Evolution of Greenery in Housing Estates

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Abstract. One of the basic values of multi-family housing estates which were built in the second half of the 20th century was their green areas. It was assumed that open spaces would serve both recreational and health purposes (related to air ventilation or air purification). In Poland, as in other socialist countries, these areas were parameterized and their size was defined in the relevant legislative documents. The principles of location of these sites in the structure of the estate as well as their equipment have changed during the period taken under consideration. Comparative analysis of specific realizations allows for their characterization and evaluation and reference to contemporary views. In the 1940s and 1950s, these areas were designed in the form of small squares and green areas located in the neighbourhood of the streets. In the sixties and seventies there were small residential parks (usually less than 1 ha). In the 1980s, extensive green areas were being developed which, for economic reasons, remained untouched in a functional way. Another decade (1990s) is associated with political and economic changes in Poland. In the case of estate greenery, it resulted in a complete deviation from its implementation. However, green was introduced on the roofs of buildings (including underground garages). Nowadays, the return to the design of large areas of greenery connected with housing development is being re-established. Their main function is recreational and leisure. One of the new tasks assigned to them is the task of gathering precipitation water. As a result of the analyses conducted, the author indicates which of the historical realizations (chosen periods) best meet modern needs and which can be adapted.

1. Introduction

The green spaces associated with the residence environment are inseparable from their social design. The beginnings of forming common gardens and recreational parks, directly belonging to the multi-family housing and used by its inhabitants, date back to the nineteenth century and the idea of healing the industrial city. Ebenezer Howard published the "Garden Cities of Tomorrow", which was devoted to the design of the garden town, in 1898. Toni Garnier published "Cité industrielle" in 1901 illustrating, among other things, the design of an industrial city; Le Corbusier, who in 1922 presented the "Ville Contemporaine" - a project of a new three-million-city, which in 1925 became the basis of the Voisin Plan - an unfinished project of reconstruction of the centre of Paris. These experiments resulted in German realizations of the twenties, when it was the first time when legislation which was regulating the quality of the living environment was introduced. They included, inter alia, aspects of health, including sunshine and ventilation. This issue was also addressed by members of CIAM, in the 1933 Athens Charter [1]. This document became the basis for modern design of cities where functional zoning was introduced, and green areas were an important element of their program and spatial layout.

In Poland in the interwar period (1918-1939) the problem of recreational areas connected with the housing environment was taken in connection with the realization of cooperative dwelling houses. In the post-war period (1944-1989) it was legally sanctioned and entered into the area of social space
programming. This problem was then raised at the level of theory and design practice. Particular attention should be paid to the monographs that were made at that time, including: Anna Ptaszynka "Green spaces in cities" from 1950 [2], Tadeusz Tołwiński "Urbanism. Greenery in urbanism" from 1963 [3], Władysław Czarnecki "Urban Planning of Cities and Settlements, Volume II, Places of Work and Residence" from 1965 [4], Alicja Lipińska, "The role of greenery in a housing estate" from 1977 [5] and Halina Skibniewska (with team) "Open Areas in the Urban Living Environment" from 1979 [6] and Barbara Orzeszek–Gajewska, "Shaping of Green Areas in Cities" from 1982 [7].

Nowadays, most of the publications on green space related to places of residence are cross-sectional studies documenting the history of the uprising and presenting a contemporary assessment of particular places. Such work for Cracow (in 2011) was conducted by Wojciech Kosiński [8], for Warsaw (in 2015) a team led by Barbara Szulczewska [9], for Lublin (in 2015) team led by Ewa Trzaskowska and Paweł Adamiec [10], and for Białystok (in 2016) Maciej Kłopotowski [11], [12], [13].

2. Area, objective, conduct of the study and methods used
The area of research covered green spaces located in the space of multi-family housing complexes, constructed after the Second World War in Białystok.

A multifaceted comparison of the analysed sites was established as a research objective. The analytical work took into account the size, land development and equipment of the estate parks. An aspect that had been paid special attention to was the location of the discussed objects in the settlement structures.

In pursuit of the goal, specific analyses were carried out in the context of their origins, and their present state was characterized and assessed. The results of the work allowed us to build theoretical models illustrating changes (evolution) in the way of shaping and localization of green areas in Polish housing complexes of multi-family housing.

3. Results of the research
The problem of green areas in the city was taken, in Polish scientific research after the Second World War in the second half of the 1940s. Green areas were then permanently divided into construction areas and open areas. [14]. The division existing in contemporaneous urban theories distinguishes residential areas (building, inhabited) and isolated industrial areas (open). This division was the result of the adoption as a valid concept a city based on functional zoning. The method of reconstruction (after wartime destruction) and design (new and developing) of the city was in full accord with the doctrinal recommendations of the Athens Charter (a paper containing the postulates of modern urban design, developed by Le Corbusier and adopted at the Fourth CIAM Congress in Athens 1933) [15].

