ТЕОРЕТИЧНІ ТА ПРИКЛАДНІ ПРОБЛЕМИ
І МЕТОДИ СИСТЕМНОГО АНАЛІЗУ

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STUDY OF SECURITY TRENDS OF THE GLOBAL SOCIETY BASED ON INTELLIGENT DATA ANALYSIS

M. ZGUROVSKY, I. PYSHNOGRAIEV

Abstract. This article is devoted to applying system analysis and data mining methodology to one of the most pressing problems today: studying the security of a global society in a conflicting world. A set of global threats relevant to the first half of the 21st century is considered. These threats have been identified by the United Nations (UN), the World Health Organization (WHO), the World Economic Forum, and other reputable international organizations. As a result of applying the Delphi method to analyze a wide range of threats identified by these organizations, 11 of the most important threats to humanity in the first half of the 21st century were identified. The vulnerabilities of different countries to the impact of the totality of these threats are analyzed. Scenarios for the possible development of a global society during and after the conflict are constructed.

Keywords: global safety, systemic conflicts, global threats, Minkowski norm, vulnerability.

INTRODUCTION

Since the beginning of the 21st century, many recognized international organizations have conducted research to identify the major challenges facing humanity. Such organizations include the United Nations (UN), the World Health Organization (WHO), the World Economic Forum (WEF), Transparency International, the Global Footprint Network, the International Energy Agency, the World Resources Institute, the British Petroleum Company and others. Each of these organizations not only identified challenges for their field of activity, but also tried to assess the impact of these challenges on other areas of human life.

There is a problem of consolidating these studies and creating a necessary and sufficient set of global threats to the sustainable development of mankind.

This study is a continuation of studies of the behaviour of complex socio-economic systems [1], global threats and sustainable development processes [2]. The new study took into account the results of the analysis of global threats to humanity, performed by the following international organizations:

1. On January 11, 2022, the World Economic Forum presented The Global Risks Report 2022 [3], in which for the next 10 years it formed the necessary and sufficient set of threats to the sustainable development of mankind. WEF experts

identified a total of 37 global threats in 5 areas of human activity: economic, environmental, geopolitical, social and technological.

2. Using the Delphi method, The Millennium Project identified 15 global challenges in the same areas [4].

3. Due to the fact that this study examines the threats to sustainable development, it is also necessary to take into account the 17 UN Sustainable Development Goals set out in the "Sustainable Development Agenda 2030" [5, 6].

For further study, we use the variety of threats formulated by the above-mentioned international organizations.

CHARACTERISTICS OF GLOBAL THREATS TO SUSTAINABLE DEVELOPMENT

As a result of applying the Delphi method to analyze a wide range of threats identified by the organizations mentioned above, 11 of the most important threats to humanity in the first half of the 21st century were identified.

Threat 1. Global decrease in energy security (ES)

The country's energy independence is an integral and fundamental component of its sovereignty. It determines the country's self-sufficiency in energy supply and energy generation. In the conditions of constant growth of consumption of energy of the world it is necessary to increase also its production (Fig. 1).

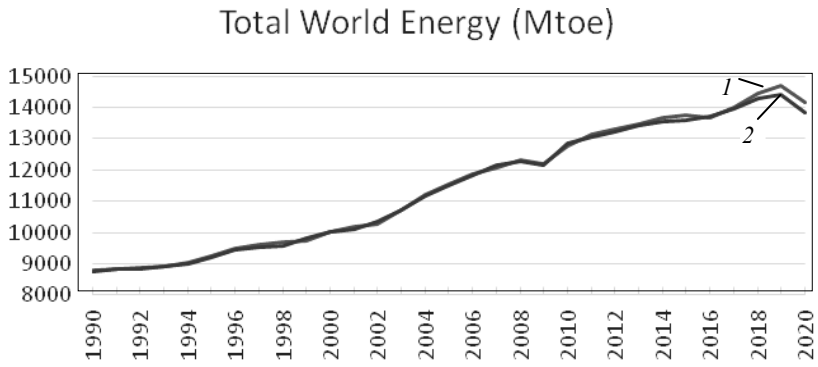

Fig. 1. World energy consumption and production: *1* — Producttion; *2* — Consumption

Source: based on data in [*7*]

At the same time, it is impossible to constantly increase the extraction of fossil energy resources (Fig. 2), whose reserves are rapidly declining. In addition, the behaviour of this type of resources in the market is significantly influenced by world politics. In the Short-term Energy Outlook of the U.S. The Energy Information Administration [8] noted that the oil and gas market have great uncertainties, including due to "Russia's full-scale invasion of Ukraine".

On the one hand, the world community needs to find new energy sources, develop alternative energy [9], and on the other hand in conditional of changing geopoletics, the is a need to take care of its independence from extremal energy supplies.

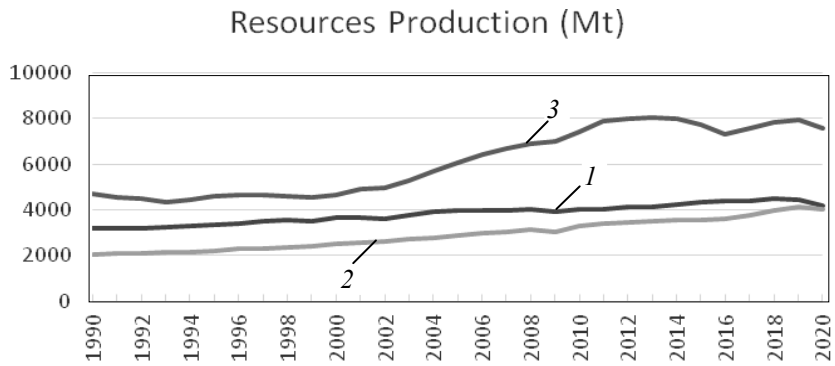

Fig. 2. Production of fossil resources: *1* — Crude oil; *2* — Natural gas; *3* — Coal and lignite

Source: based on data in [*7*]

In order to quantitatively estimate the energy security of different countries of the world the Energy Freedom Index (ES) [10] is used. It aggregates the of three separate sub-indices, which can be the object of independent analysis:

- Sub-index of energy potential – determines the established potential of the country in terms of access to fuel and energy resources: coal, natural gas and crude oil reserves (calculated as the value of the total explored reserves of coal, natural gas and crude oil, determined per capita*)*.
- Sub-index of energy balance – reflects the annual balance between total production and consumption of electricity and heat in the country (calculated as the ratio of annual production and annual energy consumption in million metric tons of oil equivalent).
- Sub-index of energy development – demonstrates the ability of the country's energy system to develop with the possibility of energy transition (calculated as chain growth rate of the total installed capacity of all electricity generation facilities in the country).

Threat 2. The imbalance between biological capacity of the Earth and human needs in biosphere (BB)

In early 2022, the world's population reached 7.95 billion people living on the total area 510 072 000 km^2 [11]. According to the method of arithmetic extrapolation the Earth population will have been 9.75 billion people by the year 2050. At the same time, our planet has limited space and resources.

In 2018, the consumption of natural resources exceeded 1.75 times that the Earth's biosphere can restore, forming a significant environmental deficit (Fig. 3).

Ecological Footprint adds up all the productive areas for which a population, a person or a product competes. It measures the ecological assets that a given population or product requires to produce the natural resources it consumes (including plant-based food and fiber products, livestock and fish products, timber and other forest products, space for urban infrastructure) and to absorb its waste, especially carbon emissions. The Ecological Footprint tracks the use of productive surface areas. Typically, these areas are: cropland, grazing land, fishing grounds, built-up land, forest area, and carbon demand on land. On the supply side, a city, state or nation's biocapacity represents the productivity of its ecologi-

cal assets (including cropland, grazing land, forest land, fishing grounds, and built-up land) [13].

