Intensity of Revitalisation Measures in Poland's County-Level Cities: Cultural and Social Aspects

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Highlights

What are the main findings?

- Composite revitalisation scores (IRSC and IRS) vary significantly across Polish county-level cities in both the spatial–cultural and social dimensions, with no consistent regional patterns.
- Approximately one-third of cities effectively apply revitalisation strategies in both dimensions, while many exhibit mismatches—excelling in one dimension but underperforming in the other.

What are the implications of the main findings?

- Financial input and activity count explain only part of the differences; programme design and local governance context critically shape revitalisation outcomes.
- Effective revitalisation requires adopting practice-informed models from high-performing cities rather than relying solely on centralised, uniform approaches.

Abstract

The study assesses the level and concentration of revitalisation measures in Poland's county-level cities across two dimensions: spatial–cultural and social. We compiled comparable indicators from the Local Data Bank (2020–2023) and municipal revitalisation programmes for 63 cities, constructing ten stimulus variables (five spatial–cultural; five social). Indicators were normalised to (0–1) and aggregated into two synthetic indices—IRSC (spatial–cultural) and IRS (social)—followed by a standard-deviation-based classification into four types/groups. Results show pronounced inter-city variation with no clear voivodeship pattern. Several cities emerge as consistent leaders across dimensions, while others perform unevenly—e.g., cases with high IRSC but moderate IRS, and vice versa—highlighting different strategic emphases of programmes. We also note large disparities in financial effort (per area and per resident) and low counts of actions per unit in many cities, contrasted with a few high-activity cases. The findings indicate that roughly one-third of cities leverage revitalisation effectively in both dimensions. The study advocates complementing synthetic, comparative assessment with practice-informed models that adapt solutions proven in top-performing cities, rather than relying solely on unified, centrally framed approaches.

1. Introduction

The legal concept of revitalisation in Poland is precisely defined in the Act on Revitalisation, which frames it as a "process of bringing degraded areas out of a crisis state, pursued in a comprehensive manner through integrated activities for the local community, space, and the economy" [1]. This formulation explicitly situates revitalisation within three interdependent dimensions—social, spatial, and economic—and establishes its remedial objective. A similar tripartite perspective is recurrent across a broad body of scholarship on revitalisation [2–8]. In certain contributions, authors emphasise one dimension over the others, notably the economic component [9–12]. This understanding is also reflected in policy and implementation documents [13,14]. Research on revitalisation has typically focused on single-case studies. The literature offers a range of reflections on challenges accompanying the revitalisation of cities such as Wrocław, Bydgoszcz, Toruń, Lublin, Zielona Góra, Gorzów Wielkopolski, Łódź, Kraków, Warsaw, Opole, Rzeszów, Białystok, Gdańsk, Katowice, Kielce, Olsztyn, Poznań, Szczecin, Sopot, Gostynin, Radom, and Legionowo [15–17]. Surveys have been the most frequently used research instrument.

In contemporary European scholarly literature on urban revitalisation, recurring analyses emphasise the use of cultural heritage as an instrument for social, spatial, and economic transformation in historic centres. This is corroborated by case studies from Lisbon, Rijeka, Sombor, and Koper, where revitalisation is framed as a multidimensional process in which cultural resources are highlighted and assigned a substantial role, as they are treated as a "city brand" [18–21]. According to Faouri, heritage-led revitalisation—considered across diverse research perspectives—aligns with the United Nations Sustainable Development Goals, particularly in social, spatial, and economic terms [22]. There is, therefore, a relationship between revitalisation and cultural heritage that is described as a dynamic process rather than a one-off intervention, requiring negotiation and agreement with the local community (the social dimension) alongside the city's economic and physical dimensions. The example from Málaga indicates that safeguarding local traditions, social rituals, and cultural expressions can initiate revitalisation processes. In Görlitz and other cities in eastern Germany, a similar approach was tested using an analytical tool (the Urban Transformation Matrix method), which provides a diagnosis of conditions and mechanisms of change and indicates directions for revitalisation activities [23,24]. In the European context, heritage protection is also interpreted as a constraint, particularly when "flexible" planning methods are adopted to reduce barriers to development [25]. At the same time, heritage-led revitalisation is increasingly examined through the lens of sustainability-oriented approaches and human needs (communities functioning within the urban fabric), within critical perspectives addressing distributional effects and conflicts [26]. European case studies demonstrate, in practice, both the beneficial and adverse consequences of such projects, with Liverpool serving as an illustrative example [27,28]. Previous partial, mono-local studies, nevertheless, emphasised the interdisciplinary and complex character of the revitalisation process, as well as the necessity of considering multiple aspects, including legal, organisational, economic, social, urban–architectural, ecological, spatial, technical, technological, and others [29,30]. Accordingly, such cross-territorial comparisons should be regarded as methodologically challenging. Despite the predominance of unit-level assessments, researchers have attempted not only to parameterise the features of revitalisation but also to conduct comparative analyses. Indicator-based approaches have already been employed: Lisowska and Ochmański [31] sought correlations between

revitalisation and the socio-economic development of cities, yet they did not confirm such a relationship—a finding consistent with international research demonstrating mixed results in establishing direct correlations between regeneration interventions and development indicators [32]. Researchers conducting a comparative analysis of standardised indicators for smart and sustainable cities have highlighted the methodological challenges inherent in cross-territorial comparisons [33]. There have also been attempts to evaluate the effects of revitalisation and its positive outcomes, as illustrated in the case of Łódź [34].

Most studies focus on single-city case studies, often concentrating on specific neighbourhoods or historic city districts. Such an approach significantly hinders, or even precludes, the possibility of reliable inter-city comparisons due to the non-uniform nature of the research methodologies. On the one hand, such analyses provide in-depth knowledge of the dynamics of social change and the needs associated with heritage-based urban regeneration. On the other hand, they offer only partial evidence regarding how these processes unfold and the extent to which they differ between individual cities within a given region. A key methodological challenge in analysing the role of culture and heritage in urban regeneration lies in the absence of a standardised scale for inter-city comparisons [35]. Previous studies have demonstrated the role of heritage building revitalisation in shaping sustainable urban development [36]. International research on urban regeneration increasingly employs indicator-based evaluation frameworks to facilitate cross-city benchmarking and operationalise multidimensional concepts [37,38]. Across this stream, indicator sets commonly cover interrelated domains such as social, spatial/physical, economic, and environmental dimensions, often complemented by governance/institutional aspects [39,40]. In evaluation practice, these frameworks are frequently structured along a results-chain logic that differentiates the scope/coverage of interventions, inputs and activities, and outputs/outcomes as proximate effects of implemented measures [41]. Based on this approach, the revitalisation process is translated into measurable indicators, through which we quantify programme scope (X1–X2), inputs, and action intensity (X3–X4, X8), as well as selected output/outcome proxy indicators related to heritage protection and social support (X5, X9–X10), while variables X6–X7 link programme scope to the population affected by the intervention. The construction of the composite measures follows established methodological guidance for composite indicators [42]. Building on these earlier efforts, this study extends the scope by applying synthetic indices to compare the composite levels of revitalisation measures across county-level cities in Poland, thereby addressing the lack of systematic, multi-city analyses. The present study advances this line of inquiry by shifting from individual case-based accounts to a comprehensive, indicator-based comparison of Poland's county-level cities. Accordingly, we address the following research questions: (RQ1) To what extent do revitalisation and composite revitalisation scores vary across county-level cities, and is this variation spatially structured (e.g., by voivodeship or contiguous clusters)? (RQ2) How closely do the spatial, cultural, and social dimensions align, and which cities display mismatches (high in one dimension but moderate/low in the other)? (RQ3) To what extent do financial effort (per area and per resident) and the number of actions per unit account for cross-city differences in the two indices? Our research builds on these findings by quantifying cultural–spatial revitalisation outcomes using the IRSC composite score across county-level cities.

