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Geo-questionnaire in urban planning – preliminary results of the experimental application in Poland

Abstract: Changes in the attitude of local authorities towards the public participation in the decision making processes have prompted development of new methods of such involvement. As far as the urban planning is concerned, of particular potential is the so-called Public Participation Geographic Information Systems (PPGIS). One of the tools used for the purpose is a geo-questionnaire, combining the benefits of a standard questionnaire and a map, which permits collecting information on particular sites and on the respondents' ideas on localisation of new objects and functionalities.
Within the project "Geoportal supporting public participation in urban planning", in the years 2015–2016, a study was undertaken to explore the effectiveness and usefulness of the geo-questionnaire. Five pilot studies were performed in the Poznań and Łódź agglomerations. The geo-questionnaires concerned the local spatial management plan in Rokietnica (Poznań agglomeration), landscape protection in Łódź, conception of the transportation system development in Łódź, conception of urban design of the Łazarski Market in Poznań, and the Map of Local Needs in the city center of Poznań. The aim of the study was to present the preliminary results of the initial implementations of geo-questionnaire developed within the project Geoportal supporting public participation in urban planning. The applications of geo-questionnaire have been analysed taking into account the characteristics of implementation areas, characteristics of users, the effectiveness of recruitment methods and opinions about the tool from two points of view: the respondents and the recipients of results.

Keywords: geo-questionnaire, PPGIS, urban planning, public participation

Introduction

Changes in the attitude of local authorities towards the managerial processes of local governments have opened the areas for cooperation of many actors in decision making processes (Stoker 1998). These opportunities are closely related to the increasing public participation in decision making, defined by Arnstein (1969: 216) as "the redistribution of power that enables the have-not citizens, presently excluded from the political and economic process, to be deliberately included in them in future". Apart from the citizens voicing the need to increase their role in making decisions about local urban development, also researchers have indicated positive aspects of public participation. It has been emphasised that taking into account the opinion of citizens actually helps making right decisions by elimination or reduction of possible conflicts related to urban development (Taylor 1999, Pawłowska 2010), provides more information on a given space in question (Friedmann 1998), and raises awareness of different interests expressed by different actors of the planning processes (Healey 1997, Simaõ et al. 2009). These claims are attributes of the digital democracy, characteristic of contemporary information society (Jensen et al. 2007, O'Reilly 2011).

The increasing complexity of urban planning means that it should not be limited only to statutory spatial planning procedures but it should also include the legally unregulated (or regulated in a very general way) processes involving public participation. This broad category of urban planning includes e.g. development strategies, transportation plans, or projects for design of public spaces (squares, market places, green areas).

Even the procedure of creating local spatial management plans, regulated in detail by the Act on Land Use Planning and Management of 27 March 2003 with its many obligatory requirements for different forms of public participation (call for initial planning motions, public presentation of the project and open discussion, call for modifications to proposed project), has in practice many shortcomings. A study by Wójcicki (2016) proved that it must be supported by additional – facultative in legal terms – stages of citizens' involvement. The 'official' public discussions often come too late to introduce broader alterations into prepared plans while the earlier and less formal rounds of consultations allow for more direct debate between stakeholders, municipal authorities and urban planners.

If public participation is limited only to statutory spatial planning procedures then it often brings harmful social and economic tensions to the local community:

1. for citizens – feeling of exclusion from real decision-making when confronted with ready-to-approve project of spatial development plan,
2. for municipal authorities – a potential financial threat to municipal budget if the plan has to be thoroughly redesigned in order to meet all – often far-reaching – demands of local residents.

To avoid such problems it is necessary to use more flexible and not strictly legally bounding methods of public participation, introducing modern technology and innovative tools. Within the project: Geoportal supporting public participation in urban planning, in the years 2015–2016, a geo-questionnaire method

was implemented in public consultations processes focused on spatial context of development. Five pilot studies were performed in the Poznań and Łódź agglomerations. The geo-questionnaires concerned the local spatial management plan in Rokietnica (Poznań agglomeration), landscape protection in Łódź, conception of the transportation system in Łódź, conception of urban design of the Łazarski Market in Poznań, and the Map of Local Needs in the city center of Poznań. The variety of problems covered by the geo-questionnaire permitted evaluation of the geo-questionnaire possibilities, definition of the urban development plans adapted to given conditions and working out the ways of cooperation with the final data users being at the same time partners in the process of consultation. The aim of this study is to present the preliminary results of the initial implementations of geo-questionnaire developed within the project Geoportal supporting public participation in urban planning. The applications of geo-questionnaire have been analysed taking into account the characteristics of implementation areas, characteristics of users, the effectiveness of recruitment methods and opinions about the tool from two points of view: the respondents and the recipients of results.