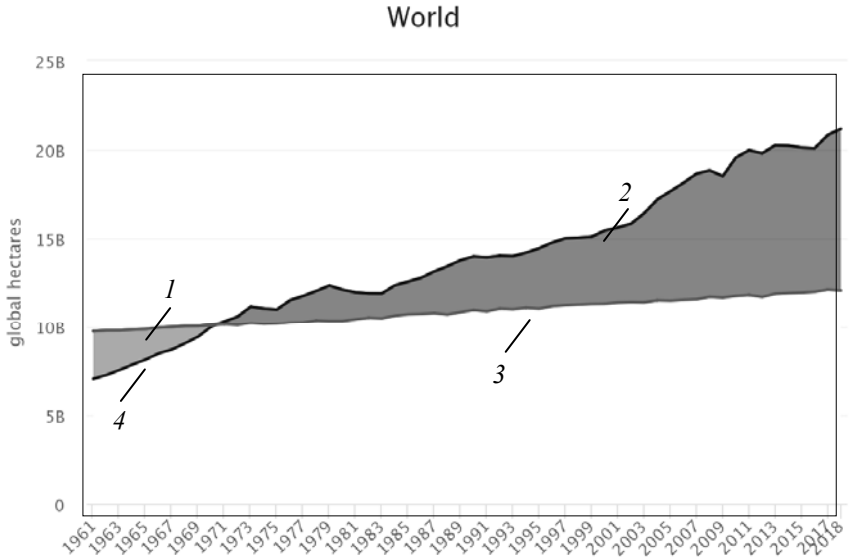

Fig. 3. Ecological footprint trend: *1* — Ecological Reserve; *2* — Ecological Deficit; *3* — Biocapasity; 4 — Ecological Footprint

Source: [*12*]

Therefore, the increase in the ecological deficit over time can lead to irreversible changes in the biosphere, which will directly threaten the existence of mankind.

For estimation of increasing threats, connected with imbalance between biological capability of the Earth and human requirements in biosphere, in terms of demographic structure change of the world we will use the indicator which is ratio level between biocapacity and ecological footprint consumption for a country [12]:

– value >1 – the country is an ecological creditor;

– value <1 – the country is an ecological debtor.

Threat 3. Growing inequality between people and countries on the Earth (GINI)

According to the World Bank, in 2018, 3 billion people live on less than $ 150 a month [14]. And although most regions, except the Middle East and North Africa, are showing progress in the fight against poverty, the situation remains threatening [15].

Political and military conflicts, pandemics, global corruption, terrorism, depletion of resources, etc. complicate humanity's ability to overcome poverty and inequality. For example, [16] emphasizss that due to the restrictions imposed by the proliferation of Covid-19, for the first time since 1993, inequalities between countries are projected to increase (Fig. 4).

To asses quantitatively the disparity of the distribution of economic and social benefits for each of the countries under study, we will use the Gini index [17], which reflects these characteristics.

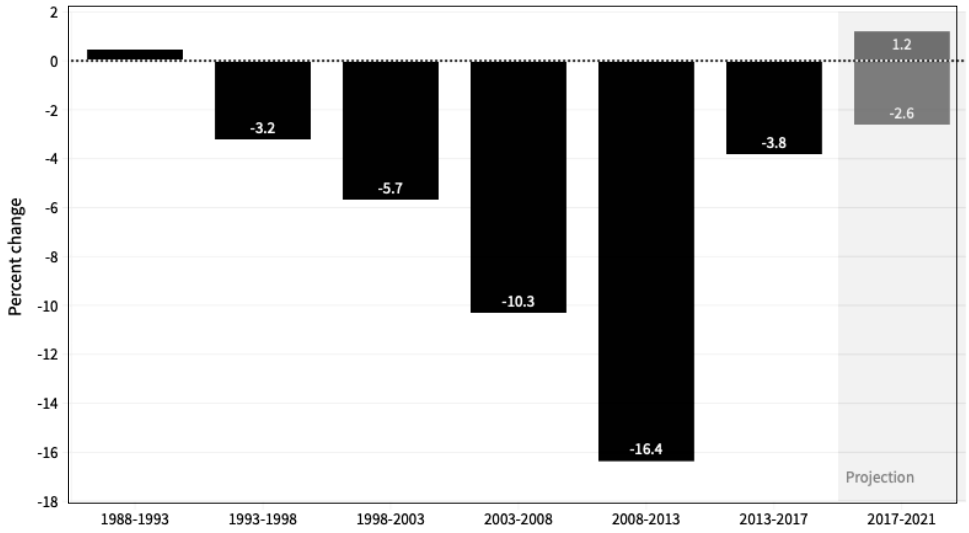

Fig. 4. Degree of inequality between countries
Source: [16]

Threat 4. The spread of global diseases (GD)

The World Health Organization has identified the top 10 causes of death globally in 2019, which caused 55% of 55.4 million deaths worldwide (Fig. 5) [18].

At a global level, 7 of the 10 leading causes of deaths in 2019 were non-communicable diseases. They kill 41 million people each year, equivalent to 71% of all deaths globally. The main types of NCD are cardiovascular diseases (such as heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma) and diabetes [19].

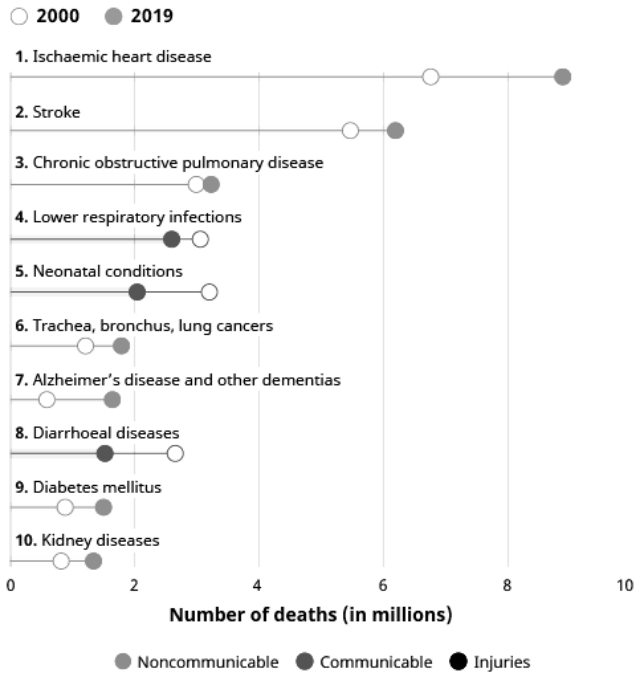

Fig. 5. Top 10 causes of death globally in 2019.
Source: [18]

Also, in the study we consider the communicable (including infectious) diseases, such as: tuberculosis, HIV/AIDS, diarrhea, malaria, hepatitis, etc. They have lower part of deaths globally, but the threat of new diseases remains. Lower respiratory infections remained the world's most deadly communicable disease, ranked as the 4th leading cause of death. However, the number of deaths has gone down substantially: in 2019 it claimed 2.6 million lives, 460 000 fewer than in 2000 [20]. Also, nearly half of the world's population was at risk of malaria in 2020, it is estimated 41 million cases [18]. In 2020, 680 000 (480 000–1.0 million) people died from HIV-related causes and 1.5 million (1.0–2.0 million) people acquired HIV [21]. Also dangerous for the world community are the pandemics of swine flu (2008–2009), Ebola (2014–2015), SARS-CoV-2 (from 2020), which also contributed to the deepening of economic crises [22].

The spread of global diseases (GD) is measured in the normalized total number of people (millions per year) who died from these diseases. For the subsequent simulation, we take data on these diseases from the World Health Organization [23].

Threat 5. Information gap (IG)

Humanity is constantly generating gigantic volumes of new data and information. There were 79 zettabytes of data generated worldwide in 2021, 90% of it is replicated [24] (Fig. 6). This raises a number of challenges: how to access this information, how to process it, and whether it is trustworthy.