2. Materials and Methods

The study aimed to compare the composite level of revitalisation across three dimensions: spatial, cultural, and social. The following hypotheses were formulated:

H1. *Revitalisation is a widely used instrument for improving the spatial structure of county-level cities.*

H2. *Revitalisation contributes to improving the social conditions of residents in degraded areas within county-level cities.*

H3. *There is substantial heterogeneity in the characteristics of revitalisation across county-level cities.*

In this study, "revitalisation intensity" is used as an operational (measurement) concept rather than a normative label. We define it as the extent and concentration of planned revitalisation measures relative to the size of the unit, expressed using comparable denominators (e.g., per hectare of the designated area and per 1000 residents) and summarised via the two composite indices (IRSC and IRS). Accordingly, we distinguish between programme scope/coverage (X1–X2; X6–X7), input and activity rates/densities (X3–X4; X8; X10), and proximate output/outcome proxies (X5; X9–X10) within the results-chain logic adopted in the paper.

The preliminary scope encompassed 66 municipalities, representing 2.7% of Poland's 2477 communes. The selection criterion was classification as an urban commune, which accounts for 6.5% of the country's 1020 cities, with the additional requirement that the city holds county rights. Among such cities, three were excluded—Wrocław, Sopot, and Mysłowice—due to missing data or the absence of ongoing revitalisation processes. Consequently, the final study area comprised 63 county-level cities, equivalent to 2.54% of all communes in Poland. The indicator set was derived from a review of the literature, which examined revitalisation reporting through indicator-development approaches used for cross-city benchmarking, and informed the selection of an appropriate quantitative operationalisation [37,38]. The variables were then chosen in line with widely recommended criteria: (1) conceptual validity, (2) comparability across units, (3) data availability for all units, and (4) reliance on routinely monitored, reproducible data sources [42,43]. In line with indicator-based evaluation logics used in urban regeneration assessment, X1–X2 capture the territorial scope of programmes, X3–X4 and X8 represent input and activity intensity normalised by the relevant scale (area/population), and X5 and X9–X10 serve as output/outcome proxies [37].

To achieve the study's aim, the following research procedure was applied:

- Filtering data from the Local Data Bank (BDL) for 2020–2023 in the domains of local government and population;
- Deriving indicators for the selected features to determine their relevance to the municipality's revitalisation process;
- Normalising the indicators to ensure comparability;
- Constructing synthetic indices for two dimensions: spatial–cultural revitalisation (RSC) and social revitalisation (RS).

To assess the spatial–cultural dimension of revitalisation, the following features and variables were used:

- Area covered by the GPR/PR (ARZ) (revitalisation programme) relative to the municipality's total area (AM)—X1 [–];
- Area of the revitalisation zone (ARZ) relative to the area of the degraded zone (ADZ)—X2 [–]; where the degraded zone was absent or smaller than the revitalisation zone, the indicator was set to 1;
- Estimated funds planned for the entire revitalisation period (FRPLN) relative to the area of the revitalisation zone (ARZ), rounded to 1 PLN—X3 [PLN/ha];
- Number of revitalisation actions planned for the entire programme period (NRA) relative to the area of the revitalisation zone (ARZ)—X4 [items/ha];
- Number of renovated historic buildings within revitalisation activities in 2020–2023 (NRB) relative to the total number of monuments recorded in the register and inventory

(NM)—X5 [–]. For X5, NRB includes historic buildings renovated under revitalisation activities as reported in municipal revitalisation programmes from 2020 to 2023, irrespective of whether the renovated building is located within the formally designated revitalisation zone. In contrast, NM refers to the total number of monuments recorded in the register and inventory for the entire municipality.

Because revitalisation programmes differ in how they structure and report projects (few large projects vs. many small actions), NRA and NRAT are treated as "actions" as defined in official programme documents. To improve cross-city comparability despite this heterogeneity, we analyse action densities rather than raw counts. Specifically, X4 is normalised by ARZ (items/ha) and X10 by NRZP (items/1000 residents). This choice reduces the influence of programme scale and the size of the revitalised area/population on the comparison.

These indicators reflect actions taken with respect to allowing specific areas or counts of spatial objects, enabling the spatial intensity of revitalisation programmes (i.e., spatial concentration per area) to be observed. The construction of IRSC and IRS follows established guidance for composite indicators: indicators are first normalised to a common scale and then aggregated to obtain dimension-specific synthetic scores. We employ a transparent linear aggregation (arithmetic mean) and equal weighting, as there is no unambiguous theoretical or empirical basis in the literature to assign differential weights to the selected components in the present exploratory, cross-city setting [42,43]. Because each dimension is represented by five components (X1–X5 for IRSC and X6–X10 for IRS), equal weighting implies $w_j = 1/5 = 0.2$ for each component within a dimension. We treat equal weighting as a transparent benchmark that minimises arbitrariness in the absence of unambiguous theoretical grounds for differential weighting in this exploratory, cross-city comparison.

To capture the social dimension, i.e., the use of revitalisation processes affecting social improvement, the following features were adopted:

- Population residing in the revitalisation zone (NRZP) relative to the municipality's total population at the time of programme adoption (NMP)—X6 [–];
- Population residing in the revitalisation zone at the time of programme adoption (NRZP) relative to the population residing in the degraded zone at the time of its designation (NDZP)—X7 [–]; where no residents lived in the degraded zone, or where the number of residents in the revitalisation zone exceeded that of the degraded zone, the indicator was set to 1;
- Estimated funds planned for the entire revitalisation period (FRPLN) relative to the number of residents in the revitalisation zone at programme adoption (NRZP), rounded to 1 PLN—X8 [PLN/person];
- Number of persons assisted under revitalisation activities (NRAP) relative to residents of the revitalisation zone at programme adoption (NRZP)—X9 [–];
- Number of revitalisation actions planned for the entire programme period, in which social interventions predominate (NRAT) per 1000 residents of the revitalisation zone at programme adoption (NRZP)—X10 [items/1000 persons].

The next step was normalisation, which transformed variables expressed in different units and ranges into a comparable form. Since all variables are stimulants, the following statistical normalisation was applied:

$$z_{ij} = \frac{x_{ij}}{\max x_{ij}}$$

where

x_{ij}—the value of the j-th feature in the i-th municipality;

max x_{ij}—the maximum value of the j-th feature;
z_{ij}—the normalised value of x_{ij}.

A synthetic representation of the spatial, cultural, and social levels of municipal revitalisation was obtained through non-reference aggregation of the data. The following formula produced values within the range of 0–1:

$$I_{RSC(RS)} = \frac{1}{n} \sum_{j=1}^{n} z_{ij}$$

where

$IRSC(RS)$—synthetic index of spatial–cultural (social) revitalisation of cities;
j—1, 2,..., n;
n—number of features included.

We applied max-based normalisation ($z_{ij} = x_{ij}/\max x_{ij}$) to obtain values in the [0, 1] range, as all indicators are stimulants. Within the comparable set of county-level cities, we interpret the maximum value as representing the most desirable situation for a given feature. A limitation of max-normalisation is its sensitivity to extreme values (outliers): a single unusually high observation may compress the normalised distribution of the remaining units and reduce differentiation. We also considered alternative normalisation procedures, in particular, standardisation based on the mean and standard deviation (z-scores). However, this approach yields unbounded values (often including negative values) and would not follow the adopted [0, 1] convention without an additional transformation. Given our emphasis on interpretability on a common scale and the subsequent threshold-based typology, we retained the max-based scaling.

The final stage of the analysis involved classifying cities based on their standard deviation, which enabled their division into types and groups, following the procedure presented in Section 3. To enhance differentiation, types were compared with groups, which allowed for the identification of sets of administrative units with similar characteristics.