3.1. Square and street greenery
In Polish urban planning of 40s and 50s of the 20th century it was a time to continue the idea of building a social settlement defined in the interwar period in Poland and shaping the space of a city modelled on Soviet experiences. Both of these streams resulted in separate spatial layouts and architectural design of buildings. In the area of shaping green areas, however, they remained the same. Greenery areas were complementary to the built-up areas during that period, and their development was primarily meant to be a "beautifying" of the architectural space. In 1951 Temporary Urban Norms were introduced (this document was supplemented in 1953). These documents validated the existing classifications of green areas. At the same time, the greenery that divided new housing estates gained the status of new parks - the facilities were left to be built in the future. The areas adjacent to the housing estates were divided into public and assigned buildings. For each group, their equipment was separated, which in practice was reduced to the implementation of the playground and the set of seats next to the building. The difficult economic conditions of this period led to the treatment of public works as a priority - related to public spaces visible in the city environment. These actions repeatedly became a showcase and were a blind imitation of Soviet solutions that were subject to criticism in the late 1950s. [16].

During this period public spaces were organized in the public squares and the street greenery areas (terrains based on extensive lawns without function, without seats and without leisure and recreational functions). In Białystok, such facilities were built on the site of the newly built Centrum
Housing Estate, which was built in the completely demolished (during World War II) downtown area. The area of Malmeda Street which was not used for construction was arranged as a representative square (Figure 1) and along Lipowa Street representative street green area appeared (Figure 2).

3.2. Housing Estate Park
In 1955, the Ministry of Municipal Economy made another legal regulation and introduced the Technical Standard of Greenery in Block Design. This document once again clarified the tasks and the area of green areas. Except house gardens, which were directly connected with residential buildings and designed for the recreation of small children and elderly people, the residential garden was separated. Its area was set at 2.5 - 3.5 m² per inhabitant. It was also proposed to divide it into a part for children sports and a recreational part for the elderly. At the same time it was recommended that the facility be located in the central part of the estate and its width would not be less than 70 m. These parameters, implemented on the estate of a population of about 5000 inhabitants, allowed to build a park of 1 - 1.5 ha.

In Białystok throughout the decade of the sixties the Millennium Housing Estate was built (the name is associated with the jubilee of the millennium of the Polish state). At its center, a housing park programmed on the basis of the urban planning mentioned earlier was completed (Figure 3.). Based on the theoretical knowledge of this period, the park was designed as a complex of lawns (working as sporting fields) with dominant trees and bushes used as shields for business spaces and communication lines. As the priority, the green had to be modest, cheap and easy to maintain, but at the same time fill the empty spaces of the housing estate and diversify the uninteresting and typical architecture of typical houses [19].

Figure 1. Białystok – square at Malmeda Street [17]
Figure 2. Białystok Lipowa Street – street green area (postcard from the beginning of 60s of the 20th century) [18]

Figure 3. Millennium Housing Estate – project [20]
Figure 4. Białystok Millennium Housing Estate – Housing Estate Park - present view
In 1974, the Ministry of Land and Environmental Protection (MGTiOS) introduced a new ordinance on indicators and guidelines for residential areas in cities. This document distinguishes Structural Housing Units (housing estates), which are functionally linked to primary schools and are defined as 6,000 inhabitants. The document defines a program of services that should be located in the housing estate and its recreational and sports equipment. The size of the estate park is defined as a minimum of 1.2 hectares and not less than 4 m² per inhabitant. As in the previous decade, housing estates developed on the basis of these regulations were located in the central parts of the estate (many times the area of the so-called safe way to school for children). Their shape was subordinated to the superior urban composition of the buildings and the functional equipment was extremely modest. These facilities were implemented as part of community activities in which participated pupils, students and residents. Most of them were not prepared for the work they had commissioned, they treated it as a nasty social obligation, or a pre-picnic activity [21]. From the perspective of time, the implementation of activities related to the establishment of these parks are assessed as lacking supervision of technical experts (designers) or supervised to an insufficient extent. This resulted in accidental tree planting sites, especially in inter-block areas, and the creation of completely random plant compositions.

In Bialystok, several housing estates were constructed during the period of validity of the quoted norms (in the 1970s and 1980s). Among them is Bema Housing Estate (Figure 5.) and Piaski (Figure 6). These implementations illustrate the principles of their origins and all problems arising from their implementation.

3.3. Housing Estate Park

The indicators and guidelines for the design of residential areas in cities in 1974 outside the Structural Housing Unit introduced the notion of a team of such units. This unit, consisting of three or four separate settlements, had a separate center and a program of post-primary services, among which the inter-district park (district) was sectioned off. Its surface area was set at 3.8 m² / inhabitant and not less than 1.5 ha. The area where this space was located indicated the areas separating individual units and areas with different meanings, which was a continuation of the principles defined in the Athens Charter. These ideas remained in line with activities from 1960s when recreational areas began to utilize the areas which surrounded larger and larger housing estates.

