from international organizations (including UNHCR, EASO, WHO) (UNHCR, 2022), statistical data from local authorities, and interviews with volunteers and PCK employees. The conclusion discusses the main organizational and systemic challenges, while also pointing out potential directions for the future development of humanitarian initiatives in the Podkarpackie region (Górny, 2022)

MATERIALS AND METHODS

The aim of the study was to investigate and analyze:

- How national and international laws influence the actions of aid organizations (including PCK) in crisis situations.
- What specific forms of support (e.g., food, medical care, psychological assistance) were provided to war refugees from Ukraine, and how was the coordination of these activities carried out?
- What logistical and organizational challenges emerged during the mass influx of refugees, and how did PCK and other entities address them?

To answer these questions, an approach combining qualitative methods with analytical and comparative techniques has been developed. Both secondary data (desk research) and primary data collected during the study (including field interviews with representatives of PCK) were used.

Given the rapidly evolving situation at the Polish-Ukrainian border and the limited number of scientific studies specifically focusing on the activities of the Podkarpacki Branch of PCK, this study is exploratory in nature. It aims to describe specific solutions and practices implemented in response to a sudden humanitarian crisis.

The case study of the Podkarpacki Branch of PCK facilitates a deeper analysis of the role and operations of aid organizations in the context of armed conflict. This branch was chosen due to the following reasons (Boyatzis, 1998):

- The proximity to the Ukrainian border required the Branch to operate within the most intense migration flow.

- The exceptional nature of the circumstances (a rapid mass influx of refugees).
- A wealth of source materials (reports, internal documents, and volunteers' reports).

The analysis of existing sources included legal and administrative documents, such as:

- Convention Relating to the Status of Refugees (1951) and the 1967 Protocol.
- Act of June 13, 2003, on Granting Protection to Foreigners in the Territory of the Republic of Poland.
- EU directives regarding the conditions for the reception of refugees.

The aim was to identify the fundamental norms and standards that an organization providing assistance to refugees should adhere to.

- Internal documentation of PCK (activity reports from reception points, minutes of coordination meetings, and reports on the utilization of financial and material resources).

As a result, a comprehensive understanding of actual practices and logistical challenges was gained. The analysis of this data enabled a comparison of the activities of PCK with those of other organizations and helped to identify the scale of the crisis and the needs of refugees. To gain insight into the practices of the Podkarpacki Branch of PCK, a series of semi-structured interviews were conducted with: representatives of PCK (full-time employees and key volunteers), local government officials (crisis management departments, social assistance centers), and refugees (in selected cases, to gather information about the experiences of aid recipients) (Spradley, 1980).

The interviews were recorded and anonymized in accordance with ethical guidelines. Subsequently, a content analysis was conducted, identifying recurring thematic categories (e.g., logistics, human resources, integration with the local system).

Participant observation was applied to a limited extent at reception points and assistance centers. Several researcher-volunteers had access to the ongoing activities of PCK, engaging in assistance tasks and compiling field notes. This method facilitated a direct understanding of the procedures and interactions among volunteers, refugees, and other entities.

The descriptive method was used to conduct the data analysis (it was applied to outline the context and present the main facts regarding the scale and types of assistance organized by PCK). Additionally, the comparative analysis method was employed (comparing the forms of support provided by PCK with the activities of governmental institutions, aiming to identify similarities and differences in operational models. Documents and statistics were utilized to verify the consistency of declared objectives with actual outcomes, such as the number of benefits provided or meals distributed).

Qualitative data from interview transcriptions and observation notes were coded using a qualitative data analysis program, which facilitated the creation of categories (themes) such as “logistics and transportation”, “medical needs”, “volunteer coordination”, and “relations with local authorities”. Based on these categories, the main issues and strategies for addressing the encountered difficulties were identified.

The research revealed certain limitations that influenced the study:

- The dynamics of the conflict – data was collected in the context of a rapidly changing situation at the border. Certain solutions, although effective at the time, may have become obsolete in the subsequent weeks.

- Access to full documentation – certain materials (particularly internal protocols and PCK reports) may have been subject to disclosure restrictions, which hindered a comprehensive assessment of all actions.

- Lack of representativeness of refugees' opinions – only a selected group consented to interviews. To obtain a more comprehensive perspective, it would be necessary to conduct a systematic survey among a considerably larger number of aid beneficiaries.

- Possible subjective perception – participant observation may introduce the researcher's involvement in PCK activities, potentially influencing the interpretation of the results.

The methods employed—document analysis, semi-structured interviews, participant observation, and comparative analysis—enabled a comprehensive understanding of the complexity of humanitarian aid in response to the mass influx of war refugees. As a result, it became possible to identify key elements, such as volunteer organization, cooperation with local authorities, and coordination principles with other entities, including NGOs and international institutions. Despite the aforementioned limitations, the research methods employed provide a solid foundation for drawing conclusions regarding the effectiveness and shortcomings of the interventions undertaken by the Podkarpacki Branch of PCK in response to the refugee crisis.

The primary source material was derived from

1. Analysis of legal acts

- oA review of the key documents regulating the status of refugees has been conducted (including, among others, the Geneva Convention of 1951, The Hague Convention, the Act of June 13, 2003, and European Union Directives.

- oAttention has been drawn to the practical implications of the regulations, particularly in the context of the ongoing armed conflict in Ukraine.

2. Literature review and analysis of reports from humanitarian organizations.

- oA query of the latest reports and studies was conducted, including, among others, those from UNHCR, IOM, the Polish Red Cross, as well as press sources and local government reports.

3. Different perspectives were examined, ranging from strictly humanitarian actions to legislative and administrative issues.

4. Case study

oThe actions of the Podkarpacki Branch of the Polish Red Cross in response to the refugee crisis of 2022 have been described in detail.

oOrganizational and logistical challenges have been identified, along with the primary types of support provided by PCK, including reception points, medical assistance, food distribution, temporary accommodation, and psychological support.

5. Field interviews

oThe section on the outcomes of cooperation with local institutions draws on available information from interviews with volunteers and staff of PCK, as well as data provided by local government units in the Podkarpackie Voivodeship (Strauss & Corbin, 1998).

As a result of applying the aforementioned methods, a comprehensive understanding of the situation was obtained, integrating legal, administrative, organizational, and human aspects.

RESULTS

The Issue of Refugees in Polish Law

In the context of war refugees, there are also specific instruments and legal acts designed to ensure protection and assistance for those particularly in need. One such instrument is The Hague Convention of 1951, which addresses the protection of civilians during wartime and has been ratified by many states. This convention provides the legal foundation for granting protection and assistance to war refugees (Balicki & Trojanowska-Strzęboszewska, 2020).

In the case of Poland, there is a legal framework and legislation that govern issues related to refugees, including war refugees. An example of such a legal act is the Act of 13 June 2003 on Granting Protection to Foreigners on the Territory of the Republic of Poland (Act of June 13, 2003). This law establishes procedures for recognizing and granting protection to refugees, including war refugees.

According to the aforementioned law, a war refugee is defined as an individual present on the territory of Poland who meets the criteria outlined in The Hague Convention of 1951 and is at risk of persecution or violence related to armed conflict. A war refugee is entitled to protection and assistance under this law, which grants them refugee status and access to fundamental rights and services.

Furthermore, in Poland, there is an institutional framework responsible for managing the affairs of war refugees. The main institution responsible for refugee affairs in Poland is the Office for Foreigners (UDSC), which handles procedures related to recognizing refugee status and providing assistance to these individuals. The UDSC also collaborates with other institutions, non-governmental organizations, and international organizations to ensure effective protection and support for war refugees.

The Republic of Poland, as a signatory to various international agreements and conventions, is obligated to respect and implement the provisions of international refugee law. The key document in this field is the 1951 Convention Relating to the Status of Refugees and its 1967 Protocol, which provide the foundation for the protection of refugees at the international level. Poland has ratified these documents and is obligated to comply with them.

Poland, as a member of the European Union, is also bound by EU law regarding the protection of refugees. The European Union Directive 2011/95/EU on standards for the qualification of third-country nationals or stateless persons as refugees regulates the rights and obligations of member states towards refugees. Poland is obligated to adhere to this directive and ensure appropriate standards of reception conditions for refugees (Pac, 2022).

The Republic of Poland has its own legal acts that regulate issues related to refugees and their protection. The key document is the Act of June 13, 2003, on Granting Protection to Foreigners on the

Territory of the Republic of Poland. This law provides the legal and organizational framework for procedures related to the reception and granting of protection to individuals seeking refugee status. It also defines the rights and obligations of refugees, as well as the procedures related to their social integration.

Under this law, a refugee is defined as an individual who is staying on the territory of Poland and applies for refugee status in accordance with international standards of refugee protection. The procedures for granting refugee status are clearly defined, including the examination of the application, conducting an interview, assessing the risk, and issuing a decision on whether to grant or deny refugee status (Klaus et al., 2022).

The law also grants refugees rights, including protection against deportation, access to education, medical care, employment, and accommodation. Refugees also have the right to access legal procedures in the event of a refusal to grant refugee status or extend protection.

Furthermore, the Republic of Poland is a signatory to the European Convention on Human Rights and is subject to the jurisdiction of the European Court of Human Rights. This means that refugees have the right to file complaints with this tribunal in the event of a violation of their rights, including the right to an independent court, protection from torture, inhuman or degrading treatment, and the right to family life.

One of the key aspects of the legal system regarding refugees in Poland is the procedure for examining applications for refugee status. The law specifies the detailed steps, which include the submission of the application, conducting an interview, assessing the risk, and issuing a decision on whether to grant or deny refugee status. This procedure aims to ensure a fair and just consideration of applications and protection against deportation in cases where the life or freedom of the refugee is at risk in their country of origin (Balicki & Trojanowska-Strzęboszewska, 2020).

Poland, as a country that accepts refugees, should also collaborate with other states and international organizations to coordinate actions, exchange information, and share best practices in refugee protection. Within the European Union, there are mechanisms of solidarity and cooperation that can support member states in dealing with challenges related to refugees.

Role of Non-Governmental Organizations in Refugee Assistance

Non-governmental organizations (NGOs) play a crucial role in providing support and protection to refugees around the world. Their activities focus on various areas, such as humanitarian aid, human rights protection, ensuring access to basic services, and supporting social integration. In the context of refugees, non-governmental organizations undertake a wide range of activities to address their needs and contribute to improving their situation.

It is also important to mention the legal conditions governing the activities of non-governmental organizations, which operate in accordance with international humanitarian law and national legal regulations. Under international law, non-governmental organizations rely on the principles of international humanitarian law and human rights law, which safeguard the rights of refugees and define the obligations of states towards them. International and regional legal instruments, such as the 1951 Convention Relating to the Status of Refugees and the 1967 Protocol, serve as the basis for the actions of non-governmental organizations in the field of refugee protection.

In the national context, non-governmental organizations operate under the Association Act, the Foundation Act, and other legal regulations governing their activities. These regulations cover the registration, statutes, financial management, activity monitoring, and other aspects related to the operation of non-governmental organizations (Stawicki, 2019).

Numerous non-governmental organizations operate worldwide to provide refugees with humanitarian assistance, protection of rights, social support, and integration. Below are a few examples of such organizations:

- International Organization for Migration (IOM) is an intergovernmental organization that focuses on migration management, including the protection and support of refugees. IOM operates internationally and collaborates with member states, non-governmental organizations, and other entities to ensure effective protection and support for migrants and refugees. IOM engages in humanitarian activities, such as providing food assistance, drinking water, medicine, and other basic necessities. The organization also runs programs for reintegration and social integration, supporting refugees in the process of adapting to new environments.

- UNHCR - the United Nations High Commissioner for Refugees, is the primary agency responsible for the protection and support of refugees worldwide. UNHCR operates under a mandate from the UN General Assembly and is responsible for coordinating actions to protect refugees, provide shelter, medical care, education, and other basic needs. The agency also undertakes activities to address the long-term challenges of refugees, such as repatriation, resettlement, and social integration.

- Red Cross and Red Crescent - The International Red Cross and Red Crescent Movement is one of the most important humanitarian organizations in the world, working to assist victims of armed conflicts and natural disasters, including refugees. These organizations provide medical support, access to drinking water and sanitation, distribute humanitarian aid, and engage in activities to protect the human rights of refugees.

- Amnesty International - is a non-governmental organization that works to protect human rights globally. The organization takes action to ensure protection for refugees, including monitoring conditions in refugee camps, supporting social integration processes, and pursuing justice for those responsible for violating refugee rights.

- Human Rights Watch - is an international organization that monitors and reports on human rights violations globally. The organization investigates the conditions of refugees and provides information on the violations of their rights. It works to ensure accountability for human rights violations and promote the protection of refugees (Kuchciński et al., 2023).

Polish Red Cross (PCK) - is one of the most important humanitarian organizations in Poland, working to protect health, provide humanitarian aid, and support those in need. The organization was founded in 1919 and has since played a significant role in providing medical assistance, conducting rescue operations, offering health education, and supporting those affected by conflicts, disasters, and other crises. PCK is an integral part of the International Red Cross and Red Crescent Movement.

Both organizations trace their roots to the work of Henry Dunant, who founded the International Red Cross and Red Crescent Movement in the 19th century. My main goal is to protect human health and life, provide medical assistance, support victims of armed conflicts and natural disasters, and promote humanitarian values and respect for human rights (Polish Red Cross, 1984).

The National Red Cross and Red Crescent Societies have similar objectives and activities, including the provision of humanitarian assistance, implementation of health programs, education, support for those in need, and the promotion of humanitarian values. These organizations also engage in rescue operations during crises such as armed conflicts, natural disasters, or pandemics.

The Polish Red Cross operates nationwide, with local branches and structures across various regions. The organization runs numerous programs and activities, such as providing first aid, organizing blood donations, offering medical rescue training, assisting the elderly and disabled, supporting homeless people, and working on the integration of refugees. PCK also collaborates with other institutions, such as emergency services, hospitals, government offices, and other social organizations, to ensure effective assistance and coordination during crisis situations.

Globally, the Red Cross and Red Crescent organizations operate across diverse regions and countries. Each national association has its own structures and programs tailored to the specific needs of the country and the situation. Differences may arise due to geographical, socio-cultural, economic, and political conditions.

The assistance provided by national Red Cross and Red Crescent societies is adapted to local needs and challenges. These actions may include providing medical assistance, conducting health programs, offering social support and education, building sanitary and hygienic infrastructure, as well as activities aimed at protecting human rights and dignity. These organizations often collaborate at both the national and international levels to provide mutual support, exchange experiences, and coordinate humanitarian assistance efforts (Kun-Buczko, 2007).

An example of international legal instruments is the 1951 Convention Relating to the Status of Refugees and its 1967 Protocol. This convention defines who can be recognized as a refugee and outlines the rights and protections they should receive. Many countries, including Poland, are parties to this Convention and are obligated to comply with its provisions.

In Poland, refugees are also protected by national laws, such as the Act on Granting Protection to Foreigners on the Territory of the Republic of Poland. Like many other countries, Poland has a legal and administrative support system for refugees. The Act on Granting Protection to Foreigners on the Territory of the Republic of Poland outlines the procedures and conditions for granting protection to refugees in Poland. This law aligns Polish regulations with international standards and includes provisions regarding the reception and assistance of refugees.

Under these regulations, refugees have the right to apply for protection in Poland and to submit applications for refugee status or other forms of protection. The procedures involve assessing the individual's situation, their protection needs, and compliance with international standards regarding refugees. Decisions regarding protection are made by the relevant institution in Poland, typically the Office for Foreigners.

As the national Red Cross association, the Polish Red Cross plays a significant role in the process of integrating refugees in Poland. The organization offers a wide range of support, including medical, psychological, and social services, assistance in finding housing, language learning support, and various social programs aimed at integrating and supporting refugees in Polish society.

The Polish Red Cross also collaborates with other non-governmental organizations, government institutions, international bodies, and local communities to provide comprehensive assistance and support to refugees. Together, they undertake actions aimed at improving living conditions, fostering social and economic integration, and promoting respect for human rights and human dignity (Gliński, 2006).

On the international stage, these organizations engage in refugee-related activities through cooperation with the International Committee of the Red Cross (ICRC) and the International Federation of Red Cross and Red Crescent Societies (Federation). The aforementioned international organizations coordinate and support the activities of national Red Cross and Red Crescent societies, offering financial, technical, and logistical assistance.

The Polish Red Cross (PCK) is one of the most important organizations providing humanitarian aid and health protection in Poland. As an independent social organization, PCK engages in a wide range of activities, including providing assistance in extraordinary situations and supporting local communities, with a focus on helping refugees. This subsection presents the structure and characteristics of PCK, including a description of the individual branches operating in Poland and their scope of responsibilities.

The Polish Red Cross has a decentralized structure, organized according to territorial divisions. The organization operates at the national, regional, and local levels, ensuring effective coordination across all tiers. The key units in the structure of PCK are as follows (Polish Red Cross, 2024):

- Main Board: It is the highest decision-making body of PCK, responsible for developing strategies, making decisions, and coordinating the organization's activities. The Main Board consists of the president, vice presidents, and board members, each responsible for different areas of activity.

- District Branches of PCK: Poland is divided into 16 districts, each with its own branch of PCK. District Local Branches of PCK: Local branches of PCK operate in cities and municipalities across the country. They are responsible for implementing programs and activities for local communities, including

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providing support to refugees. Local branches are closely connected to their communities and are actively involved in addressing health and humanitarian issues.

- **Field Units:** In addition to its branches, PCK also has field units that operate in specific towns or regions. They are designed to provide medical assistance, administer first aid, organize training, and carry out preventive activities.

PCK operates in accordance with international standards and the principles of the International Red Cross and Red Crescent Movement. The organization collaborates with state institutions, other non-governmental organizations, and international partners to effectively carry out its mission (Klaus et al., 2022).

An important aspect of PCK's work is the involvement of volunteers. Many citizens actively participate in the organization's activities, offering their skills, time, and commitment in service to local communities and refugees.

PCK branches are also responsible for promoting humanitarian values and disseminating knowledge about human rights, international humanitarian law, and the organization's principles. By organizing informational campaigns, training sessions, and workshops, PCK branches help raise public awareness on health protection, humanitarian aid, and humanitarian values.

PCK branches also collaborate with other institutions and organizations at both the national and international levels. As part of its cooperation with the government, medical services, non-governmental organizations, and other entities, PCK participates in planning and coordinating actions during crises and providing humanitarian assistance.

Specialized sections, focusing on specific areas of activity, are also a key element of the PCK structure. Sample sections include:

The Podkarpacki Branch of PCK operates throughout the entire Podkarpackie Voivodeship, covering districts and municipalities of various sizes and types. The organizational structure includes a branch management responsible for the overall supervision of activities, as well as numerous field units that implement specific projects and programs within their respective districts.

The Podkarpacki Branch of PCK also runs numerous projects and programs aimed at raising public awareness of humanitarian issues and humanitarian values. It organizes conferences, training sessions, workshops, and promotional events aimed at both the local community and institutions, as well as cooperating partners. It strives to promote knowledge and foster a culture of solidarity and empathy within society.