The inclusion of cultural heritage indicators, such as the density of protected monuments, follows earlier approaches highlighting the role of heritage in spatial planning and urban renewal [44]. Municipal revitalisation programme data were compiled from city council resolutions and programme documents adopted between 2016 and 2023 and made available on municipal websites (accessed: March 2024). The Local Data Bank (Statistics Poland) was queried for 2020–2023 in the 'Local Government' and 'Population' domains. The indicator set captures three facets of revitalisation: (i) the scope of territorial coverage (X1–X2), (ii) the scale and concentration of inputs and actions (X3–X4, X8), and (iii) results in heritage protection and social support (X5, X9–X10), while X6–X7 link programme extents to affected population. Each research question is addressed by a dedicated procedure: RQ1 through descriptive distributions and standard-deviation-based classification (including maps); RQ2 through cross-dimensional comparison of the two indices and the identification of mismatched city profiles; and RQ3 by relating both indices to financial effort and the number of actions. Cities were assigned to four categories (very low, low, high, and very high composite score) using thresholds based on the mean and one standard deviation for each index. Associations were assessed using Pearson's r and Spearman's rank ρ (two-tailed tests; $\alpha = 0.05$). Limitations include differences in the timing and scope of municipal programmes, incomplete or inconsistent reporting of outputs across cities, and reliance on self-reported administrative sources, which may affect cross-city comparability. Even after normalisation (e.g., X4 and X10), comparability may still be affected by differences in how municipalities define and disaggregate "actions" in programme documentation (few large projects vs. many small activities). NRB is derived from municipal programme reporting; hence, the indicator depends on how cities define and record 'revitalisation activities' and

'renovated historic buildings', which may introduce measurement non-equivalence and affect cross-city comparability. The methodological design directly operationalises the study hypotheses by quantifying spatial, cultural, and social dimensions and enabling cross-city comparison. Future work may involve eliciting expert-based weights (e.g., through a Delphi and Analytic Hierarchy Process (AHP) procedure [45]) and comparing weighted scenarios against the equal-weight benchmark. Moreover, municipal programme documents may differ in whether they report planned versus delivered outputs and may involve reporting time lags. Additionally, because the indicators rely on officially published municipal materials, some self-reporting bias (e.g., strategic framing or selective emphasis) cannot be excluded. The authors conclude that the indices are not entirely objective and do not serve as a formal audit. However, they are used to illustrate differences and trends across cities. Future research should nonetheless consider the adoption of harmonised reporting templates and qualitative validation.

3. Results

The results are presented in the order of the research questions. We first describe inter-city variation and the distributions of component indicators, then compare outcomes in the two dimensions (spatial–cultural and social), and finally, we relate them to the typology of types and groups. Detailed compilations of the calculated variables concerning revitalisation for the analysed cities, the results of their normalisation, and the values of the synthetic indices of the spatial–cultural revitalisation level (W_{PKR}) and the social revitalisation level (W_{SR}) are presented in Tables 1 and 2.

Table 1. Numerical data for the study objects (authors' own elaboration).

NO	CITY	WOI.	A_M [ha]	A_{RZ} [ha]	A_{DZ} [ha]	FR_{PLN} [pln]	N_{RA} [qty]	N_{RB} [qty]	N_M [qty]	N_{RZP} [per]	N_{MP} [per]	N_{DZP} [per]	N_{RAP} [per]	N_{RAT} [qty]
1.	Jelenia Góra		10930	858	5335	508961059	427	0	410	22970	80072	52551	0	13
2.	Legnica	I *	5629	61	0	18800000	12	3	286	8812	100886	0	1044	4
3.	Wałbrzych		8468	416	968	1293288,261	675	1	389	31,761	114568	53365	150	52
4.	Bydgoszcz		17596	1677	6461	338700000	127	25	509	53520	329204	52239	29074	77
5.	Grudziądz	II	5776	169	169	49294581	34	4	244	15807	88867	15807	0	16
6.	Toruń		11,572	1769	2994	112158582	65	8	901	42703	194775	56158	3128	34
7.	Włocławek		8509	42	89	279134812	92	36	155	5348	112483	0	0	35
8.	Biała Podlaska		4940	565	1755	84160072	14	0	101	16367	58124	37725	119	8
9.	Chełm	III	3997	364	1485	85787101	17	3	177	18800	64605	29263	2216	11
10.	Lublin		14746	1511	2087	1107577000	62	5	753	47870	322891	49180	16,972	24
11.	Zamość		3033	132	198	180994334	24	6	245	5150	63931	7261	0	11
12.	Gorzów Wielkopolski	IV	8573	434	434	446663509	45	0	421	27341	117262	27341	0	15
13.	Zielona Góra		27827	706	1101	320700000	59	41	839	39122	130422	59070	0	18
14.	Łódź		29325	1783	1783	5137351670	93	40	1217	152292	698688	152292	20	11
15.	Piotrków Trybunalski	V	6724	79	79	64693700	16	1	256	4825	72712	4825	0	5
16.	Skierniewice		3460	689	689	491000000	33	6	152	14128	47792	14120	3773	5
17.	Kraków		32685	850	2098	1813900000	170	14	2686	77360	703272	267690	0	34
18.	Nowy Sącz	VI	5760	200	200	287530956	22	1	291	8076	82324	8076	2926	17
19.	Tarnów		7237	558	622	389841320	132	1	529	32249	110893	34865	1922	49
20.	Ostrołęka		3346	546	1133	62768939	22	1	99	13346	51548	27154	4303	8
21.	Płock		8804	701	2122	855501944	46	25	317	34105	121295	42037	277	6
22.	Radom	VII	11180	532	11170	689595505	71	2	349	26652	208839	81526	98	8
23.	Siedlce		3186	388	492	314444104	24	0	119	11624	76570	75498	0	13
24.	Warszawa		51720	1423	1423	1590000000	26	19	3771	129838	1735442	129838	20196	12
25.	Opole	VIII	14,903	1242	2348	2037742000	19	0	476	35478	118655	78489	0	5

Table 1. *Cont.*

NO	CITY	WOI.	A_M [ha]	A_{RZ} [ha]	A_{DZ} [ha]	FR_{PLN} [pln]	N_{RA} [qty]	N_{RB} [qty]	N_M [qty]	N_{RZP} [per]	N_{MP} [per]	N_{DZP} [per]	N_{RAP} [per]	N_{RAT} [qty]
26.	Krosno		4471	671	1562	113400000	17	1	185	9734	45158	18521	0	11
27.	Przemyśl		4617	684	684	204923401	14	11	875	16982	61808	16982	0	7
28.	Rzeszów	IX	12901	594	581	229321177	36	2	575	45613	188228	45613	35	6
29.	Tarnobrzeg		8540	631	1313	213002000	41	0	87	13297	47387	25279	0	8
30.	Białystok		10213	1982	3219	376470850	56	8	682	78663	274626	107480	14805	25
31.	Łomża	X	3267	516	516	72633200	43	0	191	13000	59417	13000	1051	20
32.	Suwałki		6551	273	1623	189120460	16	48	457	10563	69370	10563	0	16
33.	Gdańsk		68300	597	729	363273263	35	1	2155	33390	433278	54150	736	12
34.	Gdynia	XI	39151	306	306	96960000	45	0	276	11183	234224	11286	0	11
35.	Słupsk		5277	272	631	467775522	92	56	352	22011	91715	43038	1559	45
36.	Bielsko-Biała		12445	404	568	509179094	65	120	594	33970	173362	33970	7	14
37.	Bytom		6948	828	1092	674108238	342	45	378	45991	168394	62984	5485	99
38.	Chorzów		3332	542	1700	500000000	47	0	347	29511	99826	88500	0	26
39.	Częstochowa		15972	867	2986	222936501	19	0	379	55545	214014	53512	1612	11
40.	Dąbrowa Górnicza		18873	1324	1324	906998162	65	1	65	34851	116810	34851	253	21
41.	Gliwice		13388	1667	2881	955180000	118	0	293	54490	184410	0	0	81
42.	Jastrzębie-Zdrój		8534	1300	3032	209131480	68	0	105	25823	86172	48769	1499	31
43.	Jaworzno		15241	475	2769	194748108	36	0	42	19457	88313	0	0	9
44.	Katowice	XII	16473	1407	4124	2157379590	171	27	905	70046	289174	128740	33467	51
45.	PiekaryŚląskie		3986	527	527	183382367	41	0	189	15979	53378	17972	0	14
46.	Ruda Śląska		7764	887	1430	595249928	103	41	275	36764	138578	103000	16878	44
47.	Rybnik		14828	736	2650	119984531	26	44	240	33471	133847	47558	1	3
48.	Siemianowice Śląskie		2551	509	509	159700000	11	1	140	18302	68011	18302	0	8
49.	Sosnowiec		9116	631	631	455000000	42	0	160	15896	204013	15896	0	20
50.	Świętochłowice		1330	106	165	290864768	24	3	74	13359	47457	13359	1788	4
51.	Tychy		8181	568	568	113862933	31	13	117	29127	128211	28218	0	19
52.	Zabrze		8042	1565	2577	674080217	53	12	379	40465	161598	0	1089	15
53.	Żory		6464	214	705	108546185	37	0	68	4258	62051	0	0	15
54.	Kielce	XIII	10965	853	0	351064275	38	0	219	57366	197724	0	0	3
55.	Elbląg		7982	567	1868	190403000	13	0	320	33887	114448	56119	6625	10
56.	Olsztyn	XIV	8832	808	808	554723876	26	0	631	50480	170789	50480	0	7
57.	Kalisz		6938	259	453	250152977	61	5	348	18027	99492	40011	1705	10
58.	Konin		8230	279	2831	196435864	35	0	428	4681	72183	50660	0	17
59.	Leszno	XV	3186	287	352	576094662	49	9	344	13300	64090	23421	15	14
60.	Poznań		26191	2387	7364	1757144000	45	150	1685	114514	542300	232981	0	8
61.	Koszalin		10557	477	961	209347326	43	2	348	28000	99637	51966	87	14
62.	Szczecin	XVI	30062	313	11209	256034014	71	1	771	51774	403883	164333	131	17
63.	Świnoujście		20207	431	544	452463500	101	0	110	10451	41142	30358	0	25

