

Delft University of Technology

Large Plate Panel Buildings in Eastern Europe:

A Case Study of Poland Neighborhoods

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Abstract:

Large plate panel building architecture is one of the important aspects related to the historical background and its development, especially in Slavic Europe where buildings were linked with the Soviet occupation. Through examination of case studies, the study focuses on social, economic, and political factors that played a role in the rapid introduction and implementation of "concrete pre-fabricated" houses, popularly known as "large plates" in Poland and other Eastern European countries.

Briefly, the paper covers the political dimension of large plate panel buildings. It is an argument in favor of aligning these buildings with socialist ideals and with other goals in shaping urban landscapes. The research provides insight into the impact of plate technology on city architecture, but it also focuses on the urbanization trends of Polish cities during the era of the People's Republic of Poland (PRL).

Furthermore, the studies focus on the existing conditions of the small plate buildings, factoring them in features like durability, problems in maintenance, and their estimated life span. Discourse on the housing crisis in Poland is undertaken, in which relevant aspects of revitalization costs are analyzed and the position of the government is examined. Despite the fears for the mere resourcefulness of big plate buildings experts say that they may have a life span of 100+ years under warranty conditions.

Thereafter, the research stresses the persistence of large plate panel buildings in the housing landscape by narrating their historical significance and searching the issues in their sustenance. Even today plate buildings constitute a very important part of Polish housing but the example of some other countries – Germany and Netherlands – show us at the same time they are facing certain deficiencies that suggest possible future developments in large sheet structures.

Narrative in architecture and urban value:

If we take a deep look at the historical background and political factors depressing the formation of large plate panel buildings in Poland and other countries in Eastern Europe, which had a great influence on city structure and development at that time. The strength of the resistance movements in the Slavic Eastern Europe nations during the Soviet occupation era was the key issue. The study acknowledges the well-known cases like Betondorp in Amsterdam and Splanemann-Siedlung in Germany as examples and adds the rationale why that type of housing gained popularity among Poles and those from other Eastern European countries - dubbed as 'large plates' - given the social, economic and political imperatives. The subject of the study is political and in some way involves the projects realized based on the modular, monumental form and ideology of communism and the social economy of the People's Republic of Poland (PRL) times. The plot entity notes that the geometric design of panel housing and its unified and egalitarian character correlated with socialist ideology. This, in turn, affected the look of urban environments, so that specific districts such as Rataje in Poznań, Ursynów in Warsaw, or Nowa Huta in Kraków were created.

The text focuses on a large spatial arrangement with big large plate units belonging to the peripheries of cities, thus enabling the emergence of new massive districts in cities. Along with acknowledgment of certain progress in the urbanization process, the study raises problems which proved to be rather difficult so far, such as inadequate housing and overpopulation.

The narrative moves on to consider the broad framework of the renewal of housing in the country and how it relates to the increasing cost of rebuilding the urban clustery. With the skyscrapers of the large plates being the most economical and viable option, it creates chances for affordable accommodation solutions to the already prevalent housing problems. A propensity of a large plate for architecture focuses on the historical value of these main plate structures, not only for their long-term stay in the urban environment but also for their character and style. It also suggests that there is a need to draw lessons from previous cases and experience abroad for future development to be sustainable and apply community-based design principles. This research finds confirmations that the large-plate type buildings can answer the contemporary and relevant housing issue and they also shape Poland's social and economic narrative.

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Introduction:

Historical Evolution of Prefabrication

Prefabrication is a method of producing standardized elements off-site in a factory or workshop, which can then be rapidly assembled on the construction site. Components are specialized for easy transport, either as flat walls stacked on top of each other or practical modular rooms/spaces that can be easily joined together like building blocks. One of the main advantages of prefabrication is the speed of project completion, but above all, its resilience to weather or transport conditions.

Prefabrication was a solution where there was a sudden need for rapid construction or a lack of local materials. Among others, in former colonial countries, where there was a demand for quick construction without much effort and a skilled workforce was scarce.

In ancient times, even the ancient Mesopotamian civilization addressed the topic of prefabrication, using fired clay elements. Ancient Romans, on the other hand, used concrete molds to build their famous aqueducts and tunnels, among other structures. Prefabrication was also used for temporary or military architecture. William the Conqueror, in the 10th century, reinforced and fortified his strongholds during conquests using compact and collapsible components.

As early as 1624, English settlers brought to Cape Ann, Massachusetts, a prefabricated wooden building, made of panels, specifically tailored to the needs of the local fishing fleet. Over time, this house underwent an extraordinary cycle of disassembly, relocation, and meticulous reassembly, representing an early and practical example of what could be called a 'dismantlable' house. This pioneering endeavor is a testament to human innovation, marking the beginning of a housing solution capable of iterative construction and deconstruction.

An instance of early large-scale prefabricated constructions could have been seen in the Crystal Palace (constructed in 1851). Situated primarily in Hyde Park, London, it hosted the Great Exhibition of the Works of Industry of All Nations. This immense glass and iron edifice not only served as the venue for the event but also showcased the industry it celebrated. As a quintessential prefabricated structure, cast-iron elements and glass panels were transported to the location and assembled within a span of six months.

Pioneering Projects and Architectural Vision

In the mid-20th century, visionary architects like Walter Gropius foresaw a revolution in housing construction through the principles of prefabrication. In his collection of essays from 1943-55, Gropius emphasized the decisive importance of reducing the cost of dwelling construction for national budgets. Conventional methods, rooted in handicrafts, proved insufficient, prompting a shift towards more rigorous organizational techniques and, eventually, the emergence of "large-plate" buildings.

These large-plate structures found their roots in pioneering projects such as Betondorp, a landmark located just outside Amsterdam. Conceived a century ago as a response to the immediate need for affordable housing between the World Wars, Betondorp, or 'concrete village,' embraced concrete as a substitute for the expensive and scarce bricks caused by the First World War. Despite challenges like dampness and foundation cracks, Betondorp became a testing ground for concrete and a symbol of a socialist utopia.



Image 1 Betondorp Neighborhood, Foto Stadsarchief Amsterdam

Similarly, in Germany's Splanemann-Siedlung District, architect Wagner championed the construction of reformed housing estates in the aftermath of World War I. The demand for small flats, coupled with a reform building regulation effective in 1925, led to the creation of practical and affordable living spaces for the lower classes, marking a significant shift in German society's living style.

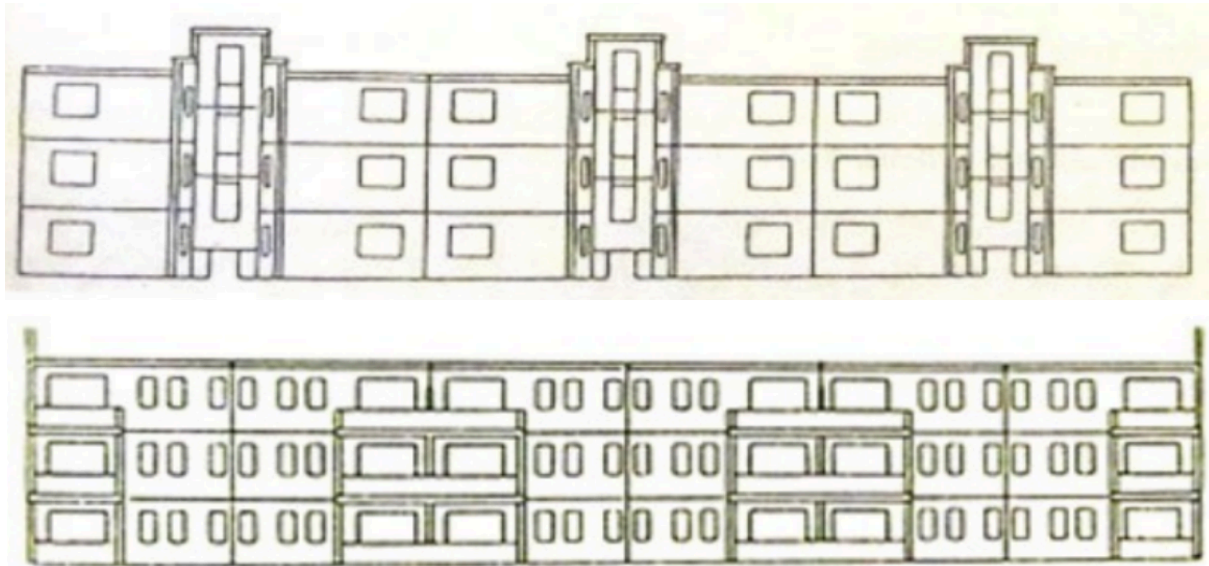


Image 2 Elevation of Splanemann-Siedlung District units with visible prefabricated panels
Sorgato, Barbara, 1993: Splanemannsiedlung in Berlin-Lichtenberg. Berlin: Technische Universität

Emergence of Large-Plate Buildings in Poland

Fast forward to the mid-20th century, large-plate buildings became a cornerstone of post-war housing solutions in Poland, constituting around 60% of urban housing developments between 1966 and 1995. Currently housing around 12 million Poles, these structures have become a permanent element of the country's landscape. However, their legacy is not without challenges. The pioneer's vision of large-plate buildings being relatively economical, quick to erect, and weather-independent seemed progressive and modern at the beginning, aligning with the principles of modernism. Unfortunately, issues related to design, construction, and aging have led to a cessation of their construction and a critical assessment by residents and specialists alike.

