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The Idea of a 'Just City' – a Concept of an Aggregate Measure of Development in Polish Cities

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Abstract. The subject of the article is the 'just city' concept. Justice, greening and making cities productive in the long term are the main axes of the integrated development of modern cities. The main goal of the paper is to discuss and assess the degree of justice in the development of 66 Polish cities with poviat rights in 2010, 2015, 2018, and 2020. Based on previous research and available data, an aggregate measure of a just city based on a linear ordering method is proposed. For this purpose, an average value of variables was determined, which were normalized using the method of zero unitarization in dynamic approach. The analysis shows that between 2010 and 2020, there was an increase in the level of justice in urban development (the average yearly rate of change was 2.5%). Only seven cities recorded a decline. There was also a slight and decreasing variation in cities in terms of the urban justice. One can even speak of an equalization of inequality here.

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1. Introduction

In the sustainable development paradigm, justice, both within and between generations, is strongly emphasized. In the current version of the global sustainable development strategy, i.e., the 17 United Nationals (UN) Sustainable Development Goals (SDGs) (UN, 2015), justice is presented from many different perspectives, e.g., poverty and hunger, gender equity, access to resources that perform basic biological functions, access to public services, freedom, governance and democracy. The 2030 Agenda for Sustainable Development focuses on making cities and human settlements safe, stable, and inclusive. Similar values described as the 'right to the city' are also included in the UN's New Urban Agenda (EU Ministers, 2016). The guiding idea of the right to the city is to ensure conditions for the full and free use of cities by all current and future residents. However, the right to the city concerns not only the use of the city itself, but also the opportunity to actively participate in its development. In this context, the idea of a civic city resonates: a city based on a multi-level governance and participatory approach to management, adapted to local needs and the expectations of its inhabitants.

The category of justice is also an important subject of the debate about the need to revise the general model of socio-economic development. It is a central category of the social economy trend (EC, 2021). Justice in local public policies is always described by the following (ICLEI, 2022):

- access – to ensure just distribution and accessibility to public services and healthy public spaces;
- participation – to consider the governance and empowerment aspects of local development, making all voices heard;
- opportunity – to provide incentives and support for development, the potential for well-being, and fair perspectives for all.

The just city is also one that supports the building of neighbourly relations and a return to the idea of locality. The basis for involving citizens and caring for the city as a common good is based on trust and mutual care. An important aspect of the just city idea is the conscious and responsible shaping of public and common spaces. Urban spaces and how the benefits of development are spatially distributed are core concerns for spatial justice (Fainstein, 2010). The space in a just city gives the opportunity for interpersonal contact and is healthy and safe. It is also filled with green spaces and is characterized by limited car traffic. Shaping city space in this way is an investment in the quality of life of current and future generations (Sobol, 2019).

Justice, greening and making cities productive in the long term are the main axes of the integrated development of modern cities This three perspectives of the city sustainability were the main subject for undertaking comprehensive research. The results make up a series of papers on urban monitoring. An important premise for undertaking the research was the updating of the National Urban Policy (NPM) in Poland in 2022 (MDFRP, 2022). The paper contributes to the study of urban monitoring and its response to the direction of sustainable development set by the current European Union (EU) strategy, i.e., the EU Urban Agenda (EU Ministers, 2016), the European Green Deal (EC, 2019), as well as by the New Leipzig Charter (EU Ministers, 2020).

The issues of justice are more and more accented in the face of multiple global crises. The situation was a catalyst for a U7 Mayors Declaration entitled "Delivering Peace, Democracy and Sustainability in the Urban World Through Sustainable Cities, Urbanization and Multilevel Cooperation" (the Urban7 Group brings together mayors through the networks of local governments of G7 nations and the EU). The Declaration incorporates all the key values of a just city with a statement: "We, the local governments of the G7 members, share common values, including respect for fundamental human rights, the rule of law, democracy and freedom of expression. Cities play a crucial role in fighting corruption, populism, and human rights abuses. We also facilitate the democratic participation of our residents. We recognize gender equality and women's empowerment, youth empowerment and intergenerational justice as necessary foundations for a peaceful, prosperous, and sustainable world" (U7 Mayors Declaration, 2023: 2).

Another act of policy statement towards the just city is the "Malmö Commitment on Inclusive and Equitable Communities", which was jointly created by ICLEI - Local Governments for Sustainability, and the City of Malmö, (originally: ICLEI - International Council for Local Environmental Initiatives) (ICLEI, 2022). The Malmö Commitment, launched in May 2022, aims to empower local and regional governments to put all people and social equity at the core of all their sustainability actions. An essential step is to develop social equity indicators to measure the impact and progress towards a just city. Similar directions are presented by OECD projects (OECD, 2016).

Justice has been researched from many different perspectives. Urban research draws on research and scientific debate on global or national scales.

However, it must also be more specific and include local conditions. In recent years, there has been a surge in discussions on the social inclusion of various social groups and issues of inequity. The turning point in our understanding of the problems was Piketty's 'Capital in the Twenty-First Century' (Piketty, 2014). As research shows, inequalities have many comprehensive implications. They weaken social solidarity and can be a source of conflict and unrest (Wilkinson, 2005). They harm natural conditions, and the environment in general (Holland et al., 2009; Landry & Chakraborty, 2009; Hicks et al., 2016). Many researchers have also explored the relationship between life satisfaction and democratic stability (Granato et al., 1996; Frey & Stutzer, 2000; Inglehart et al., 2008). In general, they showed that democracy and freedom have a major impact on happiness and quality of life (Helliwell, 2003). These statements supported Easterlin's recommendations that a policy towards happiness should focus not only on economic growth, but also on noneconomic aspects of well-being (Easterlin, 2001).

