Improving Condition of Prefab Multifamily Housing Stock: 
User Perspective Assessed via Direct Survey

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Abstract. Multifamily buildings of the mass prefabrication era (1960-1990) have a considerable share in the Polish housing stock. These assets, though still valued due to good location and shortage of other affordable flats, tend to become obsolete. So far, efforts to maintain their value were limited to reducing their heating energy demand by insulations. To go beyond obvious repairs and investment measures enforced by more strict regulations on energy demand, and to prevent depopulation, the facility managers need to think ahead and prepare for improvements that would satisfy the users. To find out what the users think on possible improvements, the author decided to undertake regular opinion surveys among the inhabitants of selected housing estates. The surveys are based on direct interviews. The paper presents findings of the survey conducted in a particular estate in Lublin, south-eastern Poland. The most frequently mentioned issue was lacking of parking spaces. Although the inhabitants seem to long for social integration and would have equipped the spaces between buildings with some infrastructure to facilitate outdoor social life, they are reluctant to the idea of hands-on participation in improvement works. As for the buildings, some functions designed before 1990 (like common laundries) are not used any more, which opens discussion on how to use spare areas. Building accessibility is considered a problem: buildings of 5 storeys have no lifts, and taller buildings are equipped with lifts accessible only form the ground floor level (which means climbing one flight of stairs). Larger balconies would be welcome. However, the inhabitants are generally not willing to pay more for the improvements, though they would accept construction of an extra floor on top of their blocks if the sales of new flats would pay for new facilities. Similarly, further measures to reduce environmental impact of the buildings would be welcome if the savings on energy consumption could be used to refund their spending; urgency of energy-saving measures is considered low as buildings were recently insulated. The users are not satisfied with the size of flats (too small) and quality of finishing. Many decide to improve flats on their own (individual owners). However, in spite of shortcomings of their dwellings, the majority of respondents declare they would rather stay than move to other housing estates – unless they could afford a detached house. The results of the survey provide a clear guideline for the facility managers: the inhabitants, if approached directly, are willing to discuss improvements. Only cooperation between the facility managers and the users is likely to provide viable solutions to maintain the estate’s value. The proposed questionnaire can be a practical tool in defining products of improvement projects.

1. Introduction
Contemporary urban renewal is considered a programme of multiple projects that are managed and coordinated with the aim of bringing sustainable improvement to the urban areas that are degraded or threatened with degradation - in terms of physical condition of infrastructure and buildings, natural and...
social environment, and local economy [1, 2, 3, 4]. Therefore, it is not limited to technical measures as refurbishment or replacement of built facilities. There are numerous examples of ambitious projects planned and executed in the “rule and divide” manner that solved some problems (mostly technical) but created others (mostly social and economic). In contrast, many projects based on involvement of local communities that empowered them to decide on the scope and type of improvements proved to be a success [5, 6, 7]. This prompts that direct and indirect users must be treated as key stakeholders of renewal projects.

Polish multifamily housing estates erected in the years of affordable housing boom of nineteen-seventies are slowly becoming a problematic asset. On the one hand, their structural condition is still sound. The estates’ location, due to the development of cities and infrastructure over the last 50 years, is in most cases favourable. The estates often stay under one management (typically, of housing cooperatives) for a long time, that gives the facility managers experience with the problems of both sides – inhabitants and building stock. On the other hand, user expectations and needs changed: flat size, accessibility of buildings, their thermal properties, and arrangement of outdoor spaces do not live up to current requirements, and some building elements and systems call for repair. Social structure of the inhabitants also changed: the young families of nineteen-seventies grew old, some of the prosperous ones moved out, and those who decided to stay oppose to increased spending on maintenance and improvement. The ownership pattern is also inconvenient from the point of assuring community involvement: individual ownership of flats combined with loosened social bonds makes it difficult to find approval for investment measures. Numerous individually owned flats are offered to short-term rental, with their tenants not interested in good maintenance or enhancement of someone else’s property. To sum up, these estates are generally not degraded yet, and therefore not an obvious object of urban renewal actions. However, trends in their development are worrying [8, 9, 10, 11, 12, 13, 14, 15].