Years	Apartments build in thousand			
	Overall in the cities	in multi-family housing		
		together	in large plate	
			%	absolute number
1966-1970	741	629,9	20	126
1971-1975	906	770,1	52	400,4
1976-1980	1099	934,1	76	710
1981-1985	785	628	83	521
1986-1988	622,5	498	79	393,44
1989-1993	286,4	229,1	57,8	132,4
1994-1998	263,2	184,1	16,9	21,2
All	4703,1	3873,2	60	2314,,6

Tabel 1 Apartments in cities and % of large plate technology buildings built in 1966–1998, Poland |
Wardach, K., & Krentkowski, M. (2023). "Current Perspective on Large-Panel Buildings". *Urban Planning Review*, 55(4), 301-319.

The large-plate housing estates, born out of necessity and modernist ideals, have not only shaped skylines but have also played a crucial role in forming communities within cities. The initial vision of these structures aimed at creating vibrant, cohesive neighborhoods. Over time, however, the evolving housing crisis and the specter of gentrification have led to significant shifts in the social and cultural fabric of these large communities.

The urban theory surrounding large plates often emphasizes the creation of clusters within cities. These clusters, composed of interconnected large-plate blocks, were strategically positioned to form microcosms of urban living. The intention was to foster a sense of community, with shared spaces, amenities, and green areas. This approach aimed at enhancing the quality of life for residents, providing a counterpoint to the congestion of traditional urban settings.

As cities expanded and housing needs intensified, large-plate communities faced challenges. The initial utopian vision gave way to issues of neglect, social disparities, and economic struggles. The housing crisis further intensified these problems, leading to a decline in the quality of life in some large neighborhoods. Gentrification, often driven by urban renewal projects, brought about a transformation in the socio-economic landscape, displacing existing communities and altering the cultural identity of these areas.

The positioning of large-plate blocks within the city played a crucial role in determining the success of these communities. The clustering of blocks allowed for the creation of shared spaces, fostering strong social connections. When well-planned, these neighborhoods exhibited resilience and a sense of identity. However, some large-plate estates faced challenges due to poor urban planning, isolation, and inadequate access to amenities, leading to social fragmentation.

Initial Vision and Subsequent Challenges

The urban theories that underpinned large-plate constructions have manifested in both positive and negative aspects within the block itself. Positively, these structures created affordable housing for a significant portion of the population, promoting a sense of community through shared spaces and common facilities. However, negative aspects include issues of maintenance, infrastructural decay, and the emergence of social problems within these large-plate blocks.

In contemporary times, large-plate communities grapple with an array of challenges. The aging infrastructure and limited adaptability to modern needs create issues of practicality. Social problems such as crime rates, unemployment, and educational disparities persist, reflecting the broader challenges faced by these neighborhoods.

The regeneration of large-plate housing estates requires a comprehensive approach that addresses both physical and social dimensions. Urban theories must evolve to incorporate modern needs, fostering inclusivity, sustainability, and adaptability. Cultural studies should focus on preserving the positive aspects of community life while addressing the negative influences, creating a foundation for revitalization that respects the history and identity of large-plate neighborhoods. Only through a holistic understanding can these clusters within cities regain their vibrancy and fulfill the initial vision of cohesive, thriving communities.

This thesis addresses the multifaceted problems associated with large-plate housing estates, spanning urban planning, architecture, social dynamics, and community concerns. Despite their fragility being a prevalent opinion, there's a lack of specific information on the estimated durability of large-panel buildings. The research delves into aspects of durability, focusing on aging and social problems during gentrification and the constant habitation of large plate clusters. While the current status of facilities arouses controversy, the crucial examination of positive and negative aspects is necessary during social efforts, to ensure the integrity and sustainability of these iconic yet aging structures. The article seeks to shed light on the challenges, potential changes, and revitalization prospects of large-plate housing estates, acknowledging their undeniable impact on the daily lives of millions in Poland.

What were the political, economic, and social factors that influenced the rapid introduction and implementation of large plate panel buildings in Poland and other Eastern European countries during the era of the Soviet occupation, and what are the current status and potential future developments of these structures in the urban landscape?

2. Historical background of large plate panel buildings in Poland and Eastern Europe

Pioneering Large Concrete Panels

Of course, the above examples (Betondrop/Splanemann-Siedlung District) don't look similar to the high-rise buildings known from Polish neighborhoods, but we can't forget they were the first attempts at using large concrete panels for dwelling construction. Large panel appearance connected with the vivid development of modernism. What is more, modernist architects and figures fell in love with the raw and solid form of concrete and constructions. We can mention Le Corbusier and his famous living unit. The one that was about to change and make a revolution in modern building society somehow large plate panels indeed have changed the aspect of urbanism but in different parts of Europe.

In the currently available documents, you can't find, despite the overall opinion of the fragileness of those buildings, dates about the estimated period of the durability of large panel buildings. Analyses are being diagnosed about aspects of durability, some of them have already been there for 40/50 years. Research is about aging and technical problems about where the problems are while construction but also where they occur after the explanation of constant habitat. Overall analysis tells the positive outcome that the current status of facilities and construction is not harmful to habitats but of course, as with all buildings regardless of the construction type one of the aspects is connectors of large panel systems, and panel systems swell in terms of isolation and layer. But how exactly has happened that a concrete large panel system has become so popular and common in Poland and other parts of the East/soviet part of Europe? While the west of our continent has been improving and experimenting with form and materials for architecture, Poland was handling terrible dwelling market conditions.

Socioeconomic Context and Housing Crisis

The housing crisis brings into focus the formerly socialist countries of Europe and includes the particularities that are unique to centrally planned economies as well as to the regional contexts in which this model developed. Some similar principles in housing production and management were instituted in countries with few urban areas on the eve of the Second World War. They included those whose low rates of urbanization were more or less destroyed after the war (from 20%, for example, in Bulgaria or Romania, to more than 40% in Czechoslovakia), and these became filled in various ways by urban and architectural modernity. This diversity also functions on the sub-national level, particularly in Poland, where the period of Partitions (1795-1918) produced highly divergent systems of urbanization and urban living. And citizens of major cities were struggling without a home. If the current state of estates and conditions are maintained, Poland might be heading toward becoming a fully rural and harvest country. Crisis was also occurring even in Warsaw, the capital, where rapidly social shelters were being built. And even the most desperate habitants were committing suicide

Of course, damage caused by the 2nd world hasn't helped the current situation in Poland. Another harassing aspect was after the war period of a decrease in the birth rate. Soviet rulers of the countries challenged themselves with a task not only to calm down the current food crisis but also to speed up cities' development and urbanization. Cities were about to be put into the biggest factories and industries.