An interesting approach to the just city concept can be presented through urban injustice patterns. Researchers working on the UrbanA project in cities in Europe identified the following ten drivers of injustice that are manifested and operating in the context of urban sustainability efforts (Kotsila et al., 2020; UrbanA, 2023):

1. Exclusive access to the benefits of sustainability infrastructure;
2. Material and livelihood inequalities;
3. Racialized or ethnically exclusionary urbanization;
4. Uneven and excluding urban intensification and regeneration;
5. Uneven environmental health and pollution patterns;
6. Unfit institutional structures;
7. Limited citizen participation in urban planning;
8. Lack of effective knowledge brokerage and stewardship opportunities;
9. Unquestioned neoliberal growth and austerity urbanism;
10. Weak(ened) civil society.

The outcomes of the UrbanA project also provided the principles for sustainable, just cities (UrbanA, 2023):

- Integrate justice into sustainable urban development;
- Embrace alternative economic models;
- Formulate policies with and for all citizens;
- Build transformative capacities;
- Integrate diversity, equity and inclusion into urban planning;
- Strengthen communities;
- Enable universal access to the environment;
- Maximize wellbeing within planetary boundaries;
- Put digitalization at the service of all.

Various organizations undertake initiatives to monitor sustainable cities, including just cities. Their analyses are used for international comparisons, which, in turn, are the basis for public policies and the development of their best models. The overview of selected initiatives to monitor the issue of justice in cities in Table 1 below was the starting point for preparing a proprietary set of just city indicators.

This paper discusses the meaning of a category of justice for sustainable development from a city perspective. It reviews the key findings and research gaps in terms of monitoring just cities. Its main goal is to propose an aggregate measure of the just city and to assess the degree of justice in the development of Polish cities. It also discusses policy implications and gives recommendations for policymaking and suggestions for future research.

2. Research materials and methods

The analysis was based on the structured logic research process presented in Figure 1. This has enabled us to identify conditions and opportunities for diagnosis and monitoring of the urban justice process.

An important stage of the research was a broad search of domestic and foreign literature, available databases, reports and studies devoted to social economy, justice and social inclusion, especially in terms of city monitoring. It allowed to create a framework for identifying and monitoring the process of developing a just city. Based on the available public data in Poland, 35 indicators were proposed (Table 2). This original set of data and indicators dedicated to 66 Polish cities with poviat status (cities of different sizes) fills the research gap in this area.

The proposed indicators were divided into stimulants and destimulants, where S is a stimulant (higher values determine a higher level of development), and D is a destimulant (which exhibits the opposite effect) (Młodak, 2006). The collected data show the status and dynamics of changes in 2010, 2015, 2018 and 2020. Institutional changes at the national (National Urban Policies) and EU level (Green Deal, New Leipzig Charter)

Table 1. An overview of the selected initiatives for monitoring a just city

Initiative (area of monitoring development of JC – just city or SC – sustainable city)	Coordination	Categories of monitoring indicators of justice in terms of access, opportunity and participation
GRI – Global Reporting Initiative Standards (SC)	GRI	human rights, local community, safety, health, democracy, freedom, diversity and equal opportunities, education
Annual Quality of Living Report (SC)	Mercer	medical and health considerations, political and social environment, public services, transport, recreation, schools and education, socio-cultural environment
SDG Voluntary Local Reviews (SC)	European Commission	social inclusion, vulnerable people, persons with disabilities, gender equality, empowerment, democracy, human settlements, safety, affordable housing and basic services, access to safe, green and safe public spaces, access to basic resources and food security, sustainable mobility, equitable quality education and lifelong learning opportunities for all, healthy lives and well-being
Building Urban Datasets for the SDGs (SC)		
European Urban Audit (SC)		housing, health, crime, civic involvement, local administration, education and training provision, educational qualifications
Survey on the quality of life in European cities, 5th edition (JC)		safety, social inclusion, housing, transport and mobility, culture, education, health care, green areas, air quality, public administration, corruption, trust
Ranking of Polish Sustainable Cities (SD)	Arcadis	public transport, access to health care and education, level of income inequality, work-life balance, proportions between professionally active and inactive people, access to green areas

Source: own elaboration based on (UN, 2017; EC, 2020; Arcadis, 2021; Siragusa et al., 2021; GRI, 2023; Mercer, 2023).

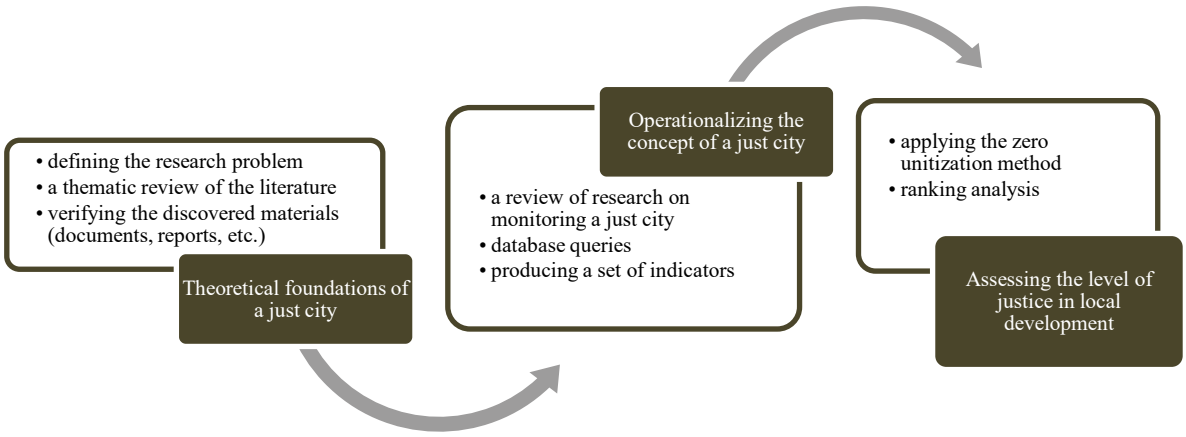


Fig. 1. Framework of the research stages for diagnosis and monitoring of the urban justice process
Source: own elaboration.