As it is better to prevent than to heal, the author recommends regular monitoring of local communities’ attitude towards improvement measures, and for keeping them informed on the condition of the built assets and possibilities of their development. This can be done by means of questionnaire-based interviews. As comes from the surveys conducted so far, the inhabitants, if approached directly, are willing to share their views. At the same time, judging by poor attendance at cooperative assemblies, the inhabitants are less willing to participate in regular meetings with the facility manager, where they are only informed on activities already completed, or asked for approval of projects whose scope was defined without their involvement. It seems that stakeholder management still does not belong to the strengths of housing cooperative administration teams. The author’s investigations reveal that they are reluctant towards enquires on needs, wants and demands as they raise the inhabitants’ expectations beyond funding capacities, and increase the managers’ workload, [8].

Therefore, the author undertook a project that consisted in regular surveys among inhabitants of selected housing estates in a number of Polish cities [16, 17, 18, 19]. The paper presents a case study of a housing estate located in Lublin, south-eastern Poland. The results proved representative for other housing estates of the same era – in terms of the perceived physical deficiencies of the housing stock, the estate’s infrastructure, and expectations towards the directions of improvement measures.

2. The Method

The survey was based on an original questionnaire prepared according to rules adopted in social sciences [20, 21], enhanced by experience-based techniques described by Sztumski [22] and inspired by methodologies used directly in architectural research, described by Niezabitowska [23]. The answers were collected in direct conversation conducted by trained interviewers who approached the inhabitants in their flats. The interviews were agreed with the estate’s management. They were announced by a short note on the purpose, method, and time of the survey, placed in the building’s noticeboards. To approach as many of the inhabitants as possible, regardless of their personal schedules, the interviewers visited the buildings at different times of the day. Only one adult person at each flat was asked to answer the questions.
The questionnaire comprised 15 questions (8 close-ended, 6 semi-open, one open-ended) and focused on the following three issues:

- perceived technical problems related with condition and functions of the estate’s infrastructure, buildings, and flats; application of the cafeteria of answers [1, 24] allowed the researcher to propose viable technical measures and to conclude on improvement priorities as well as on the improvement actions completed so far, and on assessment of contemporary use of common spaces;
- demography of the estate (age, employment status, migration) as well as attitude towards direct contribution in improvement projects (in kind or in cash) and other forms of participation;
- improvement and repair measures taken individually in the flats; this question was open-ended as it was impossible to specify all possible improvements; its aim was to recognize what the users understand under “improving standard of flats”, as well as to provide insight into technical issues affecting operation of the building as a whole, but beyond control of the facility manager (according to internal regulations, changes that affect the building’s core and systems have to be consulted with the facility manager, but users are often unaware of this fact).

3. Results and Discussion

3.1. Characteristics of the estate

The estate in question (Osiedle Moniuszki) was erected in 1974. Its area was 14.94 ha. The total number of flats was 1618 with total usable floor area of 84,441 m². The estate’s population was estimated for 6,500. The estate’s assets included 59 premises of total usable floor area of 6,225 m² that housed local service and retail establishments, as well as garage boxes of 840 m². The estate was created within the housing cooperative framework and was continuously managed by the same organization since erection. The flats ownership was mixed: most of them were individual property and “cooperative ownership” (limited ownership rights), but some still belonged to the cooperative and were rented.

3.2. Respondents

Inhabitants of 291 flats agreed to answer the questions, which makes the response rate to be relatively high (18% as one person per flat was intended to be interviewed according to the programme of the survey). Figure 1 presents the age structure of the respondents, and Figure 2 – their economic activity.