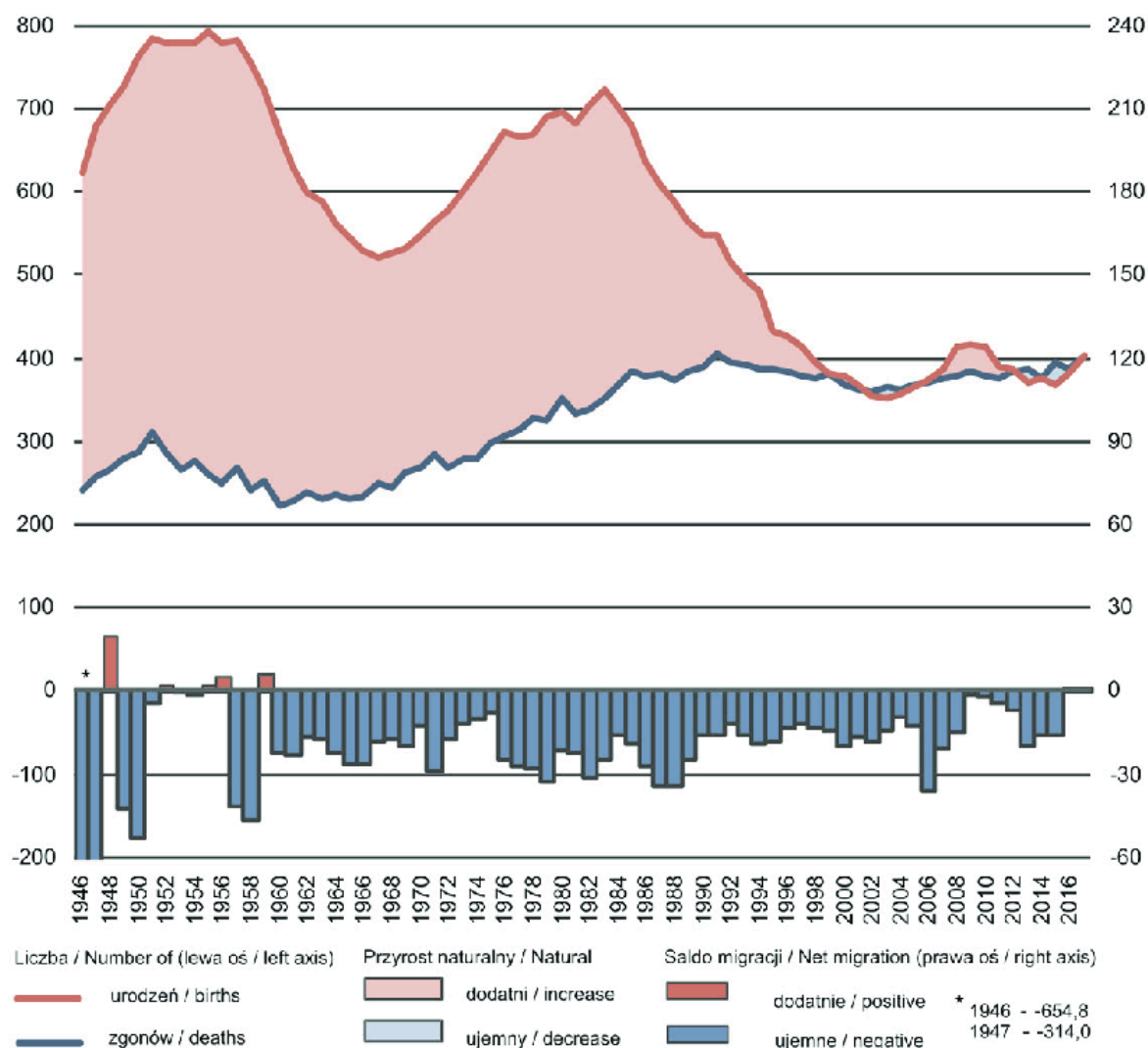
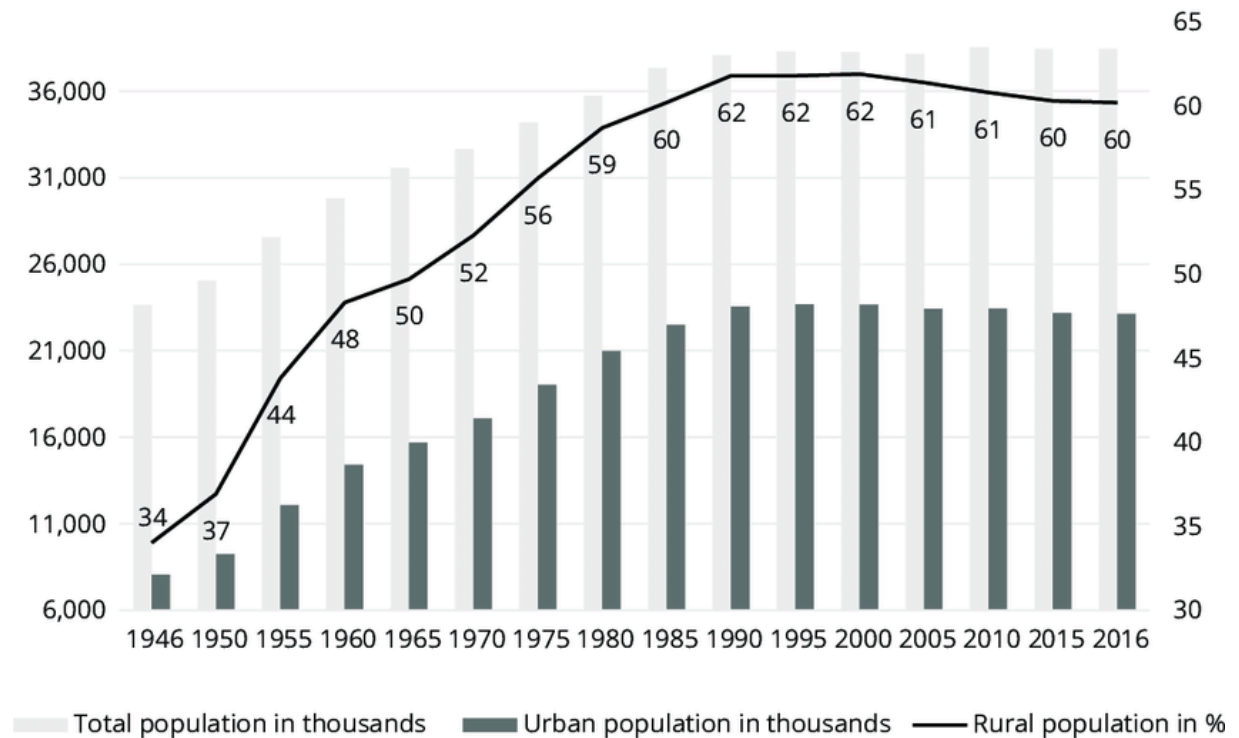


Tabela 2 Changes in Poland's natural increase and migration balance in the years 1946-2017 / Wiśniewski, Rafał & Mazur, Marcin & Śleszyński, Przemysław & Szejgiec-Kolenda, Barbara. (2020). Wpływ zmian demograficznych w Polsce na rozwój lokalny = Impact of demographic changes in Poland on local development. 10.7163/9788361590837.

The fastest income of those in Poland is aimed at the end of the 60s/70s and 80s. After the war, the increase of habitats has come. The current government decided they needed to build fast and efficiently so they chose this large plate panel for new coming families. Before the Second World War, the housing situation was already a cause for concern. It was especially dependent on the level of economic development of the regions that constituted the new Polish territory after independence in 1918. At the end of the Partition period, the regions that had been subjected to Prussian domination (Pomerania, Mazury, Silesia, Greater Poland), opened to modernity at an early stage, greatly contrasting with the regions – annexed by Tsarist Russia (almost half of which is part of the present-day territory, including Warsaw) – that were much less well developed. In the south, the thin fringe of the new Poland around Krakow, formerly under Austrian domination, was in an intermediate situation. In terms of housing, the most striking difference can be seen between the regions under Prussian and Russian domination. In the Prussia-dominated areas, urbanization developed quickly alongside industrialization. Company towns were developed (in mining towns), and there were innovative solutions for the housing problem such as the first aid societies, and rudimentary versions of cooperatives, formed at Posen (Poznań) in 1890. In

the Russia-dominated areas, the conditions of urban housing were overshadowed by the barracks building (*dom koszarny*) model. Such conditions existed in Warsaw and in the textile capital Łódź, the boom town that Władysław Reymont describes in his great novel, “*The Promised Land*”. The destruction wreaked by the First World War made housing conditions worse: in 1931, 36% of the urban population lived in single-room housing units and only 70% of units were occupied by a single household. The housing issue thus became central for the new state after 1918.



Tabel 3. Population and urbanization rate in Poland between 1946-2016 / Napiórkowski, Tomasz. (2018). Impact of Foreign Direct Investment on the Urbanization Process in Poland. Heterogeneity of Regions.

Evolution of Building Technology

Large Plate technology has been chosen because of many aspects, but the most crucial one was the tempo of the working process. Block segments have been produced in so-called "house factories" What is more each region of Poland has its unique scheme of prefabricated panels. That's why the buildings raised in Warsaw differ from the one for example put in Poznań. That helped to relocate cities around the whole land of Poland and dodge the problem of centralization. Overall government ensured 4 million new habitats in a short period. However, architects were challenged while constructing large plate panels. One of the bigger threats was of course standardization of all the elements. That's why the only actual difference was only the height or number of interior staircases and communication shafts. We can answer shortly, but the more you realize we can encounter that we don't have one specific type of large plate. One of the most common was an innovative and intriguing form of Large Plate blocks. An example is a block on Kozia Street in Warsaw. Frankly speaking, we can't lie and it was not a typical product for a "normal citizen" out of the box.