form the background of the considerations made and determined the temporal scope of the research. Urban policy as an area of public action has been formalized in Poland by the National Urban Policy 2023 (CM, 2015), adopted in 2015, so it was crucial to identify the trajectory of change in the perspective of the years: 2010 - 2020, i.e. before the NPM (hence the diagnosis at the point - 2010), in the implementation phase of the NPM 2023 (2015 and 2018) and the recognition of the current state (2020) before the adoption of the new NPM of 2022 (MDFRP, 2022). The availability and continuity of public statistics was also an important determinant.

The research and analysis were limited to 66 cities with poviat rights, which constitute a relatively homogeneous research group. This homogeneity is also due to standardized administrative conditions, competencies, and development opportunities based on dedicated public policies (Kozera, 2016). The three-tier administrative division of Poland was introduced on 1 January 1999 and divided the territory of the country into voivodships, then into poviats and gminas. As of 1 January 2023, the Polish territorial division includes: 16 voivodships (a common classification of territorial units for statistics, NUTS-2), 380 poviats, including poviats and cities with poviat status (local administrative units, LAU-1) and 2,477 gminas including urban, urban-rural and rural gminas (LAU-2) (SP, 2023). A city with poviat rights, usually counting at least 100,000 of inhabitants or, in majority being capital cities of voivodeships before 1999. In total, there are 66 cities of this type in Poland which have both municipal and county competences. Their executive body is the president, and their legislative body is the city council, which pools the competences of the country council and the municipal council (MDFRP, 2022). A city with poviat rights performs public functions in its own name and under its own responsibility. Its tasks include all public matters of local importance. The tasks are executed after the city has been provided with the necessary financial resources for their implementation. These cities are currently one of the most important service providers and public investors, and an important player in the local policy-making process (Dziekański, 2019). In this study, the selection of indicators, in addition to the substantive rationale, which covers a variety of urban development areas, was based on the current mainstreams outlined in strategic documents and international policies (Table 1).

The availability, completeness and continuity of data in public statistics were important as they allowed us to observe phenomena during the analyzed period. The characteristics that make up the synthetic measure had to meet certain statistical and formal criteria (Kusideł & Antczak, 2014). Variables should be characterized by spatial variation and low correlation. In our analysis, differentiation was investigated using the modulus of coefficient of variation (|CV|) and we considered the variables that meet the condition of |CV|>10% (Pélabon et al., 2020). Pearson's linear correlation coefficient static value and significance analysis was used to assess the degree of correlation between variables. The significance of the calculated correlation was tested using a Student's t distribution with r-2 degrees of freedom and a significance level of α=0.05 (Antczak, 2019). To confirm the validity of the selection, collinearity was excluded based on the value of the VIF (the variance inflation factor), i.e., VIF<3 (Marcoulides & Raykov, 2019). On this basis, from the set of sub-metrics, 28 that met the formal criteria were selected for further analysis. In Table 2, they are marked with an asterisk (*).

To aggregate and illustrate the dimension of the just city, a synthetic measure of development was constructed based on a linear ordering method. For this purpose, an average value of variables was determined, which were normalized using the method of zero unitarization in dynamic approach. The method allows the measure to be compared across the years studied (Fura, Stec, & Miś, 2020). In this formula, the level is analyzed in r objects W1, W2, ..., Wr (i.e., 66 cities with poviat rights). Each object is described by n diagnostic variables (Table 2). The accumulated indicator information forms a two-dimensional matrix of the form:

$$X = [x_{ij}] = \begin{bmatrix} x_{11} & \cdots & x_{1n} \\ \vdots & \ldots & \vdots \\ x_{r1} & \cdots & x_{rn} \end{bmatrix} \qquad \begin{pmatrix} i = 1, \ldots, r \\ j = 1, \ldots, n \end{pmatrix} \quad (1)$$

where x_{ij} denotes the value of variable X_j in object W_i. Each object is characterized by a vector of diagnostic variables:

$$X = [x_{i1}\, x_{i2} \ldots x_{in}], \qquad (i = 1, \ldots, r) \quad (2)$$

In the zero-based unitization method, there is a fixed reference point, which is the range of the normalized variable:

$$R(X_j) = max x_{ij} - min x_{ij} \quad (3)$$

The variable is normalized according to the nature of the trait, i.e., for stimulants, it is (4):

$$z_{ij} = \frac{x_{ij} - \min x_{ij}}{\max x_{ij} - \min x_{ij}} \quad (4)$$

Table 2. The suggested diagnostic variables for monitoring the development of a just city and the values of selected statistics (averaged for 2010, 2015, 2018, 2020)

