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RETHINKING SUSTAINABLE DEVELOPMENT (POLICY) TOWARDS INTEGRATED RESILIENCE (ACTION PLAN): REGIONAL LEVEL

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ABSTRACT: The cognitive objective was to confirm the thesis that the sustainable development policy approach supports formulating the regional resilience action plan, while the practical purpose is to propose an original method for developing action plans in the area of creating and improving local resilience, which can be applied in regions that have previously sustainable development strategies and programmes. The sustainable development and integrated resilience approaches are being analysed at the regional level from different time perspectives: from the long run (strategy) to the short period (action plan). The main research methods included the expert method for identifying integrated resilience policy factors, multi-criteria evaluation of development projects based on resilience criteria, and a review of relevant literature. Because there is a gap in research and, therefore, application of resilient policy, the research undertaken is of significant importance from the point of identifying the integrated resilience policy model appropriate in the context of contemporary external threats. The practical outcome of the research is the authors' model of resilience policy (action plan) of the regional economy using the sustainable development policy approach. The originality of the undertaken research lies in the formulation of the integrated resilience regional policy under the contemporary conditions of external threats.

KEYWORDS: sustainable development policy, integrated resilience policy, integrated resilience action plan formulating, risk analysis, contemporary external threats

Introduction

Since 2020, there has been increased interest in the concept of regional economic resilience in both academia and development policy. This is the result of numerous social, economic and environmental shocks that have affected the global economy in recent years (financial crises, recession, population crises including migration/refugee movements, COVID-19, aggressive interest rate hikes, broken supply chains, armed conflict in Ukraine and Israel, climate, food and energy crises).

In order for territorial units to be able to cope with external, violent threats and implement sustainable development policies at the regional level in the long term, it is necessary to identify the ongoing issues:

- What is resilience in the context of a regional economy (science approach vs. concept in development policy)? (operationalisation of the concept, conceptualisation, types and dimensions of resistance)
- What are the determinants (critical success factors) of regional social, economic and environmental resilience (determinants of integrated resilience)?
- What are the risks/shocks that hit the economy (types, sources and nature of shocks)? How to prevent them? Why are some regions more affected by the crisis and others not? What are the mechanisms that make some regions recover from the crisis faster than others?
- How to formulate a policy of regional integrated resilience? How to formulate short-term policy in this area? How – on the basis of the existing strategic and programme documents – formulate action plans for the region's resilience to external threats?

To answer the formulated questions, an in-depth literature review on regional economic resilience was conducted. Subsequently, key resilience determinants were identified and analysed based on empirical studies and development policy frameworks.

We have formulated the thesis that the sustainable development policy approach supports formulating the regional resilience action plan.

The practical purpose of the research provided is to propose an original method for building action plans in the area of creating and improving regional resilience, which can be applied in regions that have previously established sustainable development strategies and programmes.

The methodology section presents the approach used to identify resilience factors and develop the proposed model. The results section includes findings derived from expert and multi-criteria analyses. Finally, the discussion and conclusions provide recommendations emphasizing the need to incorporate resilience considerations into regional development planning.

An overview of the literature

Creating a resilient economy is a new and deeply unexplored issue (Sutton et al., 2023). The risk that recovery is fraught with risks and challenges has already been learned by many, so it is important to learn about the regional resilience of the economy as a pioneering theory exploring how territorial units can cope with external shocks and promote sustainable development (Martin & Sunley, 2020; Zehui et al., 2023; Giannakis et al., 2024). Building a resilient economy has become a consensus among policymakers in different countries (Kass-Hanna et al., 2022) and has contributed to research and analysis in this area (Fratesi & Perucca, 2018; Fusillo et al., 2022; Kitsos et al., 2023).

A forerunner in the use of the concept of resilience was C. S. Holling, an ecologist who defined it as the overall stability of a system and distinguished between engineering resilience, the ability of a system with one equilibrium to quickly restore a pre-shock state, and ecological resilience, the ability of a multi-equilibrium system to absorb a shock and remain in a different state. However, both definitions are static and inadequate to dynamic socioeconomic systems (Holling, 1973). As such, the term *adaptive resilience* has emerged to describe the positive adaptive ability of a system to maintain its core functions while changing its overall structure to learn from shocks and "bounce forward". Subsequently, other fields of research and human life activities, such as psychology, engineering, environmental management or economic geography, have become interested in studying the nature and effects of disturbances (Ostárková & Stanickova, 2021; Ringwood et al., 2019). The concept of economic resilience has gained particular popularity after 2020 (Shutters et al., 2021; Toth et al.,

DOI: 10.34659/eis.2024.91.4.959

2022), and references to this issue can be found, among others, in documents of the Organisation for Economic Co-operation and Development (OECD, 2021), the World Bank Group (2021), the World Trade Organization (2021) and the European Commission (2020).

