PROBLEMY EKOROZWOJU – PROBLEMS OF SUSTAINABLE DEVELOPMENT
SUBMITTED: 31.10.23, ACCEPTED: 16.11.23, PUBLISHED ON-LINE: 8.01.24
2024, 19(1): 201-212
https://doi.org/10.35784/preko.5534

Progress in the Field of Sustainable Development as a Result of Implementing the Potential of Social Cohesion: Regional Context

Postęp w zakresie zrównoważonego rozwoju w wyniku budowania potencjału spójności społecznej: kontekst regionalny

Daria Mykhailenko*, Olena Havrylchenko, Lidiia Bezkorovaina***, Nataliia Gliebova****, Viktoriia Kovalova*******

**V.N. Karazin Kharkiv National University,*
Department Marketing, Management and Entrepreneurship,
Kharkiv, Svobody Sq., 4, 61022 Ukraine
E-mail: d.g.mykhailenko@ukr.net, ORCID: 0000-0002-8420-6510
***V.N. Karazin Kharkiv National University,*
Management and Business Department,
Kharkiv, ave. Nauki, 9-A, 61166 Ukraine
ORCID: 0000-0002-0624-2938
****Simon Kuznets Kharkiv National University of Economics,*
Department of accounting and business consulting,
Kharkiv, ave. Nauki, 9-A, 61166 Ukraine
ORCID: 0000-0002-0423-0626
*****National University of Pharmacy,*
Department management and quality assurance in pharmacy,
Kharkiv, St. Pushkinska, 53, 61022 Ukraine
ORCID: 0000-0002-9908-3867
****** National University of Pharmacy,*
Department management and quality assurance in pharmacy,
Kharkiv, St. Pushkinska, 53, 61022 Ukraine
ORCID: 0000-0003-1665-6971

Abstract

The study examines the role of social cohesion in the context of sustainable development of regional societies. It is proved that progress in the field of sustainable development depends on social cohesion as one of the factors ensuring the achievement of environmental, economic and social changes. A mechanism of social cohesion has been developed, the result of which, along with social stability and justice, strengthening citizens' trust in state and public institutions, social welfare, is a request for sustainable development of regions. The article proves that modern challenges, such as social inequality, migration and ethnic differences, can weaken the potential of social cohesion as a catalyst for sustainable development of regions.

To quantify the level of social cohesion, a system of indicators is proposed that integrates economic, demographic, educational and other indicators, and allows for a detailed analysis of the current state of social cohesion in various regions. Taking into account the impact of social cohesion indicators on the progress of sustainable development of regions is realised through the inclusion of indicators that reflect the level of social cohesion potential and, at the same time, are a source of data for assessing the achievement of sustainable development goals.

Using the example of the EU countries, the analysis of indicators related to the blocks of trust in institutions and economic indicators in assessing the level of social cohesion was carried out. The estimated indicators are also taken into account when calculating the achievement of the following Sustainable Development Goals (SDGS): SDG 1, SDG 8, SDG 10, SDG 16. The proposed approach makes it possible to take into account the indicators that are most vulnerable in terms of their impact on the

progress of regions in the field of sustainable development, as well as to form a list of measures, the implementation of which will ensure capacity building of the social cohesion mechanism (hereinafter referred to as SCM).
The main innovative contribution of the study is the development of an economic and mathematical model for optimizing resources and prioritizing measures aimed at strengthening social cohesion. The model takes into account the amount of available resources, the need to use them for the implementation of specific activities and an expert assessment of their priority. This approach provides an objective and systematic solution to the challenges of sustainable development, focusing on social cohesion as a key factor. The study proves that the application of the model requires high-quality data, competence in the process of interpreting modelling results and active interaction with stakeholders. In conclusion, it is emphasized that the integration of social cohesion into strategic planning and the application of the proposed model are the basis for more effective and sustainable development of regional society.

Key words: social cohesion; social justice; sustainable development of regions; consideration of social regional justice; potential of social cohesion; modelling

Streszczenie

W artykule zbadano rolę spójności społecznej w kontekście zrównoważonego rozwoju społeczeństw regionalnych. Udowodniono, że postęp w zakresie zrównoważonego rozwoju zależy od spójności społecznej, jako jednego z czynników zapewniających osiągnięcie zmian środowiskowych, gospodarczych i społecznych. Wypracowano mechanizm spójności społecznej, którego efektem obok stabilności i sprawiedliwości społecznej, wzmocnienia zaufania obywateli do instytucji państwowych i publicznych, opieki społecznej, jest postulat zrównoważonego rozwoju regionów. W artykule wykazano, że współczesne wyzwania, takie jak nierówności społeczne, migracje i różnice etniczne, mogą osłabiać potencjał spójności społecznej jako katalizatora zrównoważonego rozwoju regionów.
Aby ilościowo określić poziom spójności społecznej, proponuje się system wskaźników, który integruje wskaźniki ekonomiczne, demograficzne, edukacyjne i inne oraz pozwala na szczegółową analizę aktualnego stanu spójności społecznej w różnych regionach. Uwzględnianie wpływu wskaźników spójności społecznej na postęp zrównoważonego rozwoju regionów realizowane jest poprzez włączenie wskaźników odzwierciedlających poziom potencjału spójności społecznej, a jednocześnie będących źródłem danych do oceny osiągnięcia zrównoważonego rozwoju.
Na przykładzie krajów UE przeprowadzono analizę wskaźników związanych z blokami zaufania do instytucji oraz wskaźników ekonomicznych w ocenie poziomu spójności społecznej. Oszacowane wskaźniki uwzględniane są także przy wyliczaniu osiągnięcia następujących Celów zrównoważonego rozwoju (SDGs): SDG 1, SDG 8, SDG 10, SDG 16. Proponowane podejście pozwala na uwzględnienie wskaźników najbardziej wrażliwych pod względem wpływu na postęp realizacji regionów w zakresie zrównoważonego rozwoju, a także stworzenie listy działań, których realizacja zapewni budowanie potencjału mechanizmu spójności społecznej (zwanego dalej SCM).
Głównym innowacyjnym wkładem badania jest opracowanie ekonomicznego i matematycznego modelu optymalizacji zasobów i ustalenia priorytetów działań mających na celu wzmocnienie spójności społecznej. Model uwzględnia wielkość dostępnych zasobów, potrzebę ich wykorzystania na realizację konkretnych działań oraz ekspercką ocenę ich priorytetu. Podejście to zapewnia obiektywne i systematyczne rozwiązanie wyzwań zrównoważonego rozwoju, koncentrując się na spójności społecznej jako kluczowym czynniku. Z badania wynika, że zastosowanie modelu wymaga wysokiej jakości danych, kompetencji w procesie interpretacji wyników modelowania oraz aktywnej interakcji z interesariuszami. Podsumowując, podkreślono, że włączenie spójności społecznej do planowania strategicznego i zastosowanie proponowanego modelu stanowią podstawę bardziej efektywnego i zrównoważonego rozwoju społeczeństwa regionalnego.