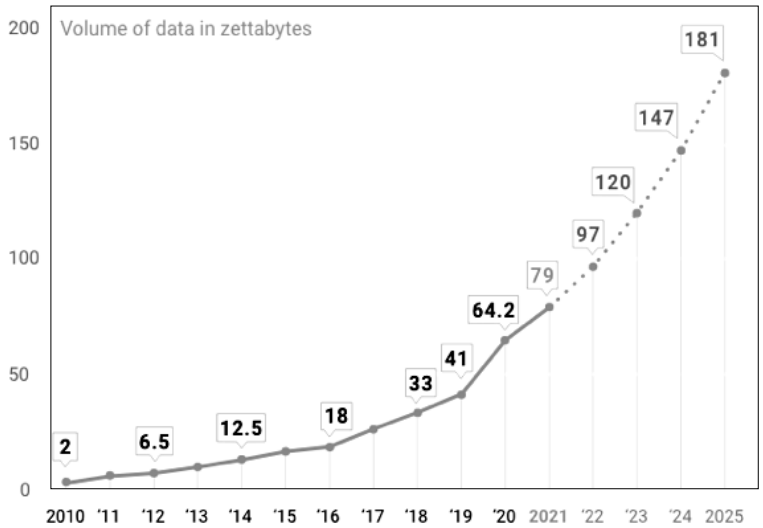

Fig. 6. Annual volume of data generated, consumed, copied and stored
Source: [*24*]

To assess these challenges Information Gap is formed by following determinants of the modern information society:

1. Readiness of the local ICT infrastructure (RLI). This indicator is based on the ICT Development Index [25], it shows the degree of involvement of the population in the consumption / generation of information and the level of exports of services and goods of the sector, which indicates the availability of an appropriate base. The following data sets with equal weights are used for this purpose:

– individuals using the Internet (% of population) [26];
– mobile cellular subscriptions (per 100 people) [26];
– fixed broadband subscriptions (per 100 people) [26];
– ICT goods exports (% of total goods exports) [27];
– ICT service exports (BoP, current US$) [28].

2. Number of secure Internet servers (per 1 million people) (SIS) [29]. Secure servers are servers using encryption technology in internet transactions. They provide the infrastructure for the secure exchange of generated data.

3. The vulnerability of one or another country, territory or world to the action of cyber-attacks. This component will be measured using the Global Cybersecurity Index (GCI) [30].

4. World Press Freedom index (WPF). It is defined as the ability of journalists as individuals and collectives to select, produce, and disseminate news in the public interest independent of political, economic, legal, and social interference and in the absence of threats to their physical and mental safety [31].

The resulting index of IG will be calculated from the formula:

$$IG = 0.4RLI + 0.15SIS + 0.3GCI + 0.15WPF.$$

Threat 6. Corruption perception (CP)

Humanity is constantly generating gigantic volumes of new data and information. There were 79 zettabytes of data generated worldwide in 2021, 90% of it is replicated [24] (Fig. 6). This raises a number of challenges: how to access this information, how to process it, and whether it is trustworthy.

Corruption is the biggest obstacle to the economic and social development of society. Over last decade world has made no significant progress against corruption [32].

To estimate the influence of corruption on socio-economical and cultural development of different countries of the world we will use the Corruption Perception Index established by the international organization Transparency International [33].

Corruption is connected with all spheres of society. Countries experiencing armed conflict or authoritarianism tend to earn the lowest scores, including Venezuela, Afghanistan, North Korea, Yemen, Equatorial Guinea, Libya and Turkmenistan. Also, last research of Transparency International showed that corruption level is opposite to the level of human rights [32].

Threat 7. Limited access to drinking water (WA)

According to the data of the World Health Organization (WHO) and the UNICEF the world is under the threat of reduced the access to drinking (potable) water and to sanitary facilities. The fourth part of all mankind (2 billion people) does not have access to drinking water in 2020. At the same time 46% (4.2 billion people) lack safe sanitation. This situation persists, provided that in 2030 the Agenda for Sustainable Development agreed to take concrete steps to achieve goals 6.1 and 6.2, i.e. to make access to water "for all" [34].

Meanwhile the world's population grows, especially in underdeveloped countries, the struggle for control over the remnants of drinking water resources

increases. This phenomenon gives rise to the next, growing in time, threat to humanity.

The limited access to the drinking water will be estimated by the inversed magnitude to the indicator of the access to drinking water [35].

Threat 8. Impact of climate change and natural disaster (CN)

According to [5], the threat of climate change and the occurrence of natural disasters require increased attention of society and its consolidated efforts to minimize this factor.

Since the 1940s, the Earth's surface temperature has been constantly rising (Fig. 7). That extra heat is driving regional and seasonal temperature extremes, reducing snow cover and sea ice, intensifying heavy rainfall, increase the number of natural disasters, and changing habitat ranges for plants and animals – expanding some and shrinking others [36].

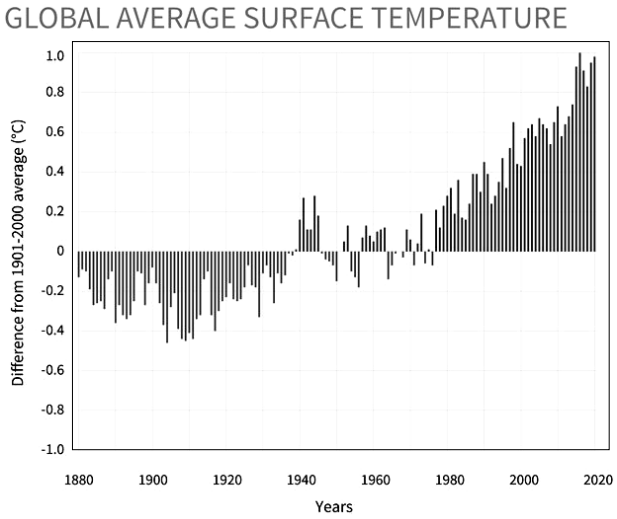

Fig. 7. Yearly surface temperature compared to the 20th-century average from 1880–2020
Source: [*36*]

It is necessary to accept that influence of carbon dioxide emissions on the global temperature changing is much higher than the corresponding influence of methane. That is why the danger of global warming could be estimated by the amount of carbon dioxide emissions CO_2 in metric tons per capita (CDE) [37].

In 2021, 432 natural disasters were registered, causing 10.5 thousand deaths and causing $252 billion as economic damage [38].

For the quantitative estimation of the degree of vulnerability of the world countries to the natural disasters the index of vulnerability to natural cataclysms (NDT) is used [39]. It includes the affected from draughts, floods, hurricanes, extreme temperatures, earth-quakes and tsunami.

As a result of the control over decreasing natural resources the struggle not only between countries but also between separate groups of population can exacerbate. This process will cause new global conflicts.

Thus, the CN we calculate as follows:

$$CN = 0.3CDE + 0.7NDT.$$

Threat 9. The state fragility (SF)

In conditions of political, social and economic instability, each country faces the task of preserving its sovereignty and improving its position in all spheres of functioning. Thus, in Fig. 8 shows the gradual growth of the World Uncertainty Index and the main reasons for its peaks [40]. It is natural that these events affect the development of each country individually.

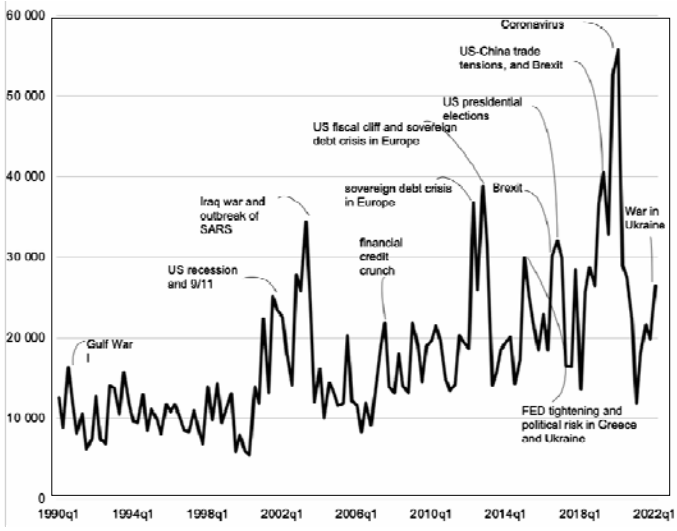

Fig. 8. World Uncertainty Index

Source: [40]

A number of such pressures act on the fragile state. For the quantitative estimation of the threat in our study the Fragile States Index produced by The Fund for Peace (FFP) is used [41]. It is based on a conflict assessment framework – known as "CAST" – that was developed by FFP nearly a quarter-century ago for assessing the vulnerability of states to collapse. The CAST framework was originally designed to measure this vulnerability and assess how it might affect projects in the field, and continues to be used widely by policy makers, field practitioners, and local community networks. The methodology uses both qualitative and quantitative indicators, relies on public source data, and produces quantifiable results.

Threat 10. Increasing proliferation and global terrorism (PT)

This global threat we will consider in the terms of the debarment of the nuclear war, terrorism and the increasing of total number of weapons. There are three components for assessing proliferation and global terrorism:

1. The Nonproliferation Index (NPI) [42]. It defines degree of military proliferation and covers four categories of policy: demilitarization or disarmament; scientific research; state's development; level of nonproliferation for neighbor states.

