Scientific Review – Engineering and Environmental Sciences (2019), 28 (3), 383–393
Sci. Rev. Eng. Env. Sci. (2019), 28 (3)
Przegląd Naukowy – Inżynieria i Kształtowanie Środowiska (2019), 28 (3), 383–393
Prz. Nauk. Inż. Kszt. Środ. (2019), 28 (3)
http://iks.pn.sggw.pl
DOI 10.22630/PNIKS.2019.28.3.36

Anna OSTAŃSKA

Faculty of Civil Engineering and Architecture, Lublin University of Technology

Monitoring the resident's needs: input for the pre-construction stage of rehabilitation projects in housing estates

Key words: housing stock, precast panel buildings, modernization, resident needs, questionnaire survey

Introduction

Large housing estates of prefabricated blocks, the product of mass housing of nineteen-seventies, home to millions of Poles, have approached a difficult stage of their life cycle (Chmielewski & Mirecka, 2001; Ostańska 2018a, 2019). Today, they are not as attractive as modern developments. They occur to fulfil neither the requirements of the new building codes nor expectations of their users. With obsolete systems and tired look, they not only require more expenditure on repairs but also a deep modernization. However, the structural fabric of their buildings is still sound. The location within towns and cities is typically attractive and lavishly designed spaces between buildings are still considered an asset. Due to the shortage of affordable housing, the "prefab estates" are often the first choice of after-market flat buyers and tenants, but this potential is not going to last forever without investment.

Reported damage to structural joints and visible damage to facade elements cause some technical problems (though not beyond repair) and negatively affect the appearance of buildings (Ligęza & Płachecki, 2000; Runkiewicz, 2002). The aging processes of housing blocks of precast panels should be monitored and the development of damage should be forecasted (Nowogońska, 2017).

As facades are potentially the most problematic components of the prefabricated blocks (in their original state they do not provide enough protection against heat loss and are hardly acceptable from the point of aesthetics; they may pose a threat to structural safety if improperly clad (Ostańska, 2016; 2018c), replacing them becomes an option. Inspiration may come from France (Druot, Lacaton

& Vasal, 2010) where an entire facade of a tower block of nineteen-sixties was stripped off; new segments of glazed loggias attached to the original structure added extra usable floor area to the flats, improved thermal performance of the building and gave it a modern look, and all this with no need for the inhabitants to move away for the time of works. Examples of a thorough reshaping of prefabricated housing blocks (adding extensions, replacing balconies, adding or removing whole floors) can be found in many countries, e.g. in Germany, where it was done on a large scale (Czarnigowska & Ostańska, 2011). Therefore, prefabricated buildings were proved to be modifiable: flats and rooms can be combined to provide larger spaces, accessibility problems can be solved, energy performance can be improved, and environmental impact can be reduced (Ostańska, 2018b).

However, the technical and financial viability of modernization are one thing. The key problem may be the inhabitants – the owners of flats. Any modernization project requires their consent and is expected be driven by their needs. As comes from practice, the involvement of estate's residents into the maintenance and refurbishment of their homes is reactive rather than proactive, and there is not much cooperation between the estate's management and the residents in preparing long-term maintenance programmes.

Therefore, the aim of research was to investigate into the opinions and needs of residents of prefabricated housing blocks of large estates – with the assumption that asking direct questions helps learn the user point of view. The results are expected to provide useful input for sustainable estate management plans.

Methods

The survey was to provide insight into opinions of residents of particular housing estates on the deficiencies in local amenities, infrastructure, buildings and flats, and willingness to participate in cash or kind in the improvement process. To assure a sufficient response rate, the author decided to conduct a direct interview using the paper and pen approach where the survey is conducted face to face and the interviewer reads the questions and records the answers in the standard form. This method, though time-consuming, allows the researcher to obtain answers to a large number of questions of a high level of complexity. In this case, the questionnaire, customized to correspond to conditions of a particular estate, comprised 15 questions of different character (open-ended, closed-ended). A complete questionnaire form can be found in Ostańska (2018b). The survey was conducted in a door-to-door manner, so the inhabitants of any flat in any building could potentially participate in the survey. The interviews were agreed with the estate management and announced in advance. The interviewers approached the respondents at home on a particular day in the mornings and in the afternoons to assure that the number of respondents is high enough to provide statistically significant results. The answers were collected from one adult person per flat who agreed to participate.