Słowa kluczowe: spójność społeczna; sprawiedliwość społeczna; zrównoważony rozwój regionów; uwzględnienie społecznej sprawiedliwości regionalnej; potencjał spójności społecznej; modelowanie

1. Introduction

The global commitment to sustainable development, declared as a priority by the overwhelming majority of states, is being implemented by them at different rates of progress in achieving the Sustainable Development Goals (SDGs) of the UN (Agenda for Sustainable Development, 2015). The civilizational choice of society consists in recognizing the lack of alternatives to sustainable development, which is a condition for the survival of mankind (Report of the World Summit..., 2002; Report of the United Nations Conference ..., 1993).
Having formed the foundation, the SDGs provide stakeholders with a comprehensive framework for solving a wide range of global problems – from the fight against hunger, poverty and inequality to environmental conservation; and also serve as a reference point for regional initiatives in the field of sustainable development. At the same time, on the way to achieving the SDGs, states face the need to find compromise solutions in terms of social justice, which in itself is a multifaceted concept, including economic and gender inequality, racial regional discrimination and much more.
Sociocultural changes are becoming the dominant factor, along with globalization and technological innovations, pandemics and military actions. In the modern world, the importance of social cohesion for the sustainable development of society is increasing, while its potential remains underestimated. Thus, according to the Organization for Economic Cooperation and Development (OECD), social cohesion is the basis for creating the well-being of a regional society capable of resisting various challenges, from economic crises to social upheavals (Perspectives

on Global Development, 2021). As the World Bank points out, many countries face the problem of increasing social gaps, which can lead to social aggression and conflicts (World Development Report, 2022).
Social cohesion, as an integrative element, plays a key role in ensuring social justice, economic stability and sustainable development of regions. According to UN research, social cohesion affects the economic and social well-being, political stability of countries (The Sustainable Development Goals Report, 2022). This underlines the need to study the mechanisms of social cohesion and its role in the sustainable development of regions. In this context, the development of tools for measuring and strengthening social cohesion is becoming a priority for many states.
Nevertheless, as UNESCO notes, existing methods of measuring social cohesion are often limited and do not take into account the versatility of this phenomenon (Thematic Indicators for Culture in the 2030 Agenda, 2019) Therefore, this study is aimed at developing proposals for creating a comprehensive system of indicators for taking into account the level of social cohesion based on modelling resource optimization in the context of sustainable development of regions.

2. Methodology

The study methodology made it possible to consistently solve the tasks set using methods of analysis and synthesis, induction and deduction, which were used in the study of factors affecting the sustainable development of regions; in the process of forming a mechanism of social cohesion; determining a system of indicators to account for the level of social cohesion. Statistical methods were used in the analysis of empirical data on EU countries in the period 2010-2022. At the modelling stage, using an economic and mathematical model, the problem of choosing scenarios for realizing the potential of social cohesion to achieve the goals in the field of sustainable development of regions, taking into account limited resources, was solved. A systematic approach was used at all stages to take into account the synergy of social cohesion and its complex impact on sustainable development goals. The analysis and generalization of the data were carried out on the basis of the Eurostat database.
Data analysis and synthesis were carried out using the Eurostat database (Eurostat: Data Browser, 2023). Thus, a block of economic indicators in the process of assessing the level of social cohesion was studied using indicator values for 2010-2022:

- employment rate (Eurostat: Employment rate by sex, 2023);
- real GDP per capita (Eurostat: Real GDP per capita, 2023)
- share of income of the bottom 40% of the population (Eurostat: Income share of the bottom 40% of the population, 2023);
- persons at risk of monetary poverty after receiving social transfers (Eurostat: Persons at risk of monetary poverty after social transfers – EU-SILC and ECHP surveys, 2023).

Information from the Statistical Office of the European Union was also used as a source of data to assess indicators reflecting trust in institutions, but for some indicators the observation period does not fully cover the period from 2010 to 2022, since the relevance of collecting data to monitor certain indicators over time is changing. Thus, indicators assessing the independence of the justice system and the perception of corruption are a valuable source of information, and are reflected in the system of sustainable development indicators after 2010. The total state expenditures on the courts were estimated for 2010-2021 (Eurostat: General government total expenditure on law courts, 2023); The perceived independence of the justice system was assessed for 2016-2022 (Eurostat: Perceived independence of the justice system, 2023); The corruption perception index was assessed for 2012-2022 (Eurostat: Corruption Perceptions Index, 2023); The population with confidence in EU institutions was assessed for 2010-2022 (Eurostat: Population with confidence in EU institutions by institution, 2023).

3. Literature review

The contradictions arising from the need to achieve the SDGs are a topic of active discussion, since the transition from intentions and declarations to actions has created a number of problems.
A number of studies critically analyse the Sustainable Development Goals, in particular, their potential incompatibility is considered. Using analytical methods, including dynamic systems models, the paper written by Spaiser et al. (Spaiser, Ranganathan, Swain, Sumpter, 2017) determined which SDGs are consistent and which contradict each other: the contradiction between socio-economic development and environmental sustainability is considered. The study quantifies the extent of these contradictions and concludes that if current approaches are maintained, the SDG agenda may fail. The focus on economic growth and consumption is named as the main factors causing inconsistencies in the paper, which, in fact, means that traditional development paradigms contradict the goals of environmental sustainability. Thus, the article concludes that for the successful implementation of the SDGs, it is necessary and possible to reorient the SDG agenda away from traditional models of economic growth to more sustainable practices.
J. Hickel also argues that there is a contradiction inherent in the Sustainable Development Goals. As an example, the Goals 6, 12, 13, 14, 15 are considered, which provide for environmental protection, and Goal 8, which provides

for annual growth of the world economy. Using empirical data on resource use and CO_2 emissions, the author comes to the conclusion that achieving the growth rate of the world economy at the level of 3% is incompatible with reducing the total use of resources and CO_2 emissions at a pace sufficient to achieve climate goals. As a result of the conducted research J. Hickel argues that the task of economic growth in accordance with SDG 8 undermines the possibility of achieving the *environmental* SDGs (Hickel, 2019). The potential contradictions between SDG 3 and SDG 17 based on empirical data for 16 low-income countries are discussed in the paper of A. E. Guzel, U. Arslan, A. Acaravci (2021).

