

Ecological security as a new challenge in local development

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Abstract

Aim: The aim of the article was to highlight the importance and increasing role of security (especially ecological security) in the implementation of local development policies, as well as to identify adaptive actions taken by local actors.

Methodology: The research methods applied are of a descriptive and comparative nature, explaining the significance of security (ecological security) along with examples of adaptive actions.

Results: Although the category of security, including ecological security, is not new in the literature, in the context of ongoing global processes (including climate change), it seems to be one of the most significant categories influencing how local development should be shaped by local entities.

Implications and recommendations: Ongoing global changes reinforce the meaning of ecological security at different self-government levels. As a consequence increase the need to seek new solutions in terms of security and resilience for local governments.

Originality/value: The article provides examples of solutions that can be implemented by local governments in the field of increasing ecological security.

Keywords: local development, security, ecological security

1. Introduction

The second decade of this century brings a series of changes that are redefining the conditions of socio-economic development. The order that has been functioning so far (at least in an unchanged form since the 1990s, and more broadly after World War II) is changing and taking on a new character. There are also a number of threats brought by the 'new world order', to which territorial units, including local entities, must respond.

We still live in a world of strong economic ties where changes occur very dynamically, which forces an adaptive attitude (connected with creativity and innovations). Changes in the geopolitical situation that have occurred in the last few years, the coronavirus pandemic, the war in Ukraine with its consequences, local conflicts around the world (Middle East) triggering loss of social and economic stability not only of countries but also local units. Furthermore, processes such as deglobalisation, climate changes, lack of resources, broken supply chains, increasing migration have resulted in the search for a new path for development, with a new management style focused on building resilience and directing more attention toward the concept of security in various dimensions.

Although the category of safety and security is nothing new, with a strong grounding in the literature, it seems to be one of the most significant aspects for anyone involved in shaping socio-economic development.

The conducted analysis included the following research (auxiliary) questions:

1. Why is the category of security so important in the contemporary local development process?
2. What can be understood by contemporary ecological security?
3. What are the selected adaptation activities undertaken in local units?
4. What are the examples of financing towards strengthening ecological security on a local scale?

The aim of the article was to characterise the concept of security with special emphasis on ecological security in the aspect of local development, and to indicate possible tasks for better adaptation to environmental changes. The concept of ecological security (environmental security) appears to be one of those most important in creating management aimed at building resilience by local units that are possibly the main recipients of ongoing ecological processes (connected with global warming, the increasing need to reduce CO₂ emissions and the growing number of waste produced in municipalities). The discussion presented in this paper is mainly an opening to further research connected with encouraging ecological approach to the local development process and local management. Furthermore, environmental safety can be researched and defined in relation not only to the territories of the state, region, administrative regions and districts, settlements (cities and villages), but also to national economic subjects – oil and gas production areas, industrial hubs, plants, factories and other state entities of industry, transport, energy, chemistry, mining, construction, communications, etc.

Considerations on security were discussed in a wide range of the subject literature, including studies: Skrabacz (2012), Haftendorn (1991), Sekściński (2013), Zięba (2008), Stańczyk (2011), Stefanowicz (1984), Koziej (2011), Levy (1995).

2. The essence and importance of security

Security is not a new factor. It is considered a basic need, and has long been one of the most highly valued and protected both by individuals and nations. Ensuring security is therefore included in the catalogue of basic needs and tasks occurring in various configurations (Ciekanowski, 2010, p. 24). It is located in the sphere of basic needs, which also include those physiological, belonging and love, recognition, self-realisation, knowledge and understanding, and aesthetic (Górecka, 2006, pp. 205-208).

Security (Latin *securitas*, from *sine cura* meaning 'without care or concern') is defined as a lack of threat, a state of peace, and a feeling that no danger is approaching.