* Voivodeships: I—Dolnośląskie, II—Kujawsko-pomorskie, III—Lubelskie, IV—Lubuskie, V—Łódzkie, VI—Małopolskie, VII—Mazowieckie, VIII—Opolskie, IX—Podkarpackie, X—Podlaskie, XI—Pomorskie, XII—Śląskie, XIII—Świętokrzyskie, XIV—Warmińsko-mazurskie, XV—Wielkopolskie, and XVI—Zachodniopomorskie.

Table 2. Variables with normalisation and the synthetic index of the spatial–cultural dimension of revitalisation in the study objects (authors' own elaboration).

No.	CITY	VOI.	x_1	x_2	x_3	x_4	x_5	z_1	z_2	z_3	z_4	z_5	I_{RSC}
1.	Jelenia Góra		0.0785	0.1668	593195	0.4977	0.0000	0.3934	0.1668	0.0893	0.2272	0.0000	0.1753
2.	Legnica	I *	0.0108	1.0000	308197	0.1967	0.0105	0.0543	1.0000	0.0464	0.0898	0.0452	0.2471
3.	Wałbrzych		0.0491	0.4298	3108866	1.6226	0.0026	0.2462	0.4298	0.4678	0.7407	0.0111	0.3791

Table 2. *Cont.*

No.	CITY	VOI.	x_1	x_2	x_3	x_4	x_5	z_1	z_2	z_3	z_4	z_5	I_{RSC}
4.	Bydgoszcz		0.0953	0.2596	201968	0.0757	0.0491	0.4777	0.2596	0.0304	0.0346	0.2115	0.2027
5.	Grudziądz	II	0.0293	1.0000	291684	0.2012	0.0164	0.1466	1.0000	0.0439	0.0918	0.0706	0.2706
6.	Toruń		0.1529	0.5908	63402	0.0367	0.0089	0.7661	0.5908	0.0095	0.0168	0.0382	0.2843
7.	Włocławek		0.0049	0.4719	6646067	2.1905	0.2323	0.0247	0.4719	1.0000	1.0000	1.0000	0.6993
8.	Biała Podlaska		0.1144	0.3219	148956	0.0248	0.0000	0.5732	0.3219	0.0224	0.0113	0.0000	0.1858
9.	Chełm	III	0.0911	0.2451	235679	0.0467	0.0169	0.4564	0.2451	0.0355	0.0213	0.0730	0.1663
10.	Lublin		0.1025	0.7240	733009	0.0410	0.0066	0.5136	0.7240	0.1103	0.0187	0.0286	0.2790
11.	Zamość		0.0435	0.6667	1371169	0.1818	0.0245	0.2181	0.6667	0.2063	0.0830	0.1054	0.2559
12.	Gorzów Wielkopolski	IV	0.0506	1.0000	1029179	0.1037	0.0000	0.2537	1.0000	0.1549	0.0473	0.0000	0.2912
13.	Zielona Góra		0.0254	0.6412	454249	0.0836	0.0489	0.1272	0.6412	0.0683	0.0382	0.2104	0.2171
14.	Łódź		0.0608	1.0000	2881297	0.0522	0.0329	0.3047	1.0000	0.4335	0.0238	0.1415	0.3807
15.	Piotrków Trybunalski	V	0.0117	1.0000	818908	0.2025	0.0039	0.0589	1.0000	0.1232	0.0925	0.0168	0.2583
16.	Skierniewice		0.1991	1.0000	712627	0.0479	0.0395	0.9980	1.0000	0.1072	0.0219	0.1700	0.4594
17.	Kraków		0.0260	0.4051	2134000	0.2000	0.0052	0.1303	0.4051	0.3211	0.0913	0.0224	0.1941
18.	Nowy Sącz	VI	0.0347	1.0000	1437655	0.1100	0.0034	0.1740	1.0000	0.2163	0.0502	0.0148	0.2911
19.	Tarnów		0.0771	0.8971	698640	0.2366	0.0019	0.3864	0.8971	0.1051	0.1080	0.0081	0.3010
20.	Ostrołęka		0.1632	0.4819	114961	0.0403	0.0101	0.8178	0.4819	0.0173	0.0184	0.0435	0.2758
21.	Płock		0.0796	0.3303	1220402	0.0656	0.0789	0.3991	0.3303	0.1836	0.0300	0.3396	0.2565
22.	Radom	VII	0.0476	0.0476	1296232	0.1335	0.0057	0.2385	0.0476	0.1950	0.0609	0.0247	0.1134
23.	Siedlce		0.1218	0.7886	810423	0.0619	0.0000	0.6103	0.7886	0.1219	0.0282	0.0000	0.3098
24.	Warszawa		0.0275	1.0000	1117358	0.0183	0.0050	0.1379	1.0000	0.1681	0.0083	0.0217	0.2672
25.	Opole	VIII	0.0833	0.5290	1640694	0.0153	0.0000	0.4177	0.5290	0.2469	0.0070	0.0000	0.2401
26.	Krosno		0.1501	0.4296	169001	0.0253	0.0054	0.7522	0.4296	0.0254	0.0116	0.0233	0.2484
27.	Przemyśl	IX	0.1481	1.0000	299596	0.0205	0.0126	0.7425	1.0000	0.0451	0.0093	0.0541	0.3702
28.	Rzeszów		0.0460	1.0000	386063	0.0606	0.0035	0.2308	1.0000	0.0581	0.0277	0.0150	0.2663
29.	Tarnobrzeg		0.0739	0.4806	337563	0.0650	0.0000	0.3703	0.4806	0.0508	0.0297	0.0000	0.1863
30.	Białystok		0.1941	0.6157	189945	0.0283	0.0117	0.9726	0.6157	0.0286	0.0129	0.0505	0.3361
31.	Łomża	X	0.1579	1.0000	140762	0.0833	0.0000	0.7916	1.0000	0.0212	0.0380	0.0000	0.3702
32.	Suwałki		0.0417	0.1682	692749	0.0586	0.1050	0.2089	0.1682	0.1042	0.0268	0.4522	0.1921
33.	Gdańsk		0.0087	0.8189	608498	0.0586	0.0005	0.0438	0.8189	0.0916	0.0268	0.0020	0.1966
34.	Gdynia	XI	0.0078	1.0000	316863	0.1471	0.0000	0.0392	1.0000	0.0477	0.0671	0.0000	0.2308
35.	Słupsk		0.0515	0.4311	1719763	0.3382	0.1591	0.2583	0.4311	0.2588	0.1544	0.6850	0.3575
36.	Bielsko-Biała		0.0325	0.7113	1260344	0.1609	0.2020	0.1627	0.7113	0.1896	0.0734	0.8698	0.4014
37.	Bytom		0.1192	0.7582	814140	0.4130	0.1190	0.5973	0.7582	0.1225	0.1886	0.5126	0.4358
38.	Chorzów		0.1627	0.3188	922509	0.0867	0.0000	0.8152	0.3188	0.1388	0.0396	0.0000	0.2625
39.	Częstochowa		0.0543	0.2904	257136	0.0219	0.0000	0.2721	0.2904	0.0387	0.0100	0.0000	0.1222
40.	Dąbrowa Górnicza		0.0702	1.0000	685044	0.0491	0.0154	0.3516	1.0000	0.1031	0.0224	0.0662	0.3087
41.	Gliwice		0.1245	0.5786	572993	0.0708	0.0000	0.6240	0.5786	0.0862	0.0323	0.0000	0.2642
42.	Jastrzębie-Zdrój		0.1523	0.4288	160870	0.0523	0.0000	0.7635	0.4288	0.0242	0.0239	0.0000	0.2481
43.	Jaworzno		0.0312	0.1715	409996	0.0758	0.0000	0.1562	0.1715	0.0617	0.0346	0.0000	0.0848
44.	Katowice	XII	0.0854	0.3412	1533319	0.1215	0.0298	0.4281	0.3412	0.2307	0.0555	0.1285	0.2368
45.	Piekary Śląskie		0.1322	1.0000	347974	0.0778	0.0000	0.6626	1.0000	0.0524	0.0355	0.0000	0.3501
46.	Ruda Śląska		0.1142	0.6203	671082	0.1161	0.1491	0.5726	0.6203	0.1010	0.0530	0.6419	0.3978
47.	Rybnik		0.0496	0.2777	163022	0.0353	0.1833	0.2488	0.2777	0.0245	0.0161	0.7894	0.2713
48.	Siemianowice Śląskie		0.1995	1.0000	313752	0.0216	0.0071	1.0000	1.0000	0.0472	0.0099	0.0308	0.4176
49.	Sosnowiec		0.0692	1.0000	721078	0.0666	0.0000	0.3469	1.0000	0.1085	0.0304	0.0000	0.2972
50.	Świętochłowice		0.0797	0.6424	2744007	0.2264	0.0405	0.3994	0.6424	0.4129	0.1034	0.1745	0.3465
51.	Tychy		0.0694	1.0000	200463	0.0546	0.1111	0.3480	1.0000	0.0302	0.0249	0.4784	0.3763
52.	Zabrze		0.1946	0.6073	430722	0.0339	0.0317	0.9753	0.6073	0.0648	0.0155	0.1363	0.3598
53.	Żory		0.0331	0.3035	507225	0.1729	0.0000	0.1659	0.3035	0.0763	0.0789	0.0000	0.1249

