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CRITERIA AND ASPECTS OF QUALITY OF OPEN SPACES IN HIGH-RISE HOUSING NEIGHBOURHOODS IN THE PROCESS OF URBAN REVITALIZATION

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Abstract. The correlation between the quality of open spaces and quality of life in high-rise housing neighborhoods in contemporary urban-architectural and social frameworks has been confirmed by a series of multidisciplinary researches. Modern research indicates that in the process of revitalization, it is necessary to look at various aspects of the quality of open spaces in order to provide a more efficient degree of improvement. Creating adequate spatial conditions for the different types of activities of the daily spare time of tenants and the exercise of physical activity in the direction of improving psycho-physical health, achieving spatial-ambient values, as well as for encouraging good neighborly relations, communion, territoriality and sense of belonging, which are all determinants of the quality of life, can be managed by providing a certain level of quality open spaces. Bearing in mind that there are no unique criteria for the quality of open spaces in high - rise residential neighborhoods, the aim of this paper is to indicate the desirable characteristics of these spaces in accordance with the contemporary principles of urban design and practice in the process of their revitalization. Therefore, residential neighborhood Poptahof has been selected as a research platform that represents the good practice example of the revitalization of open spaces in line with identified criteria and quality aspects. These criteria can serve as a basis for further research of the modes of urban revitalization of open spaces, with the aim of improving the quality of life.

Key words: open spaces, high-rise housing neighborhood, urban revitalization, criteria and aspects of quality, quality of life

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1. INTRODUCTION

The evolution of the development of urban open spaces in high - rise residential neighborhoods shows a series of transformations in accordance with the urban and architectural practice and social priorities. Creating a pleasant residential environment that can meet the changing demands and wishes of tenants in a long-term perspective, which ensures adequate hygiene conditions and comfort, is one of the greatest challenges of urban practice and at the same time a complex and socially important task. This particularly refers to housing in high - rise residential neighborhoods, which in some areas often have negative attributes. Namely, one of the main problems of high - rise residential neighborhoods is devastation of open spaces, which is reflected through inflexibility, unattractiveness and low level of order, which contributes to deterioration of basic living values and quality of life [4]. With modest design, as well as maintenance and management problems and lack of adequate standards and legal regulations, open spaces lose functional, social and aesthetic dimensions. Furthermore, their long-standing neglect leads to a disruption of their primary function being a comprehensive component of quality of life. All this indicates the need for their revitalization. In this context, the aim of this paper is to identify the desirable criteria for the quality of open spaces that can be used both for the evaluation of their current state and for determining the directions of transformation in the process of urban revitalization. In this paper the standard methodology of scientific research is applied, using several methods. Determining the criteria of quality of urban open spaces in high - rise residential neighborhoods for their evaluation was performed by review and analysis of the literature on theory and practice of planning and design of urban open spaces. After that, the systematization method is used for identification of the aspects of the quality of urban open spaces, in accordance with the aim of this paper and the contemporary principles of urban design and practice in the process of their revitalization. Therefore, residential neighborhood Poptahof has been selected as a research platform that represents the good practice example of revitalization of open spaces in line with identified criteria and quality aspects. These criteria can serve as a basis for further exploration of the modalities of promotion of open spaces, with the aim of improving the quality of life.

2. QUALITY CRITERIA OF URBAN OPEN SPACES

Modern approaches to the regulation of urban open spaces in foreign practice tend to have a synergistic treatment of their problems. Partial approaches have led to a narrow view of open spaces, the absence of a system of values, their inadequate role and importance for the quality of life of tenants of a high rise residential neighborhood. This points to the need to review the meaning of the quality of open spaces and redefine the criteria and aspects of quality in the revitalization process. In spite of numerous theories of the corresponding open spaces that we encounter in literature, the unique criteria for the quality of open spaces are neither harmonized nor defined by a single value framework [7]. In the early 1980s, Bentley et al. [3] formulated a new approach to urban design, known as the responsive environment. This approach has emphasized the need for more democratic environments and maximizing the level of choice of content and activities available to users. In addition to the above-mentioned attributes, open spaces should be harmonized with the principles of public-private delineation, be human-made, and surface treatment and urban equipment should be adequately applied, in accordance with the purpose of space [8] [1] [2] [10] [11]. In determining the criteria of the quality of urban open spaces in this paper, it starts from the fact that the open spaces are places where residents like to spend their leisure time, which they perceive as entertaining, safe, inviting and attractive, where they are satisfied and they are proud of. The development of good neighborly relations and joint activities of tenants in open areas is particularly encouraged, which is an important indicator of the quality of life [6].