The 2020 Strategic Foresight Report outlines resilience as a new compass for EU policies. Resilience is defined here as the ability not only to withstand and cope with external threats and challenges but also to undergo the transition in a sustainable, equitable and democratic way (European Commission, 2020).

An overview of selected ways of defining resilience in different development contexts is presented in Table 1.

Table 1. Review of definitions of concepts related to the economic resilience of the region

Author	Definition
Foster (2007)	Regional resilience is the ability of a region to **anticipate, prepare for, respond to, and recover** from disruptions.
Martin and Sunley (2020)	Regional economic resilience is the **ability of a region to reconfigure the economy**, which is adaptive and, thanks to its structure (firms, industries, technologies and institutions), is able to maintain an acceptable path of growth in production, employment and wealth over time.
World Bank Group (2021)	Resilience is characterized by the ability of **people, societies, and countries** to recover from negative shocks, while maintaining the ability to function.
Hallegatte (2014)	Economic resilience is the ability of the economy as a **whole to cope, recover, and recover from a shock.**
Bristow and Healy (2014)	Regional resilience is a multidimensional property that includes adaptive capacity, i.e. the ability of a region and its actors to adapt to shocks and develop further. Resilience also includes preparing for shock and a positive situation after a crisis, and **it also means having an action plan.**
Ringwood et al. (2019)	Regional economic resilience can be defined as the ability of an economy to withstand and recover quickly from shocks. **The ability to measure resilience is essential to developing an understanding of what affects resilience**.
Oprea et al. (2020)	Regional economic resilience is the **ability of a country's regions to cope with changes of a shocking and disruptive nature, regardless of their nature (economic, social, environmental)** and to use these events (disasters) to continue their development.
Gong and Hassink (2020)	The resilience of regions changes over time and depends on the shock experienced. Just because a region is immune to one shock does not guarantee that it will be immune to other types of shocks. **Determinants of resilience have spatial and temporal specificity, so the resilience of regions in a given country will also be different. It all depends on territorial conditions, economic specifics, social structure or cultural heritage**.
Program Interreg Region Morza Bałtyckiego 2021-2027 (2021)	Resilience is understood as the ability to respond to external disruptions, such as **economic recessions and financial crises, downturns in individual industries, or major health crises. Resilience also refers to a society with strong social cohesion and a shared value system**.
Masik (2022)	Regional resilience is the **ability of a region's community, economy and institutions** to withstand, adapt and transform the regional system in the face of internal tensions and external disturbances.
Majchrzak (2023)	Resilience as flexibility and the ability to revitalize (regenerate) a strategic entity (**country, region, sector, department, branch of a country, enterprise, non-governmental organization and other entities**) in conditions of extraordinary threats.

The chosen (bolded) elements of the definitions are listed in the Table 1 were invented to formulate the operational meaning of regional integrated resilience, covering human, social, economic and environmental dimensions of regional development.

On the basis of the desk research provided, the following general conclusions have been drawn: (1) There is a gap in the operational definition of *integrated resilience* of a territorial unit, which enables formulation of resilience policy and measure on the level of territorial units; (2) The category *of integrated resilience* is the short-term equivalent of the (super) long-term concept of *sustainable development;* (3) There is currently a strong demand for creating/improving the resilience of EU regions and the related availability of viable sources of funding for resilience policies at this level of governance.

DOI: 10.34659/eis.2024.91.4.959

In addition, the author's definition of *regional integrated resilience* has been formulated as the operational ability of a region to restore and maintain in short periods:

a) integration of the operational objectives of the region's development in humanistic, social, economic and environmental dimensions, as well as,
b) resilience of the region's development capital.