Activities of the Podkarpacki Branch of PCK in Support of War Refugees

As part of its organizational structure, the Podkarpacki Branch of PCK also includes specialized sections focused on specific areas of activity. These may include first aid, care for the elderly, psychological support, and social integration. These sections aim to direct their activities towards addressing the specific needs and challenges of the local community.

The Podkarpacki Branch of PCK operates mainly due to the dedication of its volunteers, who play a key role in fulfilling the organization's mission. Volunteers are trained in first aid, medical care, crisis management, and other skills essential for providing assistance. Their activities involve providing material and emotional support, organizing charity events, participating in fundraising efforts, and assisting in the implementation of projects and programs.

The Podkarpacki Branch of PCK plays a key role in the local community, assisting those in need, promoting humanitarian values, and raising social awareness about humanitarian aid. Its activities encompass a wide range of actions aimed at providing material and medical assistance, social support, and promoting social integration. Collaboration with other institutions and the involvement of volunteers form the foundation of the branch's success.

The Podkarpacki Branch of the Polish Red Cross (PCK) carries out a variety of activities aimed at fulfilling the organization's mission and responding to current social needs. In its work, the Branch is guided by specific priorities set by the strategic goals of PCK and current social and humanitarian conditions. Below, I present detailed descriptions of the priority areas of activity of the Podkarpacki Branch of PCK:

1. Humanitarian aid and crisis response: PCK takes action to assist people affected by natural disasters, armed conflicts, migration, or other crisis situations. It organizes rescue operations, provides material and medical support, and offers shelter and psychological assistance.
2. Healthcare and first aid: PCK operates in the healthcare field, providing access to primary medical care, first aid services, and conducting first aid training. It organizes courses and training sessions for the local community and medical institutions.
3. Preventive and educational programs: PCK runs various preventive programs aimed at improving health and preventing diseases. It conducts educational campaigns on healthy lifestyles, hygiene, safety, and proper nutrition.
4. Social support and integration: The PCK branch engages in activities to support those in need, such as the elderly, disabled individuals, homeless people, and those at risk of social exclusion. It organizes activities aimed at improving the quality of life, promoting social integration, and strengthening social bonds.
5. Promoting humanitarian values and social education: PCK carries out activities that promote humanitarian values such as assistance, solidarity, empathy, and respect for human dignity. It organizes conferences, meetings, lectures, and conducts informational campaigns to raise public awareness about humanitarian aid.

The Podkarpackie Voivodeship, bordering the Lviv and Zakarpattia Oblasts, has become the primary "corridor" for refugees entering Poland (Podkarpackie Voivodeship Marshal's Office, 2022). The Podkarpacki Branch of PCK had to quickly adapt to rapidly changing conditions by setting up information points, emergency warehouses, and reception centers (Polish Red Cross, 2022). In the context of the growing humanitarian crisis, cooperation with local government institutions and non-governmental organizations has proven crucial (Bartnik & Koc, 2022).

On the very day of the outbreak of the war, caused by Russia's aggression against Ukraine on February 24, 2022, the Polish Red Cross District Branch in Przemyśl began providing assistance. An account was opened to receive donations, which were subsequently allocated for essential items such as food and medical supplies. The following graphic displays a dedicated post on one of the social media platforms, which accurately illustrates the date and the described situation:

On the very day of the outbreak of the war, members of the Polish Red Cross in Przemyśl were assigned the task of establishing two medical aid stations at the two largest border crossings near the city of Przemyśl. These were the border crossings in Korczowa and Medyka. Additionally, assistance points were established at three other crossings: in Krościenko near Ustrzyki Dolne, Budomierz near Lubaczów, and at the railway crossing in Przemyśl. These points operated 24/7, offering assistance to those in need. It is important to note that, of course, without the support of other branches of the Polish Red Cross, the coordination and operation of these points would not have been possible. After two days, on February 26, 2022, a help point was also established at the Humanitarian Aid Center in Przemyśl, located on Lwowska Street (the former Tesco shopping center).

In the first phase of the crisis, the primary goal of PCK was to meet the basic needs of refugees and provide support. The actions focused on:

- Distributing food and drinking water – at key reception points and along the border (Border Group, 2022)
- Medical and psychological assistance – in cooperation with local healthcare facilities and organizations specializing in psychological support for victims of armed conflicts.

- Creating reception points – where refugees could not only receive a warm meal, but also information about further travel, accommodation options, and legal procedures.

In addition to the above activities, volunteers and employees of the Polish Red Cross can be seen as intermediaries between institutions and individuals in need who cross borders. They also organized collections, which were then used at aid points and sent abroad to regions in greatest need of assistance. The Polish Red Cross collaborated with various entities such as universities, schools, and government and local government administration centers. One of the outcomes of such meetings and numerous discussions was the establishment of accommodation facilities where refugees could rest peacefully and safely overnight. At these locations, the PCK Rescue Group in Przemyśl operated, tasked with TRIAGING, that is, sorting those in need, providing assistance, and, if necessary, transferring them to medical facilities.

In the context of humanitarian aid, we must not forget about the World Central Kitchen organization. World Central Kitchen (WCK) is an international non-profit organization founded in 2010 by renowned chef José Andrés. Its main goal is to provide meals to people affected by natural disasters, humanitarian crises, or other emergency situations worldwide. WCK not only distributes food in emergency situations but also supports local communities in rebuilding by investing in sustainable food systems and culinary education (World Central Kitchen, 2023). The employees and volunteers of this organization arrived in Poland within 48 hours of the outbreak of the war in Ukraine. The food they prepared and provided to refugees was available at the border, reception points, and in large cities. In addition, warehouses were being built at the border to store food, which was also being sent to Ukraine. In the initial stages, it was delivered to Lviv and then distributed to the area's most in need, primarily in the eastern part of the country. The above foundation was able to organize up to 100,000 meals in a single day.

The humanitarian aid described highlights only selected areas and entities, as the scale we encountered was immense. Moreover, each crossing, and especially each country, differs from one another in many aspects.

The Humanitarian Aid Center in Przemyśl was launched on March 1, 2022. It is worth noting that it was opened just a week after the outbreak of the war in Ukraine. In such a short period, thanks to the cooperation of the city authorities, hundreds of volunteers, and donors, a place was created aimed at ensuring the basic needs of individuals. Each refugee arriving at the Humanitarian Aid Center in Przemyśl could receive a package with clean clothing and provisions. As time went on, the center's capacity grew, allowing it to provide more extensive support.

The body responsible for coordination and administration is the City of Przemyśl Municipality. At the beginning of its operations, the Humanitarian Aid Center was also supported by the Polish Red Cross, mentioned earlier in this paper, which undertook many tasks. One of these tasks was providing medical security through the establishment of a medical assistance point. Many refugees had to travel hundreds of kilometers under very difficult conditions and unfavorable temperatures to reach a safe place. Citizens of the country affected by the conflict, who sought shelter at the Humanitarian Aid Center in March 2022, suffered significant health damage, including numerous abrasions, fractures, and, due to the extremely low temperatures, frostbite. Later on, psychological assistance for refugees was also organized.

In July 2022, after four months of operation, the Polish Red Cross became the entity responsible for coordinating the entire center. It was only from that moment that detailed statistics and analyses began to be conducted. From the resulting calculations, it was possible to determine the exact number of people who benefited from the center's assistance. Since March 23, 2023, over 16,000 refugees have been registered at the facility. Unfortunately, the numbers between March and July 2022 are not publicly available, but it can be confidently assumed that the center may have assisted several hundred thousand refugees during the first few months of its operation.

The facility chosen to serve as the humanitarian center was not selected randomly. Its main advantage is primarily the short distance to the Polish-Ukrainian border. Next to the former commercial facility, there is also a large parking lot, which allowed refugees to be brought directly to the center and

buses to be stationed for transporting refugees to selected European cities, including Prague and Berlin. The building, which previously served as a shopping center, also has access to running water, electricity, and efficient heating. Within the facility, there is also a gastronomic zone that enables volunteers to efficiently serve meals. Additionally, it is worth noting that by February 28, 2023, a total of 56,500 meals were served in the form of breakfasts and dinner-lunches. In addition to these meals, there was also a buffet on-site offering essential food and beverages, such as coffee, tea, juices, instant soups, and formula milk. Equally important was access to toilets. The former shopping center has several separated areas inside, where stores were previously located. Thanks to the separated space, the center was divided into several zones: a reception point, a designated area for the youngest, and several warehouses for storing surplus dry provisions and hygiene products from donations.

DISCUSSION

The Podkarpackie Voivodeship, bordering directly with Ukraine, has acquired particular significance following the outbreak of the Russo-Ukrainian war in February 2022. Due to its strategic location, it has become a key “corridor” for individuals crossing the border in search of safety and shelter (Marshal's Office of the Podkarpackie Voivodeship, 2022). The effective provision of immediate assistance was therefore contingent on:

- Geographical proximity, as border crossings in Medyka, Korczowa, and Krościenko necessitated the rapid establishment of reception points.

- This study examines the ability of local administrations to cooperate with government entities, such as the Border Guard and the Podkarpackie Voivode, as well as with non-governmental organizations (NGOs), including the Polish Red Cross.

- The presence of good transport infrastructure near main roads leading to larger cities, such as Przemyśl and Rzeszów, facilitated the development of logistical support, including aid centers and donation warehouses.

The Polish Red Cross (PCK), as a member of the International Red Cross and Red Crescent Movement, possesses extensive experience in delivering aid to victims of conflicts and natural disasters². Podkarpacki Branch of PCK:

- It applied established procedures that had been developed over the years in response to other humanitarian crises (e.g., floods and migration crises in other parts of Europe).

- It swiftly mobilized local resources by fostering collaboration with local authorities, volunteers, and private sponsors.

- It coordinated efforts at the border level by establishing assistance and information points, as well as providing support in equipping collective accommodation facilities (e.g., in repurposed halls or shopping centers).

PCK volunteers played a key role, as their prior training in first aid and crisis management enabled them to operate in an organized manner, thereby minimizing the chaos often associated with mass population movements (Interview with a Volunteer from the Podkarpacki Branch of PCK, 2022).

Despite relatively efficient organization, the Podkarpacki Branch of PCK faced numerous challenges (Office for Foreigners, Statistics and analyzes on the refugee crisis, 2022):

- Managing a massive wave of refugees required handling diverse groups arriving within a short period, which demanded swift responses and logistical adaptability.

- A shortage of specialists—such as doctors, psychologists, and Ukrainian/Russian language translators—posed a significant challenge due to limited available resources;

- There is a need for long-term solutions—following the crisis phase (the initial weeks and months of the war), a demand emerged for stable forms of support, such as Polish language courses, and assistance with finding employment and housing.

- Risk of social burnout—while the significant engagement of local communities initially fostered integration, the prolonged financial and logistical strain could, in some cases, lead to increasing hostility toward refugees.

In the context of international standards, such as the 1951 Convention relating to the Status of Refugees and the 1967 Protocol, the actions of the Podkarpacki Branch of PCK can be deemed effective and aligned with humanitarian principles (The 1951 Convention relating to the Status of Refugees, 1991). Within a short time, the following was achieved:

- Basic food needs and shelter,
- Medical and psychological support,
- Legal and administrative information, including guidance on asylum procedures,
- Support with transportation and the further relocation of refugees to other parts of Poland or other EU countries (Directive 2011/95/EU, 2021).

The analysis of the Podkarpacki Branch of the Polish Red Cross highlights that no single entity—whether governmental or a non-governmental organization—can independently address the challenges posed by a mass influx of refugees within a short timeframe⁶. The key to success proved to be a multi-sectoral model, in which:

1. The state and local administration provide the legal framework and infrastructure;
2. Humanitarian organizations (PCK, Caritas, and international NGOs) directly execute tasks in the field;
3. The private sector, including companies and sponsors, offers financial and material support, for instance, through donations and services;
4. Civil society engages in volunteering and provides resources (accommodation, transportation).

This scheme facilitates a more equitable distribution of responsibilities and costs, while also fostering social acceptance of aid efforts. Nevertheless, the conclusions derived from this discussion underscore the necessity of further development in infrastructure, human resources, and long-term strategies aimed at ensuring refugees not only receive temporary shelter but also have the opportunity for a dignified and stable life in their new circumstances⁷. The situation on Poland's eastern border remains fluid, necessitating continuous vigilance and preparedness for potential waves of refugees or other circumstances requiring humanitarian intervention. In this context, the Podkarpacki Branch of PCK, operating in extensive collaboration with authorities and other organizations, serves as a model example of an effective response to the migration crisis (Bankier.pl, 2023).

Currently, it can be observed that European Union countries (including Poland) have established common directives; however, in practice, a diverse approach to relocation and the acceptance of refugees is evident. A notable example is the situation on the Polish-Ukrainian border since 2022: the rapid mobilization of social and non-governmental assistance underscores the crucial role of citizen engagement and local institutions, alongside the efforts of central administration.

Conversely, the intensity of the conflict in Ukraine prompts the question of whether the existing legal frameworks and support mechanisms will prove adequate in the long term. The growing number of refugees places a significant strain on the healthcare system, education, and the job market. Both immediate and long-term solutions are essential to ensure that refugees not only survive but also lead a dignified life (Bilas, 2022).

It is also worth emphasizing the risk of “refugee crisis fatigue” of host communities. Without a consistent integration policy, xenophobic attitudes and social conflicts may escalate, which once again emphasizes the role of education, intercultural dialogue, and local and nationwide information campaigns (Patton, 2015).

An extensive support network for refugees, encompassing both international and national legal frameworks alongside a broad spectrum of activities by non-governmental organizations, represents the

culmination of years of efforts by the international community. The example of Poland, particularly the Podkarpacki Branch of the Polish Red Cross, which operates amidst a dramatic surge in the number of refugees from Ukraine, highlights the necessity of integrating formal mechanisms with grassroots initiatives and volunteer efforts.

In conclusion, it can be stated that the future of effective refugee protection will depend on maintaining a balance between:

1. A stable legal and financial framework,
2. Social openness and willingness to cooperate,
3. Long-term integration programs,
4. An efficient system of international coordination in the face of sudden armed conflicts or other crises.

These conclusions are significant not only for Poland but also for the broader international community, which continues to confront new migration and humanitarian challenges in the 21st century.

CONCLUSION

The main goal of an organization like the Red Cross is to assist and alleviate human suffering in the face of crisis situations by mobilizing the strength of volunteers and the generosity of donors. The failure to meet basic human needs, caused by the Russian Federation's attack on Ukraine in recent months, has forced humanitarian organizations, such as PCK, to significantly intensify their efforts. Otherwise, the consequences may escalate and reach the scale of a serious humanitarian crisis.

Russian terror in Ukraine has been ongoing for nearly 9 years. Since 2014, efforts have been made in Ukraine to ensure fundamental human needs, such as care and security. Despite the efforts being made, the situation in our eastern neighboring country continues to worsen. Violence, economic difficulties, and trauma are affecting an increasing number of residents in Ukraine due to the ongoing armed conflict (Bondarenko et al., 2023).

Since February 24, 2022, nearly 7.5 million people have fled their home country, and 7.1 million have been forced to leave their hometowns. In light of the enormous scale of the human tragedy, the International Red Cross and Red Crescent Movement has increased its assistance and cross-border cooperation to address the humanitarian needs of those affected. Movement partners support the Ukrainian Red Cross and national societies in neighboring countries by providing humanitarian aid, strengthening response capacities, and deploying delegates with the necessary technical expertise (International Committee of the Red Cross, 2023).

On February 15, 2023, the Ukrainian national authorities requested support from the European Union Civil Protection Mechanism (UCPM) due to the large-scale development of the crisis and its significant impact on the civilian population. Since then, the European Commission's Emergency Response Coordination Centre (ERCC) has received several requests from Ukraine, neighboring countries, and international organizations. This resulted in the largest UCPM operation to date and one of the most logistically complex (Report of the Ukrainian Red Cross, 2023).

Since the start of the full-scale war, the Ukrainian Red Cross has sent over 8,800,656 food and hygiene kits to regions of Ukraine. Every day, employees and volunteers at the logistics centers receive, sort, assemble, and send hundreds of tons of supplies, including food, medicines, water, bedding, and other essential items, to regions.

Most importantly, extraordinary assistance provided through non-humanitarian channels and aimed at meeting humanitarian needs should align with humanitarian principles and norms, and be coordinated with existing mechanisms. All relevant entities, whether governmental, regional, or local, as well as local non-governmental organizations and volunteer groups, must act in a coordinated and complementary manner, strengthening joint efforts towards preparedness and increasing their knowledge of the working methods of the other party. It is worth mentioning that at the beginning of the war, we often witnessed the

Pac, W. (2024). Humanitarian assistance for war refugees from Ukraine: A case study of the Podkarpacki Branch of the Polish Red Cross. *Politics & Security*, 9(3), pp.35-52. Doi: 10.54658/ps.28153324.2024.9.3.pp.36-52

abuse and unlawful use of the Red Cross and Red Crescent logos, but fortunately, this problem has gradually started to diminish over time.

The Ukrainian Red Cross Society plays a key role in coordinating its activities among local branches, 14 other national associations operating in Ukraine, and many others, with the ICRC and IFRC providing financial and material support. Elements of the movement support those who have fled and those who have been directly or indirectly affected by military actions. This includes:

1. Providing financial assistance in cooperation with government ministries, enabling people to purchase the most essential items;
2. Providing psychosocial support;
3. Providing care and services to individuals in difficult situations in their homes, particularly those with limited mobility, including the elderly and people with disabilities.
4. Repairing damaged homes, healthcare facilities, and other essential infrastructure.
5. Delivering essential aid supplies such as food, hygiene kits, blankets, sleeping sets, generators, and fuel, which are particularly crucial during the challenging winter months.
6. Delivering medical equipment and medications to healthcare facilities.
7. Evacuation of civilians from areas affected by military actions and visiting prisoners of war and interned civilians (Central Statistical Office, 2023).

The past year has demonstrated the strength and resilience of people throughout Ukraine, but further support is still necessary. Even if the armed conflict were to end today, it will take years to repair the destructive effects on people, homes, and critical infrastructure.

Both the Polish and Ukrainian Red Cross also carry out preventive actions in anticipation of a potential sudden escalation of the conflict. PCK strives to proactively create reserves of food and basic hygiene supplies, ensuring that in the event of a sudden escalation of conflict, no one is left without assistance. So far, throughout Poland, we can find collection points for food and hygiene materials. In addition to the collection efforts, first aid training sessions are also being conducted both in Poland and Ukraine.

As the conflict dragged on, it became evident that many refugees would have to stay in Poland for an extended period of time. The Podkarpacki Branch of PCK thus began implementing activities aimed at facilitating adaptation and social integration, including:

- Providing accommodation – in cooperation with local authorities, parishes, private individuals, as well as by setting up collective accommodation points (Nowak, 2022).
- Educational and language support – organizing Polish language courses for children and adults, and providing assistance with integration into Polish schools and kindergartens (Górny, 2022).
- Career counseling – conducting workshops on writing CVs and cover letters, and providing assistance in establishing contacts with potential employers (Górny, 2022).