Another problem has been the quality of materials and modules of construction. Lack of proper preparation and materials. Another issue was transport and damage caused to the materials while moving. During the post-war period, despite overall opinion, classic prefabricated building technology hasn't been that much cheaper than a traditional layering

system. The increased cost of consumption has been built due to the increased speed of assembling pieces in a quick period. Prefabricated plates have been put to unique thermal processing, thanks to that concrete being able to harden faster than in normal conditions. Another case that raised the price was the actual height of the building. It's not uncommon that the large plate industry in Poland was aiming for many levels even up to 15/16 stories tall. It increased not only the cost of construction but also maintenance because they required an elevator system and a more compelling installation that could have served all habitats of the unit. Also causes a lot of trouble with hot water transfer to the top units.

A very important turning point in the process of buildings' industrialization in Poland and in the other countries of Eastern Europe has taken place when the first attempts to utilize concrete panels of the very large size together with the large plate technology have created a new standard of architectural and urban development. In Poland, big post-war voids in the social landscape and socio-economic reality of socialist governance resulted in a large-scale panel construction, but in the mid-20th century, it reflected the modernists' love of concrete forms and a little solidity. A sharp decline in birth rates and end in WWII precipitated the shifted course prompting authorities to focus on urbanization and industrialization. Big plate technology became the answer to this frantic pursuit for more places to live and brought both quickness and scaling down to the picture. On the one hand, it provided a solution to equalize the level of living for all citizens, but on the other hand there were issues related to standardization, building quality and maintenance costs which were a problem to solve. However, a massive plate system does help the authorities to create up to millions of new homes which can be found across Poland. This transformation meant that the urbanization process in those countries was not only about the social and economical aspects but also about the peculiarities of centrally-planned economy and regional urbanization indicators, which was the starting point of a new period of architectural experimentation and social housing policy.

3. Political and economic factors influencing the construction of large plate panel buildings

Matching Form with Ideology

It's hard to deny that the modular, monumental form and shape of the buildings matched perfectly. Segments of same-looking and reportedly appearing units were ideal matches for rules and the general vibe of communism and the social Poland government economy. An economy that was being focused on putting everyone on the same level and equality. Often during urban development plans from that period, large-scale projects were reconsidering complete relocation and reshuffling the position of the historical urban structures in the city, without thinking and keeping the heritage. Additionally manufacturing large and heavy plates around the soviet union was one of the key factors of the heavy industrial economy leading in USSR and socialist countries

Urban	Architecture	Social-economics
<ul style="list-style-type: none">- Mostly large spatial scale- Location peripheral- Partially completed service program- Decorated space neighborhood and areas greenery (mainly playgrounds for kids)	<ul style="list-style-type: none">- Industrialized technology- Limited set typical projects buildings most often 5- and 10-story buildings- Inflexible layouts of small apartments (average size is 50.0 m2)- Monotonous expression architectural	<ul style="list-style-type: none">- Formerly advantage cooperative ownership with two types rights: ownership and tenancy laws- Transformations currently underway ownership related with changes in cooperative law and the process privatization- Large participation of people older and less wealthy- Relatively low operating costs- Affordable redemption conditions

Tabel 4 Characteristic features of housing estates before revitalization activities

Evolution of Suburbanization

The well-known model of Polish suburbanization was characterized by massive prefabricated housing estates spread in a scattered pattern. Eventually, in the early 1980s, the center of the city became a center of housing construction activities. The East Berlin, Marxist political economy was fused with postmodern architectural theory, with architects producing an appropriate urban ensemble contextual aesthetic vocabulary. The combination of inner-city housing with unique shops and services conceived to this space a new development. Architects proposed multi-aged housing units and installed the neighborhoods having an open area designated for children to bring up a harmonious family-like community and eco-friendly ambiance. Some of the nearest to Old Market, the city is interwoven with intricate courtyards.

The urban form comprised identical high-rise blocks clustered in such a tight space that residents could peer into each other's windows, and aside from the fortunate few at the extreme ends of the buildings, sunlight was a rarity, originating from a concept borrowed from France, which had been implementing it since the mid-1950s. Over nearly two decades until the late 1980s, nearly four million apartments were delivered for use. These were dubbed "cramped, but one's own." However, cramped living conditions, dimly lit kitchens, and crooked walls were not the only drawbacks that transformed everyday life in these housing estates into a tormenting experiment. Constructing curved walls and sloping floors from flat rectangular prefabricated panels was nearly impossible, but the Polish ingenuity prevailed. One typical obstacle, particularly in buildings equipped with elevators, was their "dysfunctionality," far more common than their "functionality." The first surprise encountered by inhabitants of these housing estates, as vividly depicted in Stanisław Bareja's film "No Rose Without Thorns," was the impossibility of maneuvering familial furniture, originating from "pre-war" times or from the 1950s, through the narrow stairwell turns. Until the mid-1970s, seven-story blocks were erected without elevators, hence grandmothers and grandfathers were carried out on stretchers just long enough to allow them to relocate from their apartment.

The opening from the architectural perception to the everyday experience of housing projects was an extremely watershed in town planning and community life. With the growing of strings of walls that shaped the sky of cities such as Poznan, the contrast of expectations of modernity against the complexities of daily life was apparent. The precise placements which had standard architectural forms and high rise construction promised to bring in an era of performance and advancement. All the same, the residents had to face many difficulties which could not be easily handled just because of the restricted space. Apart from closed-in spaces and unfamiliar settings, necessity of traveling to workplaces as well as access to required services were some of the issues that subsequently revealed themselves. Though the lofty objectives of architects and planners sound magnificent, the historical disjoint between concept and experience highlighted the fundamental challenges of city planning. While these places were the epitome of courage and outstanding commitment established during the golden age, at the same time, they became witnesses of how ambition and desperation at the same time were in conflict with each other as all this happened during an era of a great civilization transformation.

4. Urban location and impact of large plate panel buildings on city structures

Success of PRL Urbanization

Blocks units of large plates permanently have fluctuated the structure of Polish cities. Usually, they have been located in empty habitats outskirts of the city. Creating new places for large-scale fresh urban distress, built at a distance from vivid and hectic city centers and factories. Generally speaking, they were dormitories of the city with well-developed community centers and facilities. What in some points of view narrowed the possibilities of development. The outcome was generally negative because the closer people lived to the center the faster urbanization and economic growth. But in conclusion with intensive Post Soviet upgrade, Polish cities were donated with new characteristic districts like:

- Ursynów, Warsaw
- Rataje, Poznań
- Nowa Huta, Kraków
- Teofilów, Łódź
- Czarnów, Kielce

PRL process of urbanization has been generally seen as an overall success. The positive outcome was mainly an increase of people living in the cities rather than spread around plots and grasslands from 32 % in 1956 to 52 at the beginning of the 70s and it gently lasted till current times. Currently, in Poland, the urban/suburban part is leaving approximately over 60% of the whole population.

Housing estates built during the period of intense construction were characterized by a diverse social structure, expressed in occupations, education, as well as in places of previous residence. The apartments were inhabited by young people who, if they did not change their apartments, grew old together with the apartments, which were often their first independent apartments.

Planning and Construction of Rataje District

However, several years after the war, Poznań's living conditions were still poor. Many families lived in apartments and old tenement houses, people crowded into basements and attics. There was a shortage of new houses, municipal facilities left much to be desired and to make matters worse, public transport was inefficient. At the end of the 1950s, Poznań had approximately 430,000 inhabitants. Demographers predicted that by 1985 their number would increase by over 200,000. Therefore, Poznań architects started a discussion about building a new district. No architectural competition was announced, but the city authorities were presented with various concepts for the development of various areas of the city. The project that was finally selected for implementation began around 1958. Its authors were three architects: Regina Pawuła, Jerzy Schmidt, and Zdzisław Piwowarczyk. The architects undertook to develop a general plan and detailed plans for the new district. They designated areas for construction on the right bank of the Warta River, near the former village of Rataje, which was incorporated into Poznań borders in 1925. In those years, the concept of architects was considered very modern. They proposed the construction of blocks of flats made of large panels, with bright kitchens and water heated by heat from a nearby thermal

power plant. So far, only a few blocks of flats have been built in Warsaw using large panel technology.



Image 3. A model of the Lower Rataj Terrace in the park on the Warta River next to the Marchlewski Bridge (today Queen Jadwiga Bridge) CYRYL_92_0_0_1_0005

So far the plates were not produced on an industrial scale, and such production was planned in Poznań in the upcoming years of industrial development of the region of Great Poland. The framework of the planned estate was marked by factories in Starołęka and Główna and the railway tracks between Franowo and Starołęka (Image 3). In the center, there were fertile lands and the famous fruit gardens of the Bulgarians. The creators of the project proposed digging up fertile land and transporting it to Szczepanków, where the gardeners were also planned to be accommodated.

“It was believed that building a new, huge district in one place could bring significant functional, spatial and economic effects” - this is how Rataje architects justified their ideas in the "Chronicle of the City of Poznań " from 1960.