2. The Global Terrorism Index (GTI) [43]. The GTI scores each country on a scale from 0 to 10; where 0 represents no impact from terrorism and 10 represents the highest measurable impact of terrorism. It consists of:

– total number of terrorist incidents in a given year;

– total number of fatalities caused by terrorists in a given year;

– total number of injuries caused by terrorists in a given year;

– total number of hostages caused by terrorists in a given year.

3. Militarization (MLT) [44]. It is also the subindex of The Global Peace Index. It shows the state of the country armament and considers:

– military expenditure as a percentage of GDP;

– number of armed services personnel per 100.000 people;

– volume of transfers of major conventional weapons as recipient (imports) per 100.000 people;

– volume of transfers of major conventional weapons as supplier (exports) per 100.000 people;

– financial contribution to UN peacekeeping missions;

– nuclear and heavy weapons capabilities;

– ease of access to small arms and light weapons.

Thus, we obtained a comprehensive system of indicators, which is embedded in the integrated formula:

$$PT = 0.4NPI + 0.2GTI + 0.4MLT.$$

Threat 11. Conflict intensity increasing (CI)

The number of military and paramilitary conflicts occurring at the national and international levels has a tendency to increase. But the nature of armed conflicts changed significantly due to the use of high-tech weapons. It should also be noted that part of the hostilities was transferred to the digital space [42].

In our research we will consider a conflict between interstate, intrastate, substate, and transstate ones. To assess the conflict intensity in the country we take into account the two parameters.

The first one is the levels of conflicts intensity (ICB), which were proposed Heidelberg Institute for International Conflict Research in Conflict Barometer [45]. They are dispute, non-violent crisis, violent crisis, limited war, and war. In the methodology of Conflict Barometer, the level of violence and the intensity class are considered. The last three are violent conflicts, which causes deaths and distraction of the different level.

The second is the index, which characterized the parameters of the ongoing domestic and international conflicts (OCI). It is the subindex of The Global Peace Index, which was introduced by The Institute for Economics and Peace Limited [44]. It includes:

– number and duration of internal conflicts;

– number of deaths from external/internal organized conflict;

– number, duration and role in external/internal conflicts;

– relations with neighboring countries.

The quantitative value for intensity of conflicts we will take in the form:

$$CI = 0.4ICB + 0.6OCI.$$

This threat acts as a multiplier for the security level. This naturally follows from the thesis that it is almost impossible to ensure the sustainable development of the country by participating in the armed conflicts.

Given the above, we obtained a system of indicators that identify 11 threats identified in the study. Table 1 shows their relevance to the global challenges listed in the previous section.

Table 1. The connection between the 11 global treats and global challenges

Global Threat		**World Economic Forum**	**Millennium Project**	**United Nations**
ES	The global decrease in energy security	Natural resource crises	Energy	GOAL 7: Affordable and Clean Energy
BB	The imbalance between biological capacity of the Earth and human needs in biosphere	Biodiversity loss, Human environmental damage	—	GOAL 2: Zero Hunger
GINI	Growing inequality between people and countries on the Earth	Social cohesion erosion	Population and resources, Rich-poor gap	GOAL 1: No Poverty, GOAL 10: Reduced Inequality
GD	The spread of global diseases	Infectious diseases	Health issues	GOAL 3: Good Health and Well-being
IG	Information gap	—	Global convergence of IT, Science and technology	—
CP	Corruption perception	Social cohesion erosion	Population and resources	—
WA	Limited access to drinking water	—	Clean water	GOAL 6: Clean Water and Sanitation
CN	Impact of climate change and natural disaster	Climate action failure, Extreme weather	Sustainable development and climate change	GOAL 13: Climate Action
SF	The state fragility	Livelihood crises, Debt crises	Democratization, Global foresight and decision making, Status of woman, Education and learning	GOAL 8: Decent Work and Economic Growth, GOAL 16: Peace and Justice Strong Institutions
PT	Increasing proliferation and global terrorism	—	Peace and conflict, Education and learning	GOAL 16: Peace and Justice Strong Institutions
CI	Conflict intensity increasing	Geoeconomic confrontation	Peace and conflict, Transnational organized crime, Global ethics	GOAL 16: Peace and Justice Strong Institutions

MODELING THE TOTAL IMPACT OF THE AGGREGATE OF 11 GLOBAL THREATS ON DIFFERENT COUNTRIES AND GROUPS OF COUNTRIES

Let's determine the vulnerability of different countries and groups of countries to the impact of a set of 11 major threats. Quantitative data on each of the 11 threats will be obtained from the global databases specified in the description of these threats in section 2. To determine the groups of countries with close values of vulnerabilities to the impact of the 11 main threats, we use the partition algorithm

of clustering the multivariate time-series with the global alignment kernel distance [46]. It takes into the account all history of the threats and minimize differences of their values and behaviour.

Let's associate each country j with a vector $\overline{\mathrm{Tr}_j}$ for year *i*:

$$\overline{\mathrm{Tr}_j}^{\,i} = \left(ES, BB, GINI, GD, IG, CP, WA, CN, SF, PT, CI\right)\Big|_j^i,$$

elements of which characterize the degree of manifestation of corresponding 11 threats presented in Section 2, $i = \overline{2005..2021}$, $j = \overline{1..134}$.

Considering the fact that all the measured data for components of vector $\overline{\mathrm{Tr}_j}$ are presented in different units of measurement, they have different physical meaning and vary in different ranges, they have been reduced to the normalized form, so that they vary in the range (0.1). In this case, the value 0 corresponds to the minimum value of the threat, and the value 1 corresponds to the maximum of this threat. In the study the logistic normalization is used [2].

The security index I_{sec} of each country with a value $||\overline{\mathrm{Tr}_j}^{\,i}||$ is calculated as the Minkowski norm of the vector $\overline{\mathrm{Tr}_j}^{\,i}$ for the *j*th country, composed of normalized threats. After normalization the security index I_{sec} for each country is defined as the Minkowski norm:

$$I_{sec}{}_j^{\,i} = \overrightarrow{S_j^{\,i}} = \left(s_{11,j}^i \sum_{k=1}^{10} (s_{k,j}^i)^p \right)^{\frac{1}{p}}$$

with parameter $p = 3$, where $j = \overline{2005..2021}, j = \overline{1..134}$, $\overrightarrow{S_j^{\,i}}$ is the vector of the normilized threats $\overline{\mathrm{Tr}_j}^{\,i}$.

Thus, I_{sec} defines the degree of remoteness from the influence of the set of 11 threats. Based on the calculated norms of the vector of threats $||\overline{\mathrm{Tr}_j}||$ for each country *j*, we obtained an order relation between clusters of countries (Table 2):

$$\mathrm{K}_k \prec \mathrm{K}_j \Leftrightarrow \frac{\sum_{p\in \mathrm{K}_k} \overline{\mathrm{Tr_p}^{2021}}}{card\,(\mathrm{K}_k)} \le \frac{\sum_{j\in \mathrm{K}_j} \overline{\mathrm{Tr}_j^{2021}}}{card\,(\mathrm{K}_j)},$$

where $\mathrm{K_k}$, $\mathrm{K_j}$ are the pair of obtained clusters.

From Table 2 it follows that Cluster 1 includes the group of countries most successful from the safety standpoint, for which the degree of remoteness from the set of 11 global threats is the greatest during 2005–2021. And vice versa, Cluster 5 includes the most vulnerable countries. For these countries the degree of remoteness from the set of 11 global threats is minimal.

Based on the data presented in Table 2, Fig. 9 illustrates the safety levels for different countries and regions of the world.