The Polish Red Cross operated on many levels. It has acted as a mediator multiple times in delivering humanitarian aid abroad and also coordinated operations at the Przemyśl Humanitarian Center for a certain period of time. Its employees and volunteers also provided assistance at the border itself, not only in Medyka but also in Korczowa and Krościenko. During the conflict, many compassionate individuals chose to take in refugees, assist with transportation to other parts of the country, or become volunteers themselves.

The number of war refugees from Ukraine seeking shelter in Poland continues to grow in the face of the ongoing armed conflict in Ukraine. The situation in the first days of the war required the Republic of Poland, as the closest neighbor, to take effective actions aimed at providing support to those directly affected by the war.

Thanks to the clear provisions of the 1951 Geneva Convention and its protocols, as well as national laws, refugees are able to receive legal protection. However, crisis situations, such as the sudden influx of refugees from Ukraine, expose limitations and shortcomings in the implementation of international law

and the relocation system. Due to their operational flexibility, NGOs, including the Polish Red Cross, play a crucial complementary role to state procedures. In exceptional situations, their experience in volunteer work and ability to quickly mobilize resources prove to be indispensable. In the context of border regions, such as Podkarpacie, it is essential to foster collaborative partnerships among all stakeholders, from local government offices to international humanitarian organizations. Success lies in the establishment of a well-organized network of reception points and the efficient management of logistical support for donations. Once immediate needs are met, the challenge of the long-term integration of refugees arises. This necessitates the implementation of educational programs, language training, and support in entering the job market. Special attention should be devoted to psychological support and assistance with cultural adaptation. Armed conflicts in various parts of the world, as well as natural disasters, indicate that the refugee support system should be constantly improved. Enhancing the role of non-governmental organizations and local communities may serve as a pivotal component of effective humanitarian assistance. The Podkarpacki Branch of the Polish Red Cross stands out as a significant entity that, in recent months, has been carrying out intensive efforts in support of war refugees, offering humanitarian and medical assistance.

Ukraine needs our help like never before. To ensure peace, we need to take many radical steps and support Ukraine not only militarily, but on multiple fronts. Now, the fate of Ukraine is at stake, and perhaps later that of all of Europe.

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DEMOGRAPHIC AND SOCIAL CONSEQUENCES OF THE RUSSO- UKRAINIAN WAR FOR UKRAINE

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Abstract. *On February 24, 2022, Russia began its invasion of Ukraine, which has led to significant demographic and social consequences. In particular, there has been a noticeable increase in forced migrations and displacements – both internal and international. Many families are being separated, and the unstable situation is contributing to a decline in the birth rate. There are also challenges related to the integration of refugees in host countries, particularly in Poland. The long-term consequences of war can include a decline in professional activity, disruption of the labor market, and burdens on social welfare systems. The conflict also creates challenges related to gender equality, as military mobilization and the need to care for children in crisis situations primarily affect women. In the face of these challenges, it is essential to develop appropriate pro-family policies, invest in healthcare and social care, and implement sustainable integration programs for refugees. The article also discusses potential scenarios for the post-war reconstruction of Ukraine, emphasizing the need for humanitarian aid and financial support from the international community. Restoring economic and demographic stability requires comprehensive actions, such as creating new jobs, rebuilding infrastructure, and strengthening the healthcare system. The conclusions of the analysis highlight that the ongoing conflict is likely to shape the demographic structure of Ukraine and neighboring countries for many years. Despite the challenges associated with dynamic social changes, there is hope that properly planned and implemented reconstruction efforts, along with international support, will help restore normalcy, foster economic development, and stabilize the social situation.*

Keywords: war in Ukraine, migrations, social consequences, demographic consequences.

INTRODUCTION

The analysis of the demographic and social consequences of the Russo-Ukrainian war presents a significant scientific challenge, as this conflict has an exceptionally profound impact on all key aspects of social and economic life in Ukraine. On one hand, armed conflicts and forced migrations affect basic demographic indicators, such as birth rates, death rates, and the age and gender structure of the population. On the other hand, the displacement of millions of people both within the country and across its borders leads to complex consequences in the labor market, social welfare systems, and the formation of human capital.

1. Theoretical significance

From a scientific perspective, the discussed conflict enables the verification of existing demographic models that address the impact of crisis situations on the dynamics of population processes. The theory of conflict demography, developed in studies on civil wars in Africa and the Middle East, takes on a new dimension in the context of the conflict in Eastern Europe. Furthermore, sociological and economic analyses of societal destabilization during war can be reexamined using data from Ukraine, which will ultimately enable their updating and enrichment.

2. Practical significance

The results of demographic and social research on the consequences of war are particularly valuable for political decision-makers, international organizations, and non-governmental institutions that develop

strategies to support Ukraine during the conflict and plan for its reconstruction after the cessation of hostilities. Issues such as:

- legal status of refugees and internally displaced persons (IDPs),
- humanitarian and international aid organization,
- human rights protection,
- labor market restructuring,
- ensuring healthcare and education has a direct impact on shaping the living conditions of millions

of people. Therefore, a proper understanding and prediction of demographic trends is crucial for developing effective strategies in social policy, migration policy, and even family support policy.

- Significance for the development of a given area of law (theory and practice)

3. In light of the above challenges, there is an increasing demand for specialized legal regulations in the following areas:

- migration law: regulations governing the reception of refugees and their integration,
- human rights: mechanisms for safeguarding against violations during conflict,
- humanitarian law: rules and norms for the protection of civilians,
- labor law and social security law: taking into account the needs of displaced and affected individuals,
- family law: issues related to family separation, as well as support for women and children.

The following studies and reports directly address the issues related to the demographic and social consequences of the Russian-Ukrainian war for Ukraine:

- OSW (Centre for Eastern Studies - "War in Ukraine: Demographic and Social Consequences"

The report by experts from the Centre for Eastern Studies provides a detailed analysis of both current demographic changes and their potential long-term implications for Ukraine and neighboring states.

- Polish Institute of International Affairs (PISM) – "Ukrainian Refugees in Poland and Europe"

The study focuses on the issue of refugees in Poland and other European countries, particularly on the legal and administrative aspects of receiving, registering, and integrating large groups of people arriving from Ukraine.

- UNHCR - "Ukraine Emergency"

The website provides continuously updated reports on the situation of refugees, internally displaced persons, and the overall humanitarian situation in Ukraine. It enables real-time monitoring of the scale of needs and the ways in which various organizations respond to the crisis.

- IOM – „Latest Report on Displacement and Migration in Ukraine"

The International Organization for Migration (IOM) regularly publishes detailed statistical and analytical reports on the scale of population displacement, the characteristics of refugees and internally displaced persons, as well as challenges in the areas of employment and social integration.

- International Crisis Group – „Ukraine Report: Humanitarian, Social and Economic Challenges"

The publications of this organization focus on the broad aspects of the conflict, including political, economic, and social analysis. Their documents also include recommendations for necessary actions aimed at humanitarian assistance and stabilizing the situation in the region. In the past several months, a number of reports, academic articles, and expert analyses have emerged, describing various aspects of the socio-demographic impact of the conflict in Ukraine. The available publications indicate that the most important current research directions focus on:

1. Migrations and displacements

- Scale and dynamics of refugee movements from Ukraine to neighboring countries (including Poland, Romania, Slovakia, Hungary) as well as to other European and non-European countries.

- Conditions for the reception and integration of refugees (burden on social welfare systems, education of children, labor market).

- Internal migrations (IDP – Internally Displaced Persons) and their impact on the economic and demographic situation of the regions experiencing the largest displacements (particularly in the east and south of Ukraine).

2. Demographic structure

- Changes in natural population growth, including a decline in the number of births in areas affected by military actions and in regions engulfed by economic crisis.

- Impact of the conflict on mortality rates, both among the civilian population (victims of military actions) and among vulnerable groups (the elderly, sick, children).

- Changes in gender and age group proportions, which may lead to disruption of family structures and impact long-term population development trends.

3. Social consequences of the conflict

- Labor market: mass unemployment resulting from infrastructure destruction and interruptions in the

functioning of key sectors of the economy (agriculture, industry, transport).

- Healthcare: overload of the medical system, as well as issues with access to medication and basic medical assistance in conflict zones.

- Psychological issues: trauma related to wartime experiences, the need for psychological support, and the increase in cases of depression and post-traumatic stress disorder (PTSD).

- Legal issues: particularly concerning property rights, social security, and the recognition of pension and disability entitlements in the context of prolonged displacement.

Despite the presentation of current data covering many social and demographic processes triggered by the war, there is a lack of a comprehensive approach combined with an analysis of possible scenarios and the future consequences of the described reality. There is still a lack of a coherent strategy for rebuilding human capital, addressing both the material and psychological needs of individuals affected by the conflict. The scope of integrated databases covering migration movements (both external and internal) is insufficient. This leads to difficulties in planning assistance and development activities. Ensuring coherent legal regulations in the areas of international humanitarian law and migration law, which would take into account the specific nature of the Russo-Ukrainian conflict, remains a significant challenge.

MATERIALS AND METHODS

The primary aim of the proposed research is to comprehensively identify the key mechanisms influencing the shaping of Ukraine's demographic structure and social situation in the context of ongoing war threats. In particular, this research aims to:

1. Diagnose current demographic trends – establish accurate figures on emigration and immigration, natural population growth, as well as the age and gender of individuals affected by displacement.

2. Determine the long-term socio-economic consequences — analyzing how current phenomena (especially the scale of refugee movements and the potential loss of human capital) may impact Ukraine's social and economic development in the future.

3. Propose political and legislative strategies – developing recommendations for legal regulations concerning human rights protection, humanitarian assistance, family-friendly policies, the labor market, as well as international support programs and refugee integration initiatives.

4. International Cooperation – identification of specific actions that could be undertaken in collaboration with neighboring countries and international organizations to minimize the long-term negative impacts of the conflict.

The term “demography” comes from two Greek words: demos - people, and grapho - to write, literally meaning “the description of population”. This is a field of study that examines the emergence, life, and decline of human communities. When we talk about demography, we primarily have in mind people, their

rich diversity and variability across various dimensions, which are the focus of demographers' interest. The core meaning of the word "demography" is people (or populations), and the primary subject of demographic research is the population inhabiting a given territory (Okólski, 2003). The knowledge gathered by demographers is essential for understanding various social, economic, and political processes. Thanks to the use of advanced statistical and mathematical methods, demography provides data that is instrumental in planning public policies, conducting scientific research, and making strategic decisions across various sectors of the economy. An important tool for population analysis is demographic research. The aim of this research is to explore various aspects of demography, such as:

- Population size, which is a fundamental demographic indicator. This is the number of people residing in a specific area at a given time. Demographic studies enable the monitoring of population changes over time, which is crucial for planning social and economic development.

- Population structure, which refers to the distribution of individuals according to various demographic characteristics. Demographic research analyzes the structure based on factors such as gender, age, and social characteristics, allowing for the analysis of gender proportions within the population.

- Natural movement which refers to changes in the population resulting from births and deaths.

- Migrations, which are an important aspect of demography. Demographic research analyzes both internal and international migrations. They monitor the flow of population between different regions of the country and allow for analysis of factors influencing internal migration, such as living conditions, access to work or education.

Demography provides invaluable tools for studying populations and planning the future of societies. Thanks to demographic analyses, it becomes possible not only to understand the current population situation but also to predict future changes, which is crucial for sustainable development and effective resource management. Migrations of people throughout the centuries have been an integral part of history, shaping the present demographic and cultural structure. These migrations result from various causes, such as wars, economic changes, natural disasters, or political decisions. Population and migration processes have had, and continue to have, a significant impact on the social, economic, and cultural development of societies.

The word "migration" comes from the Latin word "migratio", which means "relocation". Migrations are defined as specific journeys or movements of people aimed at changing their place of residence or habitation for a certain period of time or permanently. According to S.N. Eisenstadt, migration is a change of place of residence, the physical transition of an individual or group from one society to another, which usually involves leaving a familiar environment and entering a different, foreign one with a distinct character (Eisenstadt, 1953). Population migrations are a natural process that has been occurring since the beginning of human existence and has taken place throughout all periods of history. Migration can also be caused by an economic crisis (economic migrations) or a political crisis (political migrations), while population movement is often artificially induced during military conflicts.

Migrations can be divided into external and internal. The first ones refer to the movement of people from one country to another (destination) and can take various forms, such as:

- emigration - the departure of the population of a given country to another country permanently;
- immigration - the arrival of people to a given country for a permanent period of time;
- re-emigration – the return of the population to their home country after a temporary stay abroad;
- repatriation - the return to one's homeland after a long period of forced stay outside of one's own country, for example, due to political reasons.

- deportation - the forced removal of people from a country.

- refugeeism – the act of leaving one's country due to a well-founded fear of persecution on account of race, religion, nationality, political opinion, or membership in a particular social group (Pac, 2022).

Internal movements, on the other hand, refer to movements within a country, such as from villages to cities, from cities to villages, from cities to cities, and from villages to villages (Kaczmarek, 2015). The process of migration from rural areas to cities began as early as the Middle Ages (the migration of landless peasants to cities in search of work) and expanded on a larger scale during the Industrial Revolution (19th century).

As a result of the decisions made, migrations are divided into:

- voluntary migration – it is a decision made independently by the migrant, of their own free will and initiative, where they have options to choose from;
- involuntary migration – migration decisions are the result of pressure, such as environmental or political situations, where migrants are forced to leave their place of residence and are unable to return, for example, refugees (Gieorgica, 2018).

Forced migrations can occur for political or religious reasons. Many people decide to migrate due to ongoing wars in their countries, as exemplified by Ukraine and Syria. People fleeing from war-torn countries and seeking asylum in another country are called refugees. Refugees are often deprived of all means of livelihood and housing as a result of armed conflicts, which is why they flee with their entire families, hoping to find a safe place and receive assistance from the host country. Another reason driving migration is religious persecution. Religious persecution remains a common phenomenon in various parts of the world, particularly in countries where there are religious differences among citizens, and followers of dominant religions discriminate against minorities practicing a different religion (Pac, 2022).

Demographic Consequences of the War

Since 2014, migration processes in Ukraine have been closely linked to political events and the military invasion by the Russian Federation. Migration flows have become particularly intense after the open aggression on February 24, 2022. Given the dominant power of the Russian invader, the need for evacuation and the flight of civilians from regions most at risk of confrontation with the technologically and numerically superior forces of the invader was inevitable. The population was fleeing their homes in the east, north, and south of the country, where military operations were taking place. As a result, one of the most significant consequences of the war was the forced migration movements occurring both within the country and abroad. According to data from the International Organization for Migration (IOM) and UNHCR, by the end of February 2023, 7.7 million Ukrainian refugees were temporarily abroad, while 6.2 million were internally displaced (Chugaievska et al., 2023).

In the first hours of the war, a significant number of Ukrainians fleeing the conflict arrived in Poland. Crowds have appeared at Polish-Ukrainian border crossings. Due to the arrival of hundreds of thousands of Ukrainian citizens, it became necessary to introduce regulations that would govern their status and enable their functioning in our country. According to the regulations, Ukrainian citizens have 30 days from the date of arrival in Poland to submit an application for a PESEL number. At the end of December 2023, 956,633 individuals from Ukraine residing in Poland had an active PESEL [national identification number]. According to UNHCR forecasts, by the end of 2024, there will be 1.1 million refugees in Poland. Over 90 percent of them are women, children, and elderly people (TVN24, n.d.).

RESULTS

In the two years since Russia's aggression, at least 10,582 civilians have been killed in Ukraine, including at least 587 children. 19,875 people have been injured, including 1,298 children. The highest civilian casualties occurred in the first months of the war (in March 2022, 4,289 people were killed, and another 3,013 were injured), and the symbols of Russian military cruelty against civilians became Bucha and Irpin. In the following months, the severity of the war for the Ukrainian population decreased, but it remained significant. In 2023, an average of 163 civilians were killed and 547 were injured each month. In 2024 (as

of February 15, 2024), 241 civilians have been killed. The vast majority of civilians were victims of rocket attacks (8,898 killed), as well as direct gunfire (1,341 killed) and mine explosions (343 killed). The vast majority of civilian casualties (7,668) were located in areas controlled by Ukraine and shelled by Russia. The highest number of casualties occurred in the Donetsk region (43,960). A very large number of civilians were also killed far from the front lines, for example, in the Kharkiv region – 206 people, in the Kyiv region – 193, in Dnipropetrovsk – 141, in Kyiv – 89, in Vinnytsia – 39, in Zhytomyr – 36, and in Lviv – 24.

As a result of Russian missile shelling, infrastructure and civilian buildings were destroyed: schools (1,072 in total, including 236 completely), hospitals and medical facilities (465, including 59 completely), power plants (especially in the attack on the entire territory of Ukraine on October 10, 2022), and residential buildings. In the Kherson region, approximately 30% of the population lives in damaged and destroyed buildings. Russia also bombed buildings and facilities used for storing and transporting grain, including silos, ports, and transport trucks. Russia also attacked Ukrainian nuclear power plants and destroyed critical infrastructure, including the dam on the Kakhovka Reservoir. The destruction of the dam caused a flood that affected nearly 1 million people. Over 37,000 residential houses, 37 schools, 11 medical facilities, and 11,000 hectares of forests were destroyed.

The Russian aggression against Ukraine has exacerbated the already crisis-ridden demographic situation of the country, bringing it to the brink of catastrophe. Over the course of three decades of independence, it has been observed that there has been a deepening decline in the population, resulting from a negative natural increase and high migration dynamics. Ukraine gained independence with 51.5 million inhabitants, but by 2019, the estimated population had decreased to only 37 million. The ongoing war has resulted in a large (though undisclosed) number of casualties among military personnel, primarily men of working age, as well as civilians, and a multi-million strong refugee population with unclear prospects for return. The invasion has worsened the physical and mental health of citizens and contributed to a further decline in the reproductive plans of younger generations due to the uncertainty of living conditions in the coming years. Projections regarding the population of Ukraine after the end of military operations are divergent, but all of them are extremely pessimistic. They range from 24 to 35 million and predict that by 2030, the population of this country may be one of the oldest in Europe, additionally burdened with a high percentage of individuals who are sick, disabled, or suffering from post-traumatic stress disorder (PTSD) or depression. Thus, from a country that was once among the top in Europe in terms of population just 30 years ago, Ukraine is becoming a state threatened by a demographic gap, the scale of which will hinder its dynamic development and post-war reconstruction (Eastern Studies Centre, 2023).

It is worth noting that in the medium and long term, such a large wave of migration and refugees will have a very negative impact on Ukraine's economic development. Due to a significantly smaller population, and consequently fewer people able to work, the decline in the physical and mental health of the population, and numerous other existential challenges, rebuilding the country after the war will be highly challenging. The loss of workforce activity within the country will be only slightly offset by income transfers from work performed by Ukrainians abroad, especially since a significant number of them do not plan to return to the country soon. As the Macro Analysis Team of PKO Bank Polski rightly argues, losses in the fixed assets of companies and the state, combined with the need to evacuate the population from parts of the territory, mass migration of foreign workers, and disruptions in supply chains, in many cases make it impossible to continue normal economic activity in Ukraine, both currently and in the future (Wysota, 2022).

