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## Data sources and research methods

The basis for the analysis of the spatial, sectoral, and functional changes in the industrial areas of Łódź is the material and information personally collected during the 1997–1999 field research. A field inventory of industrial sites was carried out as well as an analysis of cartographic documentation (surveying districts), legal documents, and documentation from industrial enterprise archives. Additionally, examined were the city archives and telephone directories from 1920–1939. The factual material so collected was subsequently verified in the field. The direct field inventory of sites allowed the author to collect updated material on the use, function, and property ownership structure. Cartographic materials were a particularly valuable source material which helped to carry out the urban inventory, e.g.:

- Surveying maps (so called ‘obrębówki’ [surveying district maps]) at a scale of 1: 2000 from 1988 and 1998
- Land use maps of Łódź at a scale of 1: 10 000 prepared in the 1980s for the purpose of compiling the general development plan
- Topographic maps of Poland at a scale of 1: 10 000 (sheets pertaining to Łódź)
- Maps of Łódź and Ruda Pabianicka from 1928 and 1938

The materials so collected were sufficiently reliable for further analysis. First of all, maps of industrial areas in Łódź were prepared based on the industrial sites inventory. In the analysis of material applied were cartographic methods and computer techniques such as Excel spreadsheets and the graphic application AutoCAD.

This Sheet 26 consists of maps no. 1, 2, and 3 which illustrate the changes that took place in the unusually turbulent periods in the Polish history, such as WW2 and the systemic changes after 1945, and further transformations of the political and economic system following 1989.

For the purpose of analysing structural changes, applied was the definition of industrial areas as prepared by the National Office of Statistics (GUS) for the national census. Industrial areas are those utilized by an industrial enterprise for the purposes directly and indirectly connected with industrial production. It, therefore, covers areas occupied by production, warehousing and storage enterprises, transmission facilities, and areas where employers provide social services.

**Map 1.** This map shows the distribution of industrial areas in 1938 as per industrial sectors. Almost all industry was then concentrated within the boundaries of the ring railway (also the administrative boundaries of the city). Light industries were the dominant sector in the central zone. Other sectors such as electrical machinery manufacturing, minerals extraction, foodstuffs production, chemicals production, fuel and energy industry, and timber processing were only supplementary industrial sectors.

The spatial distribution of industrial areas in 1938 is characterised by a relatively large concentration in the 19th c. waterside factory properties in the valleys of the River Jasiień, the River Łódka, and the Olechówka River. Further visible concentrations can be found in the vicinity of the railway stations (Kaliska and Fabryczna). Over a half of the industrial sites in that period were scattered around the city’s central zone and within its direct proximity in Polesie district. These were mainly small industrial enterprises, but very damaging to the environment.

Table 1. Number of industrial sites and size of industrial areas in Łódź in 1938 (as per industrial sectors and against the layout of the present-day city districts)

Industrial sectors	Bałuty		Śródmieście		Polesie		Widzew		Górna	
	Sites	Area [h]	Sites	Area [h]	Sites	Area [h]	Sites	Area [h]	Sites	Area [h]
Fuel and energy sector	–	–	1	7.39	–	–	3	4.85	–	–
Electrical machinery	8	2.17	23	12.95	43	11.56	11	3.27	14	13.65
Chemical	4	4.01	10	3.35	9	2.53	5	1.01	9	7.89
Mineral	5	11.43	6	3.76	15	5.23	4	5.54	10	28.55
Timber and paper	5	0.87	5	2.14	17	6.67	1	0.88	3	4.38
Light industries	100	56.12	150	82.99	155	139.99	72	176.3	89	114.47
Food processing	3	3.88	10	6.29	13	16.59	5	5.56	5	3.02
Other sectors	–	–	4	0.74	4	0.90	2	1.18	1	0.45
Total	125	78.48	209	119.6	256	183.47	103	198.6	131	172.41

Source: own work

**Map 2.** This map presents the distribution of industrial areas in 1988. Immediately after the war the rebuilding effort commenced, followed by modernisation and development of the existing industrial enterprises. As part of the restructuring process, small enterprises were consolidated into large single- or multi-plant enterprises.

This is the period (1950–1988) when new industrial and warehousing estates were built, mainly in the outer zones of the city (Teofilów, Nowe Sady, Brzezińska, Dąbrowa and Ustronina) and two within the ring railway – Zabieniec and Polesie Widzewskie. The total area of industrial land increased by over 500 ha. but at the same time there was a downwards trend in the number of sites – above all in Śródmieście (central district) (down by 47%) and in Polesie (down by 57%). However, despite numerous demolitions to make way for new housing initiatives in the Central Housing Microdistrict (Śródmiejska Dzielnica Mieszaniowa) large textile factories are still found at the very heart of the city (e.g. the factories formerly owned by Geyer, Silberstein, Scheibler, Leonhardt, and Steigert).

