

# Resilient Openness of Eastern European Cities in the Conditions of Sustainable Development

## Trwała otwartość miast Europy Wschodniej w warunkach zrównoważonego rozwoju

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### Abstract

This article is devoted to the research of the resilience category, which is now one of the best safety catalysts of each state and its cities. The authors consider the resilience of cities and European countries in terms of preserving the vector of their sustainable development and successful confrontation with external and internal challenges, political and intellectual elite's efforts to anticipate and neutralize these challenges. This material is disclosed in scientific and practical approaches to openness of countries (cities), as well as through analysis of results of resilience estimation on large cities of Eastern Europe in sustainable development conditions. The article emphasized importance of ratings and methods that reflect the results of the transparency assessment of the city councils' activities in order to ensure their social, economic and environmental development. For the purposes of the article the authors presented main assessment results of pollution and comfort of residence in cities of Eastern Europe, which allowed to carry out comparative assessment analysis of openness and transparency of the Ukrainian cities in the context of their resolution under sustainable development conditions.

**Key words:** resilience, cities of Eastern Europe, safety, sustainable development, rating, transparency, openness, comfort of residence

**Słowa kluczowe:** resilencja, miasta Europy Wschodniej, bezpieczeństwo, zrównoważony rozwój, ocena, przejrzystość, otwartość, komfort zamieszkania

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### 1. Introduction

The world's resilience is now one of the best security catalysts for every state and its cities. Therefore, countries and cities should be stable or resilient, able to overcome constructive ways of stress and difficult periods. That is, it is a strategy that can sustain the sustainable development of countries and cities and successfully confront external and internal challenges, political and intellectual elite's efforts to anticipate and neutralize these challenges. From the point of view of modern international practice, the resilience is the ability of Eastern European countries

(cities) to counter hybrid threats. The resilience is a sense and a goal of security of any country (cities), and failure to take into account the threats, that leads to real economic, ecological, humanitarian crises, hopeless delay from more effective and powerful countries.

Equally important for Eastern European countries is the openness and transparency of sustainable development in interaction between residents and local authorities, as well as for self-organization of citizens. That is another pole of resilience. The openness of cities is intended to make communication between the authorities and residents easier, the activity of communal enterprises more transparent, and also to give residents and public organizations the opportunity to unite efforts to solve urgent problems of the city with the purpose of comfortable living. Therefore, the results of studies related to the openness of countries and cities are very important in this context, given the introduction of the concept of sustainable development, which is based on this article, which belongs to foreign scientists (Allwood J.M., Cullen J.M., Carruth M.A., 2012; Bramezza I., 1996; Jones S., Tee C., 2017; Gunasekara C., 2008; Fothergill S., 2008; Milan-Garcia J., Uribe-Toril J., Uiz-Real J.L., Valenciano D.J., 2019; Munasinghe M., 2020; Šipilova V., Ostrovska I., Jermolajeva E. et al., 2017; Skowronski A., 2006) as well as to the Ukrainian scientists (Rohozian Yu., Hrechana S., Kuzmenko O., 2020; Roleders V., Oriekhova T., Zaharieva G., 2022; Shults S., Lutskev, O., Simkiv, L. et al., 2021; Zablodska I., Sieriebriak K., Kolomytseva O. et al., 2019).

Therefore, the resilience research of large cities in Eastern Europe in sustainable development conditions is relevant and based on popularization of positive experience and use of the obtained achievements by cities of Ukraine, which will promote the development of democracy and governance, effective use of budgets, raising living standards of Ukrainians and realization of principles of sustainable development.

## **2. Research Methodology**

The purpose of this work is to study the openness indices of large cities in Europe, which are aimed at determining the resilience of these cities and countries in the context of sustainable development. This scientific work is based on the Numbeo world's largest information base), which is a global base of data and contains the measurement results on comfort of residence among population in cities and countries of the world and other statistical data. In addition, the authors used the Transparency International Ukraine and Transparency Cities data.