The preliminary results of the experimental applications of geo-questionnaire in Poland were analysed on the basis of the quantitative data about the geo-questionnaire respondents and methods used for recruitment. To evaluate the quality of the tool, the analysis of information collected from the respondents through geo-questionnaires and interviews was carried out.

The methodological background and characteristic of geo-questionnaire

Taking into account the complexity of urban planning, including the legally unregulated processes such as architecture and urban design competitions, it is necessary to search for new methods and tools facilitating the planning processes (Manzo 2003). Of potential use are the internet tools based on geo-information systems, supporting the engagement of the public in the processes of management and consolidation of local inhabitants (Kahila & Kyttä 2009, Brown & Kyttä 2014, Johnson et al. 2015). One of such tools is the geo-questionnaire combining the benefits of a standard questionnaire and a map, that is devised to provide information on the available space and different propositions of localisation of new objects and functionalities (Czepkiewicz & Jankowski 2015, Bąkowska 2016, Jankowski et al. 2016). Geo-questionnaire extends an online participatory mapping method originally developed as part of softGIS methodology (Kahila & Kyttä 2009) by providing respondents with point and polygon map sketching tools linked with questions comprising the questionnaire. The PPGIS tools such as the geo-questionnaire, available online, offer the advantage of the participation in consultations at any place and time (Carver et al. 2001, Kingston 2011).

The basis for the preparation of geo-questionnaire (Fig. 1) is the conception of public participation geographic information systems (PPGIS) defined by

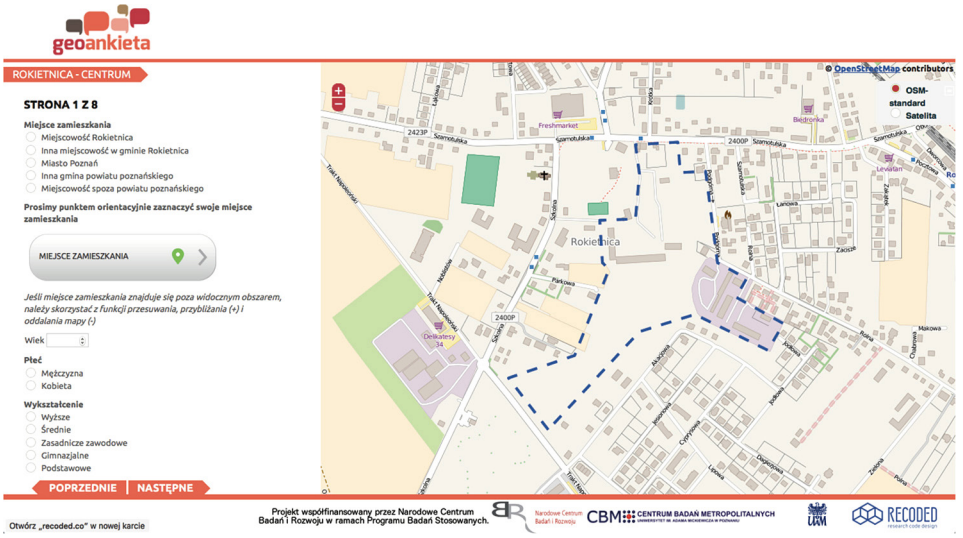

Fig. 1. An exemplary page of a geo-questionnaire performed in the first stage of public consultations on the local spatial management plan in Rokietnica. The questions ask about the demographic and education characteristics of respondents and the localization of the place of their living

Source: the authors' analysis.