In support of the points of view mentioned, H. Kopnina notes that following the Sustainable Development Goals, despite good intentions, is unlikely to lead to social equality and economic prosperity. On the contrary, they risk aggravating the problems they are aimed at solving, since they contribute to the development of unstable production and consumption patterns, as well as constant economic and demographic growth (Kopnina, 2016).

Ukrainian researchers T. Kulinich, N. Dobizha, O. Demchenko, O. Bodnar, V. Myronchuk, A. Zelenskyi A. (2021), who devoted their work to microfinance, in particular, methods, models and accounting of its impact on economic development, justified the impact of microfinance on the entrepreneurial activity of small and medium-sized enterprises, as well as proved the dependence between them and described the consequences for the well-being of the population of the region (2022). In the article of V. Baranova, O. Dutchak, V. Zvonar, L. Denyshchenko, the nature of influence and sustainability of corporate social responsibility (CSR) on the effectiveness of budgetary decentralisation of local self-government in Ukraine was substantiated by modelling, on the basis of which contradictions in the sustainability of social and economic components were outlined. A similar approach was used by N. Parkhomenko, I. Otenko, N. Martynovych and V. Otenko (2023). These authors, based on the method of multiple regression, established a correlation between business development and global and national indicators of sustainable regional development, stating that economic growth in a number of countries negatively affects both environmental and social components. In the works of Boychenko, Martinovich, the problems of sustainable development and the contradictions in it are considered through the prism of the war in Ukraine (Martynovych, Boichenko, Dielini, 2023; Martynovych, Yemchenko, Kulinich, 2023).

Considering how smart policies can address the challenge of achieving economic growth from natural resources and carbon emissions by H. Schandl, S. Hatfield-Dodds, T. Wiedmann, A. Geschke, Y. Cai, J. West and A. Owen (2016), use an approach that combines economic and environmental modelling and consider various scenarios demonstrating that global energy consumption will continue to increase, but the introduction of a global price on carbon and significant investment in resource efficiency could significantly reduce carbon emissions and material consumption. It is noted that developed countries have significant potential to reduce their environmental impact with minimal impact on economic growth. As a result, the authors suggest that it is possible to achieve economic growth and increase the level of well-being without aggravating environmental degradation. The study highlights the importance of scenario-based approaches for understanding the environmental and economic outcomes of various policy alternatives and shows that a highly resource-efficient and low-carbon global economy can put the development of humanity and the achievement of sustainable development goals on a more sustainable path.

In the paper of T. Henfrey, G. Feola, G. Penha-Lopes, F. Sekulova and A. Esteves (2023), the role of community-led initiatives in contributing to the SDGs is examined. It is argued that efforts to ensure sustainability and social justice make a significant contribution to the achievement of almost all SDGs at the local level. It is noted that these initiatives are particularly effective in terms of synergy of various goals, which allows achieving more holistic results. The authors call for a more inclusive approach that recognizes the value of community initiatives in shaping a sustainable and equitable future.

Given the variety of papers devoted to possible contradictions faced by communities in the process of achieving the SDGs, an urgent task is to study the social component of progress in the field of sustainable development and its sources.

The main objective of this study is to develop and apply a comprehensive system of indicators to analyse social cohesion in different regions, and to develop a model for realising the potential of social cohesion given limited resources. This makes it possible not only to assess the current state of social justice, but also to form sufficiently adaptive (universal) tools for forecasting and optimizing actions in the field of social cohesion. Thus, the study is aimed at identifying mechanisms for activating social cohesion and modelling them to achieve sustainable development goals at the national and international levels.

4. Discussion

4.1. Social cohesion as a catalyst for progress in the field of sustainable development of regions

Based on the generalization of the existing theoretical and methodological basis in the field of social justice, it is established that social cohesion is a process that contributes to the achievement of social unity and solidarity among various groups of the population. That is, it is an integral part, a necessary attribute of the concept of fair relations between the individual and society. In the study, social cohesion is understood as a state of internal cohesion in which society is united by common values, interests and goals.

Table 1. Elements of the mechanism for realizing the potential of social cohesion (developed by the authors)

Tools		
	Legislation	Laws and regulations aimed at strengthening social cohesion (for example, laws on equality and anti-discrimination)
	Financial mechanisms	Budget allocations, grants, incentives to support projects and initiatives aimed at strengthening social cohesion.
	Technology platforms	Social networks, mobile apps and other digital tools to promote social cohesion.
	Platforms for dialogue	Forums, conferences, working groups for discussion and coordination of actions to strengthen social cohesion.
Methods		
	Educational programs	Courses and trainings aimed at forming common values and strengthening social ties.
	Sociological research	Surveys, interviews, focus groups to study the level of social cohesion and identify problem areas.
	Mediation and reconciliation	Procedures and practices for resolving social conflicts and reducing tension.
Strategies		
	Stimulating public participation	Promoting active civic participation, civic skills and leadership training.
	Support for cultural diversity	Respect for cultural heritage, integration of migrants and ethnic minorities.
	Responding to social tensions	Mechanisms of early warning and response to emerging social conflicts.
	Strengthening local communities	Strategies for the development of local communities and civil society.
Actions		
	Awareness campaigns	Informational and educational campaigns aimed at raising awareness of the importance of social cohesion.
	Social projects	Specific initiatives and programs aimed at strengthening social ties and networks.
	Integration activities	Projects and initiatives aimed at the integration of migrants, ethnic minorities and other vulnerable groups.
Results		
	Social stability	A state in which different groups of the population feel connected and interdependent, and the likelihood of social conflicts and tensions decreases.
	Strengthening citizens' trust in state and public institutions through effective governance	A state in which society is united by common goals and values, which facilitates the decision-making process and coordination of actions between different levels of management.
	Social welfare	A cohesive society in which resources are distributed more fairly, which contributes to improving the quality of life of all citizens. The level of health, education and social protection increases, which, in turn, strengthens social cohesion and creates a positive cycle of interaction.