The methodological basis of the article is a combination of methods and principles of scientific knowledge, general and special methods and techniques used during the research. The basic provisions of the regional economy, the theory of economic analysis, statistics, and the concept of sustainable development are the basis of theoretical researches. To obtain solid conclusions, the authors relied on scientific work of leading scientists and economists on the issues of the intensive openness of large cities in the conditions of sustainable development.

The following methodical basis was used to achieve the research purpose: authors used the criterion approach, index method, ranking and mapping method to assess the resilience of large cities of Eastern Europe in conditions of sustainable development, which are based mainly on the evaluation of the controlled subsystem of the management system. Methods of scientific knowledge of dual purpose (for use at the empirical and theoretical levels of knowledge) are also used: the thought experiment, abstraction, analysis and synthesis, induction and deduction, modelling, comparative analysis, visualization. Such methodological choice based on economic specificity and basic abstract concepts, which authors investigate through openness and transparency of sustainable development of cities in Eastern Europe.

## **3. Scientific and practical approaches to resilience of countries (cities) in conditions of sustainable development**

The most successful strategy of countries resilience in conditions of sustainable development is ahead of challenges and threats. Such a strategy allows to realize and prepare countries (cities) in time with the purpose of minimization of political and material losses, which can be catastrophic for the interests of the state.

The modern world lives in an era of hybrid warfare and pandemics, so the dramatic openness of countries (cities) should take into account the following features:

First, in the modern world, global economic cooperation has yielded to a place of political and security, which causes the crisis of the essence of globalization as a result of the economic expansion of the advanced countries and transnational corporations.

Secondly, in the modern world interests are clearly dominant over values. In other words, today's world is a world of egotism and situational alliances.

Third, in the modern world, the established systems of international order and collective subjectivity are being taken over, and sometimes even destroyed. Getting and preserving the subject becomes more and more an individual matter (Bozhok E., 2021).

The above features and make a fundamentally important resilience as a strategy of challenges and threats ahead in sustainable development conditions.

Scientists stress that the resilience strategy of countries in with sustainable development components provides for

constant analysis of external and internal challenges and threats. For their monitoring, first of all, countries (allies of countries) whose national interests are crossed should be singled out – realized in the same direction or run counter to one another. At least such players as the US, NATO, the European Union, Russia and China are allocated on the current geopolitical arena. Their interests intersect to the greatest extent (Zablodska I., Sieriebriak K., Kolomytseva O. et al, 2019; Nesterovych V.F., 2016.).

Analysis of both external and internal challenges and threats of the country reveals economic, social, political, legal, military, spiritual and cultural, educational-scientific and network-information resolution. However, from the point of view of openness and transparency of cities, the resilience of mass communications, which requires assessment of the information environment (primarily mass media, social networks, the Internet) for the presence of challenges and ability to effectively counter them, is decisive. The network-information level of the resilience should be singled out especially – development of social networks in the Internet and communication in them in the XXI century became a factor of change both in economic, political, and even spiritual and cultural spheres (Bozhok E., 2021)

Ukrainian scientists stress the importance of mass communications resilience. For instance, Nesterovych V.F. considers that openness and transparency are important in the activity of state authorities as prerequisites for the establishment of democracy (Nesterovych V.F., 2016.). The openness and transparency of the city is connected with information activity of the Verkhovna Rada of Ukraine, the scientist Dorohykh S.O. noted this. He defined the basic principles of openness and transparency, starting with problems of access to public information (Dorohykh S.O., 2018).

The transparency rating of the 100 largest cities is being built annually in Ukraine, which reflects the assessment results of the transparency of the city councils' activities in the conditions of sustainable development. To this end, a set of indicators is used to assess the readiness of the city authorities to overcome existing corruption risks and can be applied irrespective of the size of the city or community taking into account the components (economic, social and ecological) of sustainable development. Then the rating is formed, which is based on the total sum of points collected by the city for 88 indicators in 13 spheres. The maximum number of points a city can receive is 100. In case of the same total number of points the city gets the same position in the rating. Among the indicators of evaluation are both simple and complex, and the corresponding scale, table 1 is used.