Figure 1. Respondents according to age
It is likely that, in the case of consultation of an intended improvement project, these groups would be similarly represented in the negotiation process: the majority were between 25 and 50 years old (theoretically, in their most productive age). However, most of the respondents (64%) were not working (still learning, retired, unemployed, ...), so without steady income which part could be potentially invested in improvements.

### 3.3. Opinions on the Estate’s Infrastructure and Facilities

Opinions on deficiencies of outdoor areas are presented in Figure 3. Most frequently, the respondents complained about lack of parking spaces, insufficient number of benches, and inadequate playgrounds for children.

The majority of respondents (57%) were against the idea of hands-on participation in physical improvement of outdoor areas or organization of social life. However, 31% would volunteer to do something for the sake of the neighbourhood.
The estate was equipped with some auxiliary buildings (like garages) and pieces of equipment (like rug-beating stands), and the buildings provided utility space (individual storage rooms, washing and drying rooms), but actual usability of these facilities was not valued equally (Figure 4). Surprisingly, in the times of cheap household appliances, rug-beating stands kept being widely used. Only a small fraction of respondents use garages, and their location in the centre of the estate was considered a mistake – the opinion was they should be replaced by some form of a central square (a meeting point with leisure facilities). Instead of parking their cars in garages, the respondents preferred to leave them within the eyesight close to the housing blocks. The fact that the number of garage boxes was very small compared with the number of cars, these opinions are not surprising. Almost all respondents (89%) declared using individual storage rooms located in basements.

![Figure 4. Use of existing indoor and outdoor facilities according to age of respondents](image)

![Figure 5. Missing local amenities according to age of respondents](image)

Many locals pointed to lack of some form of “main square” of the estate that could serve as a centre of social life with some offer of locally available entertainment (Figure 5). Out of the originally designed leisure amenities, the only establishment that survived was a small cinema. A senior club, clubs and workshops for children and teenagers are less popular choices among the ideas for enhancing community life (Figure 5). Considering that a substantial number of the inhabitants theoretically disposed of free
time (30% of people aged 12-50 and 50% of people aged 50-75 admitted not working on regular basis), at least some of them could be engaged in provision of such services.

3.4. Opinions on Buildings

All buildings in the estate were of precast concrete plate structure. They were blocks of 5, 7, or 11 storeys, some of vertical, some of horizontal shared access. Buildings of 7 and 11 floors were equipped with lifts, and these could be accessed only from the ground floor level, located at least one flight of stairs above the ground. The flats were generally small (32-62 m² of usable floor area) and included one to four rooms, a kitchen, a bathroom, a toilet and a hall. Some of internal walls were load bearing, prevented thorough changes of flat layout. Apart from original systems (water, sewage, power, district heating and domestic hot water supply, gas for cooking, lifts), the buildings were later equipped with entry phones, internet and cable TV systems. In the course of ongoing thermal improvement actions started in early 2000s, the buildings were clad with ETICS and equipped with heat allocators. Windows and external doors were being gradually replaced with new, of better thermal parameters. Repairs were conducted regularly.

The respondents were generally content with the buildings and flats and moving out was not seriously considered: only 4% would think on moving to a building of less floors, 1% think of moving out to other estates of city district in search for more comfortable living conditions, and 14% would be glad to change a flat in the block to an individual house (of course if they could afford one). However, 36% complained about too small size, and 23% on functional deficiencies of their flats. Tiny balconies were considered an issue (67% would not oppose to replacing them with bigger ones).

Improving accessibility by restructuring the entrance area and providing elevators that serve the street level was not considered important (only 14% would welcome it). Interestingly, only 9% of respondents inhabiting five-storey blocks would like that a lift was installed in their building. Adding extra floors to provide new flats to earn extra money for the cooperative was also a less popular idea (11%).