As already noted, progress in sustainable regional development is ensured by a harmonious combination of environmental, economic and social aspects and is assessed through a set of indicators and a sustainable development index – as a resulting indicator of such progress, and that the dynamics of progress depends on many factors. Without setting ourselves the task of studying the diversity of factors that affect the sustainable development of regions and their details, we outline the basic necessary list of those that form an integral system that can provide a synergistic effect on the path to sustainability.

1. Economic stability and *green* economic growth, as they create conditions for investing in sustainable technologies and infrastructure, support social stability and allow the integration of economic, social and environmental goals. (World Bank, 2012).
2. Political will and governance that, through effective regulation and incentives, form the conditions for sustainable practices. (United Nations, 2015).
3. Technological innovations and technologies such as renewable energy, smart cities and sustainable agriculture play a key role in the transition to sustainable development. (IRENA, 2020).
4. Education and awareness, which are the basis for making responsible decisions and act as catalysts for change in communities. (UNESCO, 2017).

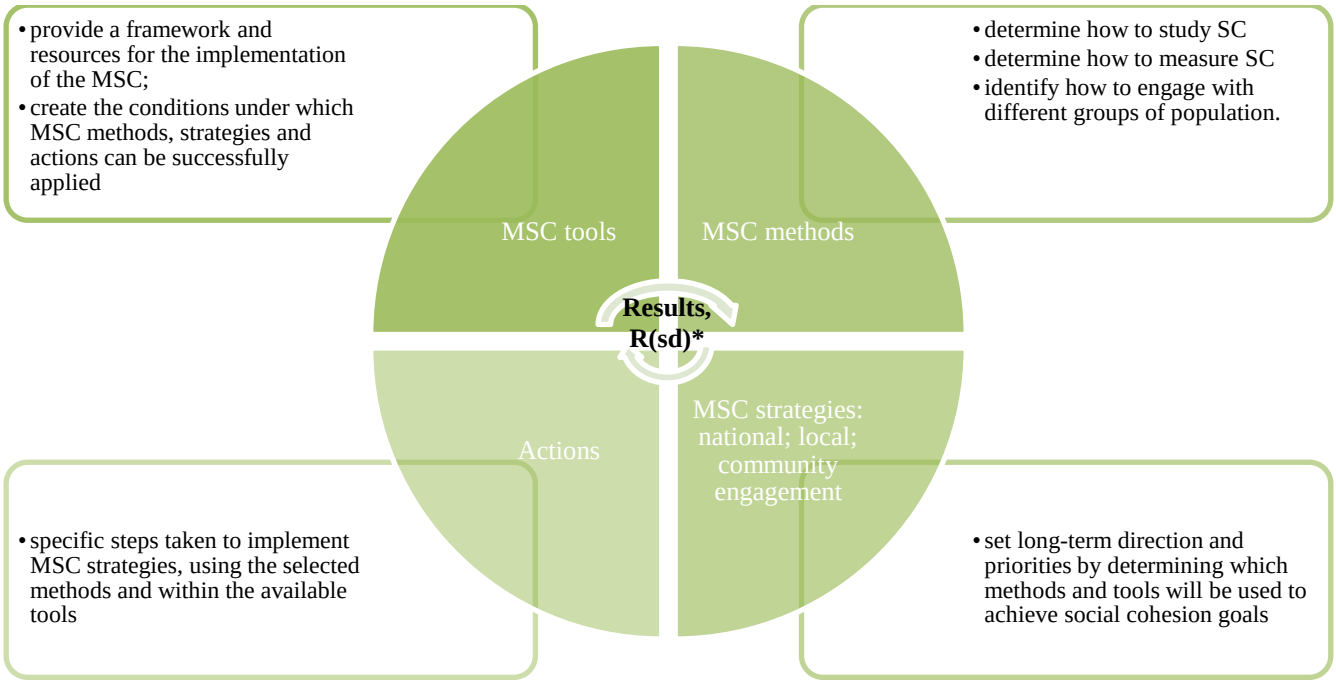

Figure 1. The relationship of the elements of the MSC (developed by the authors)
* R(sd) – request for sustainable development

Table 2. The system of indicators for assessing the level of social cohesion (developed by the authors)

Indicator	Description of the indicator
Economic indicators	
Employment/unemployment rate	Economic inclusion and opportunities
GDP growth	General state of the economy
Income differentiation	Economic equality
Poverty level	Economic security
Trust in institutions	
Trust in the Government	Public trust in government and civil institutions
Demographic indicators	
Population	Demographic changes and diversity.
Migration statistics	Diversity and social inclusion
Social trust, interaction and networks	
Community participation level	Participation in social, community or volunteer activities
Social network size	Indicates the level of social integration
Online social networks	Reflects modern forms of social interaction.
Voter turnout	Indicator of civic engagement and trust in the political system
Generalized trust	Trust in other people
Education and employment	
Access to education	Access to education and level of education
Employment opportunities	Employment level and types of employment
Housing and living conditions	
Rising house prices	Accessibility and security of housing.
Living conditions	Overcrowding, housing costs, etc.
Health	
Access to healthcare	Availability and quality of medical services
Self-report on the state of health	The idea of personal health and well-being
Life expectancy	General well-being and quality of life
Mental health prevalence rates	An indicator of mental health and well-being of society
Crime and security	
Crime rates	Different types of crime and perceptions of security
Perception of security	Measures how safe people feel in their communities
Frequency of violent crimes	The level of violence and security in communities
Public safety statistics	Accidents, injuries and deaths

Table 3. A block of economic indicators in assessing the level of social cohesion