Table 1. Transparency scale of cities in conditions of sustainable development, built by authors according to (Transparency International, 2020)

Transparency level	Points
Transparent city	80-100 points
Mostly transparent city	60-79 points
Partly transparent city	40-59 points
Mostly non-transparent city	20-39 points
Non-transparent city	0-19 points

Usually, the following are used for evaluation:

- primary data (poll of representatives of city councils): city councils receive applicants, who fill in the authorized representatives. The applicant includes only those indicators for which the method of assessment is the *official response of the city Council*;
- secondary data (city council documents; information published on the sites): analysts estimate the transparency of cities on the basis of data available in the public (on the official web sites of councils, other specialized web resources).

As for the scientific approach to the assessment of the openness and transparency for cities in the conditions of sustainable development, which is applied in the world, it was used the information of the Numbeo database, which is a global database of data on different spheres of life of society, with the help of corresponding indices. Data collected by users and data collected manually from authoritative sources (supermarket websites, taxi companies' websites, government agencies, newspaper articles, other surveys, etc.) are used to collect the data from the numbers. Data collected manually from verified sources is entered twice a year. Automatic and semi-automatic filters for filtering of noise data are also performed. User behaviour studies are used. There are more than 30 complex filters among them – rating and ranking.

The availability of different scientific and practical approaches to the assessment of the countries (cities) resilience in conditions of sustainable development allows to carry out qualitative assessment.

#### 4. Analysis of the assessment results on resilient openness of the large cities in Eastern Europe in the conditions of sustainable development

Many indicators and indices are used to assess the resilient openness of large cities in Eastern Europe in a sustainable environment, but it is impossible to study all at the same time within the framework of this work. Therefore, we will consider some, to understand the general trends, for example – comfort of residence in the city. Usually, problems of comfort of residence are connected with pollution of large cities that depends on environmental component of sustainable development.

With the help of Numbeo it is possible to get information about comfort of living in cities all over the world. The following indicators of sustainable development are used to assess the comfort of living in cities of Eastern Europe:

- satisfaction of air quality;
- quality and availability of drinking water;
- water pollution (general);
- pleasure of garbage removal;
- do people think the city is clean and clean;
- noise pollution and light at night in the city;
- green and parks in the city;
- feeling of comfort to spend time in the city.

Table 2 shows the indices of pollution and comfort of residence in cities of Eastern Europe and their ranking. The more the index – the worse.

Table 2. Randy of pollution and comfort of residence index in cities of Eastern Europe in early 2022, built by authors based on data (Numbeo database, 2022)

Rank	City	Izk	Izk exp
1	Chelyabinsk, Russia	88.06	159,39
2	Krasnoyarsk, Russia	84.08	161,57
3	Dnipro, Ukraine	80,37	142,77
4	Bucharest, Romania	75,53	135,19
5	Yekaterinburg, Russia	73,79	129,37
6	Novosibirsk, Russia	70,55	123,68
7	Cracow, Poland	70.07	138,80
8	Sofia, Bulgaria	68,93	128.07
9	Kyiv, Ukraine	65.31	114.06
10	Chisinau, Moldova	63,77	110,87
11	Odesa, Ukraine	62,44	108,36
12	St. Petersburg, Russia	62.30	106,52
13	Wroclaw, Poland	61,83	114,67
14	Varna, Bulgaria	61,55	107.19
15	Plovdiv, Bulgaria	60.14	109,76
16	Warsaw, Poland	59,92	112,80
17	Iasi, Romania	58.28	101,17
18	Poznan, Poland	57,63	101,69
19	Kharkiv, Ukraine	57.21	97,99
20	Timișoara, Romania	56.18	96,79
21	Moscow, Russia	56.12	97,32
22	Budapest, Hungary	53,79	96.03
23	Gdansk, Poland	49,35	81,77
24	Lviv, Ukraine	49.11	82.22
25	Cluj-Napoca, Romania	44.05	73,76
26	Brno, Czech Republic	42,82	71,92
27	Minsk, Belarus	41,99	69,74
28	Bratislava, Slovakia	39,79	67.24
29	Prague, Czech Republic	33,97	57,85
30	Brașov, Romania	33.04	52,68
31	Nizhny Novgorod, Russia	32.08	50,98