Since the beginning of Russia's invasion of Ukraine, the demographic situation in Europe has changed. Ukrainians began to change their place of residence on a large scale. This is particularly noticeable in Poland. The Selectivv team undertook the task of analyzing data to describe changes in the size and characteristics of the Ukrainian minority in Poland. The study was conducted based on data collected in January 2022 (just before the outbreak of armed conflict) and one year later, in January 2023. During the period described, the number of people from the conflict-affected country fluctuated

dynamically. At the peak, in May 2022, there were 3,468,068 Ukrainians in Poland, which is nearly double the number before the war. In just the first weeks of the conflict, 1,899,364 people arrived in our country from Ukraine. Since August 2022, the total number has stabilized in the range between 3,109,596 (September) and 3,184,296 (November), reaching 3,166,418 people in February 2023. Currently, people of Ukrainian origin make up 8% of the country's total population. Only one in five Ukrainians in Poland in January 2023 had also been in the country in 2022 (Selectivv, 2023).

The majority of migrants from Ukraine residing in Poland are women - nearly 70% of all respondents. Women dominate among refugees (about 80%), but also among pre-war migrants (about 54%). Compared to May 2022, the initial phase of the war in Ukraine, the percentage of men among refugees increased (from 10% to 19%). The dominant group among both migrant groups is individuals aged 27 to 44 years. The noticeable difference between refugees and pre-war migrants concerns individuals over the age of 60, who are more represented among refugees (8%). However, when comparing the refugee population in May 2022 and November 2022, it becomes evident that the percentage of individuals over 60 years old decreased from nearly 15%. This suggests that some of the oldest individuals may have left Poland.

Migrants come from all regions of Ukraine. However, pre-war migrants are predominantly from western Ukraine (34%) and central Ukraine (25%). Definitely less numerous are people from eastern and southern Ukraine. Among refugees, there are no such noticeable differences in proportions. However, compared to the spring of the previous year, there is a noticeable decrease in the share of people from northern Ukraine (from 26% to 20%), which can likely be largely explained by their return to Kyiv.

Most of the Ukrainian citizens who have come to Poland from both groups come from cities. Only 16% lived in rural areas directly before coming to Poland. Among refugees, a larger group than among pre-war migrants consists of individuals who lived in the largest cities of Ukraine, including Odessa, Kyiv, Dnipro, Donetsk, Kharkiv, Zaporizhzhia, Lviv, and Kryvyi Rih. This may be due to fears of bombing, attacks on critical infrastructure, and supply difficulties (National Bank of Poland, 2023).

In recent years, there has been a steady increase in the number of Ukrainians working in Poland. By the end of September, over a million foreigners were registered for insurance in Poland. About 779 thousand of them are citizens of Ukraine, according to data from the Social Insurance Institution. A Ukrainian citizen can work in Poland if they legally reside and have a valid residence title, or if they arrived in the country after February 24, 2022, due to the ongoing military conflict. Refugees who arrived in Poland after February 24, 2022, can obtain a PESEL number upon verifying their identity, and their stay in the country is considered legal until September 30, 2025. However, these individuals may lose their right to legal stay if they leave Poland for more than one month. However, this limitation does not apply to individuals assigned to work abroad by entities conducting business in Poland.

Families from Ukraine have access to family benefits such as "800 plus". The condition is that their children attend a Polish school. An exception to this rule has been introduced: in the 2024/2025 school year, students in the highest grade of a school operating under the Ukrainian education system will not be required to attend Polish schools. They can complete their education in a remote learning format. The Social Insurance Institution (ZUS) informed that from January to October 2024, "800 plus" was paid to 337.6 thousand children from Ukraine (ZUS, 2024). From September, 33,000 new Ukrainian children joined Polish schools, as reported by Deputy Minister of Education and Science Joanna Mucha. She added that since the beginning of the year, the number of Ukrainian children receiving the 800+ allowance has decreased by 20,000 (Bankier.pl, n.d.).

Changes in Demographic Structure

The war has changed the age and gender structure of Ukrainian society. The majority of refugees are women and children, as men aged 18-60 have been conscripted. As a result, in host countries such as Poland, a significant increase in the number of women of working age has been recorded. In Ukraine, there has been an overrepresentation of men, which has disrupted the gender balance in many regions.

Before the war, the gender structure in Ukraine was relatively balanced, with men constituting 49% of the population and women 51%. The war caused a mass exodus of women and children abroad, leaving men aged 18-60 in the country due to military mobilization. As a result, women currently make up about 80% of refugees, and Ukraine has experienced a deficit of women in some regions, especially in conflict-affected areas. Gender imbalance can lead to a decrease in the birth rate and slow down the rebuilding of family structures. Changing the gender ratio may require political actions, such as promoting the return of women to the workforce and providing support for families.

Table 1. Percentage of migration

Category	Percentage before the war	Percentage after the war
Men (Ukraine)	49%	40%
Women (Ukraine)	51%	60%
Women (refugees)	-	80%
Children (refugees)	-	20%

Source: Own study

The aging of society has been further accelerated by the war, due to the migration of younger age groups (primarily women and children) and the high mortality rate among men of working age. As a result, the percentage of people over 65 years old increased from 16% in 2020 to 19.5% in 2023, while the proportion of individuals under 18 years old decreased from 20% to 17% during the same period. An aging society will increase the demand for social services and healthcare, while the shortage of young people may hinder economic recovery and weaken the country's developmental dynamics.

Table 2. Migration rate age categories

Year	Percentage of population aged 65+	Percentage of the population under 18
2020	16%	20%
2021	16.5%	19.8%
2022	18%	18.5%
2023	19.5%	17%

Source: Own study

The humanitarian crisis, economic instability, and migration have led to a decline in birth rates to historically low levels. In 2023, the number of births was **40% lower** than in 2021. Along with the war casualties, harsh living conditions, malnutrition, and health issues have led to an increase in mortality, particularly among children and the elderly.

Selected Perspectives on the Future

The war in Ukraine has left the country grappling with serious demographic challenges that may have long-term consequences. The return of refugees and an increase in birth rates will be crucial for rebuilding society. However, this process will require the stabilization of the political and economic situation.

Table 3. Population Forecast Table

Population Forecast Table			
Year	Scenario 1: Status Quo (million)	Scenario 2: Moderate Reconstruction (million)	Scenario 3: Optimistic (million)
2023	36.0	36.5	37.0
2024	35.7	37.0	38.1
2025	35.4	37.6	39.3
2030	34.3	39.0	42.0
2040	32.5	41.5	46.0

Source: Own study

One of the most visible effects of the war was the mass migration of people, both internal and international. Millions of people have fled their homes, escaping the hostilities. According to UNHCR data, since the onset of the conflict, more than 8 million people have sought refuge outside of Ukraine, primarily in European Union countries such as Poland, Germany, the Czech Republic, and Romania. More than 6 million people have been displaced internally within the country. They were often forced to settle in regions of western Ukraine that were less impacted by the war. With the stabilization of the situation in certain regions, some people have returned; however, this process is hindered by a lack of infrastructure and the ongoing high risk of conflict. Countries like Poland have seen a sharp increase in population, which has affected the labor market, social welfare system, and education sector. Accepting refugees required substantial financial and social resources.

The war has caused a substantial loss of life, affecting both soldiers and civilians. Official data is difficult to obtain, but it is estimated that the number of fatalities ranges from 150,000 to 200,000, including soldiers and civilians on both sides of the conflict. The human losses and mass emigration have led to a reduction in Ukraine's population by approximately 20–25% compared to pre-war levels. The destruction of healthcare infrastructure has hindered access to medical care, increasing mortality from diseases and the lack of medication.

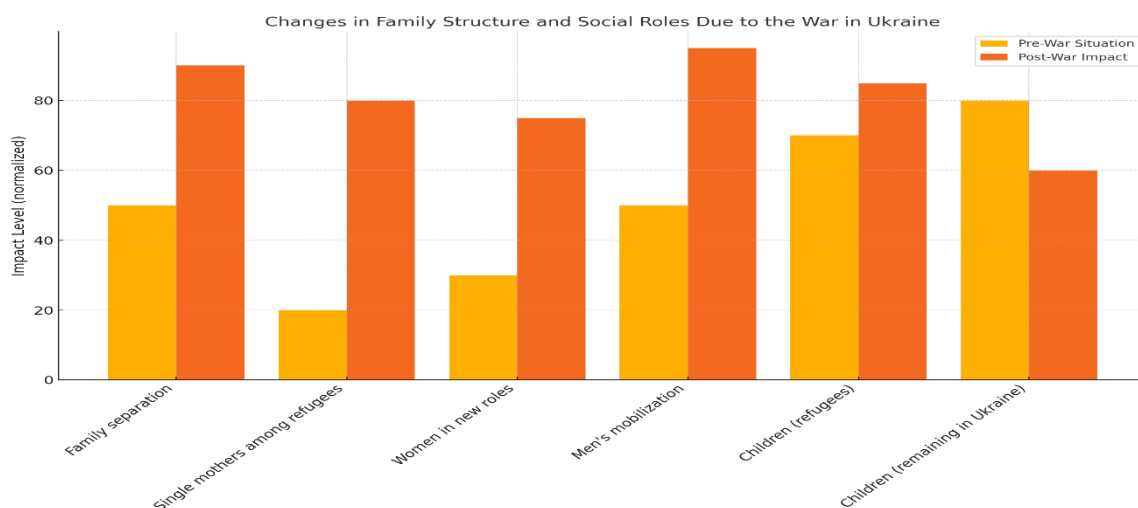


Figure 1. Changes in family structure and social roles due to the war in Ukraine

Source: Own study

Economic and Social Consequences of the War

On February 24, 2022, the established order in Europe collapsed. Despite weeks of warnings from the United States government about a potential Russian attack on Ukraine, few believed such a scenario would occur until the very end. Russian tanks on the outskirts of Kharkiv and the suburbs of Kyiv were a shock not only to the general public but also to financial markets. For two years, a war has been ongoing between forces supported by Russia and the Western world under the hegemony of the United States (Two years of war in Ukraine – economic consequences are becoming increasingly visible, n.d.).

Even before Russia's invasion of Ukraine, the global economy was suffering from several man-made conflicts, climate change, COVID-19, and rising costs, all of which had devastating consequences for impoverished populations in low-income and developing countries. In the face of the pandemic, supply chain disruptions, and rapidly rising inflation, global food prices have been increasing since mid-2020 and are currently at their highest level in history, causing significant challenges for low-income families. The war in Ukraine, a critical “breadbasket” of the world, has exacerbated these challenges on an unprecedented scale, with the resulting global crisis causing widespread food insecurity. Armed conflicts

weaken the ability of nations and households to secure their food needs and can hinder activities aimed at cultivation and harvest, processing and transportation, as well as the delivery and sale of food. Ukraine and Russia together account for 30% of global wheat exports and 62% of sunflower oil (Bezpartochnyi et al., 2021). The escalation of the conflict raises concerns in Ukraine regarding whether crops will be harvested and products exported. The war has already resulted in the closure of ports, the suspension of oilseed pressing operations, and the introduction of export license requirements for certain products. All of this may impact the export of grains and vegetable oils in the coming months. There is also considerable uncertainty regarding the prospects for Russian exports, given the challenges that may arise from selling goods due to the economic sanctions imposed on the country (Krzykowski, 2022).

Ukrainians effectively filled the gap in the Polish job market left by over 2.5 million Poles who migrated to other EU member states after 2004 and, for the most part, remained there permanently. They also earn more (three times as much as before the war in Ukraine, usually around PLN 5000 gross), with the most common employment found in trade, services, gastronomy, the hotel industry, transport, construction, agriculture, food processing, horticulture, as well as in the ICT sector and other knowledge-intensive services (KIBS). According to the report "War Refugees from Ukraine – Life in Poland and Plans for the Future", the primary group that came to Poland was the Ukrainian middle class. The majority were well-educated women from large and medium-sized cities in central and eastern Ukraine, who had worked in the service sector, most often in business, before the invasion (Baszczak et al., 2022).

The long-term influx of workers from Ukraine could be beneficial for Poland. For years, Polish companies and institutions have been grappling with a labor shortage, not only in occupations requiring low and medium qualifications but also in those demanding higher qualifications. We warmly welcome our eastern neighbors, and their commitment to providing assistance on various levels is commendable. In return, alongside many expressions of gratitude, we can rely on the efficient contributions of the Ukrainian diaspora in Poland, including paid taxes, contributions to GDP, and the potential improvement of significantly poor demographic indicators (Kolany, 2023).

The Russian Federation's attack on the independent and sovereign Ukrainian state on February 24, 2022, not only triggered a humanitarian crisis but also a series of geopolitical tensions. It has also led to significant economic and industrial turbulence. Ukraine is a large European country (603,500 km²), with a population of approximately 44 million people before the war. It is a country almost twice the size of Poland, larger than France or Spain. Ukraine is home to heavy industry, a major granary for European agriculture, and a significant processor and extractor of many key elements essential to the automotive industry. An example is neon, which is used in the production of semiconductors. The war in Ukraine caused the disruption of supply chains that have barely been restored after numerous lockdowns caused by COVID-19 (Britchenko et al., 2023). Ukraine's location on the map of Europe and the world also gives it a strategic position for railway routes leading to Asia. Russia's aggression against Ukraine has the potential to affect our wallets and businesses on multiple levels. It has affected vehicle production in Ukraine and Russia, while also destabilizing component deliveries within Europe and beyond. The consequences not only affect vehicle production in Russia and Ukraine but also cause disruptions in component deliveries both within and outside of Europe.

As early as the beginning of February, Volkswagen production plants in Poznań and Września, Poland, came to a complete halt. In the second half of March, the production lines at the Fiat factory in Tychy, owned by the Stellantis group, were also halted. There has also been a complete suspension of production at the "Eurocar" factory in Solomonovo, Ukraine, which assembles the Skoda Fabia, Superb, Karoq, and Kodiaq for local markets. Reports have emerged in Russia about component shortages causing production stoppages. Hyundai has halted production at its plant in St. Petersburg due to shortages of components. Toyota has halted production at its plant in St. Petersburg due to disruptions in the supply chain. Avtovaz, predominantly owned by the Renault Group, has reportedly halted production due to disruptions. It was also reported that this applies to Renault, which operates a factory in Moscow. The

consequences of the war in Ukraine will impact the entire production, supply, and sales structures of the automotive industry in Europe (Cartrack Magazine, n.d.).

The invasion and Western sanctions have led to a sharp increase in the prices of fertilizers, wheat, metals, and energy, contributing to both a food crisis and an inflation wave that has impacted the global economy. Shortly after Russia's invasion – the second-largest exporter of crude oil in the world – the prices of this commodity rose to their highest levels since 2008. Efforts to reduce dependence on Russian oil, gas, and petroleum products – or even cap their prices – have intensified the already severe energy crisis, the most serious since the Arab oil embargo of the 1970s. After Russia reduced gas flows through the Nord Stream 1 pipeline to Germany, wholesale gas prices in Europe surged. According to Goldman Sachs, a complete cutoff of supplies would push the eurozone into a recession, with severe consequences in both Germany and Italy (Forsal.pl, 2024).

At the end of September 2022, there were 24.1 thousand companies with Ukrainian capital operating in Poland, including 3.6 thousand established in 2022. Immediately after the outbreak of the war, the registration of new companies declined, but in the following months, their number began to rise again. They accounted for 7 percent of all registered companies, both Polish and foreign-owned. Companies with Ukrainian capital primarily operate in trade (22%), construction (19%), and transportation and warehousing (14%).

From January 2022 to June 2024, approximately 59.8 thousand active sole proprietorships were established in Poland by individuals with Ukrainian citizenship. The largest increase in active businesses occurred in April, with their number nearly tripling compared to March. Since the outbreak of the war until September, the monthly number of newly established companies increased nearly twelvefold. In January, Ukrainian sole proprietorships accounted for less than 1 percent of all newly opened businesses, and by September 2022, this figure had risen to 8.5 percent. Most Ukrainian sole proprietorships are involved in construction (24%), information and communication (16%), or other service activities (14%).

Ukrainian women own 41% of sole proprietorships. Nearly one in three companies founded by women is involved in other service activities. However, nearly two out of every five companies opened by men operate in the construction industry. The gender structure indicates that the owners of sole proprietorships established in 2022 are not only war migrants but also individuals who arrived in Poland earlier and started their businesses after the outbreak of the war. The end of the war will not mean a mass closure or relocation of businesses back to Ukraine. According to the responses from the surveyed entrepreneurs, the majority of companies intend to continue their operations in Poland, expand, strengthen cooperation with Polish partners, and participate in the future reconstruction of Ukraine (Polish Economic Institute, 2022).

At the end of March 2024, the Ukrainian pharmaceutical company Farmak completed its acquisition of the Polish pharmaceutical company Symphar. It became its sole owner. The acquisition, according to the new owners, is part of Farmak's international expansion strategy, following its recent merger and acquisitions in the Czech Republic and Slovakia last year. Farmak itself is an international pharmaceutical company founded in 1925. It has 10 strategically located sales offices worldwide, including in Ukraine, Poland, the Czech Republic, Slovakia, Central Asia, the Asia-Pacific region, the Middle East, and Western Europe. In the autumn of 2023, the Ukrainian company Trzy Niedźwiedzie acquired the Calfrost plant in Kalisz, which specializes in producing frozen foods. It marked the beginning of the end for the factory. By the end of June 2024, all employees had been laid off, and the owner announced the sale of the plant due to the company's difficult economic situation, caused by rising prices and operational costs. A Ukrainian company has put the Calfrost plant site up for sale for PLN 12.9 million. Ukrainian capital has also entered the Intersport Polska company, a well-known chain of sportswear and accessories. In October 2023, the Office of Competition and Consumer Protection approved the acquisition of a majority stake in the company by Ukrainian billionaire Galyna Fedoriwna Gerega. She is a co-owner of the Ukrainian construction hypermarket chain "Epicentr" (ZUS, 2024).

CONCLUSION

The war in Ukraine has brought not only political, demographic, and economic consequences but also lasting social and cultural changes. The conflict has led to mass migration, a decrease in population, shifts in the age and gender structure, and significant challenges in rebuilding local communities and the economy.

- Breakdown of social ties: The separation of families and forced resettlements have disrupted traditional social structures, making it difficult to rebuild local communities.
- War trauma: Both civilians and soldiers endured immense stress and trauma, which significantly impacted the mental health of society as a whole.
- Integration challenges: Refugees have faced challenges in integrating into new environments, which has affected their well-being and their ability to return to normal life.
- The departure of younger age groups and high mortality among working-age individuals have accelerated the population's aging process. Currently, the proportion of elderly people relative to young people has significantly increased. The war had a devastating impact on the birth rate, while simultaneously increasing the mortality rate (UNHCR, 2023).

The war in Ukraine has had profound social consequences, including the breakdown of social ties, changes in the functioning of local communities, an increase in psychological and health problems, and heightened tensions in the societies of countries hosting refugees. One of the painful consequences of war is the separation of families. The war forced millions of people to flee their homes, often resulting in the separation of family members. Women and children fled to European countries, while men remained in Ukraine due to mobilization. The separation of families hinders their post-war integration and impacts the emotional stability of both children and adults (UNHCR, 2023).