Country	SDG_08_30, the share of the employed population aged 20 to 64 years*		SDG_08_10, euro per capita**		SDG_10_50, revenue share***		SDG_01_20 share of income of persons at risk of poverty****	
	Rate of increase 2022/2010	Deviation from the EU-27 indicator	Rate of increase 2022/2010	Deviation from the EU-27 indicator	Rate of increase 2022/2010	Deviation from the EU-27 indicator	Rate of increase 2022/2010	Deviation from the EU-27 indicator
Belgium	9	-0.5	11	8000	4	2.4	-4	-3.1
Bulgaria	6	-2.7	43	-21610	-13	-4.7	14	7.7
Czechia	18	1.1	23	-10400	-1	2.9	21	-5.1
Denmark	15	6.7	18	22800	1	1.6	-7	-2.2
Germany	7	5.5	13	7150	1	0.5	-15	-1.8
Estonia	9	6.1	47	-12610	-5	-2.2	62	9
Ireland	21	7.3	11	48570	8	1.1	2	-0.5
Greece	19	3.6	-7	-10030	4	-1.2	-3	2.8
Spain	4	-8.3	7	-4280	3	-1.9	-2	1.5
France	11	-5.1	8	4320	-1	0.3	14	-2.4
Croatia	6	-0.6	37	-14320	9	0.1	-11	4
Italy	12	-4.9	3	-1000	-2	-1.9	9	3.3
Cyprus	7	-9.8	13	-2310	1	0.4	-0	-3.2
Latvia	4	3.3	56	-15540	4	-3	19	8.4
Lithuania	21	2.4	65	-13890	4	-3.3	10	7
Luxembourg	23	4.4	3	56990	-6	-0.5	51	-3.3
Hungary	6	0.2	44	-14490	-6	1.6	16	-2.4
Malta	29	5.6	48	-4540	-4	-0.4	14	1.2
Netherlands	35	6.5	14	14940	-4	1.5	58	-0.4
Austria	8	8.3	8	9450	0	1	-11	-4.3
Poland	5	2.7	57	-14260	12	1.8	-19	-0.9
Portugal	23	2.1	14	-9570	6	-0.8	-7	1.3
Romania	16	2.9	59	-18750	2	-2.3	4	5.4
Slovenia	22	-6.1	23	-7000	1	3.5	-1	-2.3
Slovakia	12	3.3	29	-12560	9	4.3	10	-2.8
Finland	15	2.1	8	8920	-2	2	-1	-1.4
Sweden	9	3.8	16	17390	-5	0.7	10	-0.8

*Employment rate (SDG_08_30)
**Real GDP per capita (SDG_08_10)
***Income share of the bottom 40% of the population (SDG_10_50)
****Persons at risk of monetary poverty after receiving social transfers (SDG_01_20)

5. Cultural and social values that form the basis for behaviour, interaction and perception of the world. (UNDP, 2014).
6. Social cohesion, which, by creating an environment conducive to cooperation and joint actions, creates a demand for sustainable development. It is the degree to which members of a society feel connected to each other, including a sense of belonging, interaction, and solidarity. (OECD, 2011).
7. International cooperation as a condition for the effectiveness of joint efforts at the international level. (United Nations, 1992).

Recognizing that progress in the field of sustainable development depends on many interrelated factors, this study will focus on social cohesion. Unlike the other identified factors, social cohesion is more complex in terms of its measurement, evaluation and further consideration in the process of monitoring the impact on sustainable development.

At the same time, it has significant potential to ensure and accelerate progress towards achieving the SDGs through the Social Cohesion Mechanism (MSC) presented in table 1.

The interrelation of the elements of the mechanism of social cohesion and its impact on progress in the field of sustainable development should be noted – see figure 1.

For the EU countries, we will evaluate a block of economic indicators and a block of indicators characterizing trust in institutions in order to draw conclusions about their impact on the level of social cohesion and determine the directions of changes that allow activating the mechanism of social cohesion to achieve sustainable development goals.

Table 3 presents data characterizing the change in indicators that relate to the economic block in the system of indicators for assessing the level of social cohesion (see Table 2). The estimated indicators are also derived when assessing the achievements of countries in the field of sustainable development, in particular SDG 1, SDG 8, SDG 10.

Analysing the block of economic indicators, we note that the employment rate is the only indicator the values of which have been characterized by positive dynamics for all EU countries since 2010. Eight countries have values below the European average, of which Cyprus (64.8%), Spain (66.3%), Slovenia (68.5%) have the lowest indicators.

The considered elements are interconnected and interact with each other, creating a holistic and coordinated mechanism for the implementation of social cohesion, which provides an environment favourable for economic growth, innovation and social well-being.

The challenges faced by modern society in the form of social inequality, migration, ethnic and religious differences reduce opportunities for realizing the potential of social cohesion.

In turn, an effective MSC, under the influence of such factors as *Education and awareness*, *Cultural and social values*, forms a request for progress in the field of sustainable development. Thus, social cohesion plays a key role not only in achieving the direct effect of the functioning of the MSC (see Table 2), but also forms a request for the implementation of environmental and economic initiatives, including the sustainability of the regions.

4. 2. Taking into account the level of social cohesion in the process of monitoring the sustainable development of regions

The condition necessary to take into account the impact of social cohesion on progress in the field of sustainable development is the measurement and assessment of its level. A set of indicators that allows assessing the level of cohesion is presented in Table 2. It should be noted that one of the criteria by which the selection of indicators was carried out is their availability in open sources and comparability for countries and regions. The details of the indicators, their number, the representation of groups should be determined by the objectives of the study, be adaptive to solve the tasks.

Each of the indicators in Table 2 provides a deeper understanding of social cohesion, forming a system of indicators reflecting social, economic, demographic, educational aspects, issues of trust in institutions and security, interaction within society. Using the example of two groups of indicators, let's consider a possible algorithm for taking them into account in the process of studying social cohesion.

It was also found that real GDP per capita increased from 2010 to 2022 for all countries except Greece (18,830 euros per capita in 2022 to 20,150 euros per capita in 2010), and the share of income of the bottom 40% of the population in eleven countries shows negative growth rates. These countries include Bulgaria, Greece, Estonia, France, Italy, Luxembourg, Hungary, Malta, the Netherlands, Finland and Sweden. At the same time, indicators below the European average (21.7%) in 2022 were recorded in Bulgaria (17.0%), Estonia (19.5%), Greece (20.5%), Spain (19.8%), Italy (19.8%), Latvia (18.7%), Lithuania (18.4%), Luxembourg (21.2%), Malta (21.3%), Portugal (20.9%) and Romania (19.4%).