In this respect, criteria for integrating regional resilience objectives have been identified, such as **increasing human, social, economic and environmental security, minimising the risk of threats and prevention of disturbances (hereinafter: SRP criteria)**. On the other hand, the resilience of development capital is achieved by applying the weak sustainability principle of capital in short periods. A manifestation of the region's resilience policy will, therefore, be, on the one hand, the inclusion of SRP criteria in operational objectives, measures, sub-measures and types of projects, and on the other hand, pro-resilience quantitative and structural adjustments of regional development capital.

Research methods

On the basis of desk research and the demand reported by territorial units, the research problem was formulated as an impartial identification of key factors (measures and types of projects) of resilience policy in the conditions of external developmental threats of a territorial unit (region).

It was argued that the sustainable development paradigm implemented into the region's development policy at the operational/tactical level is the appropriate basis for shaping the Integrated Resilience Policy Model.

The research objective was to develop a method for identifying the key factors of the resilience policy (integrated) development of the region, and the utilitarian objective was to develop a procedure for identifying the key measures and types of projects of resilience of its functioning and development, recommended for the formulating of adequate operational development tools (operational programmes, action plans for the resilience of the region).

Formulating of the Operational Programme and the Action Plan on integrated resilience was carried out by deductive strategic analysis, starting from the analysis of the essential features of the sustainable development paradigm through the development strategy and operational programme to the pro-resilience action plan in short periods.

While a first-order condition for the implementation of sustainable development is to formulate a participatory strategy for sustainable development, the second-order condition is its operationalisation and multi-criteria assessment of the progress of this implementation, i.e. strategy evaluation (Malik, 2011). The implementation of the sustainable development paradigm into development policy is possible through the following criteria (Barbier et al., 1990; Heffner & Malik, 2011):

a) effectiveness of integrating of developmental goals orders (EIDO),
b) efficiency of development capital (EDC),
c) long – and super-long-term sustainability of development (SD).

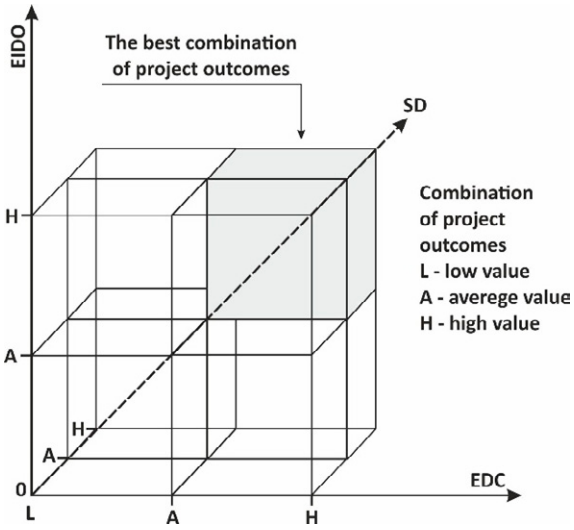
The implementation of regional development policy based on the mentioned criteria has been analysed in various works (Bedrunka & Malik, 2014; Jasińska-Biliczak & Malik, 2020). The idea of the implementation of the sustainable development paradigm into development policy is presented in the Figure 1.

The effect of unsustainable development (inefficient use of resources) is the emergence of barriers to development processes and, in the short term – the lack of resistance of the territorial unit to internal and external threats.

The method of deriving the basic elements of the new Integrated Resilience (IR) policy from the Sustainable Development policy is presented in the form of a transformation matrix in Figure 2.

The fundamental common element between sustainable development policy at the strategic level and resilience strengthening policy at the action plan level are the dimensions of sustainable development policy: these appear both in strategies, programmes, and action plans aimed at building regional resilience. In long-term sustainable development strategies, analysis and goal setting are structured according to the dimensions of sustainable development and the components of developmental capital. In contrast, short-term resilience action plans further specify this analysis by assessing the fulfilment of resilience criteria (increased safety, reduced risk of threats, and preventiveness)

DOI: 10.34659/eis.2024.91.4.959



for each dimension of development. A similar assessment is also reflected in the indicators of the effects of building resilience within the region's developmental capital.