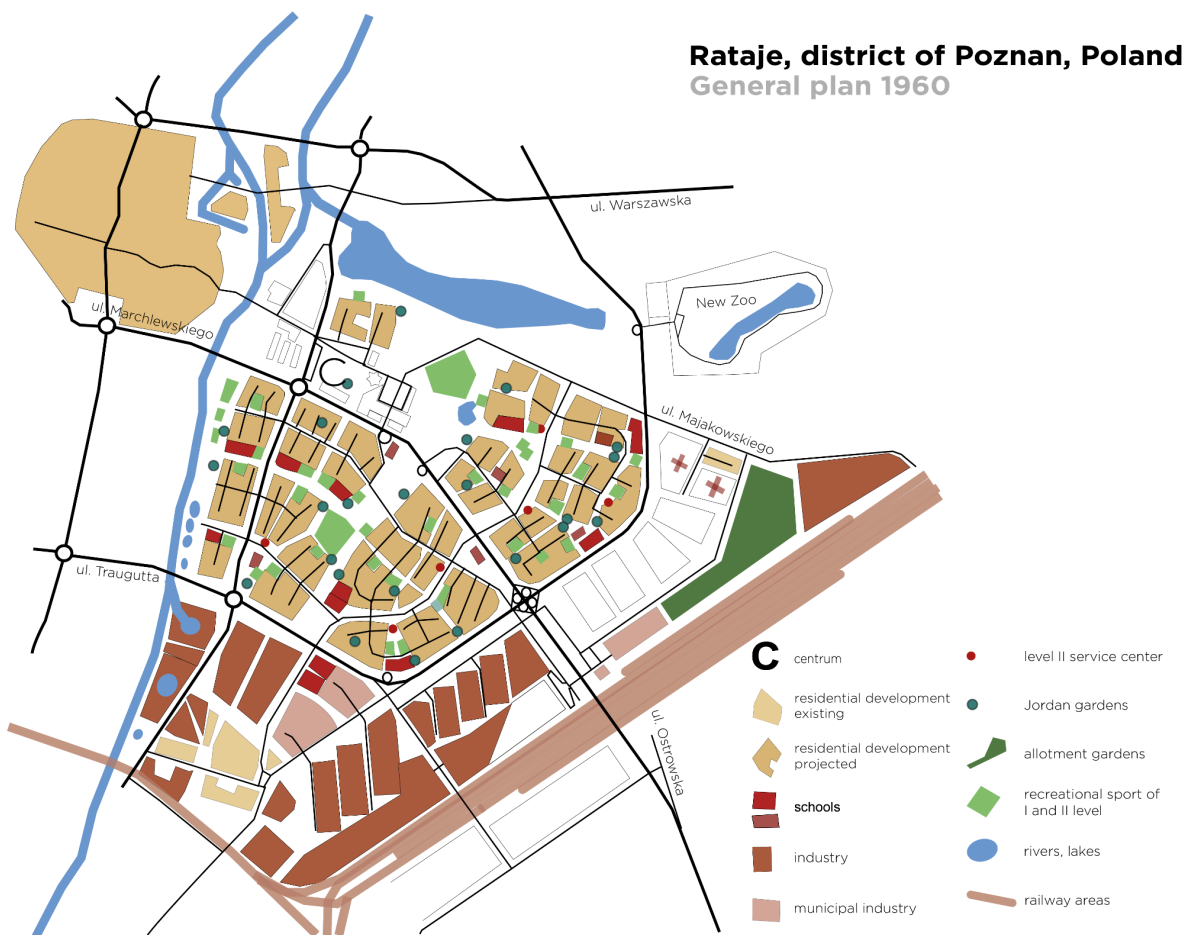


Image 4 - Rataje general plan map, redrawn based on "Chronicle of the City of Poznań" from 1960.

The investment was planned in two stages. First, in the years 1965-75, the first ten housing estates were to be built for over 60,000 people. people on the lower terrace, just above the Warta River, then plans were made to build another fifteen housing estates for 90,000 people. Poznań residents on the upper terrace. The second stage was to start in 1975 and end after ten years of construction. In the architectural plans, both terraces were divided by a large green belt. Urban planners predicted the construction of one housing estate per year, i.e. approximately 1,300 apartments. They were intended to house mainly people who had been evicted from attics and basements in the center of historic Poznań. Housing cooperatives were established only later. The estates were supposed to be similar: Urban planning discipline based on the repeatability of the layouts of individual estates provides significant economic advantages in the production of prefabricated elements, transport of elements, assembly as well as the development of the area with roads and water, sewage, gas and energy networks.

"Discipline of large plates" quickly turned into a necessity. It turned out that new housing estates had to be built quickly and cheaply. The contractors were provided with only sand and cement. There were no other materials. When building houses from prefabricated panels, it was necessary to use a rail crane that could only move in a straight line and did not tolerate any uneven terrain. This device had a great influence on the shape and direction of the blocks.

„Not everyone was satisfied with the repeatability of architectural arrangements used on the lower terrace of Rataje: There are many things to like about Rataje. But is this exaggerated

geometrization necessary, with the arrangement of identical houses, like an army in uniform? And these cold, inconvenient boards, giants..". -

Professor Zbigniew Zakrzewski in the book "I remember Poznań" timidly complained. 10- and 16-story skyscrapers built on steel structures. They were to occupy 25 percent of each area of the new district. The idea of single-family houses was the first to fail. Then it turned out that the city authorities also considered the construction of skyscrapers unnecessary. According to officials, only five-story buildings without elevators were to be built in Rataje. The authors of the project did not want to agree to such concessions because, in their opinion, the construction of only five-story blocks would result in excessive density of the estate with buildings. The number of inhabitants who were supposed to live in one hectare of the city was, according to the standards, still high. According to the architects, the skyscrapers would allow for more free space in the estate.



Image 5. Wioślarska Street (currently Piłsudskiego Street), in the foreground the estate Jagiellońskie, further housing estates of Enlightenment and National Uprisings (on the right) before the construction of skyscrapers, second half of the 1970s - CYRYL_104_0_0_3_0072

Implementation Challenges and Modifications

In the original plans, their ground floors were not to be built on, and the entire structure was to stand on poles. According to the architects, the gaps were justified by the riverside climate and the need to functionally connect the recreational areas with the greenery inside the estate. The project envisages maintaining the landscape character of the greenery at the foot of the escarpment while integrating the necessary sports and recreational facilities into the area.

The recreation center was supposed to be connected with a suspension bridge with the Culture and Recreation Park on the other side of the Warta River, but it was never built. Clearances under the "boards" on the estate. Piastowskie was built as part of the so-called densification, then basements were built, which the architects had not planned; they were to be replaced by utility storage rooms in each apartment. "Thickening" also had much worse consequences than building up the ground floors with "boards". It covered areas in the vicinity of housing estates that were originally reserved for green recreational areas. Instead of parks separating the lower and upper terraces of Rataj, new blocks of flats were built. They were built on wetlands through which rivers still flowed in the early 1960s.

The entire district was to be surrounded by a bypass, which would separate it from the new factories, the construction of which was also planned at that time. In the early 1960s, 8,000 people worked in Rataje. It was calculated that after the construction of the housing estates, almost five times as many people would be employed here - primarily residents of the new district. The construction of a new center and factories in Rataje was intended, among other things, to: solve the city's communication problems. The architects wanted workers to walk to their factories located several minutes away, through avenues, surrounded by greenery.