The most pessimistic is the dynamics of the indicator estimating the proportion of people at risk of monetary poverty after social payments. Thus, fifteen EU countries demonstrate a positive value of the growth rate, which indicates an increase in their share. At the same time, for eleven countries – Bulgaria (22.2%), Estonia (23.5%), Greece (17.2%), Spain (16.0%), Croatia (18.5%), Italy (17.8%), Latvia (22.9%), Lithuania (21.5%), Malta (15.7%), Portugal (15.8%), Romania (19.9%) – values are above the EU-27 index (14.5%).

Denmark, Germany and Ireland, both in terms of the growth rates of the estimated indicators, and in comparison, with the value of the EU-27, demonstrate dynamics indicating positive changes. For example, for Austria, Poland and Finland, only one of the estimated parameters exceeds the limits of positive dynamics. Thus, we can draw an interim conclusion that positive changes are noted in the block of economic indicators for a small number of countries: these are Denmark, Germany, Ireland, Austria, Finland and Poland.

Table 4 presents an analysis of the indicators included in the *trust in institutions* block in accordance with the proposed system of indicators for assessing the level of social cohesion (see Table XX). Note that the indicators included in this block are directly taken into account when calculating SDG 16.

The analysis of the expenses of EU states on judicial instances shows an increase in all countries except Greece, where the value of the indicator from 2010 to 2021 decreased from 675 million euros to 648 million euros. The largest increase was recorded in Bulgaria, Latvia, Malta, Romania, Iceland. The lowest values of the indicator at the end of the study period in absolute terms were in Cyprus (33 million euros), Malta (58 million euros), Iceland (51 million euros). The most significant amounts of financing of courts are in Germany (14330 million euros).

Assessing the perceived independence of the justice system in the EU countries, we note that negative trends are observed in Belgium, Denmark, Estonia, Ireland, Croatia, Cyprus, Hungary, Poland, Romania, Sweden. When compared with the EU-27 indicator, the group of countries with lower values of the indicator increases to seventeen. In addition, in the analysed period, the corruption perception index worsened in eleven countries. The largest decrease in the indicator was in Croatia (from 55 to 42 points), Cyprus (from 66 to 52 points), Malta (from 57 to

51 points). The greatest progress was in Greece (from 36 to 52 points). The highest rates are in Denmark, Finland and Sweden (90, 87 and 83 points, respectively).

Table 4. A block of indicators of trust in institutions in assessing the level of social cohesion

Country	SDG_16_30, million euros*		SDG_16_40, %**		SDG_16_50, scores from 0 to 100***		SDG_16_60, %****	
	Rate of increase 2021/2010	Deviation from the EU-27 indicator	Rate of increase 2022/2016	Deviation from the EU-27 indicator	Rate of increase 2022/2012	Deviation from the EU-27 indicator	Rate of increase 2022/2010	Deviation from the EU-27 indicator
Belgium	28	-46585.00	-3	2.00	-3	9.00	-22	1
Bulgaria	141	-47403.00	35	-37.00	5	-21.00	-27	-6
Czechia	55	-47182.00	21	-13.00	14	-8.00	-16	-2
Denmark	16	-47361.00	-5	28.00	0	26.00	-4	14
Germany	35	-33579.00	10	9.00	0	15.00	18	3
Estonia	110	-47823.00	-3	2.00	16	10.00	-3	10
Ireland	69	-47156.00	-3	15.00	12	13.00	28	14
Greece	-4	-47261.00	13	-13.00	44	-12.00	16	-6
Spain	9	-43326.00	27	-30.00	-8	-4.00	3	-10
France	32	-41637.00	4	-6.00	1	8.00	-28	-17
Croatia	16	-47645.00	-25	-32.00	9	-14.00	32	4
Italy	16	-41909.00	48	-35.00	33	-8.00	-2	4
Cyprus	27	-47876.00	-11	-4.00	-21	-12.00	0	1
Latvia	118	-47754.00	26	-18.00	20	-5.00	4	-3
Lithuania	56	-47778.00	6	-11.00	15	-2.00	-7	3
Luxembourg	74	-47747.00	5	13.00	-4	13.00	-11	7
Hungary	54	-47319.00	-12	-11.00	-24	-22.00	-10	11
Malta	176	-47851.00	52	-16.00	-11	-13.00	21	14
Netherlands	18	-45589.00	7	12.00	-5	16.00	-10	7
Austria	37	-46782.00	8	17.00	3	7.00	2	-2
Poland	43	-44928.00	-47	-15.00	-5	-9.00	-4	5
Portugal	2	-47167.00	42	-27.00	-2	-2.00	27	20
Romania	153	-46832.00	-6	-9.00	5	-18.00	-18	-1
Slovenia	14	-47671.00	63	-30.00	-8	-8.00	-12	-7
Slovakia	39	-47618.00	19	-39.00	15	-11.00	-43	-7
Finland	18	-47336.00	10	20.00	-3	23.00	-4	2
Sweden	35	-46518.00	-4	17.00	-6	19.00	2	11

* General expenses of the state on judicial instances (SDG_16_30)
** Perceived independence of the justice system (SDG_16_40)
*** Corruption perception index (SDG_16_50)
**** Population having confidence in EU institutions (SDG_16_60)

Thus, the dynamics of indicators assessing trust in institutions indicates that the problem of social cohesion is becoming more acute for most EU countries, the manifestation of which is confirmed by the data in Table 4.
Taking into account the influence of two groups of indicators on the level of social cohesion demonstrates that the negative dynamics, unique for each of the countries considered, requires the development of measures aimed at changing the identified trends. Conducting an analysis for the entire system of indicators for assessing the level of social cohesion will allow us to form a list of actions aimed at increasing the potential of the MSC and its implementation, which in turn will lead to the achievement of sustainable development goals. Determining the priority and scenarios for the implementation of the developed measures is a separate task.