As a result of the intense development of electrical machinery manufacturing and many other industrial sectors, both complementary to the textile industry and completely new ones, the city’s industrial structure was enriched. Another characteristic feature is the clear dominance of light industries, practically unchanged since the end of the 19th c. Despite the numerous post-war capital investment projects intended to diversify the city’s industrial structure, the textile monoculture further consolidates.

The post-war investment activities entailed a new spatial pattern of industrial sites which can be described as a ‘mosaic’ of compact industrial districts, concentrated and dispersed individual plants. A significant proportion of industrial sites is concentrated in a few districts and a few dozen industrial estates whose distribution patterns have both concentric and sectoral characteristics.

In the period under analysis several functional transformations of industrial areas were observed, mainly in the city centre along the axis of Piotrkowska Street. Many industrial enterprises were adapted for urban purposes (e.g. in Geyer’s ‘White Factory’ a museum of the textile industry was established). Rosenblat’s and Schweikert’s factory buildings were adapted by the Technical University of Łódź, while a few post-industrial buildings were also taken over by the University of Łódź. Many changes were observed in tiny factories in Polesie.

Table 2. Number of industrial sites and size of industrial areas in Łódź in 1988

Industrial sector	Bałuty		Śródmieście		Polesie		Widzew		Górna	
	Sites	Area [ha]	Sites	Area [ha]	Sites	Area [ha]	Sites	Area [ha]	Sites	Area [ha]
Fuel and energy sector	11	23.75	1	7.39	3	0.39	22	94.31	13	37.84
Electrical machinery	21	88.77	17	13.18	22	22.71	23	50.15	42	69.37
Chemical	16	34.42	4	1.48	12	6.66	13	55.32	5	9.93
Mineral	10	34.77	3	6.24	3	13.52	10	46.61	4	4.99
Timber and paper	16	24.39	2	2.56	9	6.93	4	9.10	13	42.33
Light industry	88	80.60	61	44.3	69	95.82	40	110.9	62	150.68
Food processing	5	13.93	4	4.53	23	32.55	11	10.54	6	4.74
Other sectors	9	4.08	6	2.17	5	4.97	5	5.12	7	7.5
Total	176	304.71	98	81.85	146	183.55	128	382.05	152	327.38

Source: Own work

**Map 3.** This map illustrates the industrial areas’ functional changes during the period of transformation into a market economy after 1989. In 1989–1999, the industry in Łódź underwent a very difficult period of adjusting to the market conditions, as reflected in a drop in the production output and employment. The changes observed in the industrial areas under analysis are, therefore, closely linked to the problems affecting that sector in the period of transformation. At the beginning of the 1990s, industrial enterprises undertake restructuring efforts which very often are unsuccessful and lead to their liquidation. So begins a new period of surveying divisions and the industrial areas are entered by new companies that bring in new lines of business.

In almost all districts observed was a drop in the size of industrial areas, accompanied by an increase in the service sector (tab. 4 and fig. 1). Generally, the largest changes in the size and number of industrial areas was observed in the city’s central zone and in the immediate neighbourhood of Polesie and Widzew. In Piotrkowska Street alone, about 50% of industrial areas changed their primary function to services. The least changes were recorded in the post-war industrial districts with still dominant industrial function.

Table 3. Number of industrial sites and size of industrial areas in Łódź in 1999 (as per industrial sectors and against the layout of the present-day city districts)

Industrial sectors	Bałuty		Śródmieście		Polesie		Widzew		Górna	
	Sites	Area [h]	Sites	Area [h]	Sites	Area [h]	Sites	Area [h]	Sites	Area [h]
Fuel and energy sector	13	22.9	1	7.39	1	0.2	35	93.96	15	28.65
Electrical machinery	57	74.18	18	9.8	20	15.56	36	41.23	25	32.27
Chemical	17	34.4	2	1.05	18	7.95	11	47.19	5	14.73
Mineral	4	24.1	–	–	1	0.53	8	25.37	8	8.63
Timber and paper	10	18.99	2	1.93	7	5.03	1	4.12	19	28.41
Light industry	172	66.95	37	23.6	54	72.6	57	67.82	69	120.21
Food processing	10	12.86	4	3.99	19	22.65	7	6.95	4	4.38
Other sectors	3	4.81	6	1.52	5	1.58	3	4.60	4	1.74
Total	286	259.19	70	49.28	125	126.10	158	291.24	149	239.02

Source: Own work

Looking at the spatial distribution of the tertiary sector “making incursions” into the industrial areas, certain regularities become clearly visible. Namely, trading companies choose their locations nearby in every single industrial area, frequently causing functional changes to the entire complex, as is the case with Polesie Widzewskie and Srebrzyńska Street. Services are typically strongly concentrated in the city centre.