The essence of security is therefore reduced to the absence of threat and protection from danger, which is also one of the basic human needs. Security is commonly perceived as the existence and survival and possibility of development of an entity (an individual, a social group, a state, a nation), in conditions of decent existence, while maintaining freedom and integrity (territorial, organizational), political, social and economic independence (Kukułka, 1982, p. 34, quote from Stańczyk, 1996). Today, the term 'security' corresponds to the English concept of security, which in Anglo-Saxon culture is synonymous with certainty (safety) and an opposite of threat (danger). In English there are two words used in this sense: safety and security. The former usually refers to the safety of people and ensuring their basic life needs, whereas the latter mainly concerns the security of resources (in particular economic, material, managerial, and technical resources including IT) primarily in the aspect of potential threats caused by deliberate human activity (more in Korzeniowski, 2017).

In reviewing the literature on the subject, one can notice that security can be understood in different ways – as a feature, as a state of being safe or as freedom from threats, fear, anxiety, but also as certainty. It can also mean a set of measures taken for broadly understood protection. In another approach, security is trust, peace of mind, lack of fear and threats, and also an objective certainty of guaranteeing inviolable survival and freedom of development (Jakubczak & Flis, 2006).

The most common synonyms for security are:

- a state of non-threat, peace and stability,
- a sense of certainty and opportunities for improvement,
- a reasonable order and standard of stability,
- the primary need of humans and social groups,
- the basic need of the state,
- a continuous social process leading to a guarantee of security,
- a state and process characterised by variability (Ficoń, 2020).

Security is valued primarily because it ensures and guarantees the achievement of other equally valuable values, such as a sense of freedom, appropriate standards of living and health, professional success and personal satisfaction, or it is a means to achieve them. It is an inalienable and irreplaceable value for every person as an individual, as well as civilised states and societies, and every praxeological system of action, it is also the basis of its current existence and its future duration (Ficoń, 2013, p. 10).

The enormous variability and dynamics of the external and internal security environment makes security itself an unstable, fragile and impermanent good (Ambrożek, 2018, p. 5). Korzeniowski additionally distinguishes:

- security of an individual or group (a person, a small/large group, society, humanity),
- security of things (e.g. a building, a bridge),
- security of money (cash, finances),
- security of information (data, correspondence) (Korzeniowski, 2017, p. 77).

In the literature, security is defined not only as a state of repelling a threat, but also as preparing an environment in which the stable development of individuals and social groups is possible. In this understanding, the process of creating security consists in creating optimal conditions for the internal, conflict-free development of important components of a given system, as well as eliminating its possible external threat by contributing to such shaping of the external environment that would support the harmonious, symbiotic development of a broader organism or system (Ficoń, 2020).

As mentioned above, contemporary new threats (geopolitical, social, economic, environmental, etc.) force many (any) entities (countries, regions, cities, entrepreneurs) to think through the concept of security (safety) in many different dimensions such as political safety, economic and social stability,

environmental or ecological safety, cybersecurity, data security, etc. Henceforth, the author's attention is focused on ecological (environmental) security.

Environmental security is the state and condition of the environment which provides ecological balance and guarantees the protection of the environment, namely biosphere, atmosphere, hydrosphere, lithosphere, cosmosphere, species composition of fauna and flora, natural resources, conservation of health and livelihood of people. It is a set of actions, states and processes that directly or indirectly do not lead to vital losses (or threats of such losses) to the natural environment, individuals and humanity; a set of states, phenomena and actions that ensure the ecological balance on Earth and in any of its regions at a level to which humanity is physically, socio-economic, technologically and politically ready.