4.3. Modelling as a tool for realizing the potential of social cohesion to achieve the goals of sustainable development in regions

The task of modelling scenarios for realizing the potential of social cohesion to achieve the goals of sustainable development in regions, taking into account their priority with limited resources (budget, people, time, etc.) can be solved using an economic and mathematical model, which will reduce subjectivity in the decision-making process.

Let *R* denote the amount of resources that a system (organisation, community, society as a whole) has at its disposal to achieve the target parameters in the field of sustainable development.
r_i – the amount of resources required for the implementation of the i-th event (determined by the results of the assessment of the current level of social cohesion).
Using the opinion of experts, who can be both representatives of the expert community and representatives of the system (then the decision is made by a majority of votes), the priority of the implementation of the i-th event Y_i is determined. At the same time:

$$\sum_{i=1}^{n} \mathrm{Y}\, i=1 \quad (1)$$

Then the economic and mathematical model will have the following form:

$$\sum_{i=1}^{n} xi * \mathrm{Y}\, i \rightarrow max \quad (2)$$

$$\sum_{i=1}^{n} \mathrm{xi} * \mathrm{ri} \leq Ri \quad (3)$$

$$\mathrm{xi}=\begin{cases} 1, & \text{if the i-th event is included in the implementation plan;} \\ 0, & \text{if the event is not included in the implementation plan} \end{cases}$$

We recommend using the proposed model to achieve the goals of sustainable development of the regions by realizing the potential of social cohesion through consistent and justified (previously assessed) activation of the MSC. Then the list of i-x measures should be based on taking into account the indicators that form the system for assessing the level of social cohesion, and can be aimed at improving the effectiveness of each of the elements of the MSC. The proposed model can be adapted to solve problems in the field of sustainable development under various constraints of a regional system that has social cohesion.

5. Conclusion

Social cohesion acts as a catalyst for achieving the Goals of Sustainable Development, ensuring social unity and solidarity among various groups of the population. The developed mechanism of social cohesion, the elements of which play a key role in the formation and strengthening of social ties, provides as a result a request for sustainable development. Contemporary challenges such as social inequality, migration and ethnic differences emphasise the need to enhance measures to strengthen social cohesion. The effective functioning of the mechanism of social cohesion can be a response to these challenges, contributing to the implementation of environmental and economic initiatives towards sustainable development.
The system of indicators presented in the study covers a wide range of indicators, from economic and demographic to educational and issues of trust in institutions, which, subject to their assessment, contributes to more accurate and effective planning and implementation of sustainable development strategies.
Based on data on two groups of indicators, it was concluded that Denmark, Germany and Ireland demonstrate positive changes in most economic indicators. This indicates more successful economic policies and measures taken by these countries to strengthen social cohesion and achieve sustainable development goals. Assessing the dynamics of a group of indicators of trust in institutions, it was concluded that for most EU countries, the development and implementation of measures to strengthen citizens' trust in state and public institutions is relevant.
An economic and mathematical model of scenarios for realizing the potential of social cohesion to achieve sustainable development goals has been developed. The use of the model makes it possible to prioritize various activities, taking into account limited resources and the current level of social cohesion, which ensures a more efficient allocation of resources. The proposed model is flexible and can be adapted to various conditions and constraints, which makes it a universal tool for solving problems in the field of sustainable development.
In general, the use of modelling in the context of social cohesion and sustainable development makes it possible to systematize and optimize the decision-making process, taking into account the current needs and limitations of the system.

References

1. BARANOVA V., KULINICH T., DUTCHAK O., ZVONAR V., DENYSHCHENKO L., 2021, Development of corporate social responsibility in business as a factor of fiscal decentralization, *Journal of Eastern European and Central Asian Research*, 8(3): 411-424, https://doi.org/10.15549/jeecar.v8i3.760.
2. DANG H. A. H., SERAJUDDIN U., 2020, Tracking the sustainable development goals: Emerging measurement challenges and further reflections, *World Development*, 127: 104570, https://www.sciencedirect.com/science/article/abs/pii/S0305750X19301445 (04.08.2023).
3. EUROSTAT, 2023, *Data Browser*, https://ec.europa.eu/eurostat/databrowser/explore/all/all_themes (20.08.2023).
4. EUROSTAT, 2023, *Eurostat*: Employment rate by sex, https://ec.europa.eu/eurostat/databrowser/view/sdg_08_30/default/table?lang=en (20.08.2023).
5. EUROSTAT, 2023, *Real GDP per capita,* https://ec.europa.eu/eurostat/databrowser/view/sdg_08_10/default/table?lang=en (20.08.2023).
6. EUROSTAT, 2023, *Eurostat: Income share of the bottom 40 % of the population,* https://ec.europa.eu/eurostat/databrowser/view/sdg_10_50/default/table?lang=en (20.08.2023).
7. EUROSTAT, 2023, *Eurostat: Persons at risk of monetary poverty after social transfers – EU-SILC and ECHP surveys*,