To capture the changes of user attitudes over time, the research programme assumed that the survey was to be repeated regularly every five years in exactly the same manner, though naturally not with exactly the same respondents.

The estate in question was surveyed in 2004, 2009, and 2014. The same questionnaire was used each time.

No prior information on the size of the estate's population was available, apart from the exact number of flats and the estimated number of residents, the latter based on the number of household members declared by the flat owner and used by the estate management to calculate service charges.

Statistical analysis of the results was performed by means of IBM SPSS Statistics. To compare frequency of answers in consecutive surveys, the chi-squared test (χ^2) was used. Means of two groups were compared using Student *t*-test, and analysis of variance (ANOVA) with Bonferroni's post-hoc test was performed if the number of groups were greater. Association between variables was measured, depending on the type of variables, by Cramer's phi (ϕ) or Spearman rang correlation (*rs*) (Aczel, 2012). All statistical tests assumed a confidence interval of 95% (the significance of differences occurs when the statistics *p* reaches values below 0.05).

Results

The estate

The estate Osiedle Moniuszki is located in Lublin, a city of 350,000 inhabitants, capital of Lublin Voivodship, south-eastern Poland. The area of the estate is 14.94 ha, and the housing stock is 1,622 flats of total usable floor area of 84,712 m^2, located in precast concrete or brick housing blocks 5–11 storey high; the size of flats ranged from 30 to 65 m^2. The population of the estate in 2004 was 6.5 thousand people, reduced to 4.2 thousand people in 2009 (figures based on declarations of flat users available to the estate management). The estate stays under one management of a housing cooperative since its erection in 1974. Apart from block of flats, the cooperative manages 59 commercial units of 6,225 m^2 usable floor area and 840 m^2 of roofed parking space.

The respondents

In 2004, the response was obtained from 291 people (one person per flat). The number of answers dropped in the consecutive surveys: in 2009, 153 inhabitants agreed to answer, and in 2014 – only 91. Those who decided to open their door to the interviewers were generally willing to cooperate and expressed their interest in the problems of the neighbourhood.

The age structure of the respondents is presented in Table 1. Statistical analyses show that the age structure of the respondents in 2004, 2009 and 2014 differ significantly ($\chi 2$ [6, n = 535] = 34.70; $p < 0.001$; $\phi = 0.255$). The number of people over 65 increased. The number of respondents aged 26–45 dropped. In the case of the remaining age groups, no significant differences were observed. Based on the observed increase in the number of people surveyed in the oldest group and the decrease in the number of people in the 26–45 age group, it may be assumed that the selection of the sample in the second and third stage of the survey corresponded to the sample from the first stage. Comparing the level of education of the participants between the stages of the study no significant differences were observed ($\chi 2$ [4, n = 535] = 2.81;

TABLE 1. Age structure of the respondents (own studies)

Survey year	18–25 years old	26–45 years old	46–65 years old	> 65 years old	Total
2004	37 (12.7%)	127 (43.6%)	113 (38.8%)	14 (4.8%)	291 (100%)
2009	31 (20.1%)	37 (24.0%)	73 (43.4%)	13 (8.4%)	154 (100%)
2014	10 (11.1%)	28 (31.1%)	35 (38.9%)	17 (18.9%)	90 (100%)

$p = 0.591$; $\phi = 0.072$). The structure of respondents according to education level is presented in Table 2.

Data on economic activity of the respondents was juxtaposed with their age. Taking into account the significant increase in the number of people in the oldest group of respondents, an increase in the number of those not working was to be expected in the consecutive surveys. As for economically active respondents aged 46–65, there was no significant difference between the stages of the survey. However, within the group of the economically inactive, significant differences between measurements were confirmed ($\chi 2$ [6, $n = 347$] = 39.08; $p < 0.001$; $\phi = 0.336$). As predicted, an increase in the number of economically inactive was observed in the senior group (from 5.6% in 2004 to 25.4% in 2014) and a decrease in the number of economically inactive people aged 26–45 (from 27.5% in 2004 to 15.9% in 2014). Detailed data are presented in Tables 3 and 4.