In Bialystok in the late 1960s the implementation of the Przyjaźń Housing Estate and associated with it two Housing Estates (Housing Estates Młodych and Sady Antoniowskie) began. Recreational areas of these units were realized as a common area, located outside their premises (separated by communication arteries). They were located in the basin of the Biała River in a place which, for geological and natural reasons, was useless for construction purposes. In the 1980s, recreation areas in the Białostoczek Housing Estate were dissolved in an analogous way (Figure 8.). In both cases the district parks at the present moment remain poorly developed and represent a natural potential for revitalization [22].
3.4. Biologically active surface

Economic transformations that took place in Poland after 1989 completely changed the way in which residential buildings were built. The place of existing housing estates, implemented comprehensively by housing co-operatives – have been taken up by individual investments built by developers. In addition, in 1994 a Construction Law was introduced - a document which regulates the rules of investment activities in space, including the realization of the housing environment. Currently, it is based on local (municipal) law - local spatial development plans. The combination of these conditions resulted in a new way of shaping the environment of residential buildings. Green areas associated with it are defined (in Construction Law) as a biologically active area, which is a minimum of 25% entrusted to the plot. At the same time it was allowed to be implemented on the roofs of buildings. Common spaces (public parks) were left to the municipality and their locations should be designated by planning documents. The spatial effects of these decisions today result in virtually deprived areas of greenery in the present sense. At present, these are only spatially separated small gardens associated with individual investments. Frequently they are fenced and accessible only to residents of individual buildings. It is significant that they are implemented on underground garage plates (Figure 9.) or roofs of buildings (fig.: 10., 11.).

3.5. Housing Estate Gardens

In modern planning studies, green spaces are often referred to as residential gardens or recreational areas. Their complex realizations are sporadic and almost exclusively associated with municipal
(municipal) investments. Their utility tasks outside the recreational and leisure function are often expanded with new ones - related to technical infrastructure.

In Bialystok, such an object (at the beginning of the present decade) was built in the northern part of the TBS housing estate (Figure12.). The area of the park was diversified. There is a set of playgrounds and a skate park and a range of children's playground equipment (Figure13.), a toboggan run and a rest area for older people. An important functional element of the facility is a water reservoir that marks its northern boundary. It is a retention reservoir that collects rainwater from part of the settlement and adjacent itinerary (Figure14.). This solution is innovative in the city scale and sets new trends in shaping green trades. With a very rich program of the facility, its area is less than 2 ha which is about 2.8 m² / inhabitant and corresponds to the norms of the mid 1950s. Outside the park, several recreational squares are located in the estate. Their scattered structure and small dimensions do not, however, allow them to be treated as a green area settlement system.

4. Summary
In conclusion, the study found that in the analyzed period (1944 - 2016) the way of designing green areas connected with housing complexes was changed. These were mainly due to economic and legal conditions. Five fundamentally different trends are illustrated using graphical schemes and their features are presented below:

- green areas in the 40's and 50's (Figure15a.) - were mainly squares and perennial greenery, they were located in the visible (representative) zones, their surfaces were small (well maintained) and the functional equipment was very modest,
- green areas in the 60’s and 70’s (Figure15b.) - these were indoor parks, their compositions were based on extensive lawns and compositions of trees and shrubs, their surface was about 1 - 2 hectares and equipment were football pitches, playgrounds and recreation areas for the elderly. These objects were often carried out during so-called community activities which resulted in randomness of many spatial solutions,
- the green areas in the 70s and 80s of the 20th century (Figure15c.) were neighbourhood parks, located in the vicinity of several housing estates, most commonly in wetlands associated with watercourses or ponds. Their equipment, many times not planted in their area of vegetation - hence now have the character of unused meadows,
- green areas in the 90s of the 20th century (Figure15d.) - are biologically active areas associated with building objects, often they are carefully designed and carefully equipped, but due to dispersion and spatial isolation (fencing) spatial and relatively small area does not constitute a system of green areas,
- green areas implemented in the first ten years of the 21th century (fig.15e.) - are residential gardens which small space is filled with functional elements of equipment, their location is related to the availability of land and is not a conscious composition in the structure of the estate. It is accompanied by small leisure and sports squares.
An analysis of the distinguished phases of the transformation of residential green spaces allows us to formulate theses concerning the subsequent phases of observed evolution. The author assumes that the next foreseeable changes will take place in two stages and will be connected back to the formation of consciously designed residential districts (not separate developer’s activities). In the first stage the area of the park will return to its central part - which will be related to the needs of residents and the need to increase the availability of recreational areas and in the second stage - it will be enlarged - which will result from the needs of users (functional equipment of these facilities).

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