Environmental security is based on:

- awareness that humanity is an integral part of nature, fully dependent on its environment;
- recognition of the limited natural-resource (ecological) potential of the Earth and its separate regions, the need for its qualitative and quantitative inventory;
- the impossibility of artificial expansion of natural-resource (ecological) potential in excess of natural-system limitations;
- determining the permissible maximum extraction of natural resources and changes in ecosystems as a living environment;
- transition to resource-saving technologies and the miniaturisation of products, to environmentally and economically safe practices;
- recognition of the law of optimality, and in economic management – the principle of reasonable sufficiency in the use of ways of obtaining the benefits of life in the spatial and temporal specific framework (restrictions on the factors of environmental, social and economic risk);
- understanding that without an adequate living environment (integrity of ecosystems) it is impossible to preserve anything living, including its species (including humans) and natural systems of a lower level of hierarchy (see European Commission, n.d.).

Basen on features listed above one can say that environmental security is directly linked with the transition to sustainable development, in other words – the concept of security is based on the idea of sustainable development.

3. Methodology and conceptual framework

The methodology of the undertaken analysis was based on comparative and explanatory methods. The first step was to present the importance of security against the background of ongoing global changes, and the next to present the essence of ecological security and its meaning in the local policy making process. The final step was to present the list of the most popular adaptive activities commonly used on a local scale in communities and cities.

4. Building ecological security at a local level – examples of actions

Among climate changes and phenomena that may potentially have negative effects on cities and the quality of life and safety of residents, one can mention: meteorological threats (heavy precipitations, extreme temperatures); climatological (water shortages, fires); biological (development of dangerous microorganisms); hydrological (IOŚ-PIB, 2023). The entities most exposed to climate change are communes, counties (local scale), and it is here that the changes will be most noticeable, hence the need for adaptation to these changes and designing a crisis management system. One of the instruments that local governments use for the changes taking place are city adaptation plans prepared by the local authorities. Shaping a city adaptation policy is a task covering a wide range of issues related

to the functioning of the city, its residents, infrastructure and ecosystems. It is a participatory process that requires the involvement of public administration and a diverse group of public partners, scientific institutions, social organizations and city residents (IOŚ-PIB, 2023). In adaptation planning, it is necessary to identify threats, assess climate risk and adequately plan adaptation actions together with established mechanisms for their implementation. The perspective of the local unit functioning concerns in particular key areas, i.e. water infrastructure, safety and crisis management services, health, biodiversity, construction, flood protection, and energy.

The table 1 presents selected good-practice adaptation activities undertaken by local authorities.

Table 1. Selected adaptation activities in the city (at local level)

Example of activity	Description
Development and updating of documentation supporting crisis management in a local government unit	It includes the development of crisis management plans, their updating, the development of documents and instructions for action in the event of threats, and information materials for stakeholders.
Support for emergency services and crisis management bodies in responding to climate threats	Support for crisis management services primarily concerns the prevention and preparation phase and aims to increase the effectiveness of services and bodies in the response phase.
Development of a local climate hazard monitoring and warning system	The action consists in taking into account potential risks to human health in local monitoring and warning systems against the effects of climate-related hazards, primarily climate-related extreme phenomena that may cause measurable effects on the health and life of residents of exposed areas (waves of heat and cold, torrential rains and strong winds (hurricanes, storms)).
Shaping awareness and positive behaviour in the event of climate threats	This primarily concerns issues related to: <ul style="list-style-type: none"> • the occurrence of extreme weather phenomena (waves of heat and cold, storms, tornadoes, floods and flooding), • disruption of food systems, • the occurrence of zoonotic diseases, • the occurrence of vector-borne diseases, • the occurrence of mental health problems.
Introducing Blue-Green Infrastructure (BGI) Solutions	Blue-green infrastructure (BGI) is a multifunctional network of areas covered with vegetation or water and solutions based on natural functions (NBS – nature-based solutions), designed and managed in a way intended to provide a wide range of natural services. BGI serves to adapt to climate change by retaining rainwater in the place of precipitation, reducing the effects of drought, mitigating the local climate, reducing the urban heat island phenomenon.
Optimisation of water consumption and increasing water efficiency in the commune, diversification of water supply sources, improvement of the water supply system, restoring and maintaining proper water conditions	The action consists of implementing solutions that support water saving and secure access to drinking water. Water management solutions lead to significant water and energy savings and to reduced sewage production. They reduce the risk of drinking water shortages during periods without precipitation and minimise the negative effects of drought.