Table 2. Countries degree remoteness from the Set of Threats Based on Clustering Analysis, 2005-2021*

CountryRank for 2021	Country, GDP per capita (constant 2015 US$) 2020, USD**	Total influence of the set of global threats on different countries											
		(ES) The global decrease in energy security (<)	(BB) The imbalance between biological capacity of the Earth and human needs in biosphere (<)	(GINI) Growing inequality between people and countries on the Earth (>)	(GD) The spread of global diseases (<)	(IG) Information gap (<)	(CP) Corruption perception (<)	(WA) Limited access to drinking water (<)	(CN) Impact of climate change and natural disaster (<)	(SF) The state fragility (>)	(PT) Increasing proliferation and global terrorism (<)	CI) Conflict intensity increasing (<)	(Isec) Degree of remoteness from the Set of Threats (<)
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Cluster 1 (Very high degree of remoteness during 2005–2021)													
1	Denmark ($ 56202.17)	0.607	0.544	27.700	0.537	0.837	88.000	96.731	0.580	18.800	0.773	0.793	1.426
2	New Zealand ($ 40218.39)	0.724	1.667	NA	0.566	0.749	88.000	100.000	0.528	18.400	0.678	0.837	1.417
4	Australia ($ 58029.52)	3.552	1.619	34.300	0.566	0.771	73.000	NA	0.466	21.800	0.582	0.828	1.372
6	Canada ($ 42258.69)	1.846	1.827	33.300	0.544	0.798	74.000	99.039	0.468	21.700	0.636	0.837	1.369
7	Uruguay ($ 15044.64)	0.583	7.405	40.200	0.537	0.673	73.000	NA	0.612	35.900	0.592	0.838	1.367
Cluster 2 (High degree of remoteness during 2005–2021)													
3	Austria ($ 43346.43)	0.322	0.441	30.200	0.544	0.784	74.000	98.901	0.557	26.100	0.693	0.836	1.374
5	Malta ($ 25005.76)	0.013	0.089	31.000	0.533	0.738	54.000	100.000	0.625	36.200	0.711	0.955	1.371
10	Belgium ($ 40438.92)	0.261	0.111	27.200	0.544	0.793	73.000	99.914	0.542	31.000	0.671	0.817	1.359
14	Finland ($ 44778.87)	0.489	1.884	27.700	0.546	0.846	88.000	99.638	0.544	70.400	0.696	0.794	1.345
15	Portugal ($ 19771.58)	0.308	0.284	32.800	0.535	0.779	62.000	95.354	0.595	26.800	0.668	0.836	1.328
17	Czech Rep. ($ 18984.64)	0.592	0.407	25.300	0.542	0.784	54.000	97.882	0.468	39.300	0.696	0.836	1.317
18	Slovenia ($ 22899.36)	0.553	0.410	24.400	0.550	0.730	57.000	98.274	0.544	28.200	0.742	0.718	1.292
19	Slovakia ($ 17360.71)	0.403	0.590	23.200	0.547	0.779	52.000	99.238	0.575	39.000	0.681	0.718	1.274
21	Germany ($ 41315.31)	0.370	0.320	31.700	0.541	0.859	80.000	99.993	0.536	24.800	0.614	0.652	1.240
22	Italy ($ 29359.93)	0.239	0.191	35.200	0.559	0.748	56.000	95.824	0.585	45.200	0.563	0.836	1.236
23	Latvia ($ 15583.93)	0.557	1.273	34.500	0.555	0.760	59.000	96.289	0.612	44.000	0.656	0.717	1.231
25	Mauritius ($ 9058.21)	0.059	0.207	36.800	0.539	0.673	54.000	NA	0.624	38.100	0.608	0.838	1.216
26	Lithuania ($ 17213.81)	0.134	0.792	35.300	0.555	0.786	61.000	94.924	0.609	38.700	0.502	0.745	1.215
27	Estonia ($ 19767.08)	0.105	1.165	30.800	0.538	0.836	74.000	95.761	0.498	39.500	0.640	0.657	1.207

1	2	3	4	5	6	7	8	9	10	11	12	13	14
30	Japan ($ 34813.22)	0.137	0.129	32.900	0.537	0.786	73.000	98.565	0.480	32.200	0.603	0.658	1.183
38	Hungary ($ 14368.69)	0.418	0.665	30.000	0.541	0.758	43.000	92.589	0.593	51.100	0.684	0.657	1.151
41	Oman ($ 15743.22)	2.742	0.227	NA	0.587	0.619	52.000	90.557	0.479	50.400	0.484	0.718	1.125
45	South Korea ($ 31327.41)	0.128	0.102	31.400	0.562	0.784	62.000	99.191	0.490	32.500	0.475	0.552	1.064

Cluster 3 (Medium degree of remoteness during 2005–2021)

8	Norway ($ 75017.16)	5.247	1.219	27.700	0.544	0.800	85.000	98.643	0.559	16.600	0.453	0.705	1.366
9	Ireland ($ 78732.55)	0.283	0.585	30.600	0.561	0.842	74.000	97.329	0.550	22.200	0.570	0.838	1.361
11	Netherlands ($ 46345.35)	0.317	0.137	29.200	0.564	0.871	82.000	99.972	0.534	24.100	0.407	0.836	1.358
12	Switzerland ($ 85685.29)	0.511	0.229	33.100	0.565	0.826	84.000	94.248	0.604	19.900	0.407	0.837	1.356
13	Luxembourg ($ 104879.26)	0.049	0.093	34.200	0.544	0.809	81.000	99.459	0.470	21.100	0.401	0.955	1.348
16	Singapore ($ 58056.81)	0.013	0.010	NA	0.550	0.797	85.000	100.000	0.536	26.600	0.522	0.810	1.320
20	Sweden ($ 51539.56)	0.590	1.427	29.300	0.542	0.834	85.000	99.752	0.619	21.400	0.563	0.609	1.242
24	France ($ 35785.97)	0.539	0.538	32.400	0.563	0.806	71.000	99.249	0.597	32.500	0.307	0.701	1.227
28	Poland ($ 14660.79)	0.630	0.396	30.200	0.536	0.755	56.000	98.325	0.540	43.100	0.574	0.746	1.204
29	Barbados ($ 13595.03)	0.119	0.047	NA	0.555	0.494	65.000	NA	0.605	47.000	0.527	0.955	1.196
32	Spain ($ 24939.19)	0.279	0.350	34.300	0.555	0.775	61.000	99.587	0.584	44.800	0.528	0.703	1.177
36	United Kingdom ($ 43020.2)	0.660	0.246	35.100	0.536	0.823	78.000	99.822	0.585	41.500	0.332	0.648	1.160
46	Cypru s ($ 26372.65)	0.046	0.053	31.200	0.544	0.762	53.000	99.765	0.575	57.400	0.528	0.606	1.064
52	Chile ($ 12954.41)	0.256	0.777	44.900	0.555	0.640	67.000	98.771	0.494	44.100	0.414	0.613	1.021
58	United States ($ 58203.38)	1.103	0.417	41.500	0.548	0.847	67.000	97.326	0.289	44.600	0.284	0.468	0.936

Cluster 4 (Low degree of remoteness during 2005–2021)

31	Fiji ($ 4911.08)	0.140	0.878	30.100	0.549	0.464	55.000	NA	0.228	16.200	0.528	0.884	1.178
33	Croatia ($ 12984.7)	0.429	0.730	28.900	0.564	0.701	47.000	NA	0.607	49.800	0.610	0.707	1.172
34	Romania ($ 10844.53)	0.538	0.887	34.800	0.545	0.709	45.000	81.989	0.613	51.000	0.559	0.808	1.168
35	Costa Rica ($ 12105.93)	0.428	0.614	49.300	0.602	0.657	58.000	80.516	0.558	42.500	0.530	0.795	1.163
37	Malaysia ($ 10631.51)	1.154	0.507	41.100	0.557	0.713	48.000	93.818	0.486	56.900	0.637	0.807	1.154
42	Cape Verde ($ 2935.32)	0.051	0.259	42.400	0.581	0.420	58.000	NA	0.652	64.200	0.473	0.955	1.114
43	Bhutan ($ 2879.64)	1.044	0.965	37.400	0.525	0.394	68.000	36.648	0.639	68.300	0.673	0.745	1.085
47	Argentina ($ 11344.41)	0.916	1.866	42.300	0.568	0.570	38.000	NA	0.588	50.100	0.482	0.767	1.062
48	Guyana ($ 9250.3)	0.005	21.338	NA	0.555	0.430	39.000	NA	0.490	66.100	0.642	0.606	1.061
49	Botswana ($ 6299.21)	0.589	1.394	53.300	0.421	0.560	55.000	NA	0.609	57.000	0.570	0.838	1.058