Table 2. *Cont.*

No.	CITY	VOI.	x₁	x₂	x₃	x₄	x₅	z₁	z₂	z₃	z₄	z₅	I_RSC
54.	Kielce	XIII	0.0778	1.0000	411564	0.0445	0.0000	0.3899	1.0000	0.0619	0.0203	0.0000	0.2944
55.	Elbląg	XIV	0.0710	0.3035	335808	0.0229	0.0000	0.3560	0.3035	0.0505	0.0105	0.0000	0.1441
56.	Olsztyn		0.0915	1.0000	686539	0.0322	0.0000	0.4585	1.0000	0.1033	0.0147	0.0000	0.3153
57.	Kalisz	XV	0.0373	0.5717	965842	0.2355	0.0144	0.1871	0.5717	0.1453	0.1075	0.0619	0.2147
58.	Konin		0.0339	0.0986	704071	0.1254	0.0000	0.1699	0.0986	0.1059	0.0573	0.0000	0.0863
59.	Leszno		0.0901	0.8153	2007298	0.1707	0.0262	0.4515	0.8153	0.3020	0.0779	0.1126	0.3519
60.	Poznań		0.0911	0.3241	736131	0.0189	0.0890	0.4568	0.3241	0.1108	0.0086	0.3833	0.2567
61.	Koszalin	XVI	0.0452	0.4964	438883	0.0901	0.0057	0.2264	0.4964	0.0660	0.0412	0.0247	0.1709
62.	Szczecin		0.0104	0.0279	818000	0.2268	0.0013	0.0522	0.0279	0.1231	0.1036	0.0056	0.0625
63.	Świnoujście		0.0213	0.7923	1049799	0.2343	0.0000	0.1069	0.7923	0.1580	0.1070	0.0000	0.2328

* Voivodeships: I—Dolnośląskie, II—Kujawsko-pomorskie, III—Lubelskie, IV—Lubuskie, V—Łódzkie, VI—Małopolskie, VII—Mazowieckie, VIII—Opolskie, IX—Podkarpackie, X—Podlaskie, XI—Pomorskie, XII—Śląskie, XIII—Świętokrzyskie, XIV—Warmińsko-mazurskie, XV—Wielkopolskie, and XVI—Zachodniopomorskie.

The spatial and financial inputs vary markedly, as evidenced by the minima and maxima in Table 1. This includes a spread from tens of thousands to several million PLN per hectare and generally low activity density in most cities (often <0.5 actions/ha), with a few higher-intensity outliers.

The descriptive statistics highlight substantial heterogeneity in the planned number of revitalisation actions across cities (from 11 in Siemianowice Śląskie to 675 in Wałbrzych). When expressed as densities, most cities record fewer than 0.5 actions per hectare (X4), with only Wałbrzych and Włocławek reaching approximately 2 actions per hectare. For socially oriented actions adjusted by the revitalised population (X10), 42 cities do not exceed 1 action per 1000 residents, while 8 exceed 2, and Włocławek reaches more than 6.5.

The distribution of the spatial–cultural synthetic index reveals pronounced stratification: a small set of leaders with high index values contrasts with many cities clustering at medium and low levels, which is consistent with the A–D typology used later in the analysis (Table 3).

Table 3. Variables with normalisation and the synthetic index of the social dimension of revitalisation in the study objects (authors' own elaboration).

No.	CITY	VOI.	x₆	x₇	x₈	x₉	x₁₀	z₆	z₇	z₈	z₉	z₁₀	I_RS
1.	Jelenia Góra	I *	0.2869	0.4371	22158	0.0000	0.5551	0.9563	0.4371	0.3858	0.0000	0.0848	0.3728
2.	Legnica		0.0873	1.0000	2133	0.1185	0.4539	0.2912	1.0000	0.0371	0.2181	0.0694	0.3232
3.	Wałbrzych		0.2772	0.5952	40719	0.0047	1.6372	0.9242	0.5952	0.7089	0.0087	0.2502	0.4974
4.	Bydgoszcz	II	0.1626	1.0000	6328	0.5432	1.4387	0.5420	1.0000	0.1102	1.0000	0.2198	0.5744
5.	Grudziądz		0.1779	1.0000	3119	0.0000	1.0122	0.5930	1.0000	0.0543	0.0000	0.1547	0.3604
6.	Toruń		0.2192	0.7604	2626	0.0733	0.7962	0.7309	0.7604	0.0457	0.1348	0.1217	0.3587
7.	Włocławek		0.0475	1.0000	52194	0.0000	6.5445	0.1585	1.0000	0.9087	0.0000	1.0000	0.6134
8.	Biała Podlaska	III	0.2816	0.4339	5142	0.0073	0.4888	0.9387	0.4339	0.0895	0.0134	0.0747	0.3100
9.	Chełm		0.2910	0.6424	4563	0.1179	0.5851	0.9701	0.6424	0.0794	0.2170	0.0894	0.3997
10.	Lublin		0.1483	0.9734	23137	0.3545	0.5014	0.4942	0.9734	0.4028	0.6527	0.0766	0.5199
11.	Zamość		0.0806	0.7093	35145	0.0000	2.1359	0.2686	0.7093	0.6119	0.0000	0.3264	0.3832
12.	Gorzów Wielkopolski	IV	0.2332	1.0000	16337	0.0000	0.5486	0.7773	1.0000	0.2844	0.0000	0.0838	0.4291
13.	Zielona Góra		0.3000	0.6623	8197	0.0000	0.4601	1.0000	0.6623	0.1427	0.0000	0.0703	0.3751
14.	Łódź	V	0.2180	1.0000	33734	0.0001	0.0722	0.7266	1.0000	0.5873	0.0002	0.0110	0.4650
15.	Piotrków Trybunalski		0.0664	1.0000	13408	0.0000	0.9326	0.2212	1.0000	0.2334	0.0000	0.1425	0.3194
16.	Skierniewice		0.2956	1.0000	34754	0.2671	0.3362	0.9855	1.0000	0.6051	0.4916	0.0514	0.6267