Figure 1. The idea of implementing the sustainable development paradigm into the region's development policy based on the value of the project outcomes

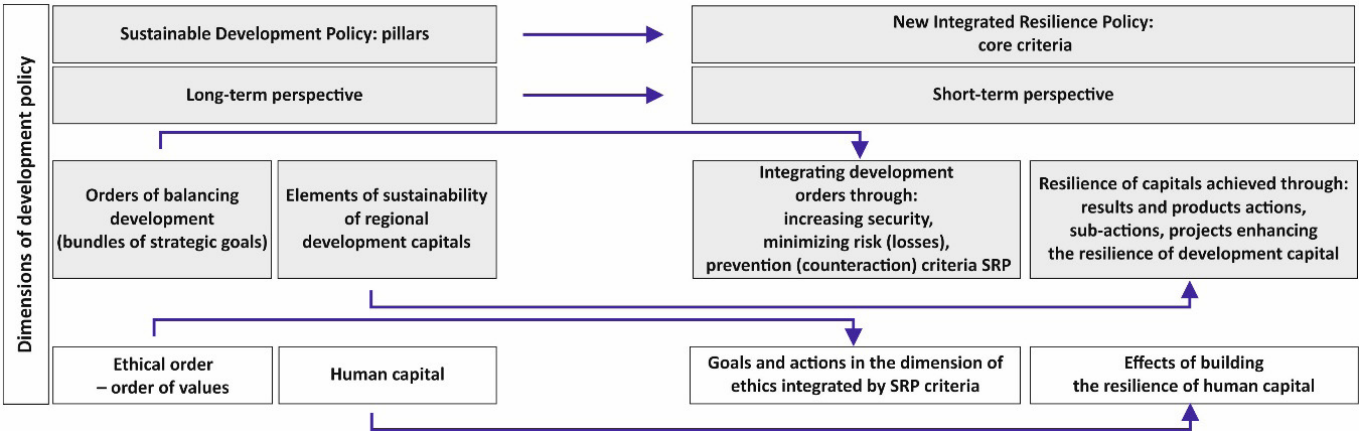


Figure 2. A method for identifying integrated resilience policy drivers: a transformation matrix

Results of the research

The experts have assessed the operational objectives of the New Integrated Resilience Policy in the economic dimension based on the SRP criteria–improving resident safety, minimising risks, and preventing threats–using a 1-to-5 point scale for each criterion. An example of this valuation is shown in Table 2 and visualised in Figure 3.

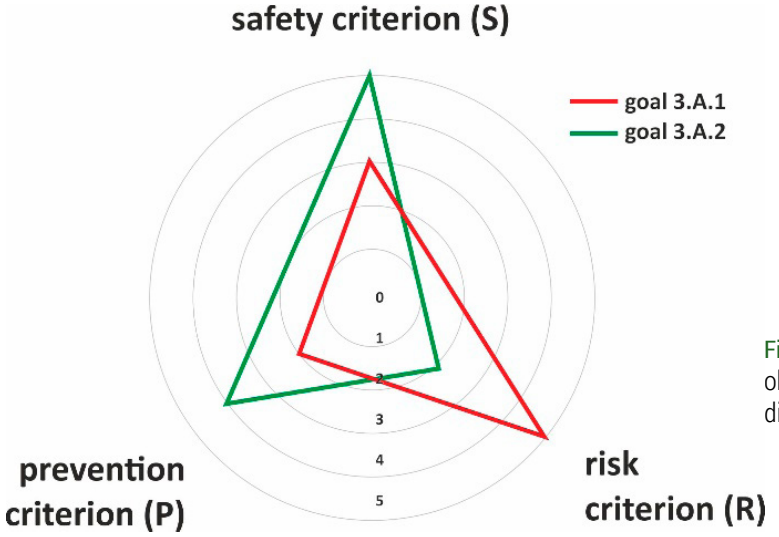


Figure 3. Assessment of operational objectives in the economic dimension according to SRP criteria

DOI: 10.34659/eis.2024.91.4.959

Table 2. Assessment of the operational objectives in the economic dimension according to the SRP criteria

	sets of goals	
evaluation/level of compliance	goal 3.A.1	goal 3.A.2
safety criterion (S)	3	5
risk criterion (R)	5	2
prevention criterion (P)	2	4

Each resilience development project has been assessed according to SRP criteria for each dimension of development capital (human, social, economic and environmental). An illustration of the multi-criteria assessment (evaluation) of development projects according to the resilience criteria is shown in Tables 3 and 4.