Post-factory facilities are most often taken over by institutions of higher education (e.g. the Academy of Humanities and Economics (WSHE) from Wtórpol, and the University of Łódź from Lodex), public administration, tax offices, banks, as well as restaurants and pubs (located mainly in Piotrkowska Street). Places of worship are also established in post-industrial areas.

What raises concern is the inertia of the industrial structures under analysis. In practice, the changes that took place in 1989–1999 did not bring about any radical makeover of the industry’s sectoral structure, still leaving the light industries in their dominant position, so the city’s industrial ‘monoculture’ was not fully overcome. This was one of the purposes for which the Special Economic Zone was established in 1997 (with its central zone in the former Grohman’s factories), where priority is given to companies employing new technologies.

Also, it is worthy of notice that the number of industrial site owners in 1988 significantly dropped in comparison with the pre-war period, of course with the exception of new industrial districts (Teofilów and Dąbrowa).

Table 4. Changes in the number and size of industrial sites in Łódź: 1937–1999 (in city districts)

City district	1938		1988		1999	
	Number of sites	Area [ha]	Number of sites	Area [ha]	Number of sites	Area [ha]
Bałuty	125	78.48	176	304.71	286	259.19
Śródmieście	209	119.61	98	81.85	70	49.28
Polesie	256	183.47	146	183.55	125	126.10
Widzew	103	198.66	128	382.05	158	291.24
Górna	131	172.41	152	327.38	149	239.02
Total	824	752.63	700	1279.54	788	964.83

Source: Own work

Fig. 1. Changes in size of industrial land in Łódź in 1938–1999

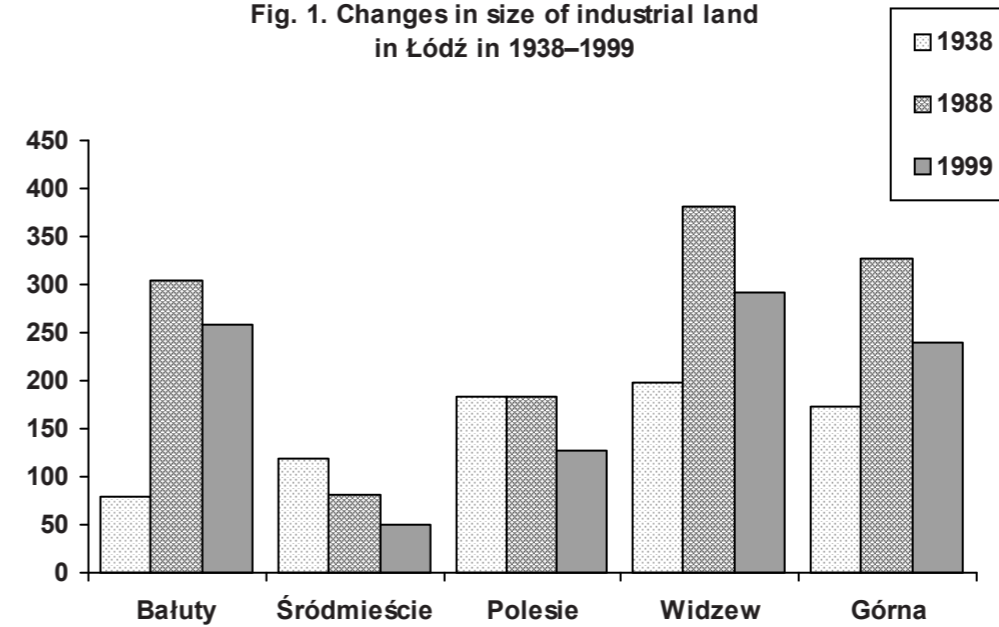


Table 5. Changes in the number of industrial site owners: 1938–1999

City district	Number of owners		
	1938	1988	1999
Bałuty	48	81	129
Śródmieście	186	78	77
Polesie	219	118	137
Widzew	53	71	107
Górna	118	104	144
Total	624	452	594

Source: Own work