Example of activity	Description
Dissemination of knowledge on adaptation to climate change in rural areas and support for the implementation of adaptation practices in agriculture, cooperation for adaptation to climate change in agriculture and rural areas	Agriculture is a sector particularly sensitive to climate change. Losses caused by extreme phenomena in the agricultural sector constitute over 50% of losses estimated in all sectors of the economy. The promoted solutions should include sustainable management of water resources in agricultural activities (increasing water retention, introducing water-saving agricultural production technologies), increasing the amount of organic matter in soils (regenerative agriculture), promoting a crop insurance system and selecting plant species for new climatic conditions.
Improving thermal comfort inside public service buildings	The action applies to buildings in which public health, social care and assistance services and education are provided, such as hospitals, nurseries, kindergartens, nursing homes, community centres, etc. The action aims to ensure the protection of people who are particularly sensitive to extreme temperatures.
Legal protection of ecosystems in the commune, strengthening the commune's natural system	The action involves taking action to include elements of the natural structure of the commune in forms of nature protection such as ecological land (local water bodies; meadows and woodlands; marshes; peat bogs; oxbow lakes); nature and landscape complexes (parks; manor and park complexes; historical parts of the landscape); natural monuments (old trees or their clusters) and protected landscape areas (areas distinguished by their landscape with diversified ecosystems; areas with the function of ecological corridors).
Securing buildings and property areas against heavy rainfall, floods and partial flooding, and strong winds	It refers to micro-retention solutions, small retention and correct drainage of rainwater and meltwater from the surface of buildings (roof slope; inverted roofs), as well as preventive and control activities (maintenance work – gutter cleaning). The action consists in ensuring protection of buildings and the property area against flood waves, including the exclusion of flood areas from the location investments, protection including flood embankments, monitoring and organisation of warnings for residents of threatened areas, protection of underground investments (e.g. metro).
Modernisation of public transport infrastructure in the face of climate change	The action promotes solutions that involve the restoration or introduction of greenery accompanying infrastructure. These solutions make it possible to improve rainwater management, as well as thermal and humidity conditions in the vicinity of infrastructure.

Source: based on (Bidałsik et al., 2023).

In the 2021 report, *Climat Change in Poland. Past, Present, Future* (Falarz, 2021), over 30 climatologists indicated the prospects for climate change in Poland. Climate change in Poland is proceeding in a similar direction to the rest of the continent and is characterized by the intensification of the greenhouse effect caused by the release of greenhouse gases into the atmosphere and the increasing level of solar radiation, the increasing air temperature causing increasingly warmer winters and

summers. The presented analyses do not show that the number of extreme phenomena such as storms, tornadoes or hail has increased in Poland since the 1970s. In the BP Statistic Review of World Energy 2020 (BP, 2020), Poland is responsible for 1% of CO₂ emissions (approximately 300 million tons of CO₂ per year) from the combustion of fossil fuels, and ranks 19th globally. From the EU perspective, it is the third largest CO₂ emitter after Germany (684 million tons of CO₂ per year) and Italy (with a level of 325 million tons of CO₂ per year). People living and working in urban areas are responsible for 67% of global energy consumption. This trend is growing and by 2030 consumption is expected to reach 73%, which will directly translate into an increase in the amount of emissions, including carbon dioxide into the atmosphere due to the use of non-renewable energy sources for heating, cooling and lighting buildings, streets and in transport. In addition, the forecasts related to climate change are not optimistic and this concerns, among others, an increase in the intensity and duration of heatwaves, an increase in the average annual temperature by even 2-5°C by the end of the century compared to the current recorded level. It should be emphasised that already weather anomalies and violent phenomena such as heavy rainfall are becoming the rule even in areas with a moderate climate. In recent years, each summer has been warmer than the previous one, which in cities means a threat, with the need for better water resource management, increased energy demand for cooling buildings and many other challenges. The average temperature of the Earth has already increased by more than 1°C since the industrial revolution. Moreover, the lack of rain and snowfall can contribute to problems in the form of water shortages and droughts, especially in conditions of gradual climate warming. A phenomenon that can have a negative impact on human safety and the functioning of cities is heavy rainfall causing floods and partial flooding.