Schroeder (1996) as "a variety of approaches to make GIS and other spatial decision-making tools available and accessible to all those with a stake in official decisions". By using the PPGIS tools it is possible to get information on the preferences of inhabitants that would supplement the professional capacity of the planners. PPGIS tools, if properly designed for the lay users and selected for the problem at hand, encourage the participation of inhabitants in the process of urban planning, help eliminate possible conflicts between particular groups of interest and give the grounds for proposing publicly acceptable solutions that are implementable and sustainable (Sieber 2006, Jankowski et al. 2016 after: Brown and Raymond 2014). The geo-questionnaires used in the study were prepared on the basis of SoftGIS methodology allowing the engagement of the inhabitants in the process of urban planning by collecting information on everyday life pathways, and sentiments related to specific sites and types of activities undertaken in a given space (Manzo 2003, Rantanen & Kahila 2008, Kahila & Kyttä 2009). This type of knowledge can be elicited through the online geo-questionnaires available also in the form of mobile applications. As a result, the information is available and stored in the form of databases ready for further analyses. According to Kahila and Kyttä (2009) the SoftGIS methodology is based on the knowledge of human geography, environmental psychology and urban planning as well as on the assumption of acquiring the knowledge by the scientifically justified, reliable and ethical methods. The methods should be developed in cooperation with urban planners and should allow the use of databases for spatial and statistical analyses. The geo-questionnaire in itself should be simple and user-friendly.

As mentioned in the introduction, the geo-questionnaire provides the information characterising the respondents, their spatial behaviour (e.g. the everyday life pathways), features of spatial organization of given sites relevant to the respondents, and respondents' preferences regarding the management of space in the future. With the use of an interactive map, the respondent can use the objects of three types: point, line and polygon to mark the sites relevant to a given question, e.g. localization of dwelling place or places important for the respondent. Moreover, in the follow-up to marking the places, pathways or areas the respondents are asked by the tool about different aspects of the marked objects, e.g. the frequency of visiting a given place or the quality of a given place. To fill in the geo-questionnaire, the respondents are required to have the abilities similar to those needed for working with the internet websites with maps, that is filling in and sending internet forms and using digital maps available from the level of an internet web browser (zoom in and out, drawing points, lines and polygons (Jankowski et al. 2016). The geo-questionnaire also contains questions not related to urban planning, e.g. demographic information on the respondent, or opinion on the questionnaire. These data can be used in the future for further analyses, e.g. of relations between a resident and the space of his/her life (Manzo 2003, Boroushaki 2010). The above information can be collected through the responses to open questions, single and multiple choice questions and other types of questions allowing the evaluation of certain aspects of a given space and preferences as to its future management.

The questions for geo-questionnaire should be constructed in the close cooperation with the recipients of its results such as local authorities, magistrate workers, urban planners, representatives of inhabitants of a given place, e.g. city council officials. This approach permits precise identification of the needs and expectations of the recipients and the adaptation of geo-questionnaire to the aims of further analyses, e.g. local spatial management plans. As a starting point,the specification of implementation is prepared. This document contains the planned schedule of implementation, spatial range, subject, target groups and respondents' recruitment methods, recipients of results, co-working persons, the form(s) of results delivery and planned way of their use, functional and technological needs of the tool and research and developmental aims that a given implementation should accomplish. On the basis of this document and consultations with the partners the content of geo-questionnaire are proposed to be further consulted within the institutions that are to receive the results. The questions in geo-questionnaire should concern the problems important from the point of view of the subject of consultation and elicit the reliable information for further urban planning processes, i.e. the results that can be applied for further analyses and the formulation of specific conclusions. An important point is that the respondents should remain anonymous, which is one of the prerogatives of digital democracy. The geo-questionnaire is prepared at first as a text and then it is transformed into a digital form, which requires the administrator authorization and access to a geo-questionnaire configuration panel. After the preliminary tests and the approval of internet version the geo-questionnaire is made available online for respondents.

To get a satisfactory sample of respondents it is highly recommended that the representatives of institution commissioning the questionnaire take part in the process of recruitment. The recruitment can be carried out by postal invitations, announcements in traditional media like radio, newspapers, tv and on the internet websites and social media, e.g. Facebook. According to the study by Jankowski et al. (2016), the most effective methods of recruitment are: the information in local media, postal invitations and social media (Facebook). However, the effectiveness may depend on the area of implementation and the subject matter, which is considered in the following section.

The temporal aspect of the geo-questionnaire depends first of all on the pace of work on a given project as indicated by e.g. the procedure of approval of local spatial management plans defined in the Act of Law on Land Use Planning and Management of 27 March, 2003. However, the recruitment period should not be shorter than 2 weeks to allow sufficient time for the application of various recruitment methods. In case of technical problems or errors (inaccuracies) raised by the respondents, it should be possible to rectify them and modify some geo-questionnaire elements. However, because of the database usually prepared before the deployment of geo-questionnaire, changes in the content of questions are to be avoided.