1	2	3	4	5	6	7	8	9	10	11	12	13	14
51	Kazakhstan ($ 10974.96)	2.603	0.722	27.800	0.568	0.607	37.000	89.335	0.496	61.200	0.495	0,606	1,029
53	Serbia ($ 6549.35)	0.877	0.547	34.500	0.558	0.671	38.000	75.038	0.549	67.400	0.630	0.606	0.989
54	Moldova ($ 3250.31)	0.023	0.667	26.000	0.540	0.583	36.000	74.071	0.611	67.000	0.598	0.552	0.964
55	North Macedonia ($ 5115.92)	0.395	0.482	33.000	0.480	0.622	39.000	76.833	0.619	64.500	0.645	0.564	0.950
56	Montenegro ($ 6512.62)	0.665	0.594	36.800	0.562	0.592	46.000	85.072	0.608	58.500	0.515	0.564	0.949
57	Dominican Republic ($ 7677.71)	0.060	0.378	39.600	0.563	0.567	30.000	NA	0.448	64.700	0.603	0.718	0.942
59	Viet Nam ($ 2655.77)	0.734	0.413	35.700	0.537	0.677	39.000	NA	0.389	63.300	0.505	0.658	0.931
60	Jamaica ($ 4539)	0.039	0.256	45.500	0.561	0.498	44.000	NA	0.570	61.200	0.625	0.613	0.920
61	Ghana ($ 2018.62)	1.479	0.648	43.500	0.451	0.588	43.000	41.410	0.596	63.900	0.577	0.656	0.919
62	Jordan ($ 4028.96)	0.055	0.086	33.700	0.539	0.487	49.000	85.701	0.637	76.800	0.582	0.543	0.911
64	Greece ($ 17323.82)	0.280	0.285	33.100	0.537	0.700	49.000	100.000	0.567	54.500	0.459	0.459	0.896
65	Albania ($ 4389.9)	0.395	0.526	30.800	0.564	0.549	35.000	70.675	0.363	59.000	0.549	0.564	0.887
66	Benin ($ 1214.66)	0.000	0.572	37.800	0.431	0.476	42.000	NA	0.637	72.800	0.501	0.690	0.886
67	Cote D`Ivoire ($ 2313.79)	0.877	1.281	37.200	0.433	0.523	36.000	35.205	0.669	90.700	0.602	0.596	0.885
68	Bosnia and Herzegovina ($ 5433.15)	0.609	0.514	33.000	0.531	0.499	35.000	88.869	0.464	72.900	0.548	0.611	0.885
71	Senegal ($ 1364.84)	0.048	0.785	38.100	0.531	0.432	43.000	NA	0.594	73.400	0.626	0.561	0.863
72	Tanzania ($ 1061.17)	0.415	0.839	40.500	0.420	0.501	39.000	NA	0.533	79.300	0.604	0.698	0.860
74	Paraguay ($ 5670.75)	1.007	3.278	43.500	0.593	0.516	30.000	64.084	0.323	66.400	0.449	0.564	0.855
75	Indonesia ($ 3756.91)	1.971	0.722	37.300	0.519	0.595	38.000	NA	0.602	67.600	0.480	0.505	0.854
76	Tunisia ($ 3780.6)	0.303	0.339	32.800	0.537	0.626	44.000	79.286	0.636	69.200	0.497	0.455	0.849
77	Armenia ($ 4021.05)	0.291	0.324	25.200	0.599	0.537	49.000	86.911	0.611	69.800	0.454	0.388	0.844
78	Azerbaijan ($ 5083.38)	4.071	0.382	26.600	0.565	0.575	30.000	88.323	0.621	75.100	0.460	0.352	0.839
79	Ecuador ($ 5317.68)	1.862	1.108	47.300	0.576	0.427	36.000	66.827	0.536	71.200	0.525	0.560	0.839
80	Guinea ($ 984.01)	0.136	1.116	29.600	0.447	0.348	25.000	NA	0.667	97.400	0.506	0.558	0.838
81	Georgia ($ 4447.66)	0.300	0.545	34.500	0.530	0.641	55.000	66.355	0.611	72.600	0.476	0.459	0.835
82	Sierra Leone ($ 623.89)	0.102	0.880	35.700	0.462	0.361	34.000	10.621	0.661	83.400	0.631	0.562	0.835
84	Kyrgyzstan ($ 1100.04)	0.659	0.779	29.000	0.582	0.488	27.000	70.090	0.644	76.400	0.748	0.365	0.832
85	Belarus ($ 6234.82)	0.081	0.649	24.400	0.556	0.565	41.000	94.611	0.561	68.000	0.526	0.362	0.805
86	Algeria ($ 3834.44)	2.702	0.243	27.600	0.571	0.415	33.000	72.381	0.603	73.600	0.413	0.389	0.794

1	2	3	4	5	6	7	8	9	10	11	12	13	14
88	Belize ($ 3968.49)	0.536	0.446	53.300	0.571	0.447	NA	NA	0.609	64.200	0.436	0.500	0.789
89	Brazil ($ 8228.78)	0.945	3.327	48.900	0.551	0.627	38.000	85.766	0.545	75.800	0.605	0.367	0.783
90	El Salvador ($ 3632.45)	0.219	0.290	38.800	0.587	0.434	34.000	NA	0.425	71.600	0.464	0.563	0.769
91	Morocco ($ 2818.77)	0.069	0.450	39.500	0.561	0.589	39.000	79.950	0.530	71.500	0.511	0.443	0.766
94	Gambia ($ 692.21)	0.003	0.496	35.900	0.518	0.400	37.000	44.715	0.562	80.500	0.507	0.563	0.752
97	Ukraine ($ 2344.36)	0.774	1.130	25.600	0.523	0.622	32.000	89.020	0.607	69.800	0.447	0.273	0.716
98	Egypt ($ 4028.42)	0.898	0.199	31.500	0.576	0.558	33.000	NA	0.637	85.000	0.400	0.322	0.712
101	Tajikistan ($ 1199.06)	0.844	0.422	34.000	0.589	0.323	25.000	55.237	0.652	75.100	0.628	0.302	0.705
105	Colombia ($ 5892.48)	2.825	1.852	54.200	0.574	0.548	39.000	73.009	0.601	79.300	0.269	0.291	0.685
108	Israel ($ 37488.45)	0.379	0.039	38.600	0.539	0.770	59.000	99.321	0.550	75.100	0.249	0.237	0.676
109	Nicaragua ($ 1922.35)	0.244	1.537	46.200	0.575	0.336	20.000	55.516	0.404	77.100	0.625	0.404	0.675
111	Russian ($ 9666.81)	2.449	1.265	35.300	0.529	0.689	29.000	76.104	0.503	73.600	0.217	0.264	0.655
113	Iran ($ 4883.6)	1.604	0.223	40.900	0.582	0.589	25.000	93.984	0.244	84.500	0.318	0.285	0.632
114	Saudi Arabia ($ 18691.25)	3.415	0.082	NA	0.606	0.620	53.000	NA	0.478	69.700	0.369	0.167	0.630
116	Venezuela ($ NA)	2.310	1.154	44.800	0.576	0.373	14.000	NA	0.594	92.600	0.386	0.292	0.619
117	Mexico ($ 8909.68)	0.683	0.485	45.400	0.644	0.612	31.000	43.026	0.572	69.900	0.450	0.197	0.601
118	Lebanon ($ 5382.34)	0.010	0.085	31.800	0.564	0.413	24.000	47.700	0.496	89.000	0.262	0.299	0.565
121	Turkey ($ 12038.63)	0.306	0.390	41.900	0.566	0.616	38.000	NA	0.591	79.700	0.404	0.145	0.530
129	Burkina Faso ($ 731.52)	0.034	0.792	47.300	0.473	0.416	42.000	NA	0.535	87.100	0.542	0.185	0.472
130	Cameroon ($ 1419.68)	1.585	1.313	46.600	0.416	0.393	27.000	NA	0.659	97.200	0.448	0.113	0.464
132	Syria ($ NA)	0.422	0.364	37.500	0.592	0.344	13.000	NA	0.607	110.700	0.325	0.059	0.440
133	Yemen ($ NA)	0.803	0.737	36.700	0.579	0.234	16.000	NA	0.595	111.700	0.280	0.066	0.438

Cluster 5 (Very low degree of remoteness during 2005–2021)