TABLE 2. Respondents according to the level of education (own studies)

Survey year	Vocational	Upper secondary	Bachelor or higher	Total
2004	45 (15.5%)	147 (50.5%)	99 (34.0%)	291 (100%)
2009	49 (20.6%)	98 (41.2%)	91 (38.2%)	243 (100%)
2014	24 (15.7%)	65 (42.5%)	64 (41.8%)	161 (100%)

TABLE 3. The number and share of economically active according to age group (own studies)

Survey year	Age of respondents				Total
	18–25	26–45	46–65	> 65	
2004	3 (3.0%)	76 (76.8%)	18 (18.2%)	2 (2.0%)	99 (100%)
2009	4 (8.7%)	31 (67.4%)	11 (23.9%)	0 (0.0%)	46 (100%)
2014	3 (11.1%)	18 (66.7%)	5 (18.5%)	1 (3.7%)	27 (100%)

TABLE 4. The number and share of economically inactive according to age group (own studies)

Survey year	Age of respondents				Total
	18–25	26–45	46–65	> 65	
2004	32 (18.0%)	49 (27.5%)	87 (48.9%)	10 (5.6%)	178 (100%)
2009	27 (25.5%)	6 (5.7%)	60 (56.6%)	13(12.3%)	106 (100%)
2014	7 (11.1%)	10 (15.9%)	30 (47.6%)	16 (25.4%)	63 (100%)

Deficiencies of the estate's infrastructure and amenities

The analysis of the results relating to the missing functions of the housing estate and infrastructure shows that there are no differences in the number of average indications for the deficits ($F(2, 533) = 1.45$; $p = 0.235$). In 2004, residents pointed to, on average, 2.08 deficiencies, in 2009 1.97 deficiencies, and in 2014 1.74 deficiencies. Detailed results are presented in Table 5.

TABLE 5. "What is worth doing to the infrastructure of the estate?" (own studies)

Survey year	Parameter	Add parking space	Improve maintenance of greens	Add benches	Add garbage cans	Add recreation equipment	Modernize playgrounds	Resurface sports field
2004	*n*	125	62	124	79	54	100	60
	%	43.0	21.3	42.6	27.1	18.6	34.4	20.6
2009	*n*	159	104	101	95	87	87	59
	%	64.6	42.3	41.1	38.6	35.4	35.4	24.0
2014	*n*	98	49	82	55	77	73	27
	%	60.1	30.1	50.3	33.7	47.2	44.8	16.6
	χ^2	0.854	6.248	3.393	1.003	5.754	3.652	3.250
	p	0.355	0.012	0.065	0.316	0.016	0.056	0.071

Looking at the opinions of missing local amenities (detailed results presented in Table 6), no significant changes between the surveys are observed apart from fluctuating interest in a children's centre or club. Additionally, marginally significant fluctuations occurred in relation to indications for the lack of a seniors centre.

Deficiencies of buildings

The aggregated results of residents' opinions on the functionality of buildings prompt a significant change in the number of perceived deficiencies of the buildings (not flats) ($F(2, 533) = 9.91$; $p < 0.001$). In 2014, the average number of deficiencies was 0.98, whereas there more needs reported in the previous surveys. Comparing 2014 to 2009 with its average number of deficiencies of 1.53 one can observe a significant change ($p < 0.001$). Similarly, there was a significant difference ($p = 0.002$) in the average number of reported deficiencies between 2014 and 2004 (in the latter, the average number of reported needs was 1.37). Comparisons between 2004 and 2009 show no significant differences ($p = 0.296$).

Considering the changes in the perception of the building-related shortfalls according to their type, significant differences concerned the replacement balconies (the existing ones are very small; it would be technically possible to remove them and add a self-supporting structures): in the consecutive surveys, the number of indications to small balconies as a problem decreased. Significant fluctuations were observed in relation to lifts: in 2004 the lack of them was the

TABLE 6. "What amenities should be introduced in the estate?" (own studies)

Survey year	Parameter	Children's centre	Youth centre	Seniors centre	Estate's "central market square"
2004	*n*	35	35	44	59
	%	12.0	12.0	15.1	20.3
2009	*n*	31	14	15	43
	%	20.1	9.1	9.7	27.9
2014	*n*	10	10	19	26
	%	11.0	11.0	20.9	28.6
	χ^2	6.35	0.89	5.87	4.57
	p	0.042	0.642	*0.053*	0.10

concern of 20.3% respondents; in 2009 39.6% complained about it, whereas in 2014 missing lifts occurred as a problem to only 4.4%. In other categories there are no significant differences between measurements. Detailed data are presented in Table 7.