Starting from the multiple significance of open spaces for the quality of life and the identified quality criteria defined by the review of multidisciplinary literature, those who are relevant for directing the regeneration of open spaces are systematized: functional-spatial, ecological, psycho-social, visual-aesthetic and technological-organizational (see Fig.1) [6].

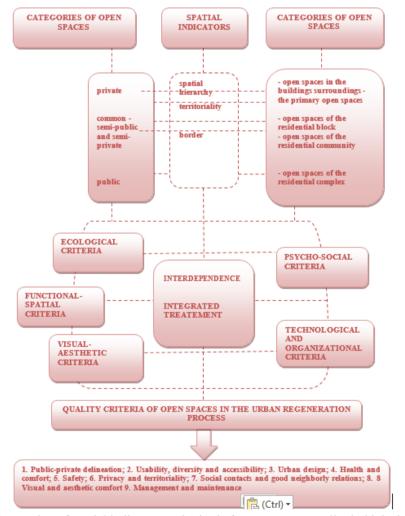


Fig. 1 Integration of spatial indicators and criteria for open space quality in high-rise housing neighborhoods. Source: Author

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It should be emphasized that various researchers cite a wide range of experience, functional, social and environmental aspects of open spaces. This leads to the conclusion that all these aspects must be treated synthetically when assessing the state of open space, and for the purpose of determining the types of problems and levels of deprivation present. In this respect, the aspects of the quality of open spaces have been established, from which the principles for critical analysis of the state of open spaces in neighborhoods with high rise housing are derived. Bearing in mind the complexity of the problem of the quality of open spaces, it can be concluded that the established quality criteria cannot be final or complete, that is, it is possible and desirable to supplement them and align them with the social, economic, architectural and urban trends and changes in the needs of the tenants. In the context of all this, 9 key aspects of the quality of open spaces have been identified:

- public-private delineation
- usability, diversity and accessibility
- urban design
- health and comfort
- security
- privacy and territoriality
- social contacts and good neighborly relations
- visual-aesthetic benefit
- maintenance [2] [6] [8] [7] (see Fig.1).

They arise from the adopted characteristics of successful open spaces and the principles for achieving successful open spaces, as well as from the defined general criteria for the quality of open spaces. Thanks to the multiple significance of the quality of open spaces, as a determinant of quality of life, the interpretation of established quality criteria at all spatial levels in high - rise residential neighborhoods is of particular importance (see Fig.1). All this in the direction of a comprehensive study of the quality of open spaces in high - rise residential neighborhoods, directing the direction of regeneration.

3.0 ASPECTS OF QUALITY OF URBAN OPEN SPACES

3.1. Public-private delineation

In the function of creating a suitable environment for active housing and stimulating social relationships and joint activities, it is important to get acquainted with the hierarchy of open spaces in high - rise residential neighborhoods based on the rules of access and the regime of space use, i.e. public-private delineation [13]. The hierarchy of open spaces is also in the function of urban design and is considered essential for achieving privacy and territoriality in residential neighborhoods. The basic typology of open spaces based on the rules of access and the regime of the use of space implies three types of open spaces: 1. private, 2. common and 3.public [12]. In addition, common spaces can be semi-private and semi-public spaces [14]. All types of open spaces have their relevance for the tenant's life and preferably all are represented (see Fig. 2). Spatial borders provide a degree of privacy, enabling people to exercise control over their own activities and activities of other [9].