Structure of the district

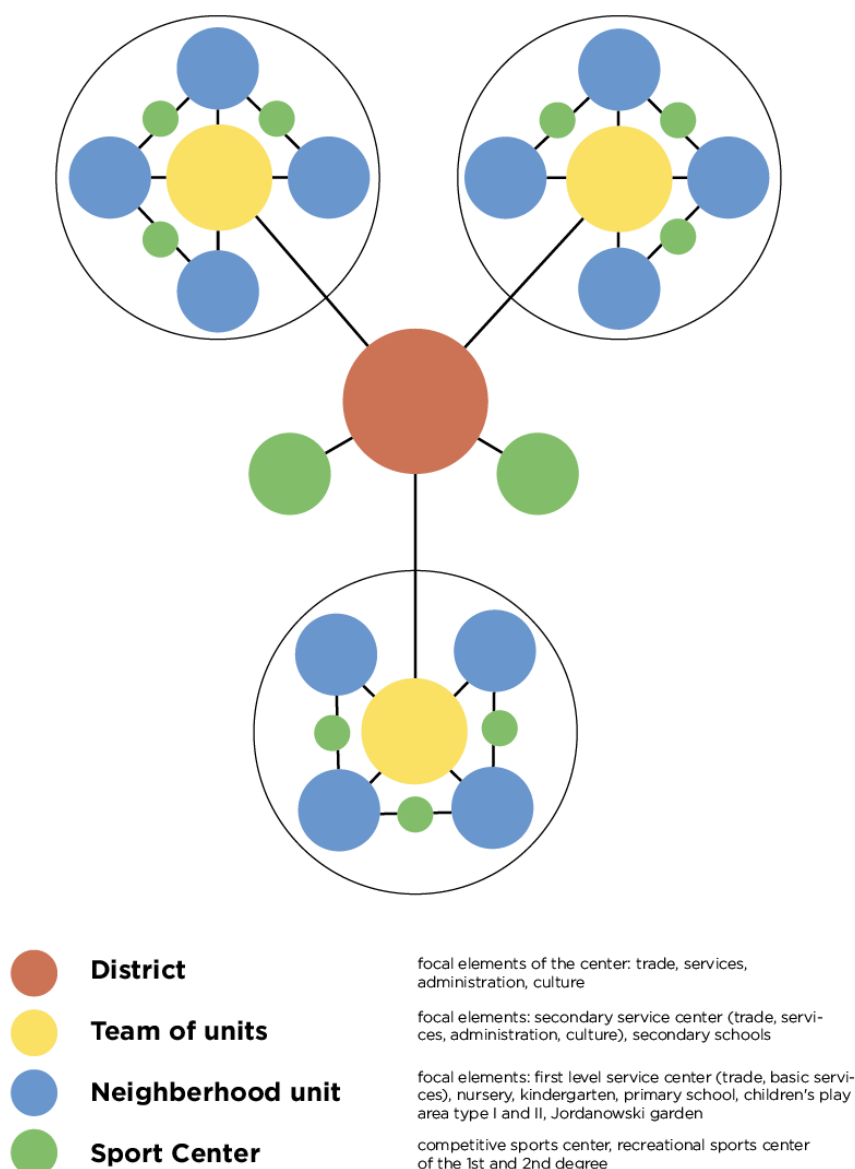


Image 6 Schematic district structure (Pawuła, Piwowarczyk, Schmidt) | Kronika budowy Nowej Dzielnicy Mieszkaniowej "Rataje" 1966-1967. In Kronika Miasta Poznania

Structure of the district

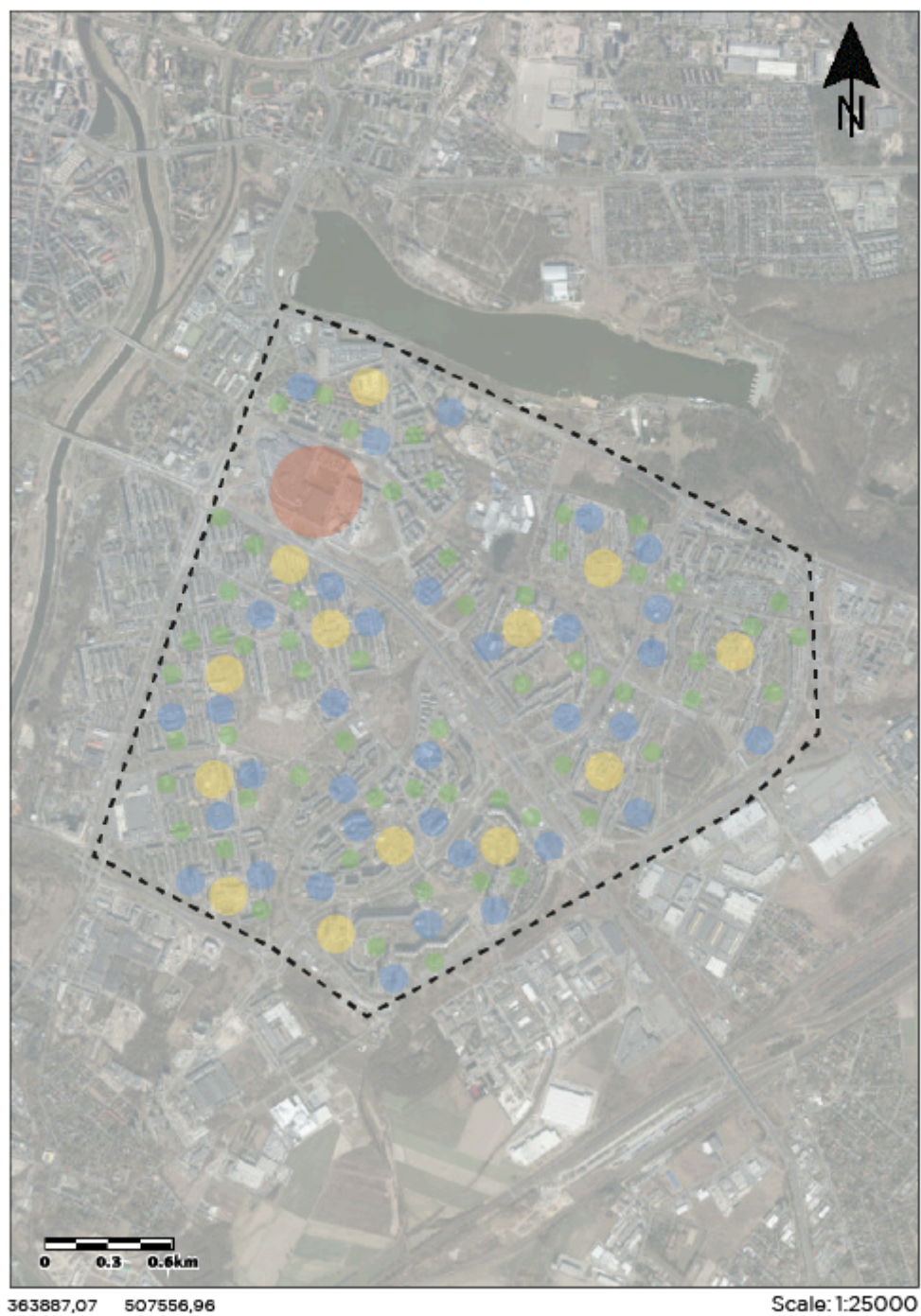


Image 7 District structure (Pawuła, Piwowarczyk, Schmidt) implemented in the actual (2024) structure of the neighborhood

The deficiencies of the body of today's city are known - chaos and conflicts of everyday life resulting from the disorganization of the basic functions of the city not adapted to the needs and requirements of modern life. Workplaces and places of residence are located on opposite ends of the city, cut in the middle by a railway trench and bottlenecks of east-west bridge routes. Public transport cannot cope with constant transfers through the crowded downtown - the team of architects working on the plans for Rataj argued to the readers of "Kronika".

To improve communication between the city and the new housing estate, the street was expanded. Starołęcka and new roundabouts were built there. The so-called Hetman's route, which was led over the new bridge. It was built by the army construction workers in just a few months. Several so-called express streets from which you can turn into internal, tight, and slow, but "collision-free" residential streets. The new center was also intended to relieve the city center and enable its reconstruction. The center of Poznań was rebuilt using the infill system, despite the apparent cosmetic modernization of shop interiors and neon signs, it does not fulfill the role of a well-functioning social and service center due to the excessive fragmentation of services, constant collisions between pedestrian traffic and road and tram transport, and difficulties in proper supply and parking - architects thought.

When two of the three originators of the new city district were removed from the Rataje project, many issues were subordinated to the requirements of the project contractor. The main focus was on the construction of new blocks of flats; service complexes were built with considerable delay or not at all. Unexpectedly, the idea of 11- and 16-story skyscrapers, which were built from prefabricated panels, also returned.

Urban Renewal and Contemporary Perspectives

Contrary to the intentions of the originators of Rataje architecture, the estates are separated from the workplaces, and most of them have not built any buildings of higher utility. The lives of housing estate residents are made difficult by poorly resolved communication problems. The extremely monofunctional, exclusively residential character of the estates, the uniformity of ownership, and the architectural form of development are already factors contributing to the degradation of these areas - wrote Wanda M. Gaczek in the book "Spatial Management of cities and towns" published by the Poznań University of Technology in the early 1990s.

The transformation of Polish cities, that included growing mass multiple storeyed flats like the Rataje estates, was part of the wider history of urbanization and social change with the construction of new social environments. Such projects were born with a noble objective – a solution to the urban plight – but could now be perceived as a distinctive mark in a city's landscape, where desires collide with realities. Rise of the city of Poznań was followed by post-war reconstruction together with the fast growing population. Then even as the new buildings happened, a number of questions emerged regarding the impact of the urban fabric and social dynamics. The pilgrimage to Rataje is exposed to the world through real life manifestation and sociological research that provides a sophisticated portrait of the community. As The Neighborhood of Rataje shows, the ubiquity of man-made entanglements and human interactions here vary from encounters of warmth and bond to those of anxiety and alienation. Through this, among other things, the research manages to disclose the cross-cutting nature of the stuff that happens in neighborhoods and at the same time adds greater value to context and lived experience as aspects of understanding the urban landscapes.