The category of justice	Variable	Unit	Character	M	SD	|CV|
Access	*Share of deaths before age 60	as % of deaths	D	17.4	2.6	15.1
	*Share of deaths from cancers	in total deaths in %	D	27.3	2.8	10.2
	*Total police-recorded crimes	per 1,000 residents	D	33.6	11.1	32.9
	*Places in kindergartens	per 1,000 children in the 3-6 age group	S	1,015.3	99.9	10.0
	Places in crèches and children's clubs	per 1,000 children under 3 years of age	S	62.2	54.9	88.3
	*Students in comprehensive schools	per district	S	27.0	3.2	10.0
	*Students in basic vocational schools	per district	S	13.0	2.2	16.9
	*Doctors (total working staff)	per 10,000 population	S	83.5	31.7	37.9
	Beds in general hospitals	per 1,000 population	S	7.7	2.4	31.6
	*Outpatient clinics	per 10,000 population	S	6.6	1.9	28.9
	Users of installation (water supply)	in % of total population	S	97.2	2.7	2.8
	*Users of facilities (sewerage)	in % of total population	S	90.9	5.8	10.3
	*Expenditures in the division of culture and national heritage protection	in PLN per capita	S	192.5	88.6	46.0
	*Stock of social housing	per 1,000 people	S	4.6	4.0	86.8
	Municipal housing stock (communal)	per 1,000 inhabitants	S	39.3	21.9	55.8
	*Number of park-and-ride sites (Park & Ride) per city	share in total number in %	S	1.5	4.7	309.6
	*Share of the length of bus lanes in the length of hard-surfaced district roads	in %	S	3.6	11.6	325.8
	*Share of municipal land area in the city area	in %	S	25.4	12.0	47.3
	*Share of uninhabited dwellings (vacant) in the city's housing stock	in %	D	0.5	0.5	107.1
	*Number of road fatalities	per 100,000 population	D	3.4	1.2	36.6
	*Injured in accidents at work	per 1,000 total employees	D	7.5	1.8	24.3
Opportunity	Share of post-working age population	in % of total population	D	22.0	2.0	9.2
	Expenditure on social assistance	in PLN per capita	S	353.3	80.5	22.8
	*Residential social assistance facilities	per 10,000 population	S	0.4	0.2	39.8
	*Average monthly gross wages	PLN	S	4,288.9	639.0	14.9
	*Homeless people in night shelters, homes, and shelters for the homeless	per 10,000 population	D	8.7	5.1	58.8
	*Number of families granted social assistance	per 1,000 population	D	241.9	67.1	27.8
	*Employed in hazardous conditions	per 1,000 employees at surveyed establishments	D	99.3	66.0	66.4
	*Total suicide attempts (including fatalities)	per 10,000 population	D	4.4	2.8	62.7
	*Sports clubs	per 10,000 population	S	3.3	1.1	33.0
	*Total registrations (migrants)	per 1,000 population	S	8.6	2.1	24.9
	*Job offers for persons with disabilities	per 1,000 unemployed persons with disabilities	S	67.0	65.4	97.6
Participation	*Number of members of circles, clubs and sections	per 1,000 population	S	9.5	7.3	76.6
	Share of working women in total workforce	in %	S	50.1	5.2	10.3
	*Share of women councilors in district legislative bodies	in %	S	27.0	6.5	24.0

Note: M – mean, SD – standard deviation, CV – coefficient of variation (Młodak, 2006). The categories in Table 1, which are more specific, do not correspond clearly to the broader dimensions of Access, Participation and Opportunity in Table 2. Table 1 includes categories of monitoring indicators related to justice that can actually be assigned to all three aggregate themes at the same time, e.g., local community, education, or human rights. In this case, the multi-faceted nature of the justice domain permeates all aspects, and the final assignment is determined by the selection of a specific indicator.

Source: own elaboration based on Statistics Poland, Police High Command, and public information bulletins.

and for destimulants, it is (5):

$$z_{ij} = \frac{\max x_{ij} - x_{ij}}{\max x_{ij} - \min x_{ij}} \quad (5)$$

where: the characteristic z_{ji} is a transformed stimulant or destimulant, maxx_{ij} – the maximum value that the characteristic reaches in the 66 cities with poviat rights, minx_{ij} – the minimum value that the characteristic reaches in the 66 cities. Normalizing the features deprives the variables of the various measurement units in which they are expressed and produces a set of features with positive values between 0 and 1. They form a matrix (6):

$$Z = [z_{ij}] = \begin{bmatrix} z_{11} & \cdots & z_{1n} \\ \vdots & \ldots & \vdots \\ z_{r1} & \cdots & z_{rn} \end{bmatrix}_{(rxn)} \quad (6)$$

Thus, a matrix (X) of dimension (r x n) goes into a matrix Z of the same dimensions. Each object is described by a vector of normalized features (7):

$$Z = [z_{i1}\, z_{i2} \ldots z_{in}] \quad (7)$$

The study used a modified dynamic approach for the development measure, which involved determining the maximum and minimum value for each feature for each year. Then, the normalization procedure (4) and (5) took the minimum and maximum among the variables' values for the entire period. The dynamization of the method made it possible to assess the magnitude and direction of changes occurring in the cities over the ten-year period (Brożek et al., 2021). To obtain a single score that characterizes an object, all variables normalized for each object were summed (8):

$$q_i = \sum_{j=1}^{n} z_{ij} \quad (8)$$

The synthetic measure of a just city (SMJC), which is an evaluation of the variable that characterizes the *i*-th object, was determined based on formula (9):

$$\text{SMJC} = \frac{1}{n}\sum_{j=1}^{n} q_i \quad (9)$$

The SMJC obtained by formula (9) takes values in the range [0,1]. The higher the index (closer to 1), the higher the development of the just city (unit) in a given year (and the higher the city's position in the ranking). Due to the lack of information about the circumstances that affect the differential importance and role of diagnostic features, the study adopted equal weights for selected diagnostic variables (OECD, 2008; Kusideł & Antczak, 2014). In this study, each feature was given equal importance (assigned a weight equal to 1).

As already mentioned, the dynamic version of the method made it possible to compare changes in the measure for the same object over time. Thus, we assessed the direction and scale of changes that occurred in the city in a given period and the city leaders' determination.