*Pollution and comfort of residence index* is an estimate of the general pollution and comfort of residence in the city. The greatest weight is given to air pollution than pollution/availability of water, two main factors of pollution. Low weight is given to other types of pollution (*Izk*).

*Pollution Exp Scale* uses an exposure scale to show very high numbers for very dirty and uncomfortable cities and very low numbers for unpolluted and comfortable cities. Therefore, the calculation uses an eccentric function to determine the index (*Izk exp*).

Thus, the worst and the best indices (*Izk*, *Izk exp*) in Russia. The worst in Chelyabinsk – 88.06, and the best in Nizhny Novgorod – 32.09. As for Ukraine, the worst indices (*Izk*, *Izk exp*) in Dnipro (80,37), and the best in Lviv (49.11). The general assessment of Eastern European countries is presented in Figure 1.

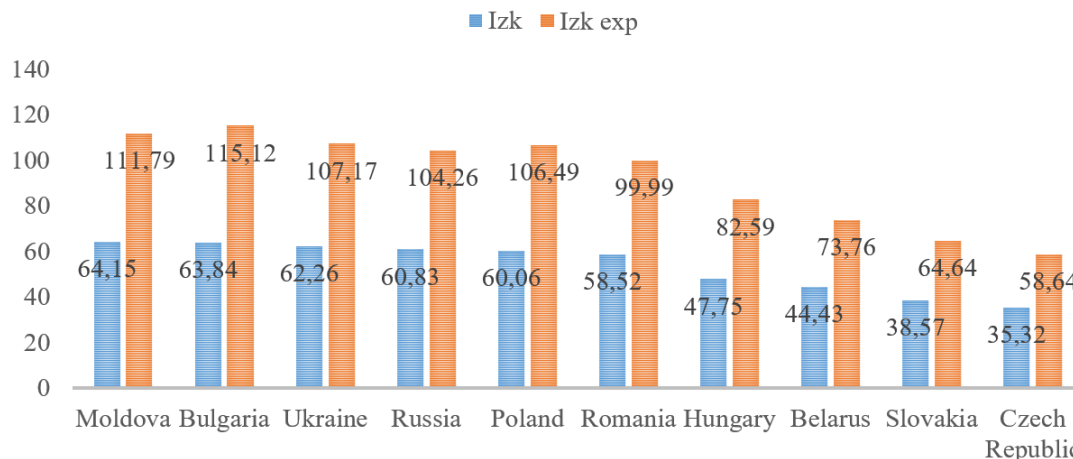


Figure 1. Assessment results of pollution and comfort of residence in cities of Eastern Europe in early 2022, built by authors based on data (Numbeo database, 2022)

Moldova and Bulgaria are the most polluted countries with low comfort living in cities. In the Czech Republic – the best situation.

As to the assessment of the transparency and openness of cities in Ukraine, which promotes comfort of residence, the survey of this aspect was conducted in 2021 for 2020 throughout Ukraine, before the war, which intensified on February 24, 2022. Fig. 2 demonstrates the visualization of Ukrainian cities on the map where the assessment was conducted.