Fig. 2 Typology of open spaces according to public-private delineation a) private b) common c) public Sources: a) www.pt.rwth-aachen.d [Accessed: 21st March 2016].
b) Knoll, T., Moser, K., 2009. Evaluierung von Freiflächen im geförderten Wohnbau, Knoll, Planung & Beratung Ziviltechniker GmbH, Wien c) www.ura.gov.sg [Accessed: 15th November 2017].

3.2. Usability, diversity and accessibility

The usability of open spaces is a prerequisite for the realization of spare time activities and various occupancy activities, and in this sense open spaces can be perceived as positive or negative [6]. Key principles related to this aspect of quality are: availability, multi functionality, good urban design, maintenance of open spaces and compliance with the needs of tenants, easy accessibility from residential buildings, comprehensibility, layout of hiking trails, public-private delineation, offer of different types of activities and contents for different age categories of tenants (see Fig. 3).

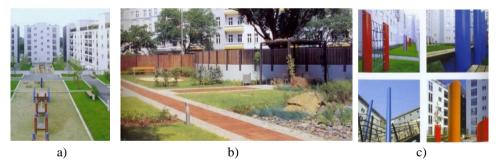


Fig. 3 a), b), c) Usability, diversity and accessibility – examples. Source: Knoll, T., Moser, K., 2009. Evaluierung von Freiflächen im geförderten Wohnbau, Knoll, Planung & Beratung Ziviltechniker GmbH, Wien

3.3. Urban design

The usability of open spaces depends largely on the urban design (see Fig. 4). Several studies indicate that the key principles of a good urban design are: urban equipment, landscaping, materialization, variability and flexibility [6]. In contrast to previous ideas that the

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urban equipment should be fixed, today most experts advocate a more liberal concept of urban equipment tailored to specific purposes. It should be flexible and multifaceted - adaptable to various joint activities of tenants. A particular attention should be paid to communication spaces, where different space and centre sites intertwine, so urban equipment should also be designed for the context of daily activities, but also specific, and occasional.



Fig. 4 Examples of good urban design a) various seating areas b) paving c) playground. Sources: a) www.pinterest.com [Accessed: 14th February 2018]. b) www.designrulz.com [Accessed: 15th January 2018]. c) Lička et al. (2012)

3.4. Health and comfort

Health and comfort support the provision of favourable microclimate and are primarily related to ecological criteria for the quality of open spaces, but also for others. A favourable microclimate depends on the presence of vegetation (see Fig. 5), landscape orientation, topography, types of paving and the presence of water surfaces. Its effects can be seen through: visual advantage, air, thermal and acoustic comfort of tenants, which is manifested by the effect on the senses, and through the experience of open spaces, pleasant or unpleasant. It can be achieved by the proper orientation of open spaces and adequate urban design, by placing spatial elements that provide shelter from sun, wind and impurities as well as planned greening [6].



Fig. 5 a), b), c) Favourable microclimate achieved by virtue of vegetation. Sources: a), b) Kirsten, R., Zwoch, F., 1998. Landschaftsarchitekten - Landscape Architecture In Germany, Nelte, Wiesbaden c) Http://Urbanplanet.Info/Urbanism/Revealing-Ecological-Potential-Open-Spaces-Urban-Fabrics [Accessed: 14th February 2018]

3.5. Safety

Safety is considered a key factor when tenants are choosing to use a certain open space. This includes both physical and social dimensions. The basic measures, whose application can provide safety are: adequate lighting of open spaces; comprehensiveness, ability to control and clear boundaries of space; differentiation of pedestrian and motor traffic; prevention of antisocial behavior; good urban design; regular maintenance; absence of parking in open and green spaces (see Fig. 6). Security implies adequate space availability, such as an appropriate location of activity schedules (such as barriers and signs) in order to prevent incidents or injuries, while social security refers to the absence of vandalism [11].