In summary, the analysis used a procedure that included the following elements:

1. Developing a database, i.e., collecting data, constructing just city indicators, and determining the nature of the variables (i.e., stimulants or destimulants).
2. Selecting diagnostic variables: formally evaluating (correlation and variance analysis) and determining the weights of selected variables.
3. Normalizing variables.
4. Calculating the synthetic measure as a measure of the development of the just city.
5. Classifying cities, which was based on quartiles, i.e., the fourth class (the least-developed just cities) boundaries were determined by the minimum and the first quartile, the third class by the first quartile and the median, the second class by the median and the third quartile, and finally, the first class (the most developed just cities) were determined by the third quartile and the maximum (Kukuła & Bogocz, 2014).
6. Visualizing, tabulating and interpreting the results.

We analyzed data in IBM SPSS Statistics v.20, and visualized in ArcMap v. 10.8.2.

3. Research results

Between 2010 and 2020, the ten cities with the highest measures of a just city were Olsztyn, Warszawa, Rzeszów, Wrocław, Sopot, Katowice, Kraków, Zamość, Bialystok, and Poznań (selected as the most just cities in class 1). In contrast, Mysłowice, Rybnik, Bytom, Ruda Śląska, Suwałki, Gliwice, Świnoujście, Dąbrowa Górnicza, Skierniewice and

Jastrzębie Zdrój were ranked bottom (the lowest values of the measure in class 4, Figure 2).

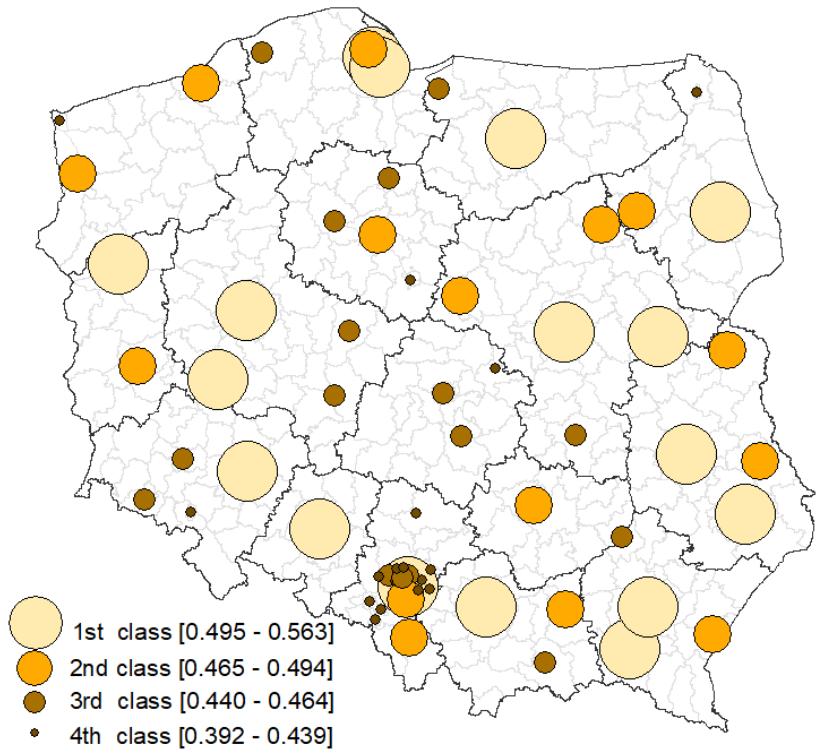
Olsztyn is the clear winner in the percentage of bus lanes to the length of hard-surfaced county roads (81.0% compared to the average of 3.6%) and in the number of members of circles, clubs and sections (20.6 per 1,000 inhabitants compared to the average of 9.5). During the period studied, the city had many more places in crèches (1,116.61 places per 1,000 children in the 3-6 age group compared to the average of 1,015.2). This city has almost twice as many residential social assistance facilities per 10,000 population as the average (0.75 vs. 0.45) and double the share of municipal land area in the city area (58.54% vs. 25.4%).

The capital, Warszawa, stands out in terms of the average gross salary (PLN 5,966.54 vs. PLN 4,288.9 in the surveyed cities) and the number of park-and-ride sites (29% of the total number). It has almost twice the share of women councilors in district legislative bodies than the average (45% vs. 27%). It also has far fewer people working in hazardous conditions per 1,000 employees in surveyed establishments than the average (35.8 vs. 99.3) and almost twice as many families on social assistance than the average (180 vs. 242 per 1,000 population).

Wrocław has the highest number of job vacancies for people with disabilities (229 vs. 67 per 1,000 unemployed people with disabilities). It has one of the lowest rates of families receiving social assistance (179 vs. 242 per 1,000 inhabitants). The city has an above-average number of Park & Ride sites as a percentage of the total (19.7% of the total number), and a high percentage of bus lanes as a percentage of the length of hard-surfaced district roads (46% vs. 3.6%).

Meanwhile, Rzeszów has an above-average number of students in comprehensive schools (30 vs. 27 per district) and basic vocational schools (16 vs. 13 per district). Between 2010 and 2020, the city recorded the highest number of total registrations of migrants among the cities surveyed (15 vs. 8.6 per 1,000 population). It is also characterized by a high number of members of circles, clubs and sections (22 vs. 9.5 per 1,000 population) and doctors (158 vs. 83.5 per 1,000 population).