Figure 2. Visualization of Ukrainian cities on the map where the assessment was conducted, built by authors

The transparency and openness assessment of cities in Luhansk, Donetsk regions and the Autonomous Republic of Crimea was not conducted due to the occupation of these territories by Russia in 2014. In other Ukrainian cities, the assessment was carried out with the help of 13 indicators in relation to the spheres of sustainable development:

*Economic sphere:*

*Procurement - Iz, Financial and material assistance, grants - If, Investment and economic development - Ii;*

*Environmental sphere:*

*Land use and construction policy - Izb, Communal enterprises - Ik;*

*Social sphere:*

*Housing policy - Ig, Social services - Is, Personnel issues - Ikp, Anti-corruption policy and professional ethics -*

*Ia, Communal property - Ikm, Education - Io, Information about the work of local self-government body - Iims, Access and participation - Id, See figure 3.*

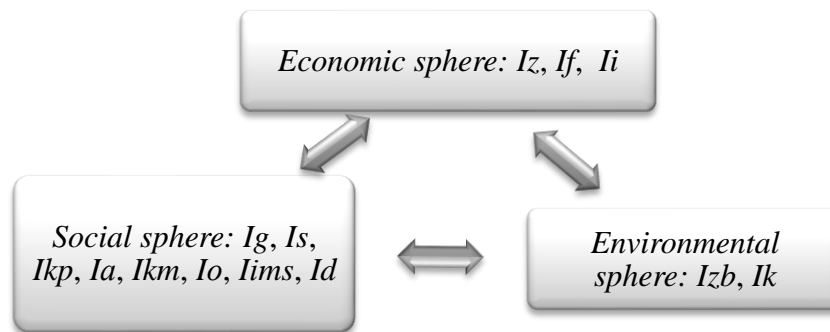


Figure 3. Indicators of sustainable development assessment in the context of openness and transparency of cities in Ukraine, built by authors

The annual rating of cities (Transparency International, 2021) is formed according to the results of the indicators assessment. However, due to Russia's full-scale invasion of Ukraine in early 2022, the assessment for 2021 was not carried out.

In 2020, for the first time during the measurement of transparency, two cities were included in the category of *transparent* — Mariupol and Lviv, which scored 86,6 and 85,2 points out of 100 respectively. The cities also took the first two steps of the reporting rating of 50 cities of Ukraine with results of 32 and 22 points from 100 respectively. A noticeable gap between transparency and accountability is observed in the assessment of other cities as well. For instance, the average reporting rate of 50 city councils is only 12,5 points out of 100 possible, while the average transparency of these cities is 54,4 points out of 100. In the top-5 rating of transparency cities also included Drohobych (78,1 points), Vinnitsa (76,7 points) and Ternopil (75,2 points).

Volodymyr-Volynsky became the leader in the transparency rating in 2020, adding 22 points to the 2019 indicators. Such growth allowed the city to enter the top ten rating. The city Council has improved the results in most areas from 1 to 3 points per year, in particular in *Communal enterprises* by 8 points (0,9→9,0), and in “Housing policy” by 0 to 6 points. At the same time, indicators in the areas of *Communal Property* and *Access and participation* fell by several decades.

In the five most accountable cities of Ukraine in 2020, except Mariupol and Lviv, as well as Pokrov (22 points), Bila Tserkva (21 points) and Chernivtsi (20 points).

Among the 100 cities estimated, only two non-transparent (0–19 points) — Izmail (18,3) and Novomoskovsk (14,8). Novomoskovsk falls into this category for the third time in 4 years of evaluation. Transparency is growing, but the pace is slowing. In 2018, the overall level of transparency in 100 cities increased by 38,5%, in 2019 by 10,4%, and in 2020 by 4,4%. In the rating of transparency in 2020, 57 cities showed a positive increase in points. The average reporting rate of 50 cities is four times lower than the transparency rate of these cities (54,4 vs. 12,5). In the reporting rating, only 5 out of 45 cities entered the category “mostly unaccountable” (20-39 points) – Mariupol, Lviv, Pokrov, Bila Tserkva and Chernivtsi. The rest of the cities have scored less than 20 points and have the status of unaccountable (Transparency International, 2020a).