The outcome of the study is a database generated from the level of the application administrator in the form of a CSV[1] file and a spatial database e.g. in the.shp format. The database permits further analyses of results by qualitative and quantitative methods, mainly statistical. Final results of the analyses are presented to the recipients in the form of a full report or in a shortened version to be published in the internet or local press. Thanks to the use of GIS spatial analysis methods, the respondent answers can be grouped and analysed against the background of the present state of urban design (Kahila & Kyttä 2009). The result recipients can get information on the preferred ways of management of particular areas, problematic spaces that need to transformed, for example, due to the needs of traffic organization, or places that need to be protected because of their natural or cultural significance. According to the Polish law regulations, if the personal data are collected through the geo-questionnaire, the database must be submitted to the General Inspector for Personal Data Protection.

The areas of pilot studies with geo-questionnaire

The chosen case-studies are different in terms of location (urban/suburban), type of project (spatial development plan, transportation plan, investment plan for neighbourhood council, design of public space) and covered area (city as a whole, districts of inner city, market town and urban neighbourhood scale). Their selection reflects the broad complexity of contemporary urban planning and affords an opportunity to test usefulness of geo-questionnaires in various spatial contexts.

[1] CSV – comma-separated values

From the group of pilot implementations of the geo-questionnaire conducted during 2015 and 2016, five projects have been described in Table 1. Three of the implementations were performed in the Poznań agglomeration (P1, P2, P3), while the other two in the Łódź agglomeration (L1, L2) (Fig. 2). In all pilot studies, the use of geo-questionnaire in the consultation process was in the response to the planned or realised projects in the areas and was commissioned by the local authorities interested in the implementation of new methods of public participation in urban planning. Thus, the main partners and recipients of the geo-questionnaire results were the representatives of local governments and the assisting organisations involved in the urban planning of Rynek Łazarski (P1) and the Map of Local Needs in the city centre of Poznań (P3). When the subjects of consultations were local urban plans, the other important partners were the relevant urban planners[2].

Geo-questionnaire P1 was the first stage of a competition for the conception of modernisation of Rynek Łazarski in Poznań, which is a small (0.58 ha) market

Table 1. Specification of geo-questionnaire implementations in the areas of Poznań and Łódź agglomerations, in 2015–2016

Name	P1: Rynek Łazarski in Poznań	P2: Map of Local Needs in Poznań Centre	P3: New Centre of Rokietnica	L1: Act of law on advertisement presentation in Łódź	L2: Public transportation plan for Łódź
Spatial range	Rynek Łazarski in Poznań	Poznań Inner city	Rokietnica Centre	Łódź city	Łódź city
The area concerned	0.58 ha	1680 ha	16 ha	29 325 ha	29 325 ha
Aim of consultation	Rehabilitation conception of Rynek Łazarski in Poznań	Preparation of a Map of Local Needs in Poznan Centre	Plan of local urban development	Preparation of the Act of Law on Landscape Protection	Preparation of a Model of Sustainable Public Transportation for Łódź 2020+
Number of inhabitants	Św. Łazarz: 32 thousand Poznań: 542.5 thousand	Poznań Centre: 122.5 thousand Poznań: 542.5 thousand	Rokietnica: 5.5 thousand Rokietnica Commune: 15.5 thousand	701 thousand	701 thousand
Recipient of geo-questionnaire results	Municipal Authorities of PoznańŁazarz Neighbourhood Council, Targowiska Ltd. (operator)	Municipal Authorities of Poznań Centre, Neighbourhood-Councils	Rokietnica Commune Authorities, local urban planning unit	Municipal Authorities of Łódź	Municipal Authorities of Łódź

Source: the authors' research.

[2] In the majority of regional capitals in Poland there are special units called Municipal Urban Development Studios responsible for urban planning, in smaller cities urban planning is performed by firms selected by tender procedure.