In Sopot, no homeless people were registered in night shelters or hostels for the homeless. Meanwhile, the city has the most clinics (11.3 vs. 6.7 per 10,000 population), users of sewerage systems (99.8% vs. 90.9%) and the highest expenditures on culture and national heritage protection (635 vs. 192.5



The highest SMJC values for cities in different classes	
4th class	**1st class**
Mysłowice	Olsztyn
Rybnik	Warszawa
Bytom	Wrocław
Ruda Śląska	Rzeszów
Suwałki	Sopot
Świnoujście	Katowice
Gliwice	Kraków
Dąbrowa Górnicza	Zamość
Skierniewice	Białystok
Jastrzębie-Zdrój	Poznań

Fig. 2. Ranking of just cities by class (2010–2020 SMJC average)
Note: The location of cities (by name) with poviat rights is presented on the map in the Appendix.
Source: own elaboration based on data presented in Tab. 2.

PLN per capita). Poznań has one of the lowest total number of suicide attempts (1.2 vs. 4.4 per 10,000 population), while Zamość has the lowest share of uninhabited (vacant) flats in the city housing stock (0.09% vs. 0.5%).

Cities at the bottom of the ranking do not have park-and-ride schemes or bus lanes, except for Gliwice, where the length of bus lanes as a proportion of the length of hard-surfaced district roads was 0.22%, compared to the average of 3.6%. On the other hand, Skierniewice, Suwałki, Dąbrowa Górnicza, and Rybnik have no social housing stock per 1,000 people. Mysłowice and Rybnik have some of the lowest rates of sewerage use (82% and 77%, respectively, compared to 90.9% of the total population). In addition, Mysłowice has one of the lowest accessibility rates of sports clubs (1.9 vs. 3.3 per 10,000 population). Moreover, together with Jastrzębie Zdrój, it has one of the highest numbers of people working in hazardous conditions (over 340 vs. 99.3 per 1,000 employees in the surveyed establishments).

What is more, Suwałki and Gliwice have one of the highest rates of total suicide attempts (about 6 vs. 4.4 per 10,000 population). Gliwice has an above-average number traffic fatalities (6.2 vs. 3.4 per 100,000 population) and the lowest number of members of circles, clubs and sections (0.03 vs. 9.5 per 1,000 population).

Świnoujście has the fewest students in basic vocational schools (5.3 vs. 13 per district), the fewest doctors (45.8 v. 83.5 per 10,000 population), and the lowest share of municipal land area in the urban area (6.7 vs. 25.4%). Finally, Skierniewice had the lowest number of job offers for people with disabilities (7.3 against an average of 67.2 per 1,000 unemployed persons with disabilities) and the highest number of accidents at work (13.2 accidents per 1,000 employees against an average of 7.5).

In general, the measure of accessibility and the degree of justice increased over the ten years by an average of 2.5% annually, and 8% across the whole period. The modulus of CV value shows a slight and decreasing variation of cities in terms of development over the years (|CV| < 10%, a decrease in CV of 0.02% over years and by 2 p.p. in 2020 compared to 2010). One can even speak of an equalization of inequality, as evidenced by a faster-than-average annual increase in the minimum value than the maximum by 0.4 p.p. (see Table 3).

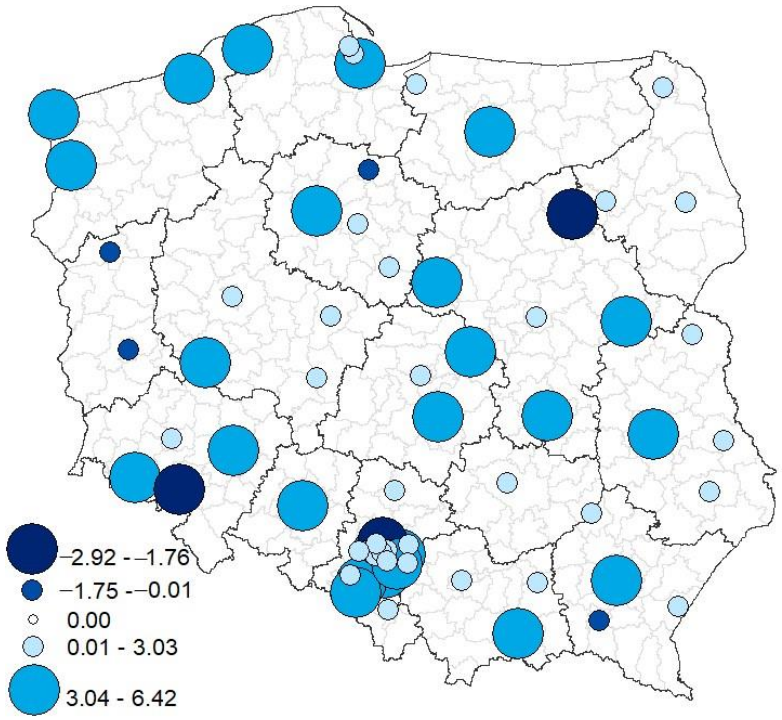
Overall, only 11% of the cities (7 units) recorded a decline in the level of development toward a just city (ranging from −2.92% to −0.01%). Figure 3 shows that the cities with the fastest negative rate were Piekary Śląskie, Wałbrzych, and Ostrołęka. In contrast, the cities with the fastest development in terms of justice were Koszalin, Piotrków Trybunalski, Skierniewice, and Tychy (with increases from 5.19% to 6.42%).