In addition, Ukraine has the *Open City* project, which is a crowdsourcing Internet platform for interaction of residents with local authorities and communal enterprises, as well as for self-organization of citizens. For this purpose, there are two sections on the site:

*Problems* – gives an opportunity to create a report on the problem of sustainable development, which will be directed to the appropriate organization for the solution;

*Useful objects* – a map of the city on which portal users can apply different kinds of useful objects, such as hospitals, schools, parking lots, tourist objects, Free Wi-Fi zones, battery reception points, other (Platform of electronic democracy *Edem*, 2022).

However, in order to understand the correlation of the assessment results on openness and transparency of Ukrainian cities in the context of their resilience as well as in the conditions of sustainable development, which contributes to the comfort of residence with the help of the Numbeo database, Transparency International Ukraine (accredited representative of the global movement Transparency International) and Transparency Cities it is appropriate to conduct comparative analysis of the received estimates, Table 3.

Table 3. Comparative analysis of assessments on openness and transparency of Ukrainian cities in the context of their resilience in the sustainable development conditions, built by authors

<i>Ukrainian cities</i>	<i>Izk</i>	<i>Izk exp</i>	<i>Rating</i>	<i>Transparency International Ukraine (max 100 points)</i>	<i>Rating</i>	<i>Transparent Cities (max 100 points)</i>	<i>Rating</i>
Dnipro	80,37	142,77	<b>5</b>	<b>71,9</b>	<b>2</b>	<b>84,20</b>	<b>2</b>
Kyiv	65,31	114,06	4	68,2	3	<b>59,10</b>	<b>3</b>
Odesa	62,44	108,36	3	61,6	3	<b>57,60</b>	<b>3</b>
Kharkiv	57,21	97,99	<b>2</b>	<b>48,9</b>	<b>4</b>	<b>52,70</b>	<b>5</b>
Lviv	49,11	82,22	<b>1</b>	<b>85,2</b>	<b>1</b>	<b>85,50</b>	<b>1</b>

The built rating shows that Lviv is the best in comfort of residence and that stands in the first-place rating by all the results of the rating. Odesa also has the same result of openness and transparency assessment of Ukrainian cities in the context of their resilience and sustainable development regarding comfort of residence (3). All other cities have excellent places in ratings. However, it should be noted that Kyiv also keeps one level (4 or 3 place in the rating). Dnipro and Kharkiv have fluctuations in evaluations and ratings, places from 2 to 5. Scientists and practitioners developed special recommendations for resilience openness of large cities of Ukraine in the conditions of sustainable development as Eastern European countries:

1. Implement electronic tools to ensure community participation in management processes to conduct public hearings with the help of video communication, to provide the possibility of remote questioning on the eve of local self-government meetings, to use the system of online registration. Use available resources that can simplify the implementation of digital sustainable development solutions.
2. Make websites more accessible, in particular to provide intuitive access to key sections, a convenient system for searching documents and news. Make websites exclusive, in particular create a version for people with visual impairments. Timely publication of the decisions and full agenda of the city Council and executive Committee meetings, especially in the context of sustainable development.
3. To announce public events and meetings of local self-government bodies in advance and to update plans of their work taking into account principles of sustainable development. Ensure unimpeded access to local government meetings for citizens and journalists with respect to quarantine requirements. To provide online broadcasting (with preservation of video record) of meetings of local self-government bodies, competitive commissions, public discussions and hearings.
4. To publish information about the public budget (participation budget), in particular, the status of realization of the winning projects. Promote the implementation of the winning objects during the calendar year after the competition.
5. Create an electronic registration system for housing applications. Publish current data on housing and housing, which is in communal ownership, in particular on free premises, provision of office housing, withdrawal from the status of service and privatization.
6. Register the office on the portal of public procurement DOZORRO and adopt an act which obligates the customers to respond to the appeals and responses of citizens. Monitor the implementation of this Act.
7. Record complaints received by public funds and city Council regarding procurement, conduct internal audits and publish results on the official website.
8. Adopt an ethical code (or a corresponding section in another normative-legal act) of deputies of the city Council, as well as officials of local self-government and employees of communal enterprises. The Code of Ethics should contain principles of non-discrimination and gender equality, as well as provide sanctions in case of violation of norms by its subjects.
9. Create a geoportal of the city where to publish interactive maps with general plan, zone plans, detailed plans of territories, as well as location of advertising structures and complex scheme of temporary structures.
10. Conduct public discussions on issues important to the community, such as the budget, tariffs for utilities and other regulatory acts on sustainable development. To publish the actual reports of municipal enterprises and to present the reports publicly. Publish information about contracts and payments on the Single Website of Public funds use. Develop regulations and appoint managers of communal enterprises on the basis of open competitions.
11. Publish data in formats to be automatically read and processed (Transparency International, 2020a).