TABLE 7. "What improvements to the building would make sense?" (own studies)

Survey year		Add a storey	Add buffer porches	Add a lift serving ground level	Glaze balconies
2004	*n*	21	102	59	217
	%	7.2	35.1	20.3	74.6
2009	*n*	14	55	61	105
	%	9.1	35.7	39.6	68.2
2014	*n*	6	29	4	50
	%	6.6	31.9	4.4	54.9
	χ^2	0.67	0.41	42.82	12.73
	p	0.714	0.816	< 0.001	0.002

Deficiencies of flats

Comparing the results at the aggregated level in relation to the assessment of the functionality of flats, a significant decrease in the number of indications to problems worth solving can be observed ($F(2, 533) = 10.74$; $p < 0.001$). In 2004, the average number of reported deficiencies was 1.63; in 2009 it dropped to 1.19, while in 2014 it was only 0.86 indications per person. Significant changes were observed in four categories of flat-related deficiencies needed rectifying: inadequate lighting at the entrance to flats and in the flats (fluctuation), inadequate electrical systems (drop in demand), inefficient natural ventilation (drop in demand), insufficient room area (drop in demand). In relation to other categories no differences were observed. Detailed results are presented in Table 8.

TABLE 8. "What improvements to flats are needed?" (own studies)

Survey year	Parameter	Install motion sensors	Improve electrical system	Improve plumbing	Switch from natural to mechanical ventilation	Install air conditioning system	Increase flat area by the expense of corridors	Increase flat area by extensions
2004	*n*	74	99	46	70	66	70	48
	%	25.4	34.0	15.8	24.1	22.7	24.1	16.5
2009	*n*	22	42	24	28	31	15	21
	%	14.3	27.3	15.6	18.2	20.1	9.7	13.6
2014	*n*	22	9	10	8	15	7	7
	%	24.2	9.9	11.0	8.8	16.5	7.7	7.7
	χ^2	7.58	20.08	1.34	10.53	1.69	21.43	4.47
	p	0.023	< 0.001	0.511	0.005	0.43	< 0.001	0.107

Views on ways to improve energy performance of buildings

Comparisons of the aggregated results relating to the opinions of residents regarding the improvement of heat and electricity savings in buildings show that the needs of residents have significantly decreased ($F(2, 533) = 11.76$; $p < 0.001$). In 2014, residents indicated an average of 3.06 needs, in 2009 it was already 2.43 needs, and in 2014 there was a decrease to the level of 2.19 needs.

Detailed analyses show that less and less residents perceive typical energy-saving measures (insulating the building's shell, replacing windows, solving the problem of thermal bridging related with cantilever balconies) as "still needed". The only category in which there were no differences was the insulation of basement ceilings. The idea of reusing grey water to flush toilets, though still popular, seems to slightly loose on importance. An increase in demand was observed only in relation to the need to install modern renewable energy sources The results are summarised in Table 9.

Opinions on the most urgent problems

Issues presented in all previous sections concerned the general deficiencies without defining the time horizon for improvement measures. The residents were also asked to indicate the problems that call for most urgent actions. This distinction between the general needs and the urgent needs may potentially help the estate managers plan both current activities and long-term modernization projects.