Fig. 6 Safe open spaces a) adequate lighting b), c) possibility of observation from residential buildings. Sources: a) www. uli.org [Accessed: 1st June 2016] b), c) Lička et al (2012)

3.6 Privacy and territoriality

Privacy and territoriality are very important aspects of the quality of open spaces and are closely related. They can be realized by application od these principles: public-private delineation; personalization / creativity of tenants (see Fig. 7); spatial possibilities for intimacy, peace, harmony, silence, protection against noise; adequate space; protection against unwanted eyes; a sense of security, security; schedule of activities, conflicts. Territoriality is a delimitation of open spaces, which allows individuals or groups to use space and defines it [11]. This implies a psychological identification with the city, which is symbolized by the attitudes, possessiveness and distribution of urban equipment.

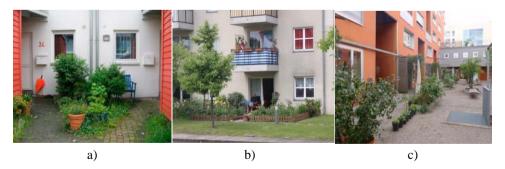


Fig. 7 a), b), c) Examples of personalization on open spaces. Source: L. Lička et al (2012)

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3.7. Social contacts and good neighborly relations

A man as a social being has the need to establish contacts with other people, and socialization is of particular importance in high - rise residential neighbourhoods. The quality of the residential environment, that is, the spatial and design potential of open spaces, plays a decisive role in promoting good neighbourly relations. It is achieved by applying a quality urban design, by building space for sitting and gathering, adequate distribution and types of urban equipment. It includes: equipment for gathering, meeting, joint activities, social games; communicating with neighbours; frequency of use of an open space; user structure - different age categories of tenants; participation of tenants in the arrangement and maintenance of open spaces [6]. That is why the significant multifaceted character of these spaces is also important for the purpose of integrated treatment of the interests of different actors (tenants) in the context of social interactions as an important parameter of the quality of life of tenants of high - rise residential neighbourhoods.

3.8. Visual and aesthetic comfort

The visual and aesthetic experience of the space is conditioned by the individual perceptions and demands of particular users. However, in general, achieving this aspect of the quality of open spaces is possible by applying the following principles: good urban design, spatial and ambient integrity, the attractiveness of space, diversity, the presence of elements of nature, the suitability of a human measure (see Fig. 8).



Fig. 8 a), b), c) Examples of open spaces that encourage good neighborly relations and which are visually and aesthetically pleasant. Sources: a), b) Nelte, H. M., 2003. Landschaftsarchitekten III. Neue Entwürfe ausgewählter Landschaftsarchitekten aus ganz Deutschland, Wiesbaden, c) http://www.urbanforestry.info/landscaping/parks-and-openspaces/ [Accessed:August 24th 2018].

It can be said that the aesthetic dimension of open spaces is a key component that attracts tenants to stay in this area, that is, which favours the creation of inviting spaces. Represented colours, styles and spatial shapes can affect the emotions and behaviour of tenants, either in a positive or negative way, they can act incentive, cause user benefits, or act monotonously and reflectively [11]. Therefore, the esthetic dimension of open spaces must be meticulously accessed in the urban design.

3.9. Management and maintenance

Regular maintenance manifests itself to the degree of usable value of open spaces. The appearance and hygiene of open spaces affect the satisfaction of the tenants in this area, and therefore the length of their stay. On the other hand, in unsustainable, abandoned and dirty open spaces, the frequency and length of tenant's residence is low, and such areas are repulsive to tenants. Long-term neglect of open spaces leads to an increasing devastation and constant disturbance of the quality of life of tenants. The share of tenants in joint activities in open spaces and in their improvement and upkeep contributes to the improvement of the feeling of pride of tenants and the responsibility for the housing environment. Tenants' participation also allows them to make choices for alternative urban design and affirmation of space quality such as security, readability, identity, which will enhance their sense of belonging and control [5].