Piekary Śląskie recorded one of the highest increases of the share of uninhabited (vacant) dwellings in the city's housing stock (90% per year) and total crimes recorded by the police (58% increase year-on-year). The city also had a significant increase in total suicide attempts (including fatalities) per 10,000 population (up 66% over years). Ostrołęka saw a high increase in homeless people per 10,000 population (almost 100% year-on-year) and an increase in road fatalities per 100,000 population (by 52% year-on-year). In Wałbrzych, there was a dynamic decline in the proportion of municipal land area in the city area (down 16% year-on-year),

Table 3. Values of selected statistics of the SMJC in the analyzed years

Statistics	2010	2015	2018	2020	Rate of change (over 2010-2020) in %
M	0.440	0.475	0.478	0.476	2.5
ME	0.436	0.469	0.475	0.473	2.6
|CV| in %	8.5	8.0	8.5	8.3	–0.02
Minimum (city)	0.358 (Mysłowice)	0.399 (Mysłowice)	0.391 (Mysłowice)	0.397 (Rybnik)	2.9
Maximum (city)	0.535 (Sopot)	0.573 (Olsztyn)	0.578 (Olsztyn)	0.580 (Olsztyn)	2.5

Note: ME-median, p.p. – percentage points. The rate of change (ySMJC) was determined from the exponential trend function ySMJC = b*mx, where the dependent ySMJC value is a function of independent x values. The m values are the base corresponding to the exponential values of x, and the b value is a constant. The exponent of this function (x) is approximately (when multiplied by 100%) equal to the average rate of change of the SMJC (Kusideł & Antczak, 2014).
Source: own elaboration based on data presented in Table 2 and Figure 2.



The highest rate of change in SMJC	
Negative	**Positive**
Piekary Śląskie	Koszalin
Wałbrzych	Piotrków Trybunalski
Ostrołęka	Skierniewice
Krosno	Tychy
Grudziądz	Świętochłowice
Gorzów Wielkopolski	Wrocław
Zielona Góra	Mysłowice

Fig. 3. The average rate of change in SMJC of just cities development [in %]
Note: The location of cities (by name) with poviat rights is presented on the map in the Appendix.
Source: own elaboration based on data presented in Table 2 and Figure 2.

a decrease in the number of job offers for persons with disabilities per 1,000 unemployed persons with disabilities (down 21% year-on-year) and a significant decline in students in basic vocational schools (down 29% year-on-year).

In Koszalin, there was an increase in expenditure on culture and national heritage protection (up by 33% from year to year), an above-average yearly decrease in total police-recorded crimes, road fatalities, people injured in accidents at work or employed in hazardous conditions, and total suicide attempts (including fatalities). Although Piotrków Trybunalski saw a dramatic 22% annual increase in average salaries, the number of sports clubs per 10,000 population (by 19% from year to year), and a 46% increase in expenditure on culture and national heritage protection, however, the number of students in basic vocational schools decreased by 43% from year to year). Skierniewice and Piotrków Trybunalski recorded a 26% year-on-year decrease in injuries from accidents at work a significant annual increase in spending on culture and national heritage protection (by 34% from year to year), and an above-average decrease in the number of deaths before the age of 60 as a % of deaths (by 19% from year to year).

4. Discussion

Research on the impact of social phenomena on social policy and quality of life have been carried out for many years (e.g. Bywalec, 1991; Allardt, 1993; Diener & Diener, 1995; Panek, 2014). In the last few decades, it has become common practice to publish city rankings on this topic. For example, since 2004, the EU has monitored the quality of life in the EU, the European Free Trade Association countries, the United Kingdom, the Western Balkans, and Turkey. Reports are published every three years, based on a survey on how citizens perceive the quality of life in their home cities. In the latest 5th edition, citizens from 83 cities were asked to assess general and particular aspects of urban life. The Polish cities included were Warszawa, Kraków, Białystok, and Gdańsk. The overall quality of urban life is rated by the statement, 'I'm satisfied with living in my city' (EC, 2020). In addition, Giffinger et al. (2007) prepared a ranking based on the quality of the health conditions of medium-sized European cities. Another report is the Arcadis Sustainable Cities Index 2015 (Arcadis, 2015), which is based on data in three domains: people, planet, and profit. The "people" dimension, which is important for this analysis, covers health, safety, affordable amenities,

education, and income inequality. The Global Liveability Index of 2023 (EIU, 2023) focuses on five broad categories of urban living conditions in 173 cities: stability, healthcare, culture and environment, education, and infrastructure.

Although these international comparisons are very valuable and contribute a great deal to the study of urban development, they lack focus on the specificity and territoriality of development. Moreover, they are limited to a standardized view of social issues. The research we present changes the optics for monitoring urban social processes and phenomena in urban communities. People are still the center of attention, and we take social justice issues, understood in a very broad sense, as touching on issues of migration, democratization of public life, social exclusion, or environmental poverty, as a perspective for consideration. Drawing on existing research by sociologists, geographers, and economists, this study proposes an alternative approach to diagnosing and monitoring urban justice issues. The rationale for this concept is based on current dynamic social processes, such as the refugee crisis, gender issues, the consequences of climate change, and others.

Monitoring social development in cities includes both quantitative and qualitative research. In quantitative research, the analyzed data, apart from selection issues, are objective; qualitative research is subjective, encompassing categories such as well-being, satisfaction with life, a sense of happiness, and views about local development and the work of local authorities. Due to difficulties of standardization and the measurement process itself, the two research approaches supplement each other and are frequently just a set of measures in studies carried out by individual cities. Moreover, a just city is a complex idea that evolves over time. For years, inequality and poverty have been hugely problematic. Nevertheless, the approach to justice changed and went beyond the economic perspective. Today, the idea of inequality and (in) justice includes a much wider group of issues, emphasizing the values of inclusion, integration, and social relations. Significantly for cities, this translates into good governance, access to public services, and participation in local development. Inequalities permeate political systems and governance issues, covering all areas of quality of life in cities (Stiglitz, 2015; UN-Habitat, 2022).