The war in Ukraine has radically altered the structure of families and social roles, both within the country and among refugees. The conflict has brought about changes to traditional family models, resulting in long-lasting social effects. Millions of families have been separated due to mass migrations and the mandatory mobilization of men aged 18–60. The majority of refugees are women (80%) and children (20%) who had to leave Ukraine, while men remained behind. Separation from family members leads to trauma and psychological issues, particularly in children. Women who have gone abroad are often forced to take up jobs in challenging conditions, frequently below their qualifications. Women must also assist their children in the process of educational integration into new environments. In Ukraine, women have assumed many traditionally male roles, particularly in agriculture, education, and healthcare. Women assuming leadership roles in families and local communities can drive long-term changes in traditional gender roles in Ukraine. New family models, including single parenting, may become more common. Women who have left Ukraine often must assume the role of head of the family, bringing new challenges. The challenge lies in the need to find employment in foreign countries, as well as integrating children into new educational systems. In many cases, women face language and cultural barriers, which hinder their adaptation (OECD, 2023). Military mobilization forced men to participate in the conflict, leading to changes in traditional family and social structures. After the war, many men may face difficulties with reintegration and mental health issues stemming from their wartime experiences. The war has destroyed thousands of schools in Ukraine, forcing children to learn remotely or interrupt their education. In countries hosting refugees, Ukrainian children were required to adapt to new educational systems, which added an additional burden. Many refugee children lack access to full education, which could lead to the creation of a so-called “lost generation” that will not acquire the necessary skills and knowledge (UN Women, 2024).

Men of working age, on the other hand, were forced to leave their jobs and join the military, which affected their family and professional roles. After the conflict, many men will face challenges reintegrating into society and dealing with the consequences of war trauma. In many villages and smaller towns in Ukraine, there is a noticeable shortage of men, which increases the burden on women and seniors. Many children are being taken care of by older family members or neighbors, which leads to safety and mental

health issues. Children learning in wartime conditions face interruptions in their education and limited access to teaching materials. Families separations, economic difficulties, and the trauma of war have led to a dramatic decline in birth rates. The lack of young families and youth migration will accelerate the aging of society.

The changes in family structure and social roles caused by the war in Ukraine will have long-lasting consequences. The separation of families, the new roles of women and children, and the military mobilization of men require comprehensive support from the state and international organizations to rebuild stable communities and mitigate the further social consequences of the conflict.

Gradually, local communities are becoming disorganized. The displacements have destroyed traditional social structures, particularly in eastern Ukraine, where the war has obliterated entire cities and villages. Rebuilding communities will require time, investment, and coordinated efforts. Thousands of people, including children, have endured direct acts of war, such as bombings, the loss of loved ones, and the destruction of homes. The war has led to an increase in anxiety disorders, depression, and PTSD (post-traumatic stress disorder).

Healthcare systems in Ukraine are overwhelmed, and access to mental health specialists is limited. International organizations such as WHO and UNICEF are working to provide psychological assistance, but the scale of the need is enormous.

The reception of a large number of refugees has also created tensions in the societies of host countries, such as Poland, the Czech Republic, and Germany. Local communities are concerned about competition in the job market and the strain on educational and healthcare systems. At the onset of the war, communities demonstrated great solidarity with refugees. However, over time, “helper fatigue” has emerged, hindering further integration and support.

The activities carried out by Ukrainian citizens in Poland meet the needs of the Polish economy by filling labor shortages in many sectors. Despite some concerns about competition from businesses run by Ukrainians, the majority of Polish entrepreneurs view them as important business partners. Ukrainians contribute to Poland's economic growth through their work, both as employees and entrepreneurs (Trade.gov.pl, 2024).

In addition to establishing business activities, there have also been Ukrainian acquisitions of companies in Poland.

The war united Ukrainians in the face of a common threat, strengthening their national identity. The sense of national belonging has even grown in regions where pro-Russian sentiments were previously strong. Long-term emigration can weaken refugees' connection to their home country, particularly for children who grow up in new cultural environments.

Organizations such as UNHCR, WHO, and UNICEF have played a crucial role in providing humanitarian, educational, and healthcare assistance. Local organizations in host countries have also played a key role in the integration of refugees. Despite widespread support, many people still lack access to adequate assistance, highlighting the need for better coordination of international efforts. The social consequences of the war in Ukraine are profound and multifaceted. The breakdown of family bonds, psychological trauma, shifts in social roles, and challenges in integration are just a few of the key aspects. The process of rebuilding society after the war will require long-term efforts, both in Ukraine and in countries hosting refugees (D'Anieri, 2019).

The demographic consequences of the war in Ukraine are both profound and complex. Mass migration, population decline, shifts in age and gender structure, and a decrease in births will be felt for decades. The challenge for Ukraine and the international community will be to create conditions that foster demographic recovery, social integration, and economic stability. These actions are crucial to mitigating the dramatic consequences of war and ensuring a future for coming generations. The war in Ukraine has impacted nearly every demographic aspect of the country. The biggest challenges include rebuilding the gender structure, which involves encouraging women and children to return and reintegrating families.

Further support for the elderly requires investment in social services and healthcare, while improving living conditions and family policy is crucial for long-term population growth.

These actions are essential to counteracting the consequences of the war and ensuring a stable demographic future for Ukraine. If you would like more detailed data, I can provide further insights based on current statistics.

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THE IMPACT OF IMPLEMENTING AGRI-ENVIRONMENTAL-CLIMATE COMMITMENTS ON THE ECONOMIC SECURITY OF POLISH FARMERS FROM THE PODKARPACIE REGION

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Abstract. *The aim of the work was to assess the impact of the implementation of agri-environmental-climate commitments under the Rural Development Program for 2014-2020 on the economic security of farmers from the Podkarpacie region in Poland. The decisions of Podkarpacie farmers regarding the number of agri-environmental-climate commitments undertaken and the value of payments granted for the implementation of the following packages and variants were analyzed in detail. In 2015-2020, Podkarpacie farmers received a total of PLN 274 032 475.30 under the implementation of agri-environmental-climate programs, significantly affecting the economic security of their farms. Podkarpacie farmers implemented the largest number of agri-environmental-climate commitments in the Lubaczów and Mielec districts (25 packages/variants each). The least interest in implementing agri-environmental-climate commitments was shown by farmers living in the following poviats: Lesko (11 packages/variants) and Ropczyce-Sędziszów (12 packages/variants).*

Keywords: economic security, implementation of agri-environment-climate, Common Agricultural Policy, financial support.

INTRODUCTION

Economic conditions of security concern primarily the structure of economic activity in rural areas. Currently, agriculture is still the dominant direction of activity in rural areas, although their multifunctional nature is increasingly noticed. Diversification of activities in rural areas, on the one hand, promotes their security, creates new opportunities, but on the other hand creates new, unknown conditions of functioning. The previous lifestyle, dependent on agriculture in rural areas, is currently impossible (Niedziółka 2018).

Agriculture, as one of the main human activities in rural areas, has a significant impact on the natural environment and on landscape shaping. Understanding this impact and implementing appropriate environmental protection programs are key to improving and preserving the condition of natural ecosystems and the quality of life in the countryside. Agriculture transforms natural ecosystems into areas used for agriculture, which leads to a change in the structure of the landscape. Traditional agricultural methods significantly support biodiversity, creating habitats for many plant and animal species. In response to the challenges related to environmental protection, the concept of multifunctional agriculture has become very important (Krzyżanowski 2015).

In recent years, significant changes have been taking place in the income structure of Polish farmers, which consists of growing income from professional and non-profit work and decreasing income from agricultural work. According to data from the Polish Central Statistical Office (2023), professional activity is the main source of income for 27% of rural residents, while self-employment, which in rural areas mainly involves work on a farm, is the main source of income for 10% of rural residents. Social benefits (pension, disability pension and allowance) are the main source of income for 25% of rural residents. Dependents account for 36% of rural residents (29% of urban residents). Practices aimed at protecting the natural environment, which include agri-environment-climatic activities, are becoming an important support for the economic security of farming families. They concern the preservation of essential natural resources for future generations through rational management without excessive exploitation, degradation and devastation. Such activities affect the maintenance of security in the cultural, social, economic and spatial areas (Niedziółka 2018).

The biological nature of agriculture makes it closely dependent on the state of the natural environment. Weather is one of the key factors influencing crop yields. Unfavorable weather conditions, such as winter extremes, rains during flowering or harvesting, droughts, hailstorms, and heavy rains, can lead to reduced or even complete loss of crops (Brodzińska 2008). In addition, agriculture is exposed to losses due to plant and animal diseases and pests. On the other hand, agricultural activity affects the natural environment in various ways. Machines and combustion engines used in production emit harmful chemicals into the atmosphere. Fertilizers and plant protection products used in agriculture can also have a negative impact on the environment, as can pollution from animal excrements. Heavy agricultural machinery can lead to soil compaction, which in turn negatively affects the conditions for plant growth. In view of these facts, it is important to ensure sustainable development of agriculture, taking into account social, economic, energy and ecological aspects (Szumski 2007, Kilar et al. 2024).

One of the key tools supporting the multifunctionality of agriculture are agri-environment-climate programs, which are an important element of agricultural policy. Effective implementation of agri-environment-climate programs can bring many benefits for improving the quality of the environment, increasing biodiversity, increasing the attractiveness of the landscape and increasing the ecological awareness of farmers thanks to their participation in such programs. (Świechowska 2004, Czudec 2009, Puślecki et al. 2010). Agriculture fulfills important functions in the economy and society, both productive and non-productive, market (commercial) and non-market (non-commercial). In particular, when we want to consider these non-market functions, we can distinguish the following functions (Van Huylenbroeck et al., 2010):

- Green - covers managing land resources to maintain its valuable properties, supporting conditions favourable to wildlife, protecting animal welfare, maintaining biodiversity and optimising the circulation of chemicals in agriculture.
- Blue - focuses on managing water resources, preventing floods, improving water quality and producing hydro and wind energy.

- Yellow - concerns maintaining the vitality and integrity of rural areas, nurturing and enriching cultural traditions and local identities.

- White - covers the production of healthy food and ensuring food security.

It should be added that non-market functions of agriculture are closely linked to its production functions. This phenomenon, referred to as the inseparability of these two types of functions, means that the implementation of non-commercial functions is dependent on the implementation of production functions. Therefore, in order for agriculture to provide numerous beneficial services, it must first of all exist and conduct production activities (Wilkin 2010, Chądzyński 2015).

In this regard, within the framework of the Common Agricultural Policy of the European Union (CAP), a shift can be observed from preferring the production aspects of agriculture towards maintaining non-production functions. More and more emphasis is placed on supporting rural areas and on the environmental and social roles of agriculture, which has a positive impact on the development of its multifunctionality, which in turn fits well into the ideas of sustainable development. (Bivona 2007, Gąsowski 2015). At the same time, this policy aims to equalize the prices of agricultural products to the world level by moving away from price support. As a result, the main support tool is becoming direct payments, which currently play mainly an income function in EU agriculture, but also a social function for smaller farms. In the future, the role of direct payments will increasingly evolve towards supporting the sustainable development of rural areas and rewarding agriculture for providing public goods that bring benefits to the entire society. This will be related to the need for farms to meet specific standards, taking into account the principles of sustainable production, animal welfare protection and care for the natural environment (Walkiewicz 2002, Kozłowska-Burdziak 2006, Czudec 2009, Grzelak 2010, Kilar 2022).

One of the objectives of the EU Common Agricultural Policy is to promote agricultural practices that are conducive to environmental protection. This objective is achieved, among other things, by implementing the Agri-Environment-Climate Measure in all EU Member States. It consists of the use of payments that compensate for additional costs incurred and lost income for farmers who voluntarily use production methods that are conducive to preserving biodiversity, landscape and environmental resources, primarily soil and water. (Niewęgłowska 2003, Niewęgłowska 2005, Kilar et al. 2023).

The essence of the agri-environmental-climate action is to promote agricultural practices that contribute to the protection of soil, water, climate, valuable natural habitats and endangered bird species, endangered genetic resources of crops and farm animals, as well as the protection of landscape diversity. (Petrosyan, Ślusarczyk 2019). The practices used within the framework of agro-environmental-climatic practices influence the diversity of biodiversity in the rural landscape, contribute to the increase in species diversity and the number of pollinating insects, as well as to the creation of habitats for many other animal species. (Szońska 2015). These activities create a financial incentive for farmers who voluntarily decide to conduct agricultural activities in accordance with the principles established therein. Under the Measure, beneficiaries fulfil obligations consisting in the implementation of detailed requirements that are favourable to various elements of the natural environment of rural areas. In most cases, these requirements lead to more extensive use, i.e. the use of agricultural practices that are environmentally friendly, which in effect involves incurring management costs and losing part of the profits. Agri-environment-climate payments constitute compensation for these lost incomes and additionally incurred costs (Przewodnik po działaniu rolno-środowiskowo-klimatycznym PROW 2014-2020)

MATERIALS AND METHODS

The aim of the study was to assess the financial support for Polish farmers from the Podkarpacie region implementing agri-environmental-climate commitments under the Rural Development Programme in 2014-2020. A detailed analysis was made of the decisions of farmers regarding the number of agri-environmental-climate commitments undertaken and the value of payments granted for the implementation of the following packages and variants:

- Package 1. Sustainable agriculture;
- Package 2. Soil and water protection;
- Package 3. Preservation of orchards of traditional fruit tree varieties;
- Package 4. Valuable habitats and endangered bird species in Natura 2000 areas;

- Package 5. Valuable habitats outside Natura 2000 areas;
- Package 6. Preservation of endangered plant genetic resources in agriculture;
- Package 7. Preservation of endangered animal genetic resources in agriculture.

Data for the research were obtained from the register of the Podkarpackie Regional Branch of the Agency for Restructuring and Modernisation of Agriculture in Rzeszów, which concerned the implementation of agri-environmental-climatic commitments under the Rural Development Programme for 2014-2020 by Podkarpackie farmers. During the analysis, data from individual counties of the Podkarpackie province were compiled according to the Classification of Territorial Units for Statistical Purposes (NUTS 3):

- Krosno subregion: counties: Bieszczady, Brzozów, Jasielski, Krosno, Sanok, Leski, the city of Krosno;
- Przemyśl subregion: counties: Jarosław, Lubaczów, Przemyśl, Przeworsk, the city of Przemyśl;
- Tarnobrzeg subregion: counties: Dębica, Leżajsk, Mielec, Nisko, Stalowawola, Tarnobrzeg, the city of Tarnobrzeg;
- Rzeszów subregion: poviats: Kolbuszowaw, Łańcut, Ropczyce-Sędziszów, Rzeszów, Strzyżów, city of Rzeszów.

The collected numerical material was subjected to statistical analysis using the Statistica 13.3 package. It included generating frequency tables and scatterplots for both variables (the number of decisions issued and the amount of payment granted) in the system of all counties and in the system of four subregions. In addition, the nonparametric Kruskal-Wallis test for a single-factor system was used. This test aimed to examine the diversity of the number of decisions issued and the amount of payment granted - in total in the entire period under study - depending on the subregion. The decision to reject the null hypothesis was made based on the value of the test statistic H and the associated test probability value " p ". Verification of all hypotheses was performed at the significance level of $\alpha = 0.05$. It was assumed that $p \leq 0.05$ indicates a significant differentiation of the assessed indicator depending on the subregion.

RESULTS

Podkarpacie is very rich in landscape values, and at the same time it is one of the most important agricultural regions in Poland, despite the very large fragmentation of farms. The area of the province, i.e. the south-eastern part of Poland, is characterized by very diverse terrain, sometimes the difference between the elevations and the lowest places is 1000 m, which is why this area is famous primarily for breeding dairy and beef cattle. For this reason, permanent grasslands in Podkarpacie constituted over 1/3 of agricultural land. Poor soils of IV, V, VI quality class prevail (brown, podsolic, formed from sand, silt, clay, in river valleys there are alluvial soils). The factor that reduces the quality of soils is their acidification.



Figure 1. Map of Poland with the Podkarpackie Voivodeship area marked

According to the 2020 General Agricultural Census, the total area of the Podkarpackie Province is 1,784.6 thousand ha. Of this area, 675.3 thousand ha, or 37.8%, were owned by farms, of which agricultural land occupied 573.1 thousand ha. Individual farms used 547.3 thousand ha, which constituted 95.5% of the area of agricultural land in the province, while farms belonging to legal persons and entities without legal personality owned 25.8 thousand ha of agricultural land. In 2020, 555.5 thousand ha, or 96.6% of the total area of agricultural land in farms, were in good agricultural condition. The remaining agricultural land occupied 17.6 thousand ha, or 3.1% of the total area of agricultural land. In the area of agricultural

land maintained in good condition, sown land on farms occupied 308.3 thousand ha, which constituted 55.5% of this area. In 2020, the area of fallow land amounted to 17.3 thousand ha, which constituted 3.1% of agricultural land. Permanent crops maintained in good agricultural condition, in accordance with standards on farms, occupied 14.1 thousand ha, i.e. 2.5% of agricultural land. Permanent grassland (including meadows and permanent pastures) occupied 212.0 thousand ha and constituted 38.2% of agricultural land in good condition and 37.0% of total agricultural land.

The structure of agricultural farms was dominated by farms with an area of agricultural land of 1–2 ha, which constituted 30.0%, and in the area of agricultural land of the voivodeship they had a share of 8.5%. A large group were farms with an area of 2–3 ha and 3–5 ha of agricultural land (24.2% and 22.7%, respectively). Farms with an area of 5–10 ha of agricultural land accounted for 13.8% and occupied 18.3% of agricultural land. The share of farms above 15 ha of agricultural land accounted for only 4.0% of all farms, but their share in the area of agricultural land was 36.7%. The average area of agricultural land of a farm in 2020 was 5.03 ha (nationally 11.35 ha) and increased by 0.59 ha compared to 2019 (nationally it increased by 0.90 ha). The total sown area in 2022 amounted to 363.5 thousand ha (which was 3.3% of the sown area in the country) and was higher than a year ago by 5.8%. In the structure of crops, total cereals (basic cereals with cereal mixtures, buckwheat, millet and other cereals, and corn for grain) occupied 231.1 thousand ha, i.e. 63.6% of total crops (in the country, cereal cultivation accounted for 65.6% of the total crop area).

Compared to 2021, the area of cereals decreased by 12.8 thousand ha (by 5.2%). In the structure of total cereal crops, similarly to the previous year, basic cereals with cereal mixtures clearly dominated - 75.3%, corn for grain accounted for 22.1%, and buckwheat, millet and other cereals - 2.6%. According to data from the Agency for Restructuring and Modernization of Agriculture, in 2024 there were 104,040 farms in the Podkarpackie Voivodeship.

Farmers who promote practices contributing to sustainable land management in their activities in order to protect valuable natural habitats, soils, climate, waters and endangered bird species, as well as landscape diversity and the protection of endangered genetic resources of crops and farm animals may apply for additional payments under the agri-environment-climate packages/variants they implement. (Pajewski 2014, Britchenko 2024).