39	Mongolia ($ 4126.7)	5.942	1.944	32.700	0.539	0.461	35.000	30.061	0.208	52.300	0.574	0.795	1.137
50	Congo ($ 1608.78)	9.043	8.538	48.900	0.411	0.303	21.000	45.897	0.432	92.400	0.479	0.661	1.045
63	Zambia ($ 1273.88)	0.681	1.373	57.100	0.403	0.455	33.000	NA	0.645	84.900	0.621	0.694	0.905
69	Angola ($ 3168.25)	9.381	2.131	51.300	0.403	0.307	29.000	NA	0.534	89.000	0.563	0.506	0.873
70	Bolivia. ($ 2983.03)	2.081	4.583	43.600	0.560	0.392	30.000	NA	0.375	74.900	0.515	0.564	0.873
73	Namibia ($ 4047.86)	0.134	2.519	59.100	0.407	0.395	49.000	NA	0.307	64.300	0.531	0.795	0.859
83	Madagascar ($ 442.19)	0.160	2.324	42.600	0.492	0.328	26.000	20.539	0.389	79.500	0.643	0.739	0.832

1	2	3	4	5	6	7	8	9	10	11	12	13	14
87	Peru ($ 5792.19)	0.980	1.525	43.800	0.578	0.529	36.000	51.264	0.471	71.400	0.402	0.560	0.792
92	Thailand ($ 6198.41)	0.456	0.540	35.000	0.566	0.668	35.000	NA	0.303	70.900	0.501	0.430	0.763
93	Nepal ($ 1028.46)	0.252	0.519	32.800	0.559	0.453	33.000	17.576	0.416	82.200	0.499	0.549	0.754
95	China ($ 10370.36)	0.812	0.243	38.200	0.558	0.684	45.000	NA	0.273	68.900	0.390	0.427	0.745
96	Laos ($ 2554.43)	1.191	0.922	38.800	0.573	0.297	30.000	17.682	0.258	76.000	0.475	0.564	0.732
99	Togo ($ 626.62)	0.002	0.569	42.400	0.447	0.369	30.000	19.561	0.661	85.100	0.418	0.549	0.707
100	Malawi ($ 394)	0.455	0.767	38.500	0.439	0.353	35.000	NA	0.345	83.200	0.501	0.694	0.707
102	Rwanda ($ 834.39)	0.168	0.516	43.700	0.413	0.449	53.000	12.103	0.663	85.000	0.452	0.445	0.701
103	Guatemala ($ 4126.21)	0.263	0.530	48.300	0.598	0.371	25.000	55.834	0.283	79.400	0.471	0.511	0.691
104	Sri Lanka ($ 4052.75)	0.157	0.300	39.300	0.597	0.487	37.000	NA	0.267	80.500	0.421	0.446	0.686
106	Honduras ($ 2223.45)	0.283	1.103	48.200	0.593	0.290	23.000	NA	0.404	79.400	0.456	0.503	0.682
107	South Africa ($ 5659.21)	1.025	0.262	63.000	0.355	0.642	44.000	NA	0.451	70.000	0.534	0.416	0.682
110	Lesotho ($ 982.97)	0.279	0.516	44.900	0.375	0.339	38.000	28.906	0.243	77.900	0.567	0.641	0.673
112	Bangladesh ($ 1643.67)	0.694	0.459	32.400	0.513	0.492	26.000	58.512	0.315	85.000	0.515	0.388	0.636
115	Cambodia ($ 1376.41)	0.204	0.796	NA	0.491	0.354	23.000	27.758	0.375	80.600	0.488	0.604	0.626
119	Uganda ($ 891.3)	0.343	0.441	42.700	0.378	0.422	27.000	16.648	0.639	92.900	0.513	0.316	0.564
120	India ($ 1811.68)	0.523	0.368	35.700	0.487	0.590	40.000	NA	0.358	77.000	0.382	0.250	0.534
122	Mozambique ($ 574.6)	3.192	1.962	54.000	0.292	0.312	26.000	NA	0.315	93.900	0.481	0.256	0.520
123	Nigeria ($ 2396.04)	3.467	0.632	35.100	0.368	0.497	24.000	21.669	0.619	98.000	0.543	0.108	0.517
124	Pakistan ($ 1446.81)	0.507	0.433	29.600	0.479	0.424	28.000	35.839	0.508	90.500	0.239	0.233	0.504
125	Kenya ($ 1559.55)	0.238	0.468	40.800	0.434	0.514	30.000	NA	0.335	89.200	0.391	0.342	0.492
126	CAR ($ 414.4)	0.174	6.237	56.200	0.369	0.239	24.000	6.183	0.648	107.000	0.467	0.094	0.491
127	Philippines ($ 3269.67)	0.315	0.351	42.300	0.476	0.628	33.000	47.465	0.205	82.400	0.390	0.230	0.482
128	Niger ($ 522.56)	0.785	0.843	37.300	0.482	0.302	31.000	NA	0.343	96.000	0.374	0.318	0.482
31	Mali ($ 781.73)	0.222	1.151	36.100	0.444	0.353	29.000	NA	0.616	96.600	0.408	0.126	0.448
134	Ethiopia ($ 826.95)	0.376	0.547	35.000	0.474	0.332	39.000	12.577	0.523	99.000	0.417	0.111	0.403

NA – data not available; critical threats are indicated by red color;
(<) – a lower value corresponds to a higher threat. (>) – a higher value corresponds to a higher threat;
*latest available data;
** Data Source: [47].

As presented in Table 3, the common trait of the ten leaders is high *Isec*, and low level of threats. E.g., the group leaders, Denmark, New Zealand, and Austria, have the best indicators among all the group countries. However, half of the list have a relatively low level of energy security (ES), this threat is critical for them. It is also necessary to pay attention to the low biological balance (BB) of Belgium and Malta, and the high level of inequality (GINI) of Uruguay.

Fig. 9. Countries safety levels – degree of remoteness from the Set of Threats (Based on Clustering Analysis)

Table 3. Top 10 countries with the highest level of national security*

Rank Isec	ISO	Country	Isec	ES	BB	GINI	GD	IG	CP	WA	CN	SF	PT	CI
1	DNK	Denmark	1.426	0.607	0.544	27.700	0.537	0.837	88.000	96.731	0.580	18.800	0.773	0.793
2	NZL	New Zealand	1.417	0.724	1.667	NA	0.566	0.749	88.000	100.000	0.528	18.400	0.678	0.837
3	AUT	Austria	1.374	0.322	0.441	30.200	0.544	0.784	74.000	98.901	0.557	26.100	0.693	0.836
4	AUS	Australia	1.372	3.552	1.619	34.300	0.566	0.771	73.000	NA	0.466	21.800	0.582	0.828
5	MLT	Malta	1.371	0.013	0.089	31.000	0.533	0.738	54.000	100.000	0.625	36.200	0.711	0.955
6	CAN	Canada	1.369	1.846	1.827	33.300	0.544	0.798	74.000	99.039	0.468	21.700	0.636	0.837
7	URY	Uruguay	1.367	0.583	7.405	40.200	0.537	0.673	73.000	NA	0.612	35.900	0.592	0.838
8	NOR	Norway	1.366	5.247	1.219	27.700	0.544	0.800	85.000	98.643	0.559	16.600	0.453	0.705
9	IRL	Ireland	1.361	0.283	0.585	30.600	0.561	0.842	74.000	97.329	0.550	22.200	0.570	0.838
10	BEL	Belgium	1.359	0.261	0.111	27.200	0.544	0.793	73.000	99.914	0.542	31.000	0.671	0.817

* For each country critical values of the threats indicators are highlighted by red color

The G7 countries are characterized by a high and medium level of national security and therefore a low vulnerability to the impact of 11 global threats (Table 4). In some sense, an exception is the United States, for which the threats of inequality (GINI), global warming and natural disasters (CN), conflicts (CI), and the prolifiration (PT) are very critical. In Japan, there are clearly threats to disrupt the biological balance (BB) and energy security (ES), which is natural in connection with the geographic location and the great density of the population.