https://ec.europa.eu/eurostat/databrowser/view/sdg_01_20/default/table?lang=en (20.08.2023).
8. EUROSTAT, 2023, *Eurostat*: *General government total expenditure on law courts,* https://ec.europa.eu/eurostat/databrowser/view/SDG_16_30/default/table (20.08.2023).
9. EUROSTAT, 2023, *Eurostat*: *Perceived independence of the justice system,* https://ec.europa.eu/eurostat/databrowser/product/page/SDG_16_40 (20.08.2023).
10. EUROSTAT, 2023, *Eurostat: Corruption Perceptions Index,* https://ec.europa.eu/eurostat/databrowser/view/SDG_16_50/default/table (20.08.2023).
11. EUROSTAT, 2023, *Eurostat: Population with confidence in EU institutions by institution*, https://ec.europa.eu/eurostat/databrowser/view/SDG_16_60/default/table (20.08.2023).
12. GUZEL A. E., ARSLAN U., ACARAVCI A., 2021, The impact of economic, social, and political globalization and democracy on life expectancy in low-income countries: are sustainable development goals contradictory?, *Environment, Development and Sustainability*, 1-18. https://doi.org/10.1007/s10668-021-01225-2.
13. HENFREY T., FEOLA G., PENHA-LOPES G., SEKULOVA F., ESTEVES A. M, 2023, Rethinking the sustainable development goals: Learning with and from community-led initiatives, *Sustainable Development*, 31(1): 211-222, https://doi.org/10.1002/sd.2384.
14. HICKEL J, 2019, The contradiction of the sustainable development goals: Growth versus ecology on a finite planet, *Sustainable Development*, 27(5): 873-884, https://doi.org/10.1002/sd.1947.
15. INTERNATIONAL RENEWABLE ENERGY AGENCY, 2019, *Innovation landscape for a renewable-powered future: Solutions to integrate variable renewables*, Abu Dhabi, https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Feb/IRENA_Innovation_Landscape_2019_report.pdf?rev=754a9a1985434152ba4eaa5ef80b7225 (03.08.2023).
16. KOPNINA H., 2016, The victims of unsustainability: A challenge to sustainable development goals, *International Journal of Sustainable Development & World Ecology*, 23(2): 113-121, https://doi.org/10.1080/13504509.2015.1111269 (06.08.2023).
17. KULINICH T., DOBIZHA N., DEMCHENKO O., BODNAR O., MYRONCHUK V., ZELENSKYI A., 2022, Microfinance: Methods, Models and its Impact on Economic Development, *WSEAS Transactions on Environment and Development*, 18 144-151, https://doi.org/10.37394/232015.2022.18.16.
18. MARTYNOVYCH N., BOICHENKO E., DIELINI M. (2023) Renovation of Ukraine After War: Special Restoration Regimes and Stimulation of Sustainable Development of Territories, *International review for spatial planning and sustainable development*, 11(4): 57-70, https://doi.org/10.14246/irspsd.11.4_54.
19. MARTYNOVYCH N., YEMCHENKO I., KULINICH T., 2023, From the territory of recovery to sustainable development: A methodological concept of effective socio-economic development of Ukraine after the war, *Problemy Ekorozwoju/ Problems of Sustainable Development*, 18(2): 12-24, https://doi.org/10.35784/preko.3923.
20. OECD, 2012, *Perspectives on Global Development 2012: Social Cohesion in a Shifting World*, https://www.oecd-ilibrary.org/development/perspectives-on-global-development-2012_persp_glob_dev-2012-en (02.08.2023).
21. OECD, 2021, *Perspectives on Global Development 2021: From Protest to Progress?*. OECD Development Centre, https://www.oecd-ilibrary.org/development/perspectives-on-global-development-2021 405e4c32-en (4.09.2023).
22. RASZKOWSKI A, BARTNICZAK B., 2019, On the Road to Sustainability: Implementation of the 2030 Agenda Sustainable Development Goals (SDG) in Poland, *Sustainability,* 11(2): 366, https://doi.org/10.3390/su11020366.
23. UNDP, 2022, *Human development report 2021-22*, https://hdr.undp.org/content/human-development-report-2021-22 (02.08.2023).
24. UNESCO, 2019, *Thematic Indicators for Culture in the 2030 Agenda,* https://uis.unesco.org/sites/default/files/documents/publication_culture_2020_indicators_en.pdf (10.08.2023).
25. UNESCO, 2017, *Education for Sustainable Development Goals: Learning Objectives*, https://unesdoc.unesco.org/ark:/48223/pf0000247444 (02.08.2023).
26. UNITED NATIONS, 2002, *United Nations Report of the World Summit on Sustainable Development Johannesburg, South Africa*, 26 August – 4 September, New York, https://documents-dds-ny.un.org/doc/UNDOC/GEN/N02/636/93/PDF/N0263693.pdf?OpenElement (02.08.2023).
27. UNITED NATIONS, 1993, *Report of the United Nations Conference on Environment and Development*. Rio de Janeiro, 3 – 14 June 1992, New York https://documents-dds-ny.un.org/doc/UNDOC/GEN/N92/836/55/PDF/N9283655.pdf?OpenElement (4.09.2023).
28. UNITED NATIONS, 2015, *Agenda for Sustainable Development*, Resolution Adopted by the General Assembly on 25 September (A/70/L.1), https://www.un.org/en/development/desa/population/ migration/generalassembly/docs/globalcompact/A_RES_70_1_E.pdf (02.08.2023).
29. UNITED NATIONS, 2022, *The Sustainable Development Goals Report 2022*, https://unstats.un.org/sdgs/report/2022/The-Sustainable-Development-Goals-Report-2022.pdf (11.08.2023).
30. UNITED NATIONS, 2015, *United Nations, Transforming our world: the 2030 Agenda for Sustainable Development*, 2015, https://wedocs.unep.org/bitstream/handle/20.500.11822/9814/-Transforming_our_world_the_2030_ Agenda_for_Sustainable_Development-2015TransformingOurWorld_2015.pdf.pdf?sequence=3&amp%3BisAllowed= (02.08.2023).
31. UNITED NATIONS, 1992, *Agenda 21: Programme of Action for Sustainable Development*, https://sustainabledevelopment.un.org/outcomedocuments/agenda21 (02.08.2023).
32. SACHS J.D., SCHMIDT-TRAUB G., MAZZUCATO M. et al., 2019, Six Transformations to achieve the Sustainable Development Goals, *Nat Sustain*, 2: 805-814, https://doi.org/10.1038/s41893-019-0352-9.
33. SCHANDLH., HATFIELD-DODDS S., WIEDMANN T., GESCHKE A., CAI Y., WESTJ., OWEN A., 2016, Decoupling global environmental pressure and economic growth: scenarios for energy use, materials use and carbon emissions, *Journal of cleaner production*, 132: 45-56, https://doi.org/10.1016/j.jclepro.2015.06.100.

34. SPAISER V., RANGANATHAN S., SWAINR. B., SUMPTER D. J., 2017, The sustainable development oxymoron: quantifying and modelling the incompatibility of sustainable development goals, *International Journal of Sustainable Development & World Ecology*, 24(6): 457-470, https://doi.org/10.1080/13504509.2016.1235624.
35. WORLD BANK, 2013, *Inclusive Green Growth Development*, https://doi.org/10.1596/978-0-8213-9551-6.
36. WORLD BANK, 2022, *World Bank, World Development Report 2022*, https://www.worldbank.org/en/publication/wdr2022 (02.08.2023).