The essence of the agri-environment-climate measure is to support agricultural practices that protect soil, water, climate, valuable natural habitats, endangered bird species and genetic resources of crops and farm animals. This measure also aims to preserve landscape diversity. Practices implemented under this measure increase biodiversity in rural areas, contribute to the increase in the number of species and the number of pollinating insects, and create habitats for various animal species. The measure creates a financial incentive for farmers who voluntarily decide to conduct agricultural activities in accordance with the principles established therein (Kania 2006, Kruszyński 2023).

Under the measure, beneficiaries undertake to meet detailed requirements that support various elements of the natural environment in rural areas. These requirements usually lead to more extensive use, which means using environmentally friendly agricultural practices. As a result, this involves additional management costs and the loss of some profits.

Agri-environment-climate payments compensate for this lost income and cover the additional costs incurred by farmers (Pawlak 2015, Janiszewska, Ossowska 2017). The beneficiary undertakes to produce in accordance with the requirements specified for the relevant package/variant for a period of 5 years. The commitment begins on 15 March of the year in which the beneficiary submits the first application for agri-environment-climate payments and lasts until 14 March of the fifth year of the commitment (Zajac 2011; Guide to the agri-environment-climate measure, 2019).

Table 1. Payments made to Podkarpacie farmers under agri-environmental-climate measures in 2015-2020 (PLN).

Years	The value of support under agri-environment-climate measures
2015	18 427 332.10
2016	28 905 319.62

2017	42 900 417.33
2018	56 400 359.40
2019	63 022 508.14
2020	64 376 538.72
Razem	274 032 475.30

Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

Based on the analysis of the data contained in Table 1, it should be stated that in the years 2015-2020 Polish farmers from the Podkarpacie region received a significant amount of PLN 274,032,475.30 as part of payments related to the implementation of agri-environmental-climate measures, which undoubtedly had a positive impact on improving the economic security of their families and farms. The largest financial support resulting from activities related to the broadly understood protection of nature and the natural environment was identified in 2020 and amounted to PLN 64,376,538.72, while the smallest support was recorded in 2015 and amounted to PLN 18,427,332.10.

Figure 2 presents data on the number of agri-environmental-climate packages implemented in individual poviats of the Podkarpackie Voivodeship in 2015-2020 under Package 1. Sustainable agriculture.

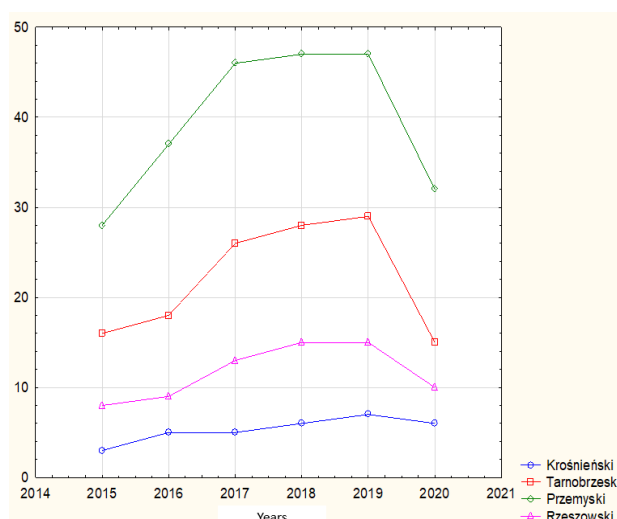


Figure 2. Number of implemented agri-environment-climate packages in 2015-2020 according to the NUTS 3 administrative division in the Podkarpackie Voivodeship

Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

As can be seen from the data in Figure 2, the largest number of agri-environmental-climate packages in the years 2015-2020 were implemented in NUTS 3 Tarnobrzeg and Przemyśl. In NUTS 3 Tarnobrzeg, the largest number of agri-environmental-climate commitments fell in 2019 (29), while the fewest commitments (15) were undertaken by farmers in 2020. In turn, in NUTS 3 Przemyśl, the largest number of agri-environmental-climate commitments fell in the years 2018-2019 (47 each), while the fewest were in 2015. The analysis shows that the smallest interest among farmers in undertaking agri-environmental-climate commitments occurred in NUTS 3 Krosno (from 3 to 7 commitments). Figure 3 presents the amounts of payments granted under Package 1 Sustainable agriculture according to the administrative division of NUTS 3.

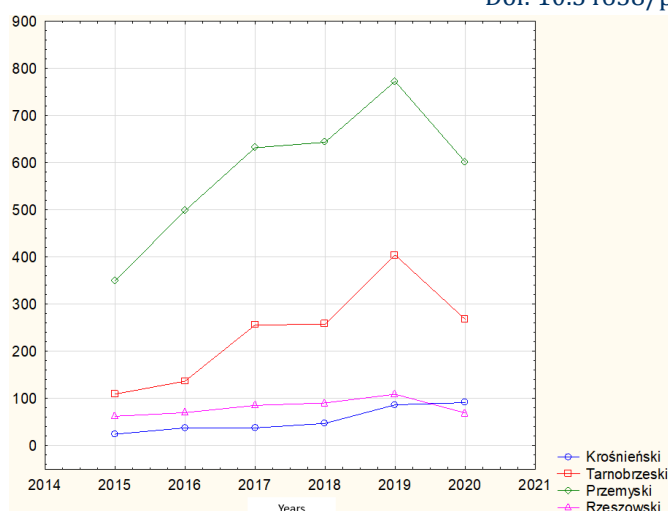


Figure 3. Amount of payment granted under Package 1 Sustainable agriculture by NUTS 3 administrative division (PLN thousand)

Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

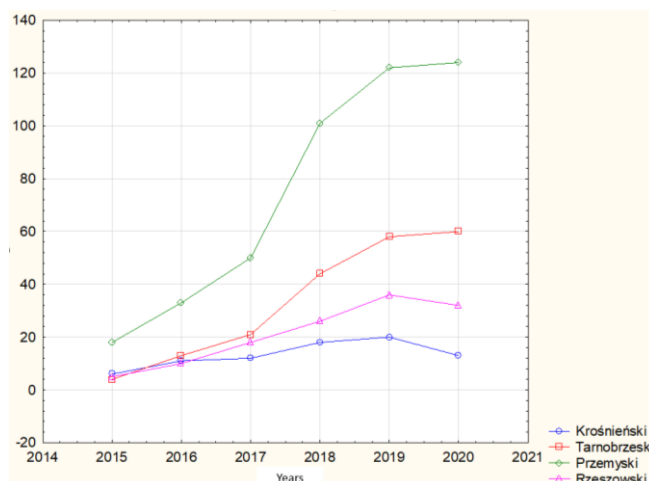


Figure 4. Number of agri-environment-climate packages implemented in 2015-2020 under Package 2. Soil and water protection according to the NUTS 3 administrative division in the Podkarpacie Voivodeship.

Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

Analyzing the data contained in Figure 4, it should be noted that the largest amount of financial resources under the obligations resulting from Package 1 was directed to farmers from NUTS 3 Przemyśl. In 2015, the total amount of financial resources transferred under the implementation of the obligations of Package 1 amounted to PLN 349.42 thousand, while in 2019 it was already PLN 773.11 thousand. In turn, the smallest financial resources were directed to NUTS 3 Krosno (from PLN 24.08 thousand to PLN 91.09 thousand) and to NUTS 3 Rzeszów (from PLN 61.99 thousand to PLN 108.96 thousand). Figure 4 presents data on the number of agri-environmental-climate packages implemented in individual counties of the Podkarpacie province in the years 2015-2020 under Package 2. Soil and water protection.

As can be seen from the data in Figure 4, the largest number of agri-environmental-climate packages in 2015-2020 were implemented in NUTS 3 Przemyśl and Tarnobrzeg. In NUTS 3 Przemyśl, the largest number of agri-environmental-climate commitments fell in 2020 (124), while the fewest commitments (18) were undertaken by farmers in 2015. In turn, in NUTS 3 Tarnobrzeg, the largest number of agri-environmental-climate commitments fell in 2020 (60), while the fewest were in 2015 (4). The analysis shows that the smallest interest among farmers in undertaking agri-environmental-climate commitments occurred in NUTS 3 Krosno (from 6 to 13 commitments). Figure 5 presents the amounts of payments granted under Package 2. Soil and water protection according to the administrative division of NUTS 3.

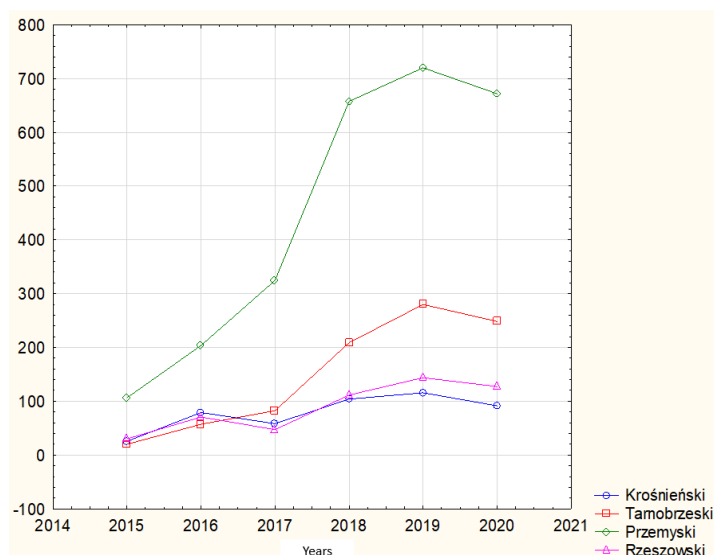


Figure 5. Amount of payment granted in 2015-2020 under Package 2 Protection of soil and water by administrative division NUTS 3. (PLN thousand)

Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

Analyzing the data contained in Figure 5, it should be noted that the largest amount of financial resources under the obligations resulting from Package 2 was directed to farmers from NUTS 3 Przemyśl. In 2015, the total amount of financial resources transferred under the implementation of the obligations of Package 2 amounted to PLN 106.35 thousand, while in 2019 it was already PLN 720.01 thousand. In turn, the smallest financial resources were directed to NUTS 3 Krosno (from PLN 25.35 thousand to PLN 91.46 thousand) and to NUTS 3 Rzeszów (from PLN 30.03 thousand to PLN 143.76 thousand). Figure 6 presents data on the number of agri-environmental-climate packages implemented in individual counties of the Podkarpackie province in the years 2015-2020 under Package 3. Preservation of orchards of traditional varieties of fruit trees.

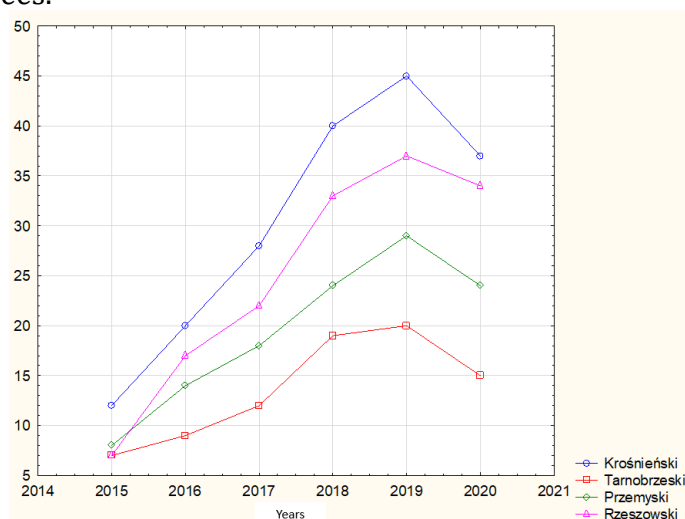


Figure 6. Number of agri-environmental-climate packages implemented in 2015-2020 under Package 3.

Preservation of orchards of traditional varieties of fruit trees according to the NUTS 3 administrative division in the Podkarpackie Voivodeship.

Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

As can be seen from the data in Figure 6, the largest number of agri-environmental-climate packages in 2015-2020 were implemented in NUTS 3 Krosno and Rzeszów. In NUTS 3 Krosno, the largest number of agri-environmental-climate commitments fell in 2019 (45), while the fewest commitments (12) were undertaken by farmers in 2015. In NUTS 3 Rzeszów, the largest number of agri-environmental-climate commitments also fell in 2019 (37), while the fewest were in 2015 (7). The analysis shows that the smallest interest among farmers in undertaking agri-environmental-climate commitments occurred in NUTS 3

Tarnobrzeg (from 7 to 20 commitments). Figure 7 presents the amounts of payments granted under Package 3 Preservation of orchards of traditional fruit tree varieties according to the NUTS 3 administrative division.

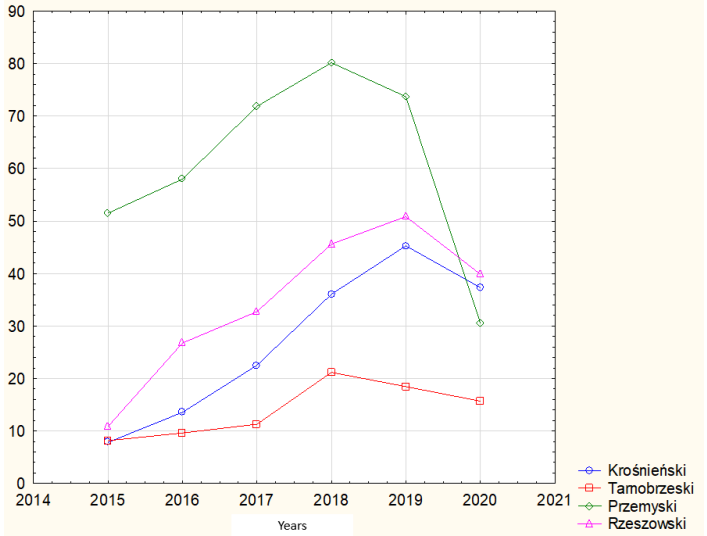


Figure 7. Amount of payment granted in 2015-2020 under Package 3 Preservation of orchards of traditional varieties of fruit trees according to the NUTS 3 administrative division. (PLN thousand
Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

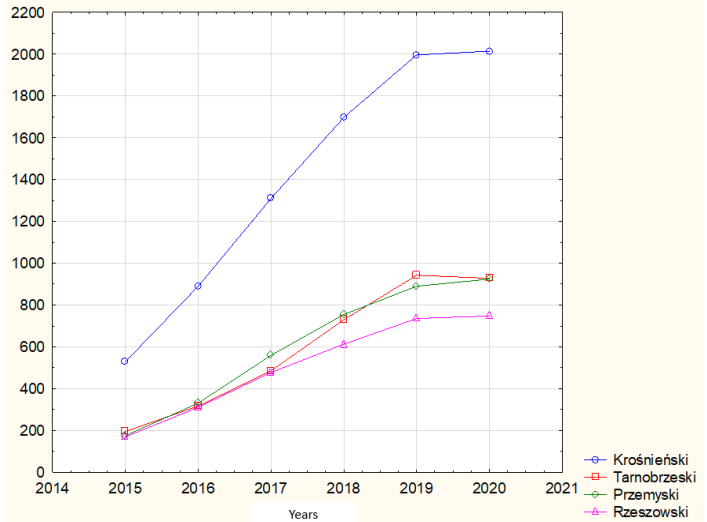


Figure 8. Number of agri-environment-climate packages implemented in 2015-2020 under Package 4. Valuable habitats and endangered bird species in Natura 2000 areas according to the NUTS 3 administrative division in the Podkarpacie Voivodeship.
Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

Analyzing the data contained in Figure 7, it should be noted that the largest amount of financial resources under the obligations resulting from Package 3 was directed to farmers from NUTS 3 Przemyśl. In 2015, the total amount of financial resources transferred under the implementation of the obligations of Package 3 amounted to PLN 51.49 thousand, while in 2018 it was already PLN 80.17 thousand. In turn, the smallest financial resources were directed to NUTS 3 Krosno (from PLN 7.83 thousand to PLN 45.28 thousand) and to NUTS 3 Tarnobrzeg (from PLN 8.15 thousand to PLN 21.16 thousand).

Figure 8 presents data on the number of agri-environmental-climate packages implemented in individual counties of the Podkarpacie province in the years 2015-2020 under Package 4. Valuable habitats and endangered bird species in Natura 2000 areas.

As can be seen from the data in Figure 8, the largest number of agri-environment-climate packages in 2015-2020 were implemented in NUTS 3 Krosno and Przemyśl. In NUTS 3 Krosno, the largest number of agri-environment-climate commitments fell in 2020 (2015), while the fewest commitments (529) were

undertaken by farmers in 2015. In turn, in NUTS 3 Przemyśl, the largest number of agri-environment-climate commitments also fell in 2020 (924), while the fewest were in 2015 (176). The analysis shows that the smallest interest among farmers in undertaking agri-environment-climate commitments occurred in NUTS 3 Rzeszów (from 170 to 748 commitments). Figure 9 presents the amounts of payments granted under Package 4. Valuable habitats and endangered bird species in Natura 2000 areas according to the NUTS 3 administrative division.

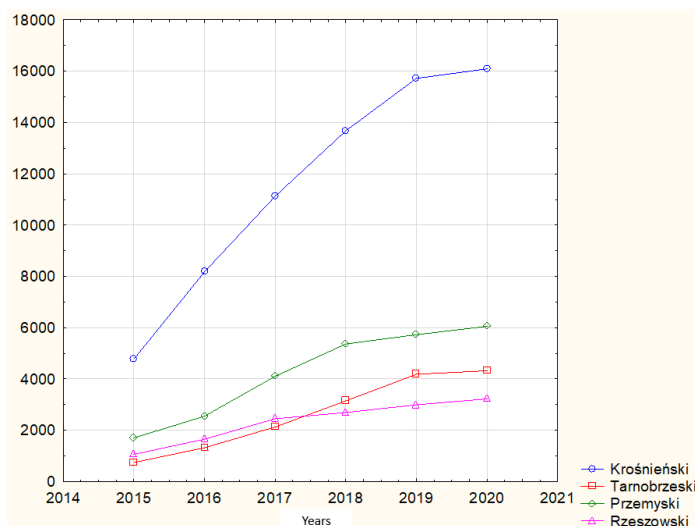


Figure 9. Amount of payment granted under Package 4. Valuable habitats and endangered bird species in Natura 2000 areas according to the NUTS 3 administrative division (PLN thousand)

Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

Analyzing the data contained in Figure 9, it should be noted that the largest amount of financial resources under the obligations resulting from Package 4 was directed to farmers from NUTS 3 Krosno. In 2015, the total amount of financial resources transferred under the implementation of the obligations of Package 4 amounted to PLN 4,779.03 thousand, while in 2020 it was already PLN 16,093.42 thousand. In turn, the smallest financial resources were directed to NUTS 3 Rzeszów (from PLN 1,060.76 thousand to PLN 3,223.99 thousand) and to NUTS 3 Tarnobrzeg (from PLN 742.29 thousand to PLN 4,321.70 thousand).

Figure 10 presents data on the number of agri-environmental-climate packages implemented in individual counties of the Podkarpackie Voivodeship in 2015-2020 under Package 5. Valuable habitats outside Natura 2000 areas.