4. REVITALIZATION OF OPEN SPACES IN POPTAHOF

Residential neighbourhood Poptahof in Delft is a model of good practice of revitalizing open spaces where the applied quality criteria were identified in the initial part of this paper in a systematic and integrated manner through the implementation of the Master Plan for the restructuring of Poptahof in order to improve the quality of life. Poptahof is a social housing area built during the 1960s outside the historic centre of Delft on 18.6 hectares, and in the neighbourhood there are about 2800 inhabitants representing a large number of different nationalities [16]. The key problem in Poptahof was the degradation of open spaces, low level of orderliness and anonymity, impaired safety, lack of sense of community and low level of quality of life. During 2000, the City of Delft and Woonbron Housing Corporation created the Master Plan for the Restructuring of Poptahof with the aim of making Poptahof a pleasant location for living, working and passing time [15]. Master plan was re-formulated in 2003, a collaborative research carried out by a team of experts and tenants of the complex, whereby data were collected through: field observation, mini-interviews of tenants at the location and interviewing passers-by. The goals of the plan were: improvement of monotonous housing spaces, reorganization and construction of new open spaces, as a part of the integrated reconstruction of the neighbourhood (see Fig. 9).

The key point of this project's success was the formation of a public-private partnership in order to promote Poptahof jointly. The basic starting point for the revitalization of the neighbourhood was that well-organized and functional open spaces were a prerequisite for the realization of the long-term improvement process of the neighbourhood. Identified criteria for the quality of open spaces, as defined in the first part of this paper, can be noticed in the reorganization of Poptapark, as well as in the revitalization of the housing platform. Poptapark is centrally located in a place where there was previously a river with tall flora on its banks, and it is designed for all categories of tenants. It was found that the park provides a great potential for improving the quality of the entire Poptahof and creating a recognizable housing neighbourhood. The park is reorganized as a place for physical activities, gatherings, relaxation and community manifestations (see Fig. 9).



Fig. 9 a) Master plan for the revitalization b) Poptapark. Source: https://www.urbangreenbluegrids. com/projects/poptahof-delft-the-netherlands/ [Accessed: August 21th 2018].

The following activities are planned in the park for various activities:

- playground, lawns, green hills (used for sunbathing, sledding, festival and other events);
 a bicycle path and walk that passes through the park and connects it to the main street and the shopping area;
- the place where the occupants deal with collective gardening.

The path for cyclists and pedestrians passing through the park contributes to the greater flow of people and facilitates interaction, observation of passers-by, and it is realized through integrated routes, directions and activities of different categories of people. A great effort was made to familiarize users with the rules of behaviour in the park for the purpose of safety and the prevention of antisocial behaviour, by placing signs and employing the park manager. The park is friendly to family gatherings - to stimulate joint activities of children and parents. It is especially important to realize a healthy and resilient water system. A part of the water system was designed to be visible. A water playground was built, the design for which was based on the winning idea from a children's competition (see Table 1).

Unlike Poptapark, the housing platform is not a public space. Although it has open access, this space can best be described as semi-public and located within the housing block. The terraced terraces of buildings surround this area and represent private spaces. The platform is also visible from the balcony and windows of the apartments on the higher floors, while the stairs are connected to the central park. Variability in design was applied at different spatial-functional level- creating various gathering and relaxing areas, then housing yards for gathering and meeting inside residential blocks, as well as informal semi-private meeting rooms.

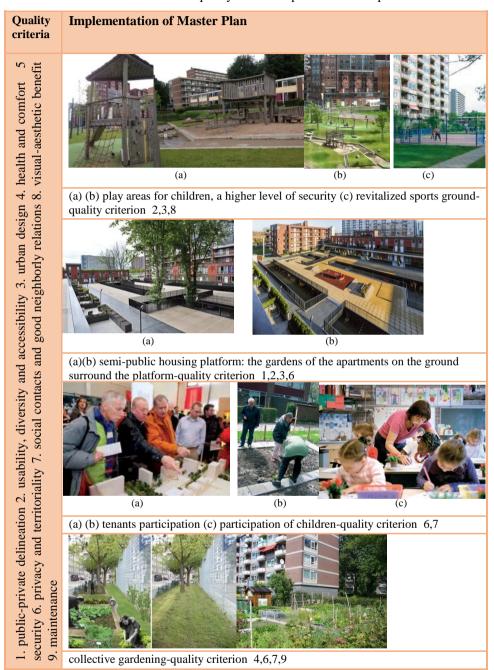
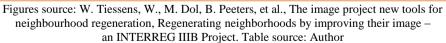