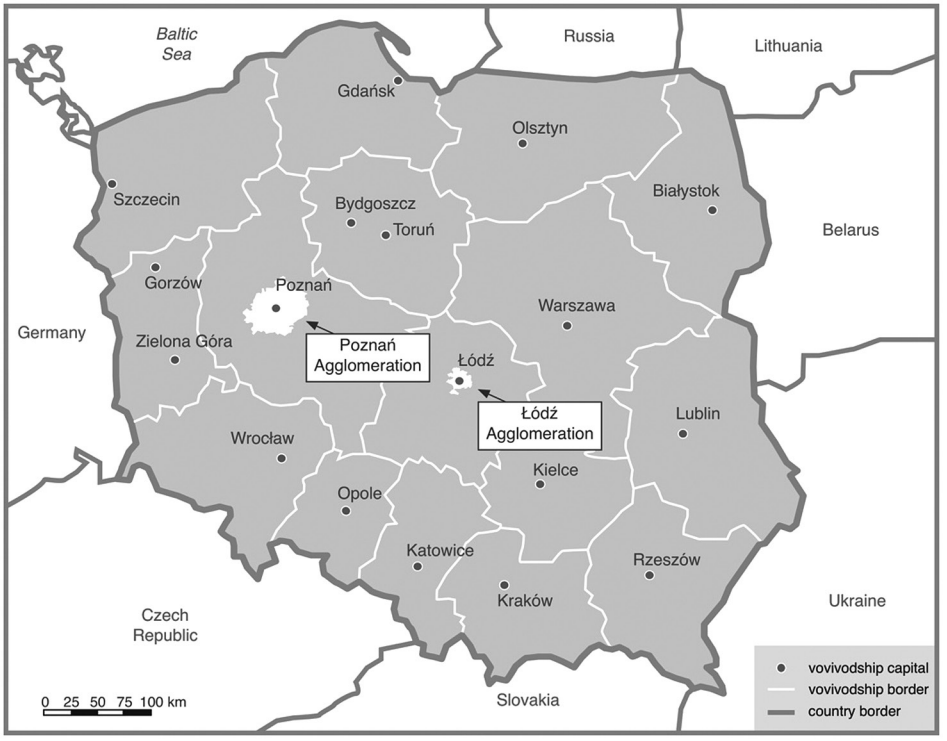

Fig. 2. The location of Poznań and Łódź agglomerations
Source: the authors' compilation.

place in the Poznań city. The aim of the competition was to find ways of increasing the attractiveness of Rynek Łazarski by endowing this place with new social and cultural functions, reduction in degradation of this area, and the introduction of new attractive elements that would create high quality common space. These aims were in full agreement with the Strategy for Poznań City Development till 2030. The geo-questionnaire was addressed to the inhabitants of the city district of Łazarz and to all inhabitants of Poznań. It should be emphasised that the Św. Łazarz housing estate belongs to the demographically oldest city districts, the inhabitants below 25 years of age make less than 10% of all its residents, while those above 60 year of age make about 25%.

The aim of geo-questionnaire P2 was the diagnosis of the living conditions in the Poznań City Centre on the basis of opinions of inhabitants and users of the housing estates: Jeżyce, Ostrów Tumski-Śródka-Zawady-Komandoria, Stare Miasto, Św. Łazarz and Wilda. The results were used for further stages of preparation of the Map of Local Needs of Poznań Centre within the Integrated Project of Poznań City Center Renewal and Development, for the period 2014–2030. The Map of the Local Needs of Poznań Centre was made to specify the needs and expectations of inhabitants of the region in such fields as safety improvement, infrastructure modernisation, cleanliness and development of common spaces. The

centre of Poznań is inhabited by 122.5 thousand people, but the questionnaire was addressed to all inhabitants of Poznań.

The aim of geo-questionnaire P3 was to assist in making local urban development plans for the centre of Rokietnica village (Poznań agglomeration). The centre of the village is the most diverse in spatial organisation and comprises different types of buildings and functional sites. According to the general concept of urban development in this area, the changes in Rokietnica centre should aim at intensive instead of extensive land use involving the introduction of higher density urban growth and shaping the space that would have central functions. The geo-questionnaire was addressed to the inhabitants of the village of Rokietnica and the whole commune.

Geo-questionnaire L1 was the preliminary procedure for preparation of the Act of Law on Landscape Protection for Łódź, prompted by the new legal regulation for the whole country (the Act of Law of 24 April, 2015, on modification of certain acts of law imposed by the increased level of landscape protection). The aim of the geo-questionnaire was the identification of advertisements and the means of advertising that are positively and negatively evaluated, identification of sites that should be directed to by the city system of signposts, delineation of paths leading to malls, shops and services in order to find most effective places for advertisements, and getting opinions on some particular regulations within the landscape protection zones. The questionnaire was addressed to all inhabitants of the city of Łódź.

The geo-questionnaire regarding the model of sustainable public transportation in Łódź, L2, was also addressed to all inhabitants of this city. It was an element of consultations of the Model of Sustainable Public Transportation for Łódź for 2020+. The problems covered in the questionnaire included: the evaluation of the availability and quality of public transportation, and the public transportation means used and proposed changes in the system.