Table 3. Multi-criteria evaluation of development projects according to development capital dimension

development capital evaluation	development project 1	development project 2
economic capital	15	15
environmental capital	15	3
human capital	13	9
social capital	13	11

Table 4. Multi-criteria evaluation of development projects according to resilience criteria SRP

development project 1				development project 2		
criteria SRP				criteria SRP		
B	R	P		B	R	P
5	5	5		5	5	5
5	5	5		1	1	1
3	5	5		4	3	2
5	4	4		4	2	5

An illustration of the multi-criteria assessment (evaluation) of development projects within dimensions of development capital according to the resilience SRP criteria is shown graphically in Figure 4.

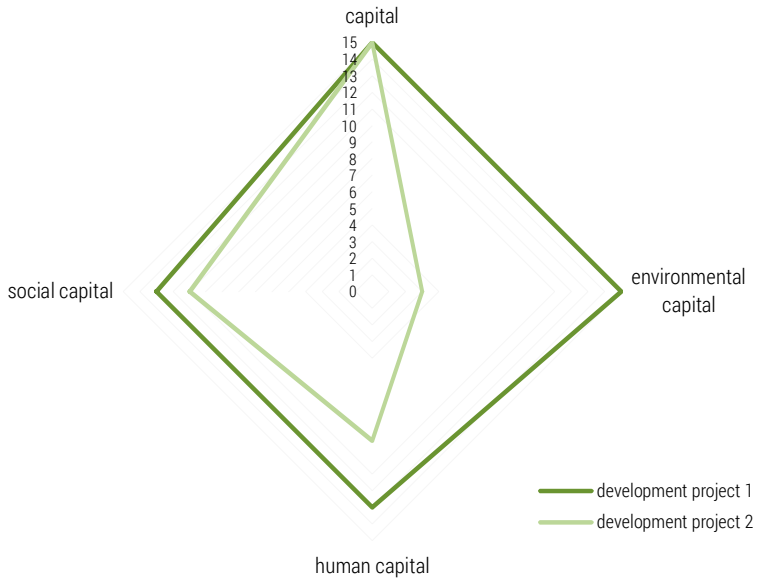


Figure 4. Multi-criteria evaluation of development projects according to resilience criteria

An example of the identification of short-term objectives and measures, as well as types of projects in order to formulate the regional resilience policy, is provided in Table 5. The example has been provided within the human dimension of development policy. The methodology for identifying integrated resilience policy drivers was provided using the two criteria of the author's definition of *regional integrated resilience*: (1) integration of the operational objectives of the region's development as well as (2) resilience of the region's development capital.

Table 5. Methodology for identifying integrated resilience policy drivers: an example

Dimensions of development policy	Ethical order – goals order of values	Human capital	Goals and measures in the dimension of ethics integrated by SRP criteria	Effects of creating the resilience of human capital
Human dimension	Social justice within and between generations	Health status	Ensuring equal access for residents to safety infrastructure, e.g., preventive and health programs, and raising residents' awareness	Implementation of investments in health care Adequate number and structure of protection facilities for residents of a specific territory, including medical institutions, personnel, and modernized emergency systems Resilience of residents of the region to biological (pandemic), chemical, radiological, and mechanical threats

In this way, the transformation matrix (Figure 2) is gradually fulfilled in the perspective of short-term goals and measures as well as type of projects for creating regional resilience.

Another element of the method is the analysis and assessment of risk in the procedure for identifying key factors of integrated resilience for the purpose of preparing a short list of resilience projects in the Action Plan.

The risk analysis and assessment in the procedure for identifying key factors of integrated resilience was carried out according to the following described process:

- risk areas and types of risk in areas (preparation of the register; risk areas: social, economic, ecological, ethical) were identified,
- identification of risk factors (probability of occurrence of a factor/problem, e.g. 5 levels, 5 – very high (almost certain) above 80%, 4 – high 60-79%, 3 – medium 30-59%, 2 – low 10-29%, 1 – very low (almost impossible) below 10%. Scale of effect (consequence of the occurrence of a risk factor/problem) has been used in point weight, e.g. critical – 5, serious – 4, significant – 3, insignificant – 2, no disturbance – 1. Risk level is the product of the weight of probability and severity of the effect. The analysis has been provided for all development capitals: human, socio-institutional, economic, natural (according to lists of factors),
- threats risk analysis (hazard analysis, determination of the risk value/level – whether the risk is acceptable or not; risk level: very high, high, medium, low, very low risk – matrix showing the point intervals resulting from the value of the product of the probability weight and the severity of the effect),
- risk response – remedial and/or corrective actions (depending on the result – risk level – the following actions may be taken: mitigation, avoidance, acceptance, transfer (insurance).