All this points to the increasing need to create special place for environmental security in local development management.

5. Discussion and conclusion

The main conclusions can be presented in the following points:

1. Among the growing list of threats posed by the modern world, security is an increasingly frequently raised issue. The main changes one can distinguish are: progressive deglobalisation (which deepens global fragmentation), climate change and the related climate transformation, migration, technological changes with the wide application of artificial intelligence, and the war of influence between China and the USA deepening political and economic instability. One can also point out the growing social problems (polarisation, loneliness, depression, loss of social ties), the increasing use of digital technologies in everyday life as well as the number of threats related to the growing presence in the virtual world (cybersecurity, disinformation). Among such a defined list of threats and new trends, environmental security is gaining particular importance.
2. According to the definition developed by Pietraś, ecological security is the state of social relations, including the content, forms and methods of organizing international relations, which not only limits and eliminates ecological threats, but also promotes positive actions, enabling the realisation of values that are important for the existence and development of nations and states (Pietraś, 2000, p. 85). Ecological security can be understood very generally as the state of the environment in which one can live safely and the use of this environment continues to ensure socio-economic development. Among the most important types of ecological security, according to the subject criterion, are those biological, chemical, technical and technological, sanitary, veterinary, emission, immission, nuclear, natural (including species safety and ecosystem safety), flood and epidemic safety (Bar et al., 2012, p. 18).
3. The entities most exposed to the reception of unfavourable changes from the natural environment are municipalities (cities), because real processes take place there. A relatively new instrument that municipalities have been equipped with (for which EU funds can be used) are municipal climate

change adaptation plans (MPA), developed in over 100 Polish cities by 2023. This article provides a catalogue of examples of actions that municipalities can undertake to improve their resilience.

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Bezpieczeństwo ekologiczne jako nowe wyzwanie rozwoju lokalnego

Streszczenie

Cel: Celem artykułu jest wskazanie znaczenia i wzrastającej roli bezpieczeństwa (szczególnie ekologicznego) w prowadzeniu polityki rozwoju lokalnego, a także wskazanie działań adaptacyjnych podejmowanych przez lokalnych aktorów.

Metodyka: Zastosowane metody badawcze mają charakter metod deskryptywnych, porównawczych wyjaśniających znaczenie bezpieczeństwa (bezpieczeństwa ekologicznego) wraz z przykładem działań adaptacyjnych.

Wyniki: Pomimo tego, że kategoria bezpieczeństwa, w tym bezpieczeństwa ekologicznego nie jest nowa w literaturze, na tle zachodzących procesów globalnych (w tym zmian klimatu) wydaje się jedną z najistotniejszych kategorii wpływających na to, jak powinien być kształtowany rozwój przez jednostki lokalne.

Implikacje i rekomendacje: Trwające globalne zmiany wzmacniają znaczenie bezpieczeństwa ekologicznego na różnych poziomach samorządowych. W konsekwencji zwiększa się potrzeba poszukiwania nowych rozwiązań w zakresie bezpieczeństwa i odporności dla samorządów lokalnych.

Oryginalność/wartość: Artykuł wskazuje przykłady rozwiązań możliwych do zastosowania przez samorządy w zakresie zwiększania bezpieczeństwa ekologicznego.

Słowa kluczowe: rozwój lokalny, bezpieczeństwo, bezpieczeństwo ekologiczne