Table 1 Review of of quality criteria implemented in Poptahof



5. CONCLUSION

In the current conditions, we are facing a trend of marginalization and degradation of the quality of open spaces in high-rise housing neighborhoods, which necessitates their revitalization and harmonization with the modern needs of the users. In this paper an integrated set of criteria for the quality of open spaces is presented, which can be used in the process of urban revitalization in order to improve the tenants quality of life in highrise housing neighborhoods. By unifying different requirements that these spaces should fulfil in the quality of life function, criteria and aspects of quality that are relevant for revitalization of open spaces are systematized. A particular challenge is to harmonize the mutual relations of the varied and changing needs of tenants with established criteria for the quality of urban open spaces, as an instrument for determining the conditions that open spaces should fulfil in order to represent the desired destination of tenants in their spare time. The implementation of the Master plan for the revitalization of open spaces in Poptahof, demonstrates that the application of various measures towards the achievement of an integrated set of quality criteria contributed to modernization and creation of a positive perception of the entire residential neighborhood, so as to attracting additional investments of various interest groups and for the purpose of investing in mixed and multifunctional contents within the neighborhood.

The criteria and aspects of quality set forth in this paper cannot be final or complete, but can be adopted in the process of urban revitalization. Much more detailed research is needed to elaborate how to apply the proposed criteria, both within the analysis of the existing state of open space, in the function of identifying the types of problems, as well as in the process of determining the necessary measures and activities in the process of urban revitalization in order to achieve a higher level of quality.

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IDENTIFIKACIJA KRITERIJUMA KVALITETA OTVORENIH PROSTORA U STAMBENIM NASELJIMA SA VIŠEPORODIČNIM STANOVANJEM U PROCESU URBANE REVITALIZACIJE

Korelacija između kvaliteta slobodnih prostora i kvaliteta života u stambenim naseljima sa višeporodičnim stanovanjem u savremenim urbanističko-arhitektonskim i socijalnim okvirima potvrđena je nizom multidisciplinarnih istraživanja. Savremena istraživanja ukazuju da je u procesu revitalizacije potrebno sagledati različite aspekte kvaliteta otvorenih prostora kako bi ostvario što efikasniji stepen unapređenja. Stvaranje odgovarajućih prostornih uslova za različite vrste aktivnosti dnevnog slobodnog vremena stanara i vršenje fizičke aktivnosti u pravcu unapređenja psiho-fizičkog zdravlja, postizanja prostorno-ambijentalnih vrijednosti, kao i za podsticanje dobrosusjedskih odnosa, zajedništva, teritorijalnosti i osećaj pripadnosti, koji su sve determinante kvaliteta života, mogu se postići obezbeđivanjem određenog nivoa kvalitetnih otvorenih prostora. Imajući u vidu da ne postoje jedinstveni kriterijumi kvaliteta otvorenih prostora u stambenim naseljima sa višeporodičnim stanovanjem, cilj ovog rada je da ukaže na poželjne karakteristike ovih prostora u skladu sa savremenim principima urbanog dizajna i prakse u procesu njihove revitalizacije. Stoga je Poptahof stambeno naselje odabrano kao istraživačka platforma koja predstavlja primer dobre prakse unapređenja otvorenih prostora u skladu s utvrđenim kriterijima i aspektima kvaliteta. Ovi kriterijumi mogu poslužiti kao osnova za dalja istraživanja modaliteta urbane revitalizacije otvorenih prostora, sa ciljem poboljšanja kvaliteta života stanara stambenih naselja sa višeporodičnim stanovanjem.

Ključne reči: otvoreni prostori, stambena naselja sa višeporodičnim stanovanjem, urbana revitalizacija, kriterijumi kvaliteta