Table 3. *Cont.*

No.	CITY	VOI.	x_6	x_7	x_8	x_9	x_{10}	z_6	z_7	z_8	z_9	z_{10}	I_{RS}
17.	Kraków		0.1100	0.2890	23448	0.0000	0.4330	0.3667	0.2890	0.4082	0.0000	0.0662	0.2260
18.	Nowy Sącz	VI	0.0981	1.0000	35603	0.3623	2.1360	0.3270	1.0000	0.6199	0.6669	0.3264	0.5880
19.	Tarnów		0.2908	0.9250	12088	0.0596	1.5194	0.9695	0.9250	0.2105	0.1097	0.2322	0.4894
20.	Ostrołęka		0.2589	0.4915	4703	0.3224	0.5994	0.8631	0.4915	0.0819	0.5935	0.0916	0.4243
21.	Płock		0.2812	0.8113	25084	0.0081	0.1833	0.9374	0.8113	0.4367	0.0150	0.0280	0.4457
22.	Radom	VII	0.1276	0.3269	25874	0.0037	0.3002	0.4254	0.3269	0.4505	0.0068	0.0459	0.2511
23.	Siedlce		0.1518	0.1540	27051	0.0000	1.1184	0.5061	0.1540	0.4710	0.0000	0.1709	0.2604
24.	Warszawa		0.0748	1.0000	12246	0.1555	0.0924	0.2494	1.0000	0.2132	0.2863	0.0141	0.3526
25.	Opole	VIII	0.2990	0.4520	57437	0.0000	0.1339	0.9968	0.4520	1.0000	0.0000	0.0205	0.4939
26.	Krosno		0.2156	0.5256	11650	0.0000	1.1301	0.7186	0.5256	0.2028	0.0000	0.1727	0.3239
27.	Przemyśl	IX	0.2748	1.0000	12067	0.0000	0.4269	0.9160	1.0000	0.2101	0.0000	0.0652	0.4383
28.	Rzeszów		0.2423	1.0000	5028	0.0008	0.1315	0.8079	1.0000	0.0875	0.0014	0.0201	0.3834
29.	Tarnobrzeg		0.2806	0.5260	16019	0.0000	0.5640	0.9355	0.5260	0.2789	0.0000	0.0862	0.3653
30.	Białystok		0.2864	0.7319	4786	0.1882	0.3178	0.9549	0.7319	0.0833	0.3465	0.0486	0.4330
31.	Łomża	X	0.2188	1.0000	5587	0.0808	1.5385	0.7294	1.0000	0.0973	0.1488	0.2351	0.4421
32.	Suwałki		0.1523	1.0000	17904	0.0000	1.4674	0.5076	1.0000	0.3117	0.0000	0.2242	0.4087
33.	Gdańsk		0.0771	0.6166	10880	0.0220	0.3594	0.2569	0.6166	0.1894	0.0406	0.0549	0.2317
34.	Gdynia	XI	0.0477	0.9909	8670	0.0000	0.9836	0.1592	0.9909	0.1510	0.0000	0.1503	0.2903
35.	Słupsk		0.2400	0.5114	21252	0.0708	2.0444	0.8001	0.5114	0.3700	0.1304	0.3124	0.4249
36.	Bielsko-Biała		0.1959	1.0000	14989	0.0002	0.3974	0.6532	1.0000	0.2610	0.0004	0.0607	0.3951
37.	Bytom		0.2731	0.7302	14657	0.1193	2.1472	0.9105	0.7302	0.2552	0.2195	0.3281	0.4887
38.	Chorzów		0.2956	0.3335	16943	0.0000	0.8810	0.9855	0.3335	0.2950	0.0000	0.1346	0.3497
39.	Częstochowa		0.2595	1.0000	4014	0.0290	0.1980	0.8652	1.0000	0.0699	0.0534	0.0303	0.4038
40.	DąbrowaGórnicza		0.2984	1.0000	26025	0.0073	0.5954	0.9946	1.0000	0.4531	0.0134	0.0910	0.5104
41.	Gliwice		0.2955	1.0000	17529	0.0000	1.4819	0.9851	1.0000	0.3052	0.0000	0.2264	0.5033
42.	Jastrzębie-Zdrój		0.2997	0.5295	8099	0.0580	1.2005	0.9990	0.5295	0.1410	0.1069	0.1834	0.3920
43.	Jaworzno		0.2203	1.0000	10009	0.0000	0.4626	0.7345	1.0000	0.1743	0.0000	0.0707	0.3959
44.	Katowice	XII	0.2422	0.5441	30799	0.4778	0.7210	0.8075	0.5441	0.5362	0.8795	0.1102	0.5755
45.	PiekaryŚląskie		0.2994	0.8891	11476	0.0000	0.8449	0.9980	0.8891	0.1998	0.0000	0.1291	0.4432
46.	Ruda Śląska		0.2653	0.3569	16191	0.4591	1.1968	0.8844	0.3569	0.2819	0.8451	0.1829	0.5102
47.	Rybnik		0.2501	0.7038	3585	0.0000	0.0971	0.8337	0.7038	0.0624	0.0001	0.0148	0.3230
48.	SiemianowiceŚląskie		0.2691	1.0000	8726	0.0000	0.4098	0.8971	1.0000	0.1519	0.0000	0.0626	0.4223
49.	Sosnowiec		0.0779	1.0000	28624	0.0000	1.2582	0.2598	1.0000	0.4983	0.0000	0.1922	0.3901
50.	Świętochłowice		0.2815	1.0000	21773	0.1338	0.3181	0.9384	1.0000	0.3791	0.2464	0.0486	0.5225
51.	Tychy		0.2272	1.0000	3909	0.0000	0.6523	0.7574	1.0000	0.0681	0.0000	0.0997	0.3850
52.	Zabrze		0.2504	1.0000	16658	0.0269	0.3707	0.8348	1.0000	0.2900	0.0495	0.0566	0.4462
53.	Żory		0.0686	1.0000	25492	0.0000	3.5228	0.2288	1.0000	0.4438	0.0000	0.5383	0.4422
54.	Kielce	XIII	0.2901	1.0000	6120	0.0000	0.0523	0.9672	1.0000	0.1065	0.0000	0.0080	0.4164
55.	Elbląg		0.2961	0.6038	5619	0.1955	0.2951	0.9871	0.6038	0.0978	0.3599	0.0451	0.4187
56.	Olsztyn	XIV	0.2956	1.0000	10989	0.0000	0.1387	0.9853	1.0000	0.1913	0.0000	0.0212	0.4396
57.	Kalisz		0.1812	0.4506	13877	0.0946	0.5686	0.6040	0.4506	0.2416	0.1741	0.0869	0.3114
58.	Konin		0.0648	0.0924	41965	0.0000	3.5783	0.2162	0.0924	0.7306	0.0000	0.5468	0.3172
59.	Leszno	XV	0.2075	0.5679	43315	0.0011	1.0714	0.6918	0.5679	0.7541	0.0021	0.1637	0.4359
60.	Poznań		0.2112	0.4915	15344	0.0000	0.0699	0.7040	0.4915	0.2672	0.0000	0.0107	0.2947
61.	Koszalin		0.2810	0.5388	7477	0.0031	0.5000	0.9368	0.5388	0.1302	0.0057	0.0764	0.3376
62.	Szczecin	XVI	0.1282	0.3151	4945	0.0025	0.3284	0.4274	0.3151	0.0861	0.0047	0.0502	0.1767
63.	Świnoujście		0.2540	0.3443	43294	0.0000	2.3921	0.8468	0.3443	0.7538	0.0000	0.3655	0.4621

* Voivodeships: I—Dolnośląskie, II—Kujawsko-pomorskie, III—Lubelskie, IV—Lubuskie, V—Łódzkie, VI—Małopolskie, VII—Mazowieckie, VIII—Opolskie, IX—Podkarpackie, X—Podlaskie, XI—Pomorskie, XII—Śląskie, XIII—Świętokrzyskie, XIV—Warmińsko-mazurskie, XV—Wielkopolskie, and XVI—Zachodniopomorskie.