5. Social approach of Large Plate panels and its inhabitants

Understanding Urban Neighborhoods: Field Study in Rataje District

The work of neighborhoods in urban sceneries is a beautiful cloth where the interplays of people's social relations, cultural diversity, and individual lives are embodied. This field study presents a peculiar and optimal option which is, the city itself with its diverse culture, historical roots, and complex social structure. In the context of the classical tradition of area sociological studies, however, this research study aims to explore the real life of residents of the Poznań-Rataje district and the network of social interdependencies that constitute its broader community fabric on the background of intensive residential construction.

In the afternoon, we moved to the rear of the housing blocks in Rataje, district of Poznań, and saw a woman with two kids heading our way. Unlike modern salesmen who look frenetic and harp on time, these merchants seemed unconcerned with the elderly woman and her son, presenting a good chance to converse with them. Biased for smiles, I would unveil our professions and intention of prolonging our acquaintance in this exploration. The man advanced instead, but just as quickly the woman disappeared into the darkness, her presence engulfed in the pall of fear as she rushed away and in the other direction. Next, a stranger walking by made us feel even more embarrassed because he threw contemptuous looks at us.



*Image 8 Block no. 122-129, the so-called board for pers. Lech part of Rataje, early 1980s
CYRYL_104_0_0_3_0098*

Inveigling the stumbling blocks, we subsisted and wisely tweaked the plan of action. In an attempt to get to the other side, we found ourselves building up where we identified a door

wearing a typical Polish family name. We came to the door, a shy child about six years old opened the door and we were welcomed in, even one of us received a hug. In a short time, his father, who usually came into the house with a beer in his hand, walked out. And his presence, which seemed to compress me together with him into the grindstones of social convenience, scared me off at the first instance. Notwithstanding our hesitance, we still approached them with a grin as we began a friendly conversation. The man's anguish was indicated by his responses, these responses were short and left us with a sense of him being contented with phrases like "all is well" and "no bother". After a few sentence exchanges resident areas subtly shifted into intolerance, particularly about the new Arab inhabitants. Peculiarly, this experience threatened us with an extraordinary feeling of being out of place in the vicinity where this man had designated his home, as the place seemed to place him on the higher tier of the hierarchy of beings (if there was any).

Engagement with Community Professionals

The fact that we have a scheduled meeting with the contact person, who is a doctor of science, showed us that the community wants to deal with their problem professionally, the scheduled meeting will be a day after at the district center. With rings of comfortable smiles, as we came into the office, the doctor greeted us. His speech made me remember myself and destiny and I often wondered what life was all about, especially in this town. He can boast about his profound observations of the community, therefore, he likes the neighborhood for being multicultural as well as filled with harmony among the many residents. Moreover, was happy and well disposed to freely pass some information to us on the neighborhood but he turned down our request to be introduced to other residents. With the aid of our contact person, we began a tour of the neighborhood, which teems with interesting landmarks and great facilities. Although the range of stories and experiences conveyed was rich, we yearned for some personal stories to uniquely enlighten us about life. Upon wending our way to a park, we happen upon an army of children whose bodies are like a warm embrace, unlike the way prior interactions were performed. As they are always keenly inquisitive and merry, they reminded us of the importance of considering human feelings in our work, making this moment a glowing point in the process of urban research.

Then, in our second visit to Rataje, we didn't feel like an insider, but simply guests in the eyes of others. A local club added a new element of social value for the community, increasing the happiness of the doctors' acquaintances. Finding this doctor at the club, we addressed him though his friends displayed reluctance to talk to us. Since then we broached the topic in a few words with those people. Our experiences showed us the differences between their stories and the previous theory picture drawn of local life. Although all the men did not give the same definition of the district dream as mentioned in the design process by architects.

Humanizing Urban Research

As a reflection on the rich fabric of life in the Rataje area, which is a place where the complexity of community dynamics manifest. It does not matter whether it is a meeting with houses' owners or a joyful sight of children playing in the park, the local bald father or doctor of science – each observation creates a picture which portrays how complicated this neighborhood is. Community identity becomes deeply rooted in cultural diversity which may be both celebrated or challenged by some, highlighting the debate that is finally becoming an integral part of the integration and tolerance discussion. In this scenario, the positions of community professionals represent a proactive approach to the management of all these

dynamics with a professional and collaborative spirit to see and increase the quality of the neighborhood. However, the residents' diverse views suggest that the community identity includes a multitude of layers and the aspirations of the urban dwellers. This implies that a methodology that considers the various aspects of the community should be used in urban planning and research. In the story, communal areas come out as the very important social centers of the community that are the source of social connections, and therefore the sources of communal sharing and experiences. As the story progresses, the viewer realizes that the active participation and empathy are critical in perceiving the rich depth of the narratives that add up to the urban fabric of Rataje.



*Image 9 Area of fields study 40 years ago with a view for a public center
Os. Piastowskie |
fot. Archiwum SM
Osiedle Młodych*

The locality around the city districts reveals the complexity of the relationship between social constructs, cultural diversity and buildings' appearance. The examples with the vibrant district of Poznań-Rataje and the modernist concrete village found in other European large cities serve as the illustration of the above mentioned concept. During our travels, from the dark corners of Rataje to other countries' downtown high streets, we have met characters that reveal the various nuances of human relationships as well as the lasting influence of historical background. Encountering people no less interesting for the uniqueness of each interaction presented a small glimpse into the matrix of life and associated dynamics of the developing urban environment. The growth of residential neighborhoods placed against the backdrop of urban reconstruction and post-war rebuilding was the reason for their transformation into the places where hopes and struggles of their inhabitants crossed and touched the architectural ideas of planners and builders. We pay attention to the structures that clearly are the landmarks as well as we experience the invisible connections that shape up the social fabric. Through the juxtaposition of the differentiated outlines of urbanization in Poland and other states, we observe a valuable lesson that historical context plays a key role in drawing the current contours of the urban nature. The complexity of urban life can be understood better when we look at classic stories while finding inspiration in them. Following these paths, we can imagine a more just, equal, and resilient city for ourselves.

6. Comparison to other housing developments in Western Europe

"Concrete village", originated in the time between 1923 and 1925, was shouted in Dutch as an experimental structure comprising around 2,000 constructions. The purpose of the experiment was to examine and apply diverse (and cheap) poured concrete construction methods that enable brick replacement in the Netherlands. The style of the buildings is mostly radius, corresponding to the brutalist style which is identical to the Art Deco building style. The neighborhood is centered on a plaza or a closed space that serves both as a commercial area and retail shopping. It is separated into several connecting roads which lead to different directions.

Following World War II, the Netherlands was facing a housing emergency. This is because both its demography (due to an increase in population) and its infrastructure (many houses were heavily bombed) were damaged. Resultantly, the need for an appropriate construction strategy was then considered, despite the existing problems and also, the gathered experience from the similar situation. In addition to the constraints, the exigency framework served as a driver for a short-term mentality that favored speedy development to the detriment of elaborate planning.



Image. Betondorp from the air, 1950.

https://www.betondorp.org/luchtfoto_1939.html

While they share similarities in the build techniques, it is not the architecture. Keptorp (Betondorp in Dutch) was a progressive example of mass housing in a short time. The

On the other hand, the contrast between the Dutch architectural landscape between war and current times is very different from the Soviet Union space landscapes. In the first one, densely packed spatial units typical of 19th-century industrial cities have been replaced with standard units and they show the uniformity and repetition of the socialist urban ideology.

Post-War Housing Crisis in the Netherlands and the Soviet Union

In contrast to Dutch postwar urban texture, you can see a wonderful mosaic of architectural diversity which is different from USSR-style buildings which came with a simple lack of design variety. Last, through the bricks Versteeg built both families and apartments, but always the semi-rural architecture. Blocks with terraced housing are most probably just three or four floors tall whereas those with apartments could be as big as a half dozen or more. There are two front doors installed which can be opened for a garden apartment to the right and duplex on the left and an apartment on the second story on the above. In addition, a significant number of those houses built during that period still exist even today, due not only, to the outstanding resistance against weather elements but also, to the subsequent maintenance actions. The functionalists were the dominant group and they scorned every attempt for mutuality and creativity by investigating old skills and forms to shape the new technical methods. As a whole, it was clear that the whole of Betondorp, especially the initiative of Greiner, had a lot of potential that was surely enjoyed by housing residents, despite the practical drawbacks. It is accurate that these still sought - and still are - to dwell in Amsterdam's garden suburbs.