Analysing the number of the urgent needs reported by the interviewees, a decrease can be observed ($F(2, 533) = 19.04$; $p < 0.001$). The highest number of indications was recorded in 2004 (on average, 3.46 per person), in 2009 there was a drop to 2.64 indications, while in 2014 the number of indications fell again to 2.11. A pairwise comparison between the consecutive surveys indicates sig-

TABLE 9. "What should be done towards reducing environmental impact of the estate and save energy?" (own study)

Survey year	Parameter	Insulate basement ceilings	Insulate external walls	Insulate roofs	Replace windows	Glaze balconies	Add controllers to heating system	Install renewable energy systems	Utilize grey water
2004	*n*	68	43	63	127	174	135	109	171
	%	23.4	14.8	21.6	43.6	59.8	46.4	37.5	58.8
2009	*n*	28	9	4	32	63	71	74	93
	%	18.2	5.8	2.6	20.8	40.9	46.1	48.1	60.4
2014	*n*	14	12	12	14	36	21	49	41
	%	15.4	13.2	13.2	15.4	39.6	23.1	53.8	45.1
	χ^2	3.43	7.80	29.30	38.39	20.04	16.68	9.59	6.38
	p	0.180	0.020	< 0.001	< 0.001	< 0.001	< 0.001	0.008	0.041

nificant differences between 2004 and 2009 ($p < 0.001$) and 2004 and 2014 ($p < 0.001$). There are no significant differences between the 2009 and 2014 surveys.

Significant differences were observed in six areas – for each of them there was a decrease in the number of indicated needs: painting staircases, combining bathrooms with WC (originally they were separated by a partition wall and very small), insulating basement floors, replacement of windows, insulation of roofs, and replacement of the electrical system. Full data is presented in the figure on page 391.

Discussion and conclusions

The research confirms the practical application of surveys in checking current opinions and obtaining information whether the actions taken by the estate management are appreciated (or even noticed) by the residents and whether they correspond to changing user needs. Surveys provide both input and feedback important for the programming the revitalisation process in the estates.

The analyses of repeated multifaceted studies concerned the existing global needs – in general, these are the elements which, in the opinion of the inhabitants, should be changed without indicating the exact time horizon for the implementation of the changes.

Considering the user needs related with the infrastructure of this particular estate, the availability of parking spaces proved to be a constant issue (2004 – 43.0% respondents wanted more parking space, 2009 – 49.4%, 2014 – 44.0%) – and this should give the management a spur for improvement actions to satisfy the clients. In contrast to the parking space problem, some issues loose on importance, such as the problem of noise generated while beating carpets (2004 – 18.6% respondents thought that it would be reasonable to install acoustic shields around carpet racks, in 2014 only 6.6% considered it worth doing).

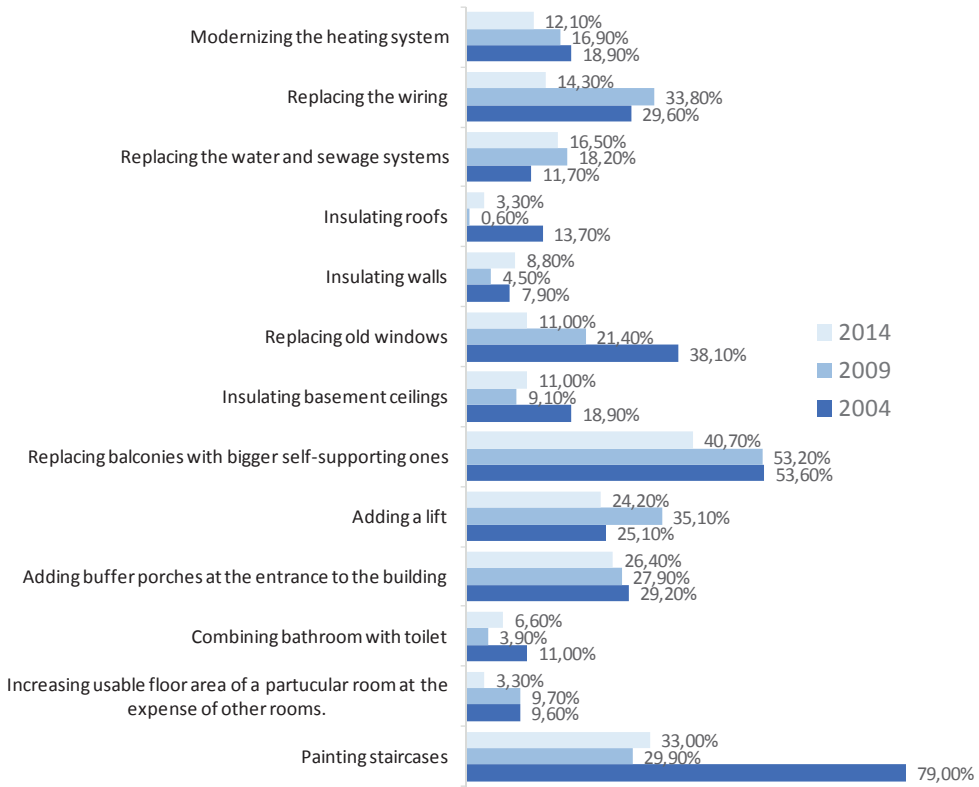

FIGURE. Most urgent needs (own studies)