Table 4. The level of national security of the G-7 countries*

Rank Isec	ISO	Country	Isec	ES	BB	GINI	GD	IG	CP	WA	CN	SF	PT	CI
6	CAN	Canada	1.369	1.846	1.827	33.300	0.544	0.798	74.000	99.039	0.468	21.700	0.636	0.837
21	DEU	Germany	1.240	0.370	0.320	31.700	0.541	0.859	80.000	99.993	0.536	24.800	0.614	0.652
22	ITA	Italy	1.236	0.239	0.191	35.200	0.559	0.748	56.000	95.824	0.585	45.200	0.563	0.836
24	FRA	France	1.227	0.539	0.538	32.400	0.563	0.806	71.000	99.249	0.597	32.500	0.307	0.701
30	JPN	Japan	1.183	0.137	0.129	32.900	0.537	0.786	73.000	98.565	0.480	32.200	0.603	0.658
36	GBR	United Kingdom	1.160	0.660	0.246	35.100	0.536	0.823	78.000	99.822	0.585	41.500	0.332	0.648
58	USA	United States	0.936	1.103	0.417	41.500	0.548	0.847	67.000	97.326	0.289	44.600	0.284	0.468

* For each country critical values of the threats indicators are highlighted by red color

The last 10 countries by the *Isec* are characterized by a very high vulnerability to the impact of 11 global threats (Table 5). These are countries with hostilities on their territory (CI), low stability of the state (SF) and a high level of proliferation (PT).

Table 5. Last 10 countries with the lowest level of national security*

Rank Isec	ISO	Country	Isec	ES	BB	GINI	GD	IG	CP	WA	CN	SF	PT	CI
125	KEN	Kenya	0,492	0,238	0,468	40,800	0,434	0,514	30,000	NA	0,335	89,200	0,391	0,342
126	CAF	Central African Republic	0.491	0.174	6.237	56.200	0.369	0.239	24.000	6.183	0.648	107.000	0.467	0.094
127	PHL	Philippines	0.482	0.315	0.351	42.300	0.476	0.628	33.000	47.465	0.205	82.400	0.390	0.230
128	NER	Niger	0.482	0.785	0.843	37.300	0.482	0.302	31.000	NA	0.343	96.000	0.374	0.318
129	BFA	Burkina Faso	0.472	0.034	0.792	47.300	0.473	0.416	42.000	NA	0.535	87.100	0.542	0.185
130	CMR	Cameroon	0.464	1.585	1.313	46.600	0.416	0.393	27.000	NA	0.659	97.200	0.448	0.113
131	MLI	Mali	0.448	0.222	1.151	36.100	0.444	0.353	29.000	NA	0.616	96.600	0.408	0.126
132	SYR	Syria	0.440	0.422	0.364	37.500	0.592	0.344	13.000	NA	0.607	110.700	0.325	0.059
133	YEM	Yemen	0.438	0.803	0.737	36.700	0.579	0.234	16.000	NA	0.595	111.700	0.280	0.066
134	ETH	Ethiopia	0,403	0,376	0,547	35,000	0,474	0,332	39,000	12,577	0,523	99,000	0,417	0,111

* For each country critical values of the threats indicators are highlighted by red color

As for Ukraine, the most critical for it is the threat of increasing armed conflicts (CI), which prevents the sustainable development of its territory (Table 6). Among the neighboring countries, Ukraine ranks second to last (the last is Russia).

Table 6. Ukraine in the European context*

Rank Isec	ISO	Country	Isec	ES	BB	GINI	GD	IG	CP	WA	CN	SF	PT	CI
19	SVK	Slovakia	1,274	0,403	0,590	23,200	0,547	0,779	52,000	99,238	0,575	39,000	0,681	0,718
21	DEU	Germany	1,240	0,370	0,320	31,700	0,541	0,859	80,000	99,993	0,536	24,800	0,614	0,652
22	ITA	Italy	1,236	0,239	0,191	35,200	0,559	0,748	56,000	95,824	0,585	45,200	0,563	0,836
24	FRA	France	1,227	0,539	0,538	32,400	0,563	0,806	71,000	99,249	0,597	32,500	0,307	0,701
28	POL	Poland	1,204	0.630	0.396	30.200	0.536	0.755	56.000	98.325	0.540	43.100	0.574	0.746
34	ROU	Romania	1.168	0.538	0.887	34.800	0.545	0.709	45.000	81.989	0.613	51.000	0.559	0.808
36	GBR	United Kingdom	1.160	0.660	0.246	35.100	0.536	0.823	78.000	99.822	0.585	41.500	0.332	0.648
38	HUN	Hungary	1.151	0.418	0.665	30.000	0.541	0.758	43.000	92.589	0.593	51.100	0.684	0.657
54	MDA	Moldova, Republic of	0.964	0.023	0.667	26.000	0.540	0.583	36.000	74.071	0.611	67.000	0.598	0.552
85	BLR	Belarus	0.805	0.081	0.649	24.400	0.556	0.565	41.000	94.611	0.561	68.000	0.526	0.362
97	UKR	Ukraine	0.716	0.774	1.130	25.600	0.523	0.622	32.000	89.020	0.607	69.800	0.447	0.273
111	RUS	Russian Federation	0.655	2.449	1.265	35.300	0.529	0.689	29.000	76.104	0.503	73.600	0.217	0.264

* For each country critical values of the threats indicators are highlighted by red color

POSSIBLE SCENARIOS OF WORLD DEVELOPMENT DURING "CONFLICT XXI"

According to the results of the above-mentioned studies, the following scenarios of the development of global society during the conflict of the 21st century and after its end can be assumed:

Pessimistic scenario. As a result of the conducted research, the question arises: what does the 21st century have in store for civilization? What is the nature of the final state of civilization as a system? What should happen to world civilization, in particular, in the 22nd century? Perhaps the final cycle of some global evolutionary chain of human development is beginning?

The answer to this question can be found in the research of two outstanding scientists of the last century: Vernadskyi [48] and Moiseev [49]. Independently of each other, they formulated a very close idea: if humanity on a planetary scale does not radically change its behaviour (using its mind and its work to self-destruct), then in the middle of the 21st century conditions may arise in which people will not be able to exist. Such conclusions were made for the paradigm constant throughout the history of mankind: "unlimited and growing consumption" and for the technosphere (a set of technological ways of life), unfriendly to human habitation, which developed in the 19th and early 21st centuries.

An optimistic scenario. If humanity can change the paradigm of its behaviour on a planetary scale, for example, to "harmonious coexistence" and radically transform the technosphere into a "nature-like" one (a human-friendly environment based on the convergence of nano-, bio-informational, cognitive and socio-humanitarian technologies [50]) , then the regularity revealed for the previous paradigm of the development of systemic world conflicts is not justified for the new paradigm. And this, in turn, will allow humanity to continue its creative mission on planet Earth.

CONCLUSIONS

The study analyzed the global challenges and problems of humanity. According to the results of the analysis, the set of global threats to sustainable development have been defined.

Based on the provided global modelling, 5 clusters of countries were identified according to their remoteness from these threats during 2005–2021. Using the obtained results, critical threats were identified for each country. Groups of countries (Top10, Last10, G7, Ukraine in the European context) were analyzed and their features were identified.

Assumptions are made about possible pessimistic and optimistic scenarios for the development of the world during the "Conflict XXI" and after it.

These results can be used to study and model the degree of cultural and civilizational gaps in the world.

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INFORMATION ON THE ARTICLE

Ivan O. Pyshnograiev, ORCID: 0000-0002-3346-8318, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Ukraine, e-mail: pyshnograiev@gmail.com

Michael Z. Zgurovsky, ORCID: 0000-0001-5896-7466, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Ukraine, e-mail: zgurovsm@hotmail.com

ДОСЛІДЖЕННЯ ТЕНДЕНЦІЙ БЕЗПЕКИ ГЛОБАЛЬНОГО СУСПІЛЬСТВА НА ОСНОВІ ІНТЕЛЕКТУАЛЬНОГО АНАЛІЗУ ДАНИХ / М.З. Згуровський, І.О. Пишнограєв

Анотація. Присвячено застосуванню методології системного аналізу та інтелектуального аналізу даних до однієї з найактуальніших проблем сучасності: дослідження безпеки глобального суспільства в конфліктному світі. Розглянуто комплекс глобальних загроз, актуальних для першої половини XXI ст. Ці загрози були визначені Організацією Об'єднаних Націй, Всесвітньою організацією охорони здоров'я, Всесвітнім економічним форумом та іншими авторитетними міжнародними організаціями. У результаті застосування методу Delphi для аналізу широкого спектру загроз, виявлених цими організаціями, виявлено 11 найважливіших загроз людству в першій половині XXI ст. Проаналізовано вразливість різних країн до впливу сукупності цих загроз. Побудовано сценарії можливого розвитку глобального суспільства під час та після конфлікту.

Ключові слова: глобальна безпека, системні конфлікти, глобальні загрози, норма Мінковського, вразливість.