The research findings confirm the desirability of this wider approach. Furthermore, the issue of territorial conditions and cities' response to transnational problems and challenges clearly resonates. The results of the present study indicate that the lowest-ranked group of cities is made up of mostly Silesian metropolises (Rybnik, Gliwice, Jastrzębie Zdrój, Mysłowice), a region dominated by the mining industry (Żuk et al., 2021), However, there is also Świnoujście, the center of the Polish maritime economy and an important spa town, where part of the population lives from tourism, and infrastructure investment causes social conflict (Sajniak, 2022). Furthermore, it should be noted that this was determined by above-average levels of destimulants such as progressive aging of the population and worsening working conditions in Jastrzębie Zdrój and Skierniewice, high unemployment in Rybnik and Gliwice, suicide attempts in Rybnik (Bukowski et al., 2018) and lack of public space for social integration and a social support organizations network in Skierniewice (RMS, 2021).

Among the cities with the greatest decline in the level of development toward justice were post-industrial towns with declining industry like coal mining, such as Piekary Śląskie, Wałbrzych, and Ostrołęka (once a giant in the conventional energy industry and currently known for the demolition of the former Ostrołęka C power plant started in March 2021), (Raszka et al., 2021). It is worth emphasizing that an important determinant for a high level of justice is the position of cities as regional capitals in the administrative structure of the country or region, for example, Warszawa, Wrocław, Kraków, and Białystok (Włodarczyk, 2015). A special case is Rzeszów, which recently played a key role in dealing with migrants from Ukraine and was on the first "help line."

In light of the above, the local context, and the ability of cities to adapt to new situations and conditions should be clearly highlighted as important. The issues of urban resilience, responding to shocks and adapting to new conditions are also key in building a just city (Bosher & Coaffee, 2008; Drobniak, 2015). Research has also shown that cities such as Koszalin, Piotrków Trybunalski, Skierniewice, and Tychy are addressing the challenge of adapting and building resilience, and as a result, we observe dynamic progress in their level of justice (Starczewski et al., 2023).

5. Conclusions

The article posed a research question regarding the level of development, trend and scale of differences in the development of justice in the 66 Polish cities with poviat rights. For this purpose, a synthetic

measure was built based on the dynamic version of the zeroed unitarization method. The analysis presents the state and dynamics of changes in 2010, 2015, 2018, and 2020.

The general conclusion of the research is that urban monitoring, including both quantitative and qualitative data, is an important local policy tool. It supports just cities and directs leaders towards strategic goals. Without monitoring, cities are unaware of the social development conditions and the conditions that create a just city. Monitoring can be perceived as a learning tool. Collecting a solid evidence base and implementing monitoring mechanisms is crucial for the course of public policy toward justice. Even with the best ideas and the will to build just cities, urban planners and local decision-makers cannot do much without data and monitoring analysis. Polish cities are on their way toward justice. The research revealed a constant annual increase of the just city aggregated measure at an average rate of 2.5%, and 8% over the study period. One can even speak of an equalization of inequality. Nevertheless, much needs to be done and can be done, also based on changing know-how and disseminating good practices. If a just city is to exist, measuring, monitoring, and reporting on social justice are vital.

The limitations of the research include deficiencies in access to elementary urban data. The final set of measures resulted from a database that was available and comparable for all the examined cities at the adopted time points. Our study results show:

- a lack of widely available public statistics in many areas of monitoring a just city (e.g., gender wage gap, availability of public transport, registered immigrants, NGOs and their members, and participatory budgeting);
- there is no comprehensive approach in Polish cities to the concept of a just city; in particular, there is insufficient data related to local governance and democracy;
- incomplete data in public statistics – gaps and deficiencies (unreliable reporting);
- a lack of continuity and regularity in data collection and sharing;
- data referred to and are often aggregated only at the voivodeship level, preventing analysis in cities.

Regardless of the identified barriers to conducting research on just cities, the importance of undertaking such research, both from a scientific and an applied perspective, should be clearly emphasized. The set of data and indicators inventoried (Table 1) and developed in the study (Table 2) focuses on issues of urban justice. This set and the proposed method represent an important contribution to the development of research on cities and the determinants of their development. It allows to identify socially sensitive areas of the city. The prepared set of diagnostic variables can be an inspiration for the development and improvement of research and assessment of the level of justice in cities. Moreover, it allows to implement it in cities of different scales (sizes) and to conduct analyses identifying spatial differences.

The conducted research and the presented results indicate that the complex interoperation of a just city should be one of the components of city monitoring. International and national rankings are important for general comparisons, searching for best practices, and changing know-how. However, they are incomplete for specific local policies. Based on in-depth studies of local conditions and assessments of local actors, cities need to monitor justice issues. Therefore, improving public statistics and data collection at the local level on the one hand, and redirecting the perspective on social issues in cities on the other, are crucial to the effectiveness of research and its development. Above all, it is about looking at the city through the lens of a just, open and inclusive city.

In times of crisis (migration, climate, energy), research that contribute to risk reduction become even more important. Moreover, studies that allow the application of protective and adaptive actions, especially in the context of social phenomena, are particularly relevant. The perspective of urban justice also appears to be an important area of urban policy and the creation of a good living conditions, especially in terms of transformation processes or adaptation to complex changes. The proposal study is a starting point for discussions on the development of an optimal set of data and indicators allowing to assess the level of development of a just city and to conduct comparative analyses and studies of spatial differences. The presented findings are also an integral part of the comprehensive research on cities and complement the studies on green cities (Antczak et. al., 2023) and productive cities (Antczak et. al., 2023). The next stage of research is to identify and link the conditions and levels of urban development, taking into account the three perspectives of justice, productivity and 'greening'. This will allow, on the one hand, to develop a tool for assessing the level of development of modern cities or to specify the strengths and weaknesses of urban functioning, and, on the other hand, to identify the determinants and paths of urban transformation.

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Appendix I

Fig. Appendix. Location of the Polish cities with poviat rights
Source: own elaboration