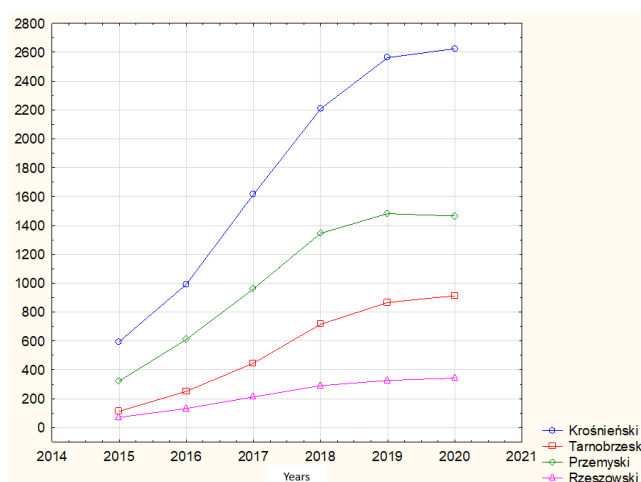


Figure 10. Number of agri-environmental-climate packages implemented in 2015-2020 under Package 5. Valuable habitats outside Natura 2000 areas according to the NUTS 3 administrative division in the Podkarpackie Voivodeship.

Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

As can be seen from the data in Figure 10, the largest number of agri-environment-climate packages in 2015-2020 were implemented in NUTS 3 Krosno and Przemyśl. In NUTS 3 Krosno, the largest number of agri-environment-climate commitments fell in 2020 (2624), while the fewest commitments (595) were undertaken by farmers in 2015. In NUTS 3 Przemyśl, the largest number of agri-environment-climate commitments fell in 2019 (1482), while the fewest were in 2015 (322). The analysis shows that the smallest interest among farmers in undertaking agri-environment-climate commitments occurred in NUTS 3 Rzeszów (from 71 to 342 commitments).

Figure 11 presents the amounts of payments granted under Package 5. Valuable habitats outside Natura 2000 areas according to the NUTS 3 administrative division.

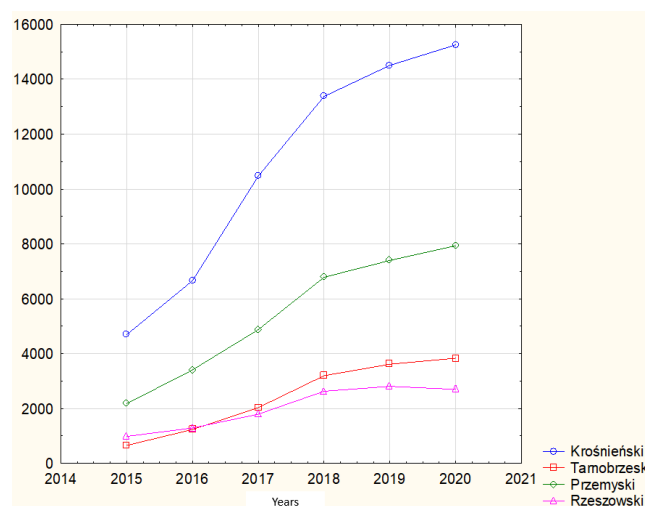


Figure 11. Amount of payment granted under Package 5. Valuable habitats outside Natura 2000 areas according to the NUTS 3 administrative division (PLN thousand)

Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

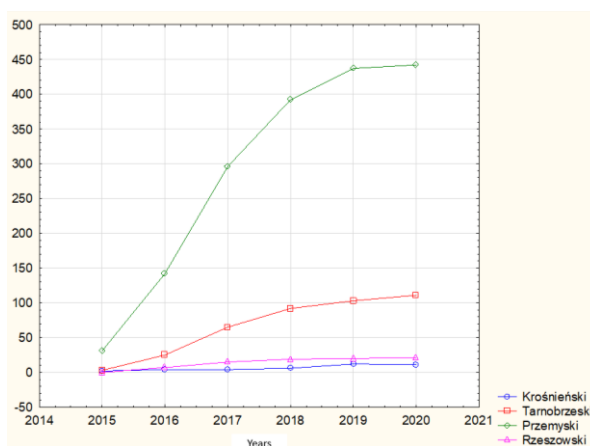


Figure 12. Number of agri-environment-climate packages implemented in 2015-2020 under Package 6. Preservation of endangered plant genetic resources in agriculture according to the NUTS 3 administrative division in the Podkarpackie Voivodeship.

Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

Analyzing the data contained in Figure 11, it should be noted that the largest amount of financial resources under the obligations resulting from Package 5 was directed to farmers from NUTS 3 Krosno. In 2015, the total amount of financial resources transferred under the implementation of the obligations of Package 5 amounted to PLN 4,692.52 thousand, while in 2020 it was already PLN 15,256.79 thousand. In turn, the smallest financial resources were directed to NUTS 3 Rzeszów (from PLN 987.37 thousand to PLN 2,809.08 thousand) and to NUTS 3 Tarnobrzeg (from PLN 656.90 thousand to PLN 3,835.33 thousand). Figure 12 presents data on the number of agri-environmental-climate packages implemented in individual

poviats of the Podkarpackie Voivodeship in 2015-2020 under Package 6. Preservation of endangered plant genetic resources in agriculture.

As can be seen from the data in Figure 12, the largest number of agri-environment-climate packages in 2015-2020 were implemented in NUTS 3 Przemyśl and Tarnobrzeg. In NUTS 3 Przemyśl, the largest number of agri-environment-climate commitments fell in 2020 (442), while the fewest commitments (31) were undertaken by farmers in 2015. In NUTS 3 Tarnobrzeg, the largest number of agri-environment-climate commitments also fell in 2020 (111), while the fewest were in 2015 (3). The analysis shows that the smallest interest among farmers in undertaking agri-environment-climate commitments occurred in NUTS 3 Krosno (from 2 to 11 commitments). Figure 13 presents the amounts of payments granted under Package 6. Preservation of endangered plant genetic resources in agriculture by NUTS 3 administrative division.

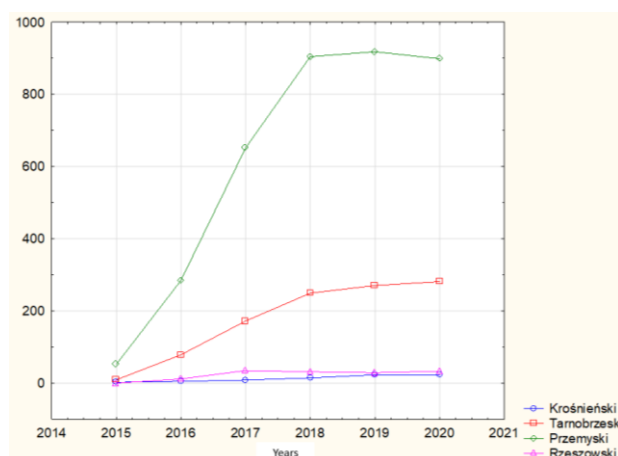


Figure 13. Amount of payment granted under Package 6. Preservation of endangered plant genetic resources in agriculture by NUTS 3 administrative division (PLN thousand)

Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

Analyzing the data contained in Figure 13, it should be noted that the largest amount of financial resources under the obligations resulting from Package 6 was directed to farmers from NUTS 3 Przemyśl. In 2015, the total amount of financial resources transferred under the implementation of the obligations of Package 6 amounted to PLN 52.02 thousand, while in 2019 it was already PLN 917.81 thousand. In turn, the smallest financial resources were directed to NUTS 3 Krosno (from PLN 2.40 thousand to PLN 23.29 thousand) and to NUTS 3 Rzeszów (from PLN 0.00 thousand to PLN 32.87 thousand).

Figure 14 presents data on the number of agri-environmental-climate packages implemented in individual counties of the Podkarpackie province in the years 2015-2020 under Package 7. Preservation of endangered animal resources in agriculture.

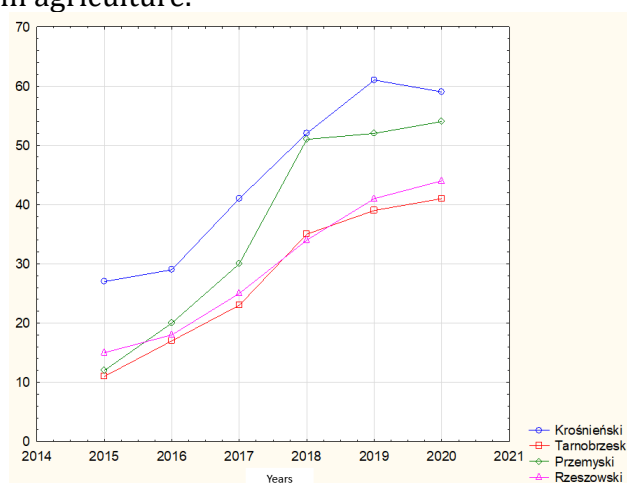


Figure 14. Number of agri-environmental-climate packages implemented in 2015-2020 under Package 7. Preservation of endangered animal resources in agriculture according to the NUTS 3 administrative division in the Podkarpackie Voivodeship

Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

As can be seen from the data in Figure 14, the largest number of agri-environment-climate packages in 2015-2020 were implemented in the Krosno and Przemyśl NUTS 3. In the Krosno NUTS 3, the largest number of agri-environment-climate commitments fell in 2019 (61), while the fewest commitments (27) were undertaken by farmers in 2015. In the Przemyśl NUTS 3, the largest number of agri-environment-climate commitments fell in 2020 (54), while the fewest were in 2015 (12). The analysis shows that the smallest interest among farmers in undertaking agri-environment-climate commitments occurred in the Tarnobrzeg NUTS 3 (from 11 to 41 commitments). Figure 15 presents the amounts of payments granted under Package 7. Preservation of endangered animal resources in agriculture by NUTS 3 administrative division.

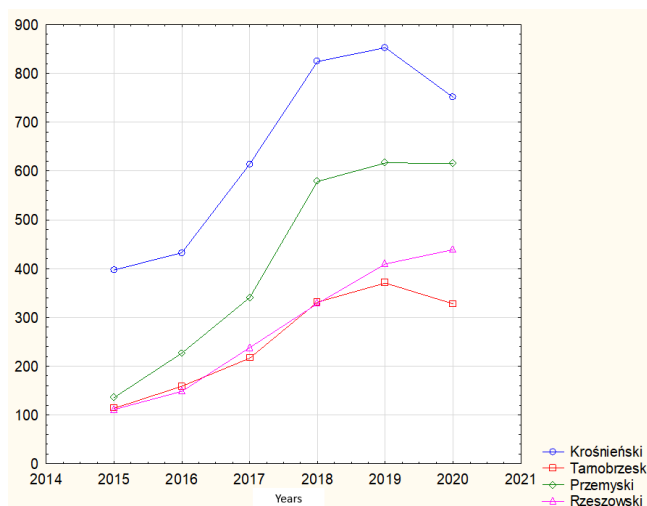


Figure 15. Amount of payment granted under Package 7. Preservation of endangered animal resources in agriculture by NUTS 3 administrative division (PLN thousand)

Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

Analyzing the data contained in Figure 15, it should be noted that the largest amount of financial resources under the obligations resulting from Package 7 was directed to farmers from NUTS 3 Krosno. In 2015, the total amount of financial resources transferred under the implementation of the obligations of Package 7 amounted to PLN 397.26 thousand, while in 2019 it was already PLN 852.71 thousand. In turn, the smallest financial resources were directed to NUTS 3 Tarnobrzeg (from PLN 113.64 thousand to PLN 370.44 thousand) and to NUTS 3 Rzeszów (from PLN 111.22 thousand to PLN 438.82 thousand). Table 2 presents an analysis using the Kruskal-Wallis test of the differences depending on the subregions regarding the number of decisions issued and the total amount of payments granted in the years 2015-2020.

Table 2. Analysis of variation by subregions regarding the number of decisions issued and the total amount of payments granted in 2015-2020.

Package	Number of decisions issued		Amount of payment granted	
	H	p	H	p
1	14,40	0,006	11,91	0,020
2	10,30	0,020	11,10	0,018
3	7,44	0,042	10,91	0,023
4	12,42	0,011	12,24	0,010
5	11,64	0,015	11,92	0,014
6	13,32	0,009	13,45	0,007
7	8,21	0,038	10,11	0,024

Source: Own calculations based on data from the Agency for Restructuring and Modernisation of Agriculture

Based on the analysis, it should be stated that all values of the test probability "p" are lower than the assumed significance level (0.05). This means that in relation to all packages in the entire period under review, both indicators were significantly different depending on the subregions.

CONCLUSION

The Common Agricultural Policy (CAP) was subject to transformations under the influence of social and economic conditions concerning the European Union (EU) countries, as well as under the influence of international trends. One of the foundations of the Common Agricultural Policy was to ensure Community preferences and economic security within the mechanism of the single market. This is done using income redistribution instruments - primarily direct payments and other subsidies that should take into account the specificity of agriculture. Despite the evolution of the Common Agricultural Policy instrument basket, the imperative of developing a competitive agricultural sector, combined with care for the natural environment, remains basically unchanged. Political decision-makers jointly responsible for the shape of the CAP also notice the significant problem of farmers' economic security, the stability of agricultural income, which is becoming a complex issue of a socio-economic nature (Soliwoda 2014).

Agriculture, as one of the main human activities in rural areas, has a significant impact on maintaining safety in the area of the natural environment, shaping the landscape and, above all, the economic security of the farm and its family. Understanding this impact and implementing appropriate environmental protection programs is crucial to improving and preserving the state of natural ecosystems and the safety of the quality of life in the countryside. Farmers who promote practices that contribute to sustainable land management in order to protect valuable natural habitats, soils, climate, waters and endangered bird species, as well as landscape diversity and the protection of endangered genetic resources of crops and farm animals, can apply for additional payments under the agri-environment-climate variants/packages they implement, thereby obtaining additional income, ensuring economic security for their family and farm.

In 2015-2020, Podkarpacie farmers received a total of PLN 274,032,377.6 under the implementation of agri-environmental-climate programs, significantly affecting the economic security of their farms.

The largest number of agri-environmental-climate commitments were implemented by Polish farmers from the Podkarpacie region in the Lubaczów and Mielec counties (25 packages/variants each), as well as in the Jarosław, Przemyśl, Rzeszów and Tarnobrzeg counties (22 packages/variants each). The smallest interest in implementing agri-environmental-climate commitments was shown by farmers living in the following counties: Lesko (11 packages/variants), Ropczyce-Sędziszów (12 packages/variants) and Strzyżów (13 packages/variants).

The largest number of agri-environment-climate packages in 2015-2020 were implemented in NUTS 3 Tarnobrzeg and Przemyśl. In NUTS 3 Tarnobrzeg, the largest number of agri-environment-climate commitments fell in 2019 (29), while the fewest commitments (15) were undertaken by farmers in 2020. In NUTS 3 Przemyśl, the largest number of agri-environment-climate commitments fell in 2018-2019 (47 each), while the fewest were in 2015. The analysis shows that the smallest interest among farmers in undertaking agri-environment-climate commitments occurred in NUTS 3 Krosno (from 3 to 7 commitments).

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FOOD SECURITY CONTROL SYSTEM IN POLAND

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Abstract. Food security and food safety are a key element of each country's food policy, having a direct impact on public health. To ensure that products available on the market are completely safe, cooperation of all participants in the supply chain is essential. Shaping the quality and safety of food requires precise control, which enables the creation and introduction of food quality and safety management systems. This means focusing on the problems of ensuring appropriate conditions for the production of food of the expected quality and safety for the consumer. The paper presents how the food safety control system functions in Poland and a detailed analysis of official control of food production and trade is made.

Keywords: food security, food safety control, food contamination.

INTRODUCTION

Technological development in the 20th and 21st centuries has brought many innovations to the food industry, but food safety issues are still relevant. Foodborne infections and poisoning not only affect human health, but also trust in food products and entire brands (Klikocka et al 2022). Therefore, in order to meet consumer demands, the food industry must focus on ensuring the highest quality and safety of products. In the context of food safety, various quality management systems, such as HACCP (Hazard Analysis and Critical Control Points), are crucial, as they allow for the identification and control of hazards in the food production process. The implementation of such systems requires involvement at every stage of production - from raw materials to distribution - which allows for monitoring and eliminating potential health hazards. In addition to quality management systems, appropriate training for employees is also important, which increases their awareness of hazards and safety procedures.

Modern technologies, such as process automation, product batch tracking or the use of data analysis, can support these activities, enabling faster identification of problems and taking corrective actions. Finally, communication with consumers is key. Offering transparent information about ingredients, production methods and product certification can help increase customer trust and satisfaction. In the information age, where customers are more aware and demanding, transparency is becoming an important element in building relationships with consumers. To ensure food safety in the modern food industry, a comprehensive approach is necessary, combining technology, quality management systems, employee education and effective communication with customers. All this aims not only to meet consumer expectations, but above all to protect their health and life (Kardas et al 2024).

One of the foundations of the proper functioning of society is to ensure food security in all its dimensions, especially the economic dimension (Kilar et al., 2024; Kilar et al., 2023; Bezpartochnyi, 2023).

Food safety is a situation in which the risk of negative impact of food on the health and life of consumers is eliminated or limited to a generally acceptable level. It is a set of conditions and actions that must be met at all stages of the food production process and food circulation, thus ensuring the health of consumers (Kowalska et al., 2006).

Food safety is a key element of each country's food policy, having a direct impact on public health. To ensure that products available on the market are completely safe, cooperation between all participants in the supply chain is essential, which is included in the idea of "from farm to fork". Effectively ensuring food safety requires a well-organized system that not only effectively enforces legal regulations against food sector companies, but also engages in promotional and educational activities aimed at both consumers and producers. Within this system, regular inspections, monitoring of food quality and availability of information on the origin of products are important. Educating consumers about healthy eating and safe food storage is equally important so that they can make informed decisions about purchases. Cooperation between government institutions, non-governmental organizations, scientists and the private sector is crucial to creating an integrated approach that not only prevents health threats, but also promotes sustainable development and innovation in food production (Kilar et al., 2024; Gajda et al., 2020).

MATERIALS AND METHODS

The paper presents the food safety system in force in Poland. The official control and safety of food production and trade were characterized, with particular emphasis on the competences of individual control bodies in this area. The paper used data from the control documentation of the Supreme Audit Office, and also analyzed the legal regulations regulating the issue of food safety in the European Union countries and in Poland. The methodological basis of the study is general economic principles and methods of a systematic approach to studying the problem of efficient organization of the food safety control system in Poland. The methods of analysis and synthesis were used, which allowed to characterize the most important elements of the food safety control system and determine the directions of its development.

RESULTS

Characteristics of The Food Safety Control System in Poland

Ensuring food safety involves guaranteeing the consumer that after its consumption there will be no adverse side effects, resulting from poisoning, for example. When we add aspects related to, among others, supervision over proper documentation, monitoring, management responsibility or audits to ensuring food safety, then we are dealing with food safety management (Walaszczyk, 2016).

Food law, as an important area of regulation, aims to ensure that food and feed are produced, processed and distributed in accordance with rigorous quality and safety standards. EU and national regulations define rules that oblige producers, processors and distributors to comply with hygiene standards, quality of raw materials, labelling and consumer protection. Control bodies play a key role in monitoring compliance with these standards. Regular controls, audits and inspections allow for the identification of potential threats and ensuring that products entering the market are safe for consumers. In the event of detection of irregularities, these authorities have the right to take action, which may include imposing penalties, withdrawing products from the market, and informing the public about the risks. For

producers and processors, compliance with food law not only minimizes legal risk, but also builds consumer confidence. In an era of growing health awareness in society, food quality and safety are becoming key criteria for consumers' product selection (Godela et al., 2016).