Then, pro-resilience projects are ranked according to the probability of loss of immunity for a given project in a specific dimension of development: the lower the probability of loss of immunity – the higher the project is ranked (see Formula 1).

$$P_{ij} = I_{Ij} \cdot J_{Ij} \quad (1)$$

where:
P_{ij} – probability of loss of resilience for the i-project in the j-development dimension,
I – probability of the occurrence of the immunodeficiency factor,
J – significance of the consequences of the loss of resilience for the development of the region.

DOI: 10.34659/eis.2024.91.4.959

The risk analysis and assessment matrix for building the resilience of a given regional development project is included in Table 6.

Table 6. Risk matrix for building resilience of a given regional development project

J – the significance of the consequence of resilience loss for regional development						
	critical disruption 5 pts	P_{I1J5}	P_{I2J5}	P_{I3J5}	P_{I4J5}	P_{I5J5}
	severe disruption 4 pts	P_{I1J4}	P_{I2J4}	P_{I3J4}	P_{I4J4}	P_{I5J4}
	significant disruption 3 ps	P_{I1J3}	P_{I2J3}	P_{I3J3}	P_{I4J3}	P_{I5J3}
	minor disruption 2 pts	P_{I1J2}	P_{I2J2}	P_{I3J2}	P_{I4J2}	P_{I5J2}
	no disruption 1 pts	P_{I1J1}	P_{I2J1}	P_{I3J1}	P_{I4J1}	P_{I5J1}
		very low – almost impossible	low	medium	high	very high – almost certain
		below 10%	10-29%	30-59%	60-79%	above 80%
	I – probability of the occurrence of a resilience loss factor					

To sum up, the method of formulating the Action Plan for the identification of key objectives according to SRP and projects for the development of resilience according to the P_{ij} risk assessment ranking consists of the following milestones:

Paradigm of Sustainable Development
1.A. sustainability/integration of development orders
- 1.A.1. integrating ethical governance
- 1.A.2. integrating social governance
- 1.A.3. integrating economic governance
- 1.A.4. integrating environmental governance

1.B. sustainability of development capital
- 1.B.1. sustainability of human capital
- 1.B.2. sustainability of social capital
- 1.B.3. sustainability of economic capital
- 1.B.4. sustainability of environmental capital

Development policy (strategy) (long and medium term)
2.A. integrating strategic objectives
- 2.A.1. integrating ethical values
- 2.A.2. integrating social goals
- 2.A.3. integrating economic goals
- 2.A.4. integrating environmental goals

2.B. effects of the development of the region's capital
- 2.B.1. effects of human capital development
- 2.B.2. effects of social capital development
- 2.B.3. effects of economic capital development
- 2.B.4. effects of environmental capital development

Integrated Resilience Development Programme
3.A. set of objectives/measures according to criteria
- 3.A.1. improved safety
- 3.A.2. minimizing the risk of hazard effects
- 3.A.3. prevention

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3.B. programmed effects of resilience development projects
    3.B.1. output indicators of resilience development projects
    3.B.2. outcome indicators for resilience development projects

Region-specific risk analysis and evaluation
4.A. set of objectives/measures according to SRP criteria
    4.A.1. improved safety
    4.A.2. minimizing the risk of hazard effects
    4.A.3. prevention
4.B. programmed effects of resilience development projects
    4.B.1. output indicators of resilience development projects
    4.B.2. outcome indicators for resilience development projects

Action Plan on Key Factors of Resilience of the Region
5.A. bundles of targets according to their ranking in the SRP criteria
    5.A.1. improved safety
    5.A.2. minimizing the risk of hazard effects
    5.A.3. prevention/risk Prevention
    5.B. effects of resilience development projects according to the risk evaluation ranking Pij
    5.B.1. output indicators of resilience development projects
    5.B.2. outcome indicators for resilience development projects

The set of short-term resilience goals formulated in the Action Plan according to the dimensions of sustainable development and the evaluation of the SRP criteria within each dimension is crucial. The effects of resilience-building projects compiled in the Action Plan according to the ranking of risk assessments correspond to the ranking of objectives. These effects – in accordance with the EU nomenclature – are expressed in indicators of outputs and outcomes (results) of the development of resilience at the level of regional development policy.