The above described geo-questionnaire implementations were characterised by different spatial ranges and different objectives. The implementations in the Poznań agglomeration concerned specific areas being parts of the entire administrative unit, while those in Łódź concerned the entire city. Nevertheless, the questionnaires were addressed to all inhabitants of the respective cities. Different objectives of the questionnaires permitted testing their effectiveness in application to different problems and preparation of the standard plans of geo-questionnaire implementation.

Analysis of the geo-questionnaire implementation

The total number of respondents taking part in the study (in all five implementations) was 4054. The time of access to the geo-questionnaire was two weeks for 4 questionnaires (Table 2), while for the questionnaire regarding the new centre of Rokietnica (P3) the access time was 4 weeks. The extension of the access time was related to the limitations related to the time of Christmas and New

Table 2. Specification of geo-questionnaires implemented in the Poznań and Łódź agglomerations in the years 2015–2016

Name	P1: Rynek Łazarski in Poznań	P2: Map of Local Needs of Poznań Centre	P3: New Centre of Rokietnica	L1: Act of Law on advertisement presentation in Łódź	L2: Public transportation plan for Łódź
Access time	3–16.12.2015	14–31.03.2016	14.12.2015–17.01.2016	27.11–7.12.2015	28.02–14.03.2016
Number of respondents	386	709	435	137	2387
Percentage of inhabitants	0.9%	0.58%	7.91%	0.02%	0.34%
Methods of recruitment according to effectiveness	Social media (51.6%) Internet information portals (18.2%) City Hall website (5.4%)	Social media (58.7%) Internet information portals (9.7%) City Hall website (4.2%)	Social media (31.9%) Commune Office website (19.2%) Postal invitation (8,7%) Internet information portal (7.5%) Traditional media (6.3%)	No data	No data
Geo-questionnaire sections	(I) personal data, (II) hitherto forms of the space use, (III) directions of modernisation of Rynek Łazarski, (IV) expected urban development in Rynek Łazarski (V) evaluation of the geo-questionnaire	(I) personal data, (II) sites visited in Poznań city centre (III) mobility (IV) evaluation of dwelling conditions, (V) evaluation of the space quality, (VI) evaluation of the geo-questionnaire	(I) personal data, (II) sites visited and perception of space, (III) directions of urban development (IV) public transportation system, (V) service infrastructure (VI) developmental potential of the site, (VII) Evaluation of the geo-questionnaire	(I) personal data, (II) preferred forms of advertisements (III) landscape protection zones, (IV) evaluation of space in the context of advertisements presentation (V) evaluation of the geo-questionnaire	(I) personal data, (II) use of public transportation, (III) evaluation of public transportation functioning, (IV) expected changes in public transportation, (V) evaluation of the questionnaire

Source: the authors' analysis based on the geo-questionnaire implementations results.

Year celebrations and to the decision of using postal invitations delivered to all households in this village. The high percentage of inhabitants taking part in the geo-questionnaire on the new centre of Rokietnica is interpreted as the result of longer access time and the effectiveness of communication with inhabitants via

the internet website of the Rokietnica Commune Office. The postal invitations were declared as effective by 8.7% respondents, which is rather insignificant, in particular when taking into account the cost of this way of promotion, while the cost of the other recruitment channels was zero or included in the cost of the Commune Office functioning.

The subjects of consultations via geo-questionnaires were chosen on the basis of SWOT analysis defining the research potential of implementations and representing a range of different problems so that the effectiveness of the questionnaires could be tested on a number of problems (Table 2). The aim of this stage of study was to create a tool of the highest possible universality taking into account its further commercialisation. Each questionnaire also collected information on the respondents such as: age, sex, education, dwelling place and the open question that permitted expressing the opinion on the application and the form of public consultation. The open questions were of the same character in each questionnaire to help make comparisons. The geo-questionnaires included also the sections concerning the evaluation of the way of using a given space, preferences of its use or preferences for future urban development of a given space. The questions in these sections were formulated to best correspond to specific aims of each consultation. The differences are particularly pronounced in the questionnaire P3 on the new centre of Rokietnica. The area in question was poorly developed, which implied the questions concerning mainly its future use including the intensity of buildings, functions of the area, localisation of public spaces and the development of new communication lines.

Characteristic of respondents

The information provided by