The social dimension captures both the scale of population coverage and the rate of resident-oriented interventions. While many cities record low numbers of actions per 1000 residents, several display markedly higher effort, reflected in elevated values of the social index. Based on the synthetic IRSC index, the study objects were classified according to the following rules:

- Type A (municipalities making very good use of the revitalisation instrument in the spatial–cultural dimension): IRSC values exceeding the sum of the mean and standard deviation, IRSC > X_RSC + S_RSC, i.e., >0.378.
- Type B (municipalities making good use of the revitalisation instrument in the spatial–cultural dimension): XRSC + SRSC ≥ IRSC ≥ XRSC, values within the range <0.273–0.378>;
- Type C (municipalities making average use of the revitalisation instrument in the spatial–cultural dimension): IRSC values within the range XRSC > IRSC ≥ XRSC-SRSC, and values within the range <0.168; 0.273>;
- Type D (municipalities making poor use of the revitalisation instrument in the spatial–cultural dimension): values lower than 0.168, and values within the range IRSC < XRSC-SRSC.

The maps do not reveal a clear voivodeship-level pattern; rather, localised pockets of high and low values prevail, suggesting that city-specific and programmatic factors outweigh regional effects.

Based on Figure 1, with reference to the social aspects of revitalisation, the following classification was applied:

- Group I (municipalities making very good use of the revitalisation instrument in the social dimension): IRS values exceeding the sum of the mean and standard deviation, IRS > XRS + SRS, tj. 0.502;
- Group II (municipalities making good use of the revitalisation instrument in the social dimension): IRS values within the range XRS ≥ IRS ≥ XRS-SRS, i.e., <0.408–0.502>;
- Group III (municipalities making average use of the revitalisation instrument in the social dimension): IRS values within the range XRS > IRS ≥ XRS-SRS, i.e., <0.314; 0.408>;
- Group IV (municipalities making poor use of the revitalisation instrument in the social dimension): IRS values lower than 0.314, i.e., IRS < XRS-SRS.
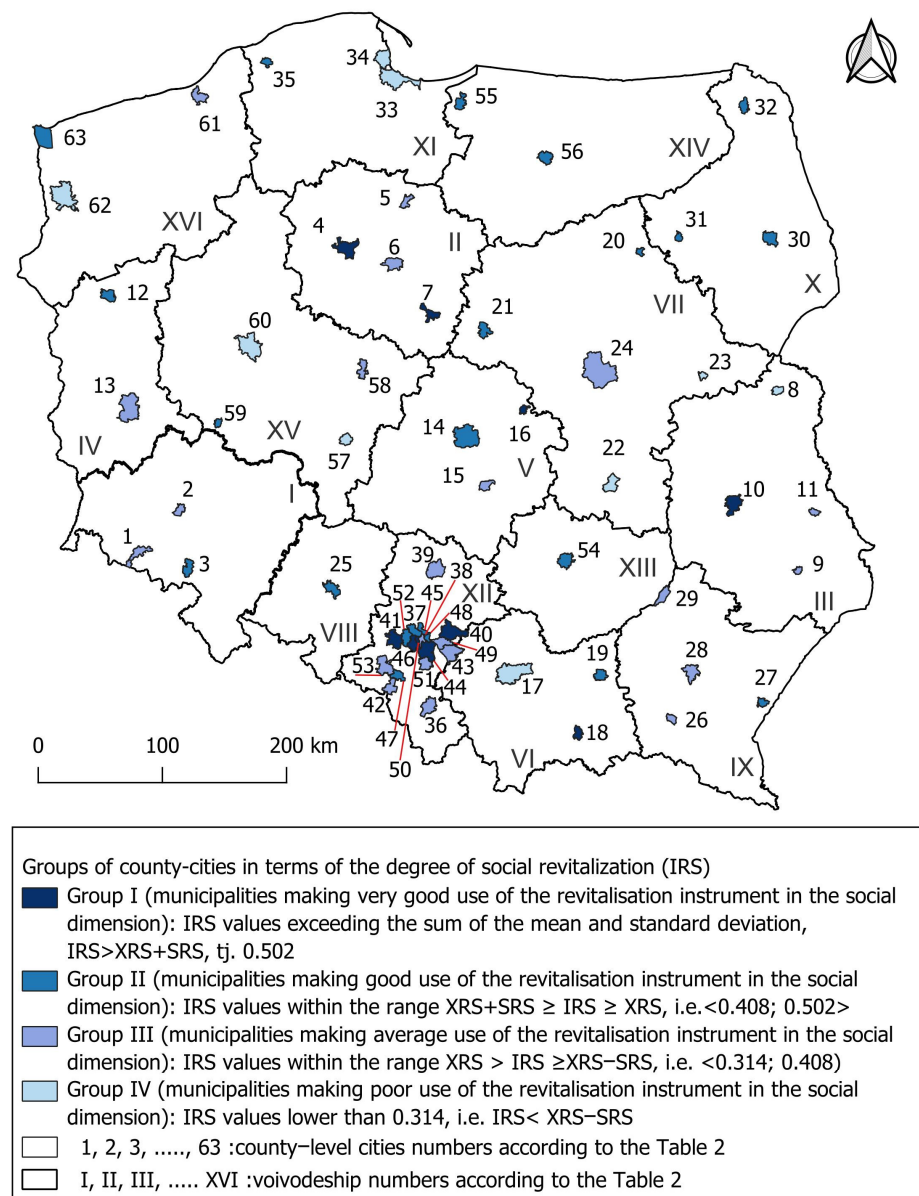
The spatial distribution of social groups only partially overlaps with the spatial–cultural classification; many cities (Figure 2) display asymmetric profiles (high in one dimension, moderate/low in the other), pointing to selective programme priorities. In the context of the conducted research and the formulated research questions (RQ1–RQ3), the following can be concluded:

- Answer to RQ1. The level of revitalisation effort (as captured by IRSC/IRS) is markedly uneven across cities; no consistent voivodeship pattern is observed, and localised clusters of high/low values prevail.
- Answer to RQ2. Alignment between the spatial, cultural, and social dimensions is limited; several cities exhibit mismatched profiles (high in one, moderate/low in the other).
- Answer to RQ3. Financial effort and action count for only part of the cross-city variation; programme design and local context are consequential.

Types of county-cities in terms of the degree of spatial and cultural revitalization (IRSC)

■ Type A (municipalities making very good use of the revitalisation instrument in the spatial–cultural dimension): IRSC values exceeding the sum of the mean and standard deviation, IRSC >XRSC+SRSC, i.e. > 0.378

■ Type B (municipalities making good use of the revitalisation instrument in the spatial–cultural dimension): XRSC+SRSK≥IRSC≥XRSC, values within the ran<0.273;0.378>

■ Type C (municipalities making average use of the revitalisation instrument in the spatial–cultural dimension): IRSC values within the range XRSC > IRSC ≥ XRSC−SRSC, values within the ran <0.168; 0.273)

□ Type D (municipalities making poor use of the revitalisation instrument in the spatial–cultural dimension): values lower than 0.168, values within the ran IRSC< XRSC−SRSC

▫ 1, 2, 3, ..., 63 :county−level cities numbers according to the Table 1

▫ I, II, III, ... XVI :voivodeship numbers according to the Table 1

Figure 1. Spatial distribution of city types according to the spatial–cultural revitalisation index and the social revitalisation index (authors' own elaboration).

To strengthen the link to RQ2–RQ3, we quantified relationships between key measures using correlation tests. The two composite indices are moderately and significantly associated (Pearson r = 0.549, $p < 0.001$; Spearman ρ = 0.512, $p < 0.001$), while financial effort is positively related to action intensity (X3–X4 and X8–X10), but relationships between inputs/actions and outcome proxies (X5; X9) are weak and statistically insignificant, suggesting that spending and action counts alone do not fully explain cross-city differences.