These arguments prove that Ukraine as a country of Eastern Europe has all the prerequisites for the implementation of the resilient openness strategy for countries (cities) in sustainable conditions. The strategy should be determined by the innovative direction of sustainable urban development, based on active use of knowledge and scientific achievements, stimulation of innovation activity, creation of favourable investment climate, updating of production funds, formation of high-tech activities and branches of economy, increase of energy efficiency of production, stimulation of balanced economic growth, which requires further scientific research in this field.

## 5. Conclusions

The conducted research of the resilient openness of large cities in conditions of sustainable development allowed to come to the following conclusions.

The modern world lives in an era of hybrid warfare and pandemics, so the rapid openness of countries (cities) in conditions of sustainable development has a strategy of meeting challenges and threats, preservation and development of real sovereignty and independence. Analysis of both external and internal challenges and threats of the country reveals economic, social, political, legal, military, spiritual and cultural, educational-scientific and network-information resolution. However, from the point of view of openness and transparency of cities the resilience of mass communications is dominant.

The importance of mass communications resilience of open cities is emphasized by Ukrainian scientists and practices, which refer to the assessment of transparency and openness of 100 largest cities of Ukraine. For this purpose, a set of indicators is used, among which are both simple and complex. A set of estimates based on primary and secondary data is used. However, the worldwide approach is based on the information from the Numbeo database, which is a global database of data on different areas of sustainable development, with the help of relevant indices. With the help of the Numbeo platform scientists will get information about pollution and comfort of residence in cities of the whole world, according to the following indicators: satisfaction of air quality; quality and accessibility of drinking water; pollution of water (general); satisfaction of garbage removal; whether people consider the city clean and safe; six pollution and light at night in the city; green and parks in the city; feel comfortable to spend time in the city.

In the paper the authors give some results of ranking indices (*Izk*, *Izk exp*) in cities of Eastern Europe in the beginning of 2022. The worst condition of pollution and comfort of residence in Chelyabinsk, and the best in Nizhny Novgorod. As for Ukraine, the worst condition of pollution and comfort of residence in the Dnipro, and the best in Lviv. Moldova and Bulgaria are the most polluted countries with low comfort living in cities. In the Czech Republic – the best situation.

The results of the transparency and openness assessment for cities in Ukraine, which contributes to the comfort of living, cover thirteen indicators of sustainable development, which are set into three groups: economic, ecological and social. In 2020, two cities fell into the category of *transparent* – Mariupol and Lviv, but Volodymyr-Volynsky became the leader in the rating of transparency of openness. Among the 100 cities evaluated, only two cities are opaque Izmail and Novomoskovsk. Also, in Ukraine is being implemented the "Open City" project, which is a crowdsourcing Internet platform for interaction of residents with local authorities for sustainable development.

In order to understand the correlation of the assessment results on openness and transparency of Ukrainian cities in the context of their resilience and sustainable development, the authors demonstrated comparative analysis of the received assessments by different stakeholders. This allowed to establish that a comfortable city for living is Lviv, which stands in the first place by all estimates. In order to enhance the resilient openness of large cities in Ukraine in the conditions of sustainable development, such as Eastern Europe, scientists and practitioners gave some recommendations, which implementation will contribute to the emergence of a high-quality strategy of the resilient openness of large cities as it is vital for the further restoration of the cities of Ukraine affected by Russian military aggression.

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