It is also worth noting that food law is a dynamic field that evolves in response to new challenges such as climate change, technological development, and market globalization. Therefore, continuous updating of regulations and education of all participants in the food supply chain are essential to ensure high standards of quality and safety (Britchenko, 2024).

The development of food quality and safety requires precise control, which enables the creation and introduction of food quality and safety management systems. This means focusing on the problems of ensuring appropriate conditions for the production of food of the expected quality and safety for the consumer. Food quality and safety management systems concern food control in the "from farm to fork" concept, which guarantees products that are unchanged in terms of health requirements. (Godela et al., 2016)

In Poland, the food sector is strictly regulated, which aims to ensure high standards of quality and food safety. The obligations of entrepreneurs in this industry include not only compliance with legal standards, but also the implementation of modern quality management systems, such as HACCP (Hazard Analysis and Critical Control Points), ISO 22000 or BRC (British Retail Consortium) (Maruszczyńska & Miśniakiewicz, 2018).

These systems help identify and eliminate potential food safety hazards at every stage of production – from raw materials, through the technological process, to distribution. Thanks to them, entrepreneurs can monitor the quality of their products, which translates into increased consumer confidence and improved market competitiveness. Additionally, in the context of growing consumer awareness of healthy eating and ecological aspects of food production, companies often implement ecological or local quality certification systems. An example of this is BIO certificates, which confirm that products have been produced in accordance with the principles of organic farming. Nowadays, food quality and safety are crucial not only for consumer health, but also for the image of companies and their success on the domestic and international market. Therefore, entrepreneurs must constantly raise their standards and adapt to changing customer expectations and legal regulations. (Popis, 2013).

The official food control system in Poland is based on the principles established in EU law. Currently, these issues are regulated in detail by Regulation (EU) 2017/625 of the European Parliament and of the Council of 15 March 2017 on official controls and other official activities performed to ensure the application of food and feed law and the rules on animal health and welfare, plant health and plant protection products. This regulation specifies the scope of public control over the production, processing and distribution of food and establishes general principles for its conduct.

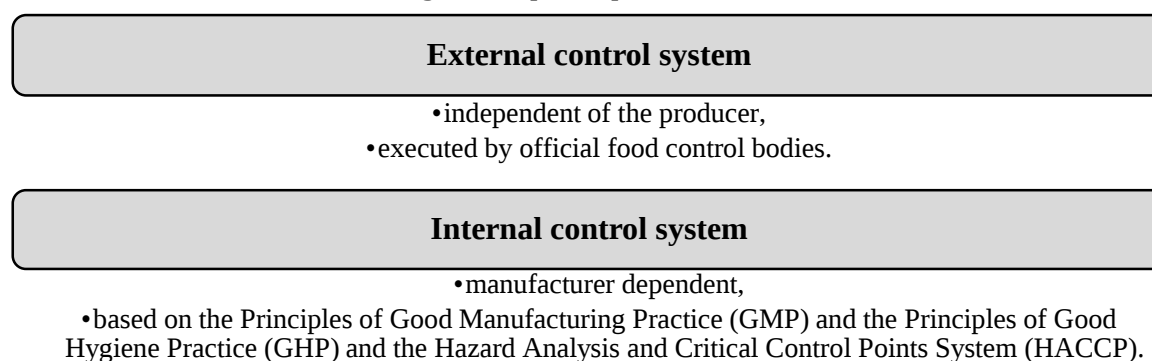


Diagram 1. Food control system in Poland

Source: Own study based on: Food safety control system in Poland - current status and desired directions of changes. Supreme Audit Office 2021

According to the Food and Nutrition Safety Act (2006), food producers are obliged to apply internal control measures:

- Good Manufacturing Practice (GMP), which in relation to food production means the actions that must be taken and the conditions that must be met so that food production takes place in a way that ensures food safety, in accordance with its intended use. In relation to the production of materials and products intended for contact with food - good manufacturing practice means those aspects of quality assurance that ensure uniform production of materials and products and their control in order to ensure compliance with the regulations applicable to them and the quality standards that are appropriate for the intended use of these products, preventing human health from being endangered or causing unacceptable changes in the composition of food, or deterioration of its organoleptic properties.

- Good Hygiene Practices (GHP), i.e. the actions that must be taken and the hygiene conditions that must be met at all stages of production or trade to ensure food safety.

- Hazard Analysis and Critical Control Points (HACCP) system, i.e. a procedure aimed at ensuring food safety by identifying and estimating the scale of hazards from the point of view of food health requirements and the risk of hazards occurring during all stages of food production and circulation. This system is also aimed at determining methods for eliminating or reducing hazards and establishing corrective actions.

The essence of the HACCP system operating in a given establishment is that all data and documentation concerning any activities related to food must be monitored, recorded and updated on an ongoing basis. Entrepreneurs are obliged to present, at the request of official food control bodies, evidence confirming the development of appropriate procedures based on the principles of the HACCP system and their implementation in a given establishment. In Polish administrative law, control is understood primarily as an examination of the compliance of the existing state with the postulated state, determining the scope and causes of discrepancies and providing the result of this determination. In the case of the scope of competences of a public administration body covering, in addition to activities verifying the possibility of interference in the activity of the controlled entity using measures of an authoritative nature, we are dealing with supervision. Therefore, the concept of official control within the meaning of EU Regulation 2017/625 is equivalent to the concept of supervision in Polish administrative law (Position on the revision of the existing food safety control system in Poland, 2021)

The external control of food production in the European Union aims to ensure food safety and protect public health. By introducing Regulations EC 178/2002 and EC 882/2004, the EU has established a legal framework that requires Member States to carry out regular, independent and impartial official controls. Regulation EC 178/2002 concerns general principles and requirements in the field of food safety, while Regulation EC 882/2004 focuses on control procedures (Burkowska et al., 2021). These requirements cover all stages of the supply chain - from production, through processing, to distribution. A key aspect is that controls should be carried out without prior notice, which increases their effectiveness and reliability. Member States are obliged to designate appropriate authorities responsible for control and to ensure cooperation between the various institutions involved in this process. In Poland, appropriate regulations have been introduced in the Act on Food and Nutrition Safety, which shows the commitment to complying with EU standards. Thanks to these regulations, it is possible to monitor and ensure high quality and safety of food on the market, which is important for both consumers and producers who can be sure that their products meet the applicable standards. (Poczta-Wajda & Sapa, 2021).

The subject scope of official control in food law includes primarily supervision of food safety (identified with the health quality of food) and its commercial quality. Official food control, in addition to the control function, covers the entire scope of activities of an authoritative nature, aimed at eliminating irregularities identified during the control and refers to all activities related to the production and trade of food, covering not only food, but also feed, products and materials intended for contact with food, as well as the process of production and trade in food itself and internal control systems conducted by entrepreneurs. Among EU countries, the dominant solution in the field of food safety is to establish at the national level one body responsible for food safety or several institutions, of which one has a dominant position. Such an organized system has been implemented in 23 of 28 member states (82.1%). Institutional changes in the above-described scope have not been implemented in five countries, including Poland. (National food safety systems in the European Union: A comparative survey", 2013)

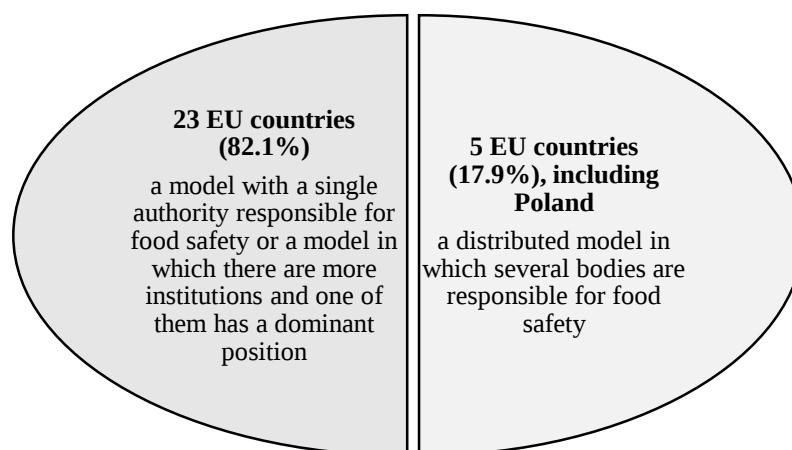


Diagram 2. Food safety systems in EU countries

Source: Own study

The Polish food safety model is a distributed model. The division of competences in the scope of monitoring and control of compliance with food law requirements by entities operating on the food market at all stages of production, processing and distribution between five specialized inspections is based on several mutually overlapping areas. It can be carried out according to the following criteria:

- health quality (food safety) and commercial quality - on the one hand, such a division characterizes IJHARS and IH as responsible in the area of commercial quality, on the other hand, IW and PIS as competent in the area of health quality - food safety (i.e. protection of health and life of consumers);
- origin of food - the Sanitary Inspectorate controls the safety of food of non-animal origin at the production stage and all products on store shelves, while the Veterinary Inspectorate is responsible for food of animal origin at the production stage and in wholesale trade;
- product turnover stage - this criterion is used in the division of competences between IJHARS and IH. IJHARS controls the commercial quality of food at the producer and in wholesale trade, while IH takes care of the commercial quality of food in retail trade.

EU Member States, in accordance with Article 4(1) of Regulation No. 882/2004, are required to designate bodies competent for official food controls at the national level. In Poland, these bodies are the four inspections subject to control (Chief Sanitary Inspectorate, Chief Veterinary Inspectorate, Chief Inspectorate of Trade Quality of Agricultural and Food Products, Trade Inspection) and the bodies of the State Plant Health and Seed Inspection. In Poland, competences in the field of food safety have been divided between several institutions without specifying a leading institution. In addition, these institutions are subordinate to three supreme bodies. This model of food safety supervision stands out on a European scale.



Diagram 3. Polish model of food safety system

Source: Own work

The following institutions operate within the structure of the official food control system (Wojciechowski, 2014):

- **State Sanitary Inspection (PIS)** – the competences of this Inspection result from the Act on the State Sanitary Inspection and the Act on Food Safety and Nutrition. This Inspection was established to carry out tasks related to public health, and tasks related to official food control are only one of many aspects of its operation. In accordance with art. 4 sec. 1 points 3, 3a, 4 of the Act on the State Sanitary Inspection, the tasks of the Inspection in the field of current sanitary supervision include control of compliance with regulations specifying hygiene and health requirements. The tasks of the PIS also include control of the quality of water intended for human consumption (art. 4 sec. 1 point 1 of the Act on the State Sanitary Inspection). The Sanitary Inspection controls the safety of food of non-animal origin at the production stage and all food products on store shelves. The scope of activities of the State Sanitary Inspectorate includes primarily monitoring compliance with the regulations specifying hygiene and health requirements relating to the microbiological quality of water intended for human consumption, the conditions of production, transport, storage and sale of food and the conditions of mass catering, supervision over the health quality of food and the health conditions of production of materials and trade in materials and products intended for contact with food.

- **Trade Inspection (IH)** – until 30 June 2020, the tasks of this Inspection included the control of products in trade or intended for introduction into such trade, also regarding labelling and adulteration, and the control of services (Article 3, paragraph 1, point 2 of the Act on Trade Inspection). Since 1 July 2020, these tasks have been taken over by IJHARS.

- **Inspection of the Commercial Quality of Agricultural and Food Products (IJHARS)** – pursuant to the provisions of art. 17 section 1 point 1 letter a of the Act on the Inspection of the Commercial Quality of Agricultural and Food Products, the tasks of this Inspection include supervision over the commercial quality of agricultural and food products, and in particular control of the commercial quality of agricultural and food products in production and trade, including those exported abroad (until July 1, 2020, IJHARS controlled the commercial quality of food at the producer and in wholesale trade).

- **Veterinary Inspection (IW)** – the tasks, organization and mode of operation of this Inspection are specified in the Act on Veterinary Inspection. According to art. 3 sec. 1, the Veterinary Inspection carries out, in order to ensure the protection of public health, tasks in the field of animal health protection and the safety of animal products and food containing both non-animal foodstuffs and animal products found in agricultural retail trade. The Veterinary Inspection supervises veterinary requirements in the production of animal products, placing them on the market and direct sale. It also controls the introduction of animals and animal by-products to the market, production, trade and use of animal feed. It also watches over compliance with veterinary requirements on farms keeping farm animals and over the monitoring of prohibited substances, chemical and biological residues, medicinal products and radioactive contamination in animals, in animal products, in water intended for animal drinking and animal feed. The Veterinary Inspection also deals with combating infectious animal diseases. It prevents their occurrence and detects and eliminates the outbreaks of these diseases (including zoonoses or biological pathogens causing these diseases). It monitors animal infections and examines slaughter animals and animal products. It carries out veterinary border control, veterinary control in trade and export of animals and products within the meaning of the regulations on veterinary control in trade.

- **State Plant Protection and Seed Inspection (PIORIN)** – pursuant to art. 2 points 2 and 5 of the Act on the State Plant Protection and Seed Inspection, this Inspection supervises the prevention of threats related to the production of plant protection products, trade in these products and the use of these products within the scope specified in the Act of 8 March 2013 on plant protection products and tasks related to monitoring the use of these products.

All of the above-mentioned inspections have a multi-level structure, comprising central level units and local branches, with the central bodies being subordinate to ministers managing the relevant government administration departments. The Minister responsible for health supervises the State Sanitary Inspection, while the Minister responsible for agriculture supervises the Veterinary Inspection, the State Plant Protection and Seed Inspection and the Agricultural and Food Quality Inspection. The Trade Inspection is subordinate to the Prime Minister. The local structure of individual inspections is not

uniform, both in terms of the number of organizational levels and the organizational structure. Local inspection bodies belong to the combined administration. The Agricultural and Food Quality Inspection and the State Plant Protection and Seed Inspection have a two-level structure – a central body and provincial bodies, while the Veterinary Inspection and the State Sanitary Inspection have a three-level structure – a central body, provincial and district bodies.

Additionally, the bodies of the National Revenue Administration (Customs and Revenue Service) subordinate to the Minister of Finance are involved in the implementation of the country's customs policy concerning the import and export of goods, including food. The Environmental Protection Inspection also operates in the food safety system, assessing the state of the environment, which directly affects the health of animals and plants. The official food control system is supplemented by institutions conducting food safety risk assessments. These are the State Veterinary Institute and the National Institute of Public Health – National Institute of Hygiene. These institutions conduct research on food safety, within their competences and on behalf of the ministers supervising them.

Early Warning System for Food Safety (RASFF)

As part of the implementation of food safety policy, an important tool is the Rapid Alert System for Food and Feed (RASFF), implemented within the EU, which serves to rapidly exchange information on hazards detected in food between official food control authorities in Europe. A Member State in which a health hazard has been detected is obliged to notify the other members of this network of the product in question and what actions have been taken to eliminate the risk. These actions include: stopping the distribution of the product, withdrawing the product from consumers and stopping the product at the border. Thanks to such rapid exchange of information, all members of the RASFF system can check on an ongoing basis whether a given problem concerns them and whether urgent actions are needed. Authorities in countries where a given hazard occurs are obliged to take the necessary emergency measures, such as informing the public, withdrawing specific products from the market or carrying out on-site inspections. (Muss & Lesiów, 2018).

The obligation to communicate relevant information to the RASFF, which may be relevant for the relevant authorities responsible for food and feed controls in the European Union, results from European Union law, and in particular from Article 50(3) of Regulation (EC) No 178/2002, and is the same for each member of the RASFF network. The implementing measures for the rapid alert system for food and feed, ensuring the smooth functioning of that system, were laid down in Commission Regulation (EU) No 16/2011⁵⁴ and, from 14 December 2019, in Commission Implementing Regulation (EU) 2019/1715 of 30 September 2019 laying down rules for the operation of the information management system for official controls and its system components,⁵⁵ which repealed Regulation (EU) 16/2011. In accordance with Article 3(1) and (2) of Regulation (EU) No 16/2011, and subsequently Article 17(1) of Regulation (EU) No 178/2002, 1 and 2 of EU Regulation 2019/1715, network members send alert notifications to the Commission contact point without undue delay and in any case within 48 hours of receiving information about the alert. The RASFF system operates 24 hours a day. The Commission contact point checks alert notifications and forwards them to the contact points of the alert and cooperation network within 24 hours of receiving them. In accordance with the instructions developed in the Chief Sanitary Inspectorate and the Chief Veterinary Inspectorate, information about the alert should be forwarded to the next level within the RASFF network within 48 hours (Muss & Lesiów, 2018).

CONCLUSION

Food security is indeed a key element of the broader concept of national security. In crisis situations, such as natural disasters or armed conflicts, the stability of the food system becomes even more important. Countries must be able to not only ensure access to food for their populations, but also protect their natural resources and agricultural production. Food safety regulations cover many aspects. These include ensuring appropriate standards of quality and safety of food products, control of supply chains, and support for local agricultural producers. In crisis situations, states can introduce interventions such as subsidies, price controls, or aid programs for the poorest to ensure that food is available to all citizens. Additionally, in the

context of globalization and international trade, food security also relates to issues of trade policy and international cooperation. Joint actions to monitor and respond to threats such as plant and animal diseases can significantly affect the stability of the food system in different countries. (Wiśniewska & Wyrwa, 2022).

Security is a complex and multifaceted topic that requires analysis from various perspectives, both national and international. Its perception as a global public good emphasizes that security is not only a matter for individual states, but concerns the entire international community. In the context of the definition of security, it can be seen that its essence lies in a state that eliminates threats or minimizes their impact. The concept of surpassing defense potential over threats indicates the need to constantly strengthen defense capabilities, which is a dynamic process. It is worth paying attention to the evolution of threats, which in today's world often have no clear boundaries between what is internal and what is external. As globalization progresses, many problems, such as terrorism, cybersecurity or climate change, are becoming transnational phenomena that require cooperation and integrated actions at the international level. Therefore, security should be treated not only as a goal to be achieved, but also as a continuous process that requires flexibility, adaptation and cooperation of various actors - states, international organizations and societies. Joint responsibility for global security is becoming a key element in the face of contemporary challenges (Płaczek, 2015).

The Polish food safety model is a distributed model. The division of competences in the scope of monitoring and control of compliance with food law requirements by entities operating on the food market at all stages of production, processing and distribution between five specialized inspections is based on several mutually overlapping areas.

In accordance with Article 4, paragraph 1 of Regulation No. 882/2004 EU, all Member States are obliged to designate bodies competent for official food controls at the national level. In Poland, these bodies are four inspections subject to control (Chief Sanitary Inspectorate, Chief Veterinary Inspectorate, Chief Inspectorate of Trade Quality of Agricultural and Food Products, Trade Inspection) and the bodies of the State Plant Health and Seed Inspection. In Poland, competences in the scope of food safety have been divided between several institutions without specifying a leading institution. In addition, these institutions are subordinate to three supreme bodies. This model of food safety supervision stands out on a European scale.

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