Increased interest in provision of a some form of the estate's central square with cafés (2004 – 20.3%, 2009 – 27.9%, 2014 – 20.3%) prompts that introducing new functions to the estate's amenities is worth considering. Similarly, some form of children's club and seniors centre were also increasingly missed by the inhabitants.

As for the change in the opinion of residents on the need to improve the functionality of buildings, significant fluctuations were observed for the need of installing lifts (2004 – 20.3% of respondents would welcome them, 2009 – 39.6%, 2014 – only 4.4%); still over 30% respondents are concerned with the lack of buffer porches at the entrance to the buildings (in 2004 – 35.1% of indications, in 2009 – 35.7%, and in 2014 – 31.9%), less and less users would demand bigger balconies (2004 – 74.6%, 2009 – 68.2%, 2014 – 54.9%). The idea of building an extra floor in the existing blocks was generally not very popular (2004 – 7.2% of indications, 2009 – 9.1% of indications, year 2014 – 6.6% decrease).

Opinions on the need to improve the functionality of flats also fluctuated. The inadequate lighting was considered a problem by a quarter of the respondents in 2004, in 2009 only 14.3% pointed to it, and in 2014 – 24.2%. Interestingly,

improvement of electrical installations was postulated by less and less respondents (2004 – 34%, 2009 – 27.3%, 2014 – 9.9%), similarly to the need to improve ventilation system (2004 – 24.1%, 2009 – 18.2%, 2014 – 8.8%), and the need to change the room layout (2004 – 24.1% of indications, 2009 – 9.7%, 2014 – 7.7%).

Changes in the needs of residents in terms of energy efficiency indicate a growing concern in either energy prices or the environment: in 2004 – 37.5% respondents saw benefits of using renewable energy sources, in 2009 their share went up to 48.1%, in 2014 increased further to 53.8%. A significant decrease occurred in popularity of almost all other ideas for improving energy performance, however, fluctuation occurred in opinions on further insulation of walls (2004 – 14.8% of indications; 2009 – 5.8%; 2014 – 13.2%) and insulation of roofs (2004 – 21.6% of indications; 2009 – 2.6%; 2014 – 13.2%).

The views on what is considered an urgent need were also not stable over time. Installation of lifts, a frequent choice on the list of most urgent improvements in all rounds of the survey, first gained and then lost on popularity (2004 – 25.1% of indications; 2009 – 35.1%; 2014 –24.2%); the attitudes towards modernisation of the electrical system developed in a similar way (2004 – 29.6% of indications; 2009 – 33.8%; 2014 – 14.3%) just as in the case of modernization of the plumbing (2004 – 11.7%; 2009 – 18.2%; 2014 – 16.5%). Painting staircase walls, the first choice on the list of most urgent needs in 2004, lost on importance in the consecutive surveys (drop from 79% in 2004 to 33% in 2014). A slight decrease was observed in the case of the need for buffer porches (2004 – 29.2% of indications; 2009 – 27.9%; 2014 – 26.4%) and replacing balconies (2004 – 53.6% of indications; 2009 - 53.2%; 2014 – 40.7%); however, the demand for them was still high.

The respondents were asked to declare their willingness to participate in modernization and revitalization activities in cash or by voluntary work. No significant differences in the share of those willing to participate was observed (2004 – 22.3%, 2009 – 21.4%, 2014 – 18.7%).

The recurrent survey conducted in the analysed estate confirmed that this method of monitoring user needs is viable. On the basis results of such surveys, the user (a manager of a housing estate) is able to revise the programme of improvement measures to satisfy users and obtain feedback on the actions taken so far: if they were noticed and appreciated or not. However, a face-to-face interview is extremely labour-intensive way of collecting input. It would be advisable to construct an Internet-based platform to improve communication between the residents and the estate management.