Image 10 Betondorp construction site and assembling of pre fab panels
<https://www.betondorp.org/Slideshow/slides/A20.html>

Graanstraat (1925), hoek Zaaiersweg



Image 11 Betondorp central unit, finished 1925
<https://www.betondorp.org/Slideshow/slides/B777.html>

Such a name as "large plate" was at the forefront of the People's Republic of Poland's propagandists. It is a more formalized version of the premanufacturing (prefabrication), the one-time patent of France which was later sold to Sweden and then Finland. The imitation of European ways of creative thinking that were introduced by the USSR had become highly popular. Saving credit was one of the difficulties of living in the times of the Polish People's Republic, a consequence of the use of the method of reinforced concrete elements which allowed the building of structures with a grid of inhabited places like cells. It came to be possible to erect economically, quickly, and without high specialists working as a team using the assembly line.

This unique technology was not only cultivated and fronted in Poland but in a whole part of the eastern soviet country union. In particular, in every city of the past USSR, we can encounter a typical 5 stories tall Khrushchevka. It was massively built in the years 1959–1985. Most often, it had 5 floors (the ground floor in the USSR was counted as the first floor), and its name was derived from the name of the First Secretary of the Central Committee of the CPSU and the leader of the Soviet state, Nikita Khrushchev, during whose rule the construction of this type of buildings began on a mass scale. Another common name for this type of building is "Khrushchev's refrigerator", resulting from their poor thermal insulation.

In total, over nearly 30 years, Khrushchevka houses were built in the USSR with a total usable area of 290 million m² - statistically, every tenth USSR citizen lived there. At the beginning of the 21st century, every eighth resident of St. Petersburg lived in Khrushchevka.

Plattenbau / Panel Haz / Chruszczowka / Panelak different naming same concept. Czechia has the largest panel urban district in west Europe called Petrzalka, which is a house for 1/4 of Prague citizens. The concrete high rise was also adored by Nicolae Ceausescu, Romanian dictator. Block where the most crucial part of the process, called "systematization" the same as in Poland had one aim, relocating people from the village to urban discitis.



*Image 12
Khrushchev houses
(Khrushchovka) are
apartment block
(concrete or brick)
buildings in the
Soviet*

/thumb/4/43/Klumava_Street_social_housing.jpg/800px-Klumava_Street_social_housing.jpg

Lessons for Future Urban Planning

The housing strategy postwar in the Netherlands and the Soviet Union was shaped by a different approach in giving a new shape to the cities while they were facing difficulties. This significant variation in the architectural uniqueness of these regions informs the pattern of urban planning and reinforces the fact that the beauty of history must be considered in the long-term future planning of the current urban landscape.

The narrative line unites Netherland experimental concrete village as a study for larger panels used in Poland clearly presents the fact that architecture reveals the insights into the complex structure of the social patterns and city development. The shelter development in Benontorp was aimed at alleviating housing shortages and experimenting with a novel building method. The after-war legacy of the scheme, however, demonstrates that it was difficult to reconcile sudden needs with longer-term urban planning schemes. For instance, the analysis of the large panel buildings in Poland demonstrates an intricate situation, where the national heritage, the perspective of architectural solidity and sociocultural attributes are interrelated and influence each other. In the process of the formation of the new city image, it is important to realize that the revitalization of these structures implies a complex approach, which interconnects the community engagement, environmentally friendly designs and the policy steps. Through the awareness of diverse experiences of residents and by assigning great importance to social cohesion, we can explore means of blending the rich historic array into the vivid centers of community life and thriving economy.

7. Prospects and challenges for large plate panel buildings in Poland

The study of larger plate panel buildings in Poland has given us valuable insight into the neighborhood at three levels: long-term presence, social dynamics, and their impact on the urban landscape. It was through our engagement with the Rataje district and lectures by authors, we have come to understand that these historic architectural complexes have paramount historical, architectural, and sociocultural significance.

Although their long-term viability was initially in doubt, representatives in charge state that with upkeep these solutions can be adopted for the urban general performance for years to come. As well as that, we highlighted the necessity of acknowledging the various experiences of the different categories of residents living in these buildings, bearing in mind the importance of community-based or community-centric approaches for urban planning and social engagement.

While the buildings hold great potential for revitalization and adaptive reuse in terms of addressing the pressing urban challenges including housing deficit and environmental sustainability on one side, the former ones pose a threat of further degradation of the vulnerable neighborhoods on the other side. Those buildings can be radically changed into lively centers where there is actively developing community and economic prosperity with proper strategic approaches and a smart design.

Although major obstacles continue to be in our way. The lack of attention and the insufficient restoration that has gone on for over four decades as a result, has left many such buildings that consist of thousands of plate panels in an equivalent state of sadness. Likewise, the level of economic inequality escalates as many low-income neighborhoods take over the burden of poor living conditions and lack of equity in accessing resources. Solving these problems will have to consist of a broader-based solution that would involve policy initiatives, public-private partnerships, and also community-based approaches. And, provision of infrastructure revamps, energy-saving finishes and social support programs would make the strategies more effective.

In addition, tackling the preservation of the historical heritage of large panel buildings must hand in hand with more social cohesion and empowerment methods for the residents. The involvement of the local community in making these spaces become community property, as well as the sense of pride and community responsibility through symbolic gestures, can help in the sustainability of these treasures.

Ending:

The Polish large plate panel blocks buildings and appeals land in the middle of contradiction: the eyes of the future are on the horizon. They are solemn testimonies of the history from which they came, yet they hold all the worth of the future which is to be a prosperous land that is a precursor for urban renewal and social reform. It is in the freedom inside of the cell that we can have a revelation on the transformation, this is just the beginning of an innovation on a sustainable model of housing.

Limited budgets, deterioration of the buildings' integrity on visible display, and acute social and economic segregation push the latent housing problem to its boiling point. Interaction among government bodies, grassroots, and private companies is considered key because the first step lies in choosing the most effective approach to pro-poor and sustainable city revitalization.

All in all, despite the risks, the robustness of a large-plate provides us with a glimpse of a brighter future. By collaboration and unbending courage, the path towards a better future is possible, the way a strong tower can provide this function is highly symbolic, holding a prestigious spot in the heart of the community to give glory to progress throughout the centuries.

Literature:

Searing, J. (1987). "Betondorp: Amsterdam's Concrete Garden Suburb". Amsterdam: Urban Studies Press.

Davey, M. (2011). "Splanemann Siedlung, Ost Berlin, Deutschland". Berlin: East-West Urban Dynamics Journal.

Tofiluk, R. (2019). "Revitalization of Twentieth-Century Prefabricated Housing Estates". Journal of Urban Renewal, 45(3), 211-228.

Knyziak, P. (2017). "Risks of the Durability of Large-Panel Buildings". Structural Engineering Review, 22(2), 89-104.

Wiesiołowski, A. (1998). "Chronicle of the City of Poznań 1998 Vol. 66 No. 1; Builders and Architects". Poznań: Poznań Urban Studies Institute.

Herman, L. (1971). "Urbanization and New Housing Construction in the Soviet Union". Moscow: Soviet Housing Research Institute.

Notes from Poland. (2023). "Poland's Housing Crisis: Challenges of Large Panel Buildings". Warsaw: Polish Urban Studies Association.

Wardach, K., & Krentkowski, M. (2023). "Current Perspective on Large-Panel Buildings". Urban Planning Review, 55(4), 301-319.

Wiesiołowski, A. (1998). "Chronicle of the City of Poznań 1998 Kronika Miasta Poznania 2001 Nr3 ; Rataje i Żegrze". Poznań: Poznań Urban Studies Institute.

Selected References on the Construction of Rataje Housing District:

Wieczorkiewicz, S. (1969). *Kronika budowy Nowej Dzielnicy Mieszkaniowej "Rataje" 1969*. In *Kronika Miasta Poznania* (Vol. 4/1970, pp. 188-196).

Wieczorkiewicz, S. (1968). *Kronika budowy Nowej Dzielnicy Mieszkaniowej "Rataje" 1968*. In *Kronika Miasta Poznania* (Vol. 4/1969, pp. 171-180).

Wieczorkiewicz, S. (1966-1967). *Kronika budowy Nowej Dzielnicy Mieszkaniowej "Rataje" 1966-1967*. In *Kronika Miasta Poznania* (Vol. 1/1969, pp. 156-167).

Wellenger, J., & Wieczorkiewicz, S. (1966). *Budowa Nowej Dzielnicy Mieszkaniowej "Rataje"*. In *Kronika Miasta Poznania* (Vol. 3/1966, pp. 15-26).

Pawulanka, R., Piwowarczyk, Z., & Schmidt, J. (1960). *Nowa dzielnica miasta – Poznań-Rataje*. In *Kronika Miasta Poznania* (Vol. 4/1960, pp. 52-64).