The most desired improvements in flats were: replacing electric wiring (36% of respondents maintain that the original one is obsolete and insufficient), providing some form of a cooling system (29% of respondents complain that their flats are overheated in summer), and modernizing flat layouts (27% of respondents would like to change functions of rooms that are generally perceived too small). Mechanical ventilation systems were less desired (22%), as well as improvement of staircase lighting system (21%), replacement of worn-out water and sewage piping (17%). The idea of enlarging flats by cutting off some corridor area, technically possible in dome flats in particular building types is also not very popular (16%).

The buildings were recently insulated, and this improvement was appreciated (thermal comfort was increased, though due to increasing energy prices direct savings are not high). Nevertheless, the inhabitants seem to realize that more can be done towards energy saving: 62% believe that heat recovery from used domestic hot water is worth considering, and 52% would reduce heat losses due to thermal bridging caused by cantilever balconies. Automatic control of heating system would be considered a good investment by 52% of the respondents (currently, heating is manually controlled by means of thermostatic valves, and heat allocators remind the users of turning the heating down). 46% liked the idea of using some form of renewable energy in their buildings. 40% point to windows as a weak point of the building envelope, though the windows are being gradually replaced by the cooperative. The benefits of insulating flat roofs (17%) and basement ceilings (21%) seem a less obvious choice in terms of energy efficiency measures.

As for prioritizing improvements according to urgency, the top choice was surprising (Figure 6): painting staircase walls occurred to be the most urgent (aesthetic matters!). It was followed by enlarging balconies and installation of buffer porches at the entrance to the buildings. The inhabitants would quickly do something with old windows and obsolete wiring and heaters rather than complete envelope insulation (roofs and basement ceilings were still “cold”). Flat layout changes such as combining bathroom with toilet or kitchen with one of the rooms and the corridor were also considered less urgent.
The inhabitants realized that any improvements came at a cost. The cooperative collected money for the repair fund as an element of monthly rent/service fee, and larger improvements were funded by bank loans repaid over long time – the money for this purpose was collected together with the same fee. As a lot of money had been recently invested in improving energy efficiency of the buildings, the monthly housing expense was considerable, and not all respondents would like to see it increased. Nevertheless, 17% of them would agree to spend extra PLN 500 a year, 6% said they could afford PLN 1000 a year, and 1% - PLN 1500 a year towards improvements.

4. Conclusions

The author’s survey was conducted in a particular estate of a particular city, and was generalized on its basis may seem unwise. However, the estate selected for this case study is typical for estates of seventies to nineties. At least from the point of architectural and urban planning constraints, the estate is representative of the habitat of millions of people in Poland. After comparing the results with findings of surveys conducted in similar estates over last ten years, the author concludes that:

- From the user point of view, the main deficiencies of the estates’ outdoor infrastructure were: lack of parking spaces close to the buildings, and insufficient facilities for outdoor life.
- Large majority of respondents were quite content with their living conditions. Though they often complain about small size of flats and balconies and low standard of finishing, they generally do not want, or they cannot afford, to move out of the estate.
- Most people declared they would not contribute their work and time for physical improvements of facilities or tightening social bonds. However, one third of them would not mind some voluntary work, and about one fourth would be ready to pay a little extra towards improvements in the estate and buildings.
- As lots had been recently done to improve energy efficiency of buildings (façade insulation, replacement of windows, improvements in heating systems), heat losses ceased to be the main problem of prefab block dwellers, but summer overheating became a problem, and using environmentally friendly systems to reduce energy and water consumption occurred a popular idea.

The results of surveys as the one presented in the paper may provide a guideline for the facility managers, regardless of the type and age of assets in question. The inhabitants, if approached directly,
are willing to communicate what they considered an important deficiency of their living space. The
user’s point of view may differ from the view of the facility manager. Only cooperation between the
stakeholders is likely to provide viable solutions to maintain value of housing estates. However, as
economic and demographic conditions constantly evolve, the dialog between the estate manager and the
inhabitants should be continuous, or at least conducted on regular basis.

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