Conclusions

The starting point for the development of programmes and action plans for the resilience of the region's development was the region's development policy (strategy) based on the sustainable development paradigm.

The resilience of a region's development was defined as (1) the ability to integrate operational objectives in the humanistic, social, economic and environmental dimensions, as well as (2) the resilience of its development capital. The criteria for integrating the objectives included increased safety (S), minimised risk of threats (R) and prevention (P). The resilience of development capital is achieved through the application of the weak sustainability principle in short periods.

To identify the factors of resilience of the region's development, the author's transformation matrix was used, initially filled with bundles of goals and components of development capitals derived from the principles of sustainable development and the Millennium Goals.

The milestones of the developed method for identifying key factors of resilience development policy are:

- the paradigm of sustainable development is understood as the integration of goals and orderliness and the sustainability of development capitals,
- regional development policy (strategy),
- operational programme for the development of integrated resilience of the region,
- analysis and risk evaluation for the programmed effects (outputs and outcomes) of resilience development projects,
- a regional resilience action plan containing key integrated resilience type of projects of the region ranked according to their threat risk evaluation.

DOI: 10.34659/eis.2024.91.4.959

The formulated method of identifying key objectives, measures and projects for the development of resilience in the region's development policy makes it possible to finance their implementation from public money, including EU funds.

A special role in the process of building the integrated resilience of the region can be played by the so-called smart specialisations focused on technological and product-oriented support for the resilience of the region's economy.

A certain limitation of the rapid implementation of the proposed method of modelling and formulating the action plan in the field of key factors/ projects of the region's resilience is the multidisciplinarity and multidimensionality of the approach to pro-resilience objectives, measures and projects, requiring the cooperation of multi-expert work in this area.

The Authors realise that the presented novel framework method requires further research and should be empirically tested to validate its feasibility and practical relevance.

The contribution of the authors

Conceptualisation, K.M.; literature review, M.S.S.; methodology, K.M. and M.S.S.; formal analysis, K.M. and P.B.; writing, K.M., M.S.S. and P.B.; conclusions and discussion, K.M., M.S.S. and P.B.

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DOI: 10.34659/eis.2024.91.4.959

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PONOWNE ODCZYTANIE (POLITYKI) ROZWOJU ZRÓWNOWAŻONEGO W KIERUNKU (PLANU DZIAŁAŃ) ZINTEGROWANEJ ODPORNOŚCI: POZIOM REGIONALNY

STRESZCZENIE: Celem poznawczym artykułu było potwierdzenie tezy, że podejście polityki zrównoważonego rozwoju wspiera formułowanie regionalnego planu działań na rzecz odporności. Natomiast celem praktycznym jest zaproponowanie oryginalnej metody opracowywania planów działań w zakresie budowania i wzmacniania odporności lokalnej, która może być stosowana w regionach posiadających wcześniej strategie i programy zrównoważonego rozwoju. Oba podejścia tzn. rozwój zrównoważony i odporność zintegrowana zostały przeanalizowane na poziomie regionalnym według różnych perspektyw czasowych: od długoterminowej (strategia), średniookresowej (program operacyjny) do krótkoterminowej (plan działania). Głównymi metodami badawczymi były metoda ekspercka identyfikacji czynników polityki odporności zintegrowanej, analiza wielokryterialna projektów rozwoju wg kryteriów odporności, a także przegląd odpowiedniej literatury. Ze względu na istniejącą lukę w badaniach i – co za tym idzie – stosowaniu polityki odpornościowej, podejmowane badania mają istotne znaczenie z punktu widzenia modelowania zintegrowanej polityki odporności, w kontekście współczesnych zagrożeń zewnętrznych. Praktycznym i oryginalnym wynikiem badań jest autorski model formułowania polityki odporności gospodarki regionalnej z wykorzystaniem podejścia polityki zrównoważonego rozwoju. Oryginalność przeprowadzonych badań polega na sformułowaniu modelu zintegrowanej polityki odporności regionalnej w warunkach współczesnych zagrożeń zewnętrznych.

SŁOWA KLUCZOWE: polityka rozwoju zrównoważonego, plan działań odporności zintegrowanej, regionalna polityka rozwoju, analiza ryzyka, współczesne zagrożenia zewnętrzne

DOI: 10.34659/eis.2024.91.4.959