References

Aczel, A.D. (2012). *Complete Business Statistics*. New York, NY: Tata McGraw-Hill.

Chmielewski, J.M. & Mirecka, M. (2001). Modernizacja osiedli mieszkaniowych [*Modernization of housing estates*]. Warszawa: Oficyna Wydawnicza Politechniki Warszawskiej.

Czarnigowska, A. & Ostańska, A. (2011). A revitalization programme for estates of pre-fabricated housing blocks, on the example of Frankfurt (Oder). *Przegląd Budowlany*, *82*(11), 63-67.

Druot, F., Lacaton A. & Vasal J.P. (2010) Transformation of Tour Bois le Prêtre. In A. Lepik (ed.) *Small Scale Big Change. New Archi-*

tecture of Social Engagement (pp. 103-112). New York NY: The Museum of Modern Art.

Ligęza, W. & Płachecki, M. (2000). Uszkodzenia złączy w ścianach osłonowych budynków wielkopłytowych [Damage of joints in curtain walls of large-panel buildings]. *Inżynieria i Budownictwo*, *56*(4-5), 204-208.

Nowogońska, B. (2017). *Diagnoza w procesie starzenia budynków mieszkalnych wykonanych w technologii tradycyjnej* [*Diagnosis in the aging process of residential buildings made in traditional technology*]. Warszawa: Komitet Inżynierii Lądowej i Wodnej PAN.

Ostańska, A. (2016). *Wielka płyta. Analiza skuteczności podwyższania efektywności energetycznej. Termomodernizacja, termowizja, wytyczne naprawcze* [*Large panel. Analysis of the efficiency of increasing energy efficiency. Thermomodernization, thermography, repair guidelines*]. Warszawa: Wydawnictwo Naukowe PWN.

Ostańska, A. (2018a). Aktualne potrzeby mieszkańców podstawą programowania rewitalizacji osiedli budynków prefabrykowanych [Current needs of inhabitants base of programming regarding revitalization of housing estates of prefabricated buildings]. *Przegląd Budowlany*, *89*(3), 38-40.

Ostańska A. (2018b). *Programowanie rewitalizacji osiedli mieszkaniowych z wykorzystaniem modelu PEARS* [*Programming revitalization of housing estates using the PEARS model*]. Lublin: Komitet Inżynierii Lądowej i Wodnej PAN.

Ostańska, A. (2018c). Thermal imaging for detection of defects in envelopes of buildings in use: qualitative and quantitative analysis of building energy performance. *Periodica Polytechnica – Civil Engineering*, *62*(4), 1-8.

Ostańska, A. (2019). Improving condition of prefab multifamily housing stock: user perspective assessed via direct survey. *IOP Conference Series: Materials Science and Engineering*, *471*, 072037. DOI: 10.1088/1757-899X/471/7/072037

Runkiewicz, L. (2002). Błędy i uszkodzenia w budownictwie wielkopłytowym [Errors and damage in large-panel construction]. In *Błędy i uszkodzenia budowlane oraz ich usuwanie* [*Errors and damage to construction and their removal*].Warszawa: WEKA.

Summary

Monitoring the resident's needs: input for the pre-construction stage of rehabilitation projects in housing estates. The task of maintaining Polish prefabricated housing stock is a challenge due to its scale. These assets are still nearly 50% of the multi-family houses in use. They are in good technical condition. To define the objectives and scope of improvements, the manager needs to account for not only technical merits but also the user/flat owner point of view. As observed in practice, estate managers rarely strive to identify the needs of residents. This study investigates into opinions and needs of inhabitants of a housing estate in Lublin, south-eastern Poland. A series of surveys were carried out at five years intervals to capture their evolution. The questions concerned accessibility, deficiencies in local amenities, the condition of the estate's infrastructure, buildings and flats, and opinions on priorities of improvement measures. The survey results are intended as input for planning the modernization of the estate.

Author's address:
Anna Ostańska
(https://orcid.org/0000-0002-1789-4288)
Politechnika Lubelska
Wydział Budownictwa i Architektury
ul. Nadbystrzycka 38D, 20-618 Lublin
Poland
e-mail: a.ostanska@pollub.pl