Figure 2. Spatial distribution of city groups according to the social revitalisation index (authors' own elaboration).

4. Discussion and Conclusions

To obtain a comprehensive picture of the variation among urban municipalities in terms of the use of revitalisation processes across spatial, cultural, and social dimensions, and to provide a basis for discussion, a typology of cities was developed. Table 4 presents the numerical distribution of the analysed units across the respective categories. The cross-tab typology (A–D × I–IV) orders cities by profile coherence. High–high cells (A1, B1) identify leaders, whereas high–low and low–high combinations (e.g., A3/B3 and C1/C2) indicate goal–outcome mismatches that merit closer interpretation.

The intensity of revitalisation is clearly uneven across cities, alignment between spatial–cultural and social dimensions is limited, and variation in spending and activity does not fully account for observed differences. The findings support H1, confirming substantial inter-city heterogeneity. H2 is partially supported: the cross-dimensional relationship is limited by many mismatched profiles. H3 is supported: spending does not fully account for cross-city differences.

Table 4. Quantitative distribution of city types by the spatial, cultural, and social level of revitalisation.

Group	Type				
	A	B	C	D	Σ
1	Włocławek Skierniewice Ruda Śląska	Lublin, Nowy Sącz, Przemyśl, Dąbrowa Górnicza, Świętochłowice	Bydgoszcz, Gliwice, Katowice	---	11 17.5%
2	Wałbrzych Łódź, Bytom, Siemianowice Śląskie	Gorzów Wielkopolski, Tarnów, Ostrołęka, Białystok, Łomża, Słupsk, Piekary Śląskie, Zabrze, Kielce, Olsztyn, Leszno	Płock, Opole, Suwałki, Świnoujście	Żory, Elbląg	21 33.3%
3	Bielsko-Biała	Toruń, Sosnowiec, Tychy	Jelenia Góra, Legnica, Grudziądz, Zamość, Zielona Góra, Piotrków Trybunalski, Warszawa, Krosno, Rzeszów, Tarnobrzeg, Chorzów, Rybnik, Jastrzębie Zdrój, Koszalin	Chełm, Częstochowa Jaworzno, Konin	22 34.9%
4	---	Siedlce	Biała Podlaska, Kraków, Gdańsk, Gdynia, Kalisz, Poznań	Radom, Szczecin	9 14.3%
Σ	8 (12.7%)	20 (31.7%)	27 (42.9%)	8 (12.7%)	63

The outcomes of revitalisation processes are clearly grounded in economic aspects. As many authors observe, public–private partnership forms—fundamental for implementing revitalisation projects in Western European cities—have been only weakly developed in Poland [18]. An examination of the results indicates that the range of financial resources allocated to revitalisation is very broad: from over PLN 6.646 million per hectare in Łódź to just above PLN 63,000 per hectare in Toruń. Disparities are smaller in the social dimension. The highest expenditure per resident of the revitalised area was recorded in Opole (almost PLN 57,500), while the lowest occurred in Legnica (just over PLN 2000). This raises the question of whether the relatively low allocations in some cities stemmed from a lack of awareness of the need for revitalisation or from difficulties in securing funds.

This study shows that the intensity of revitalisation is highly uneven across county-level cities, with a clear stratification by types and groups and no consistent voivodeship pattern. The alignment between the spatial–cultural and social dimensions is limited; many cities display mismatched profiles, with high values in one dimension and only moderate or low values in the other. Differences in spending and the number of actions do not fully account for these disparities, which underscores the importance of programme design and local context. About 36.5% of cities use revitalisation effectively in both dimensions; Włocławek, Skierniewice, and Ruda Śląska stand out as leaders, whereas Radom and Szczecin lag behind. Statutory limits on the extent of revitalisation areas and urban morphology appear to favour broader social coverage over extensive spatial delineation, helping to explain the observed patterns. In practice, synthetic comparative assessments should be complemented with practice-informed models that adapt solutions proven in leading cities rather than relying solely on centrally framed standards. Policy-wise, a national, standardised reporting framework should be established, public–private partnership capacity strengthened, and peer-learning schemes introduced to pair leaders with laggards while balancing social and spatial components at the design stage. The study's limitations include equal weighting of indicators and reliance on administrative or self-reported sources, as well as the 2020–2023 observation window, which restricts the assessment of long-term effects. Future research should adopt longitudinal designs, incorporate variables describing programme design, and test alternative weighting and aggregation schemes.

When considering the legal frameworks shaping revitalisation actions, it is necessary to account for statutory spatial limits. According to Article 10 of the Revitalisation Act, the revitalisation area cannot exceed 20% of the municipality's total area and may not be

inhabited by more than 30% of its population. In spatial terms, only ten cities designated a revitalisation area covering more than 15% of their territory, while as many as 24 cities allocated less than 5%. The situation is more expansive in the social dimension: 42 municipalities included more than 20% of their population within the revitalisation zone, while only 11 fell below 10%. These data suggest that socio-sociological factors play a greater role in decisions on revitalisation than spatial–urban factors. This pattern is partly shaped by urban morphology: in many cities, historic core areas have higher population densities than peripheral zones.

In the context of the applied methodology, one might argue that the best-performing city—Włocławek—benefited from its very small revitalisation zone (0.5% of the city area, covering less than 5% of its population), which favoured high index values. However, this critique can be dismissed by the example of Skierniewice, which achieved an equally high overall score while designating nearly 20% of its area and almost 30% of its residents, values approaching statutory maxima.

The statistics on revitalisation activities raise concern. Their overall number is modest, ranging from 11 in Siemianowice Śląskie to 675 in Wałbrzych. Adjusted for revitalisation area, most cities recorded fewer than 0.5 actions per hectare, with only Wałbrzych and Włocławek reaching approximately 2 actions per hectare. For socially oriented actions—measured per residents rather than per area—the situation is somewhat more favourable. In 42 cities, the number of actions did not exceed 1 per 1000 residents of the revitalised area, but in 8 cities it surpassed 2, and in Włocławek it reached more than 6.5 actions.

Considering the distribution of municipalities across the types, it is unsurprising that the most numerous groups are those moderately or well-utilising the revitalisation instrument (types B2, B3, C2, and C3). This reflects, at least partly, the adopted evaluation method. More importantly, however, is the identification of positive cases—12 municipalities (types A1, A2, and B1), accounting for 19% of the total—which can be regarded as leaders. Interestingly, the proportion of negatively assessed cities is identical, also amounting to 19%.

The analysis indicates that the percentage distribution of municipalities by spatial–cultural revitalisation types is broadly similar to the distribution of groups by social revitalisation. In most cases, this suggests that revitalisation programmes are being used with a comparable emphasis on addressing social problems as well as spatial construction challenges.

The most positive examples of county-level cities in terms of revitalisation processes are Włocławek, Skierniewice, and Ruda Śląska. The weakest cases proved to be Radom and Szczecin. Cities that merit the greatest discussion in terms of revitalisation policy include Bielsko-Biała, with a high WRPK but an average WRS, and Katowice, Bydgoszcz, and Gliwice, each with a medium WRPK but a high WRS.

A comparison of the spatial distribution of cities with the distribution of WRPK and WRS values no relationship between the composite revitalisation effort levels (IRSC/IRS) and voivodeship location. In 36.5% of the analysed cities, revitalisation can be regarded as an effective tool for improving both the spatial fabric and the social situation. The evidence provides clear answers to RQ1–RQ3 and supports H1 and H3, with partial support for H2.

In the search for an effective system of revitalisation processes, it appears necessary to move away from purely statistical comparisons [46], which tend to flatten the picture of revitalisation's potential. Instead, systems should be adapted to those processes that have proven effective in the best-performing municipalities. Polish revitalisation seems to be based primarily on locally decided, municipal-level models, rather than on comprehensive, centrally integrated frameworks as in Germany [47].

Abbreviations

The following abbreviations are used in this manuscript:

PLN	Polish Zloty (official currency of Poland, ISO 4217 code)
BDL	Polish Local Data Bank
RSC	Spatial–cultural revitalisation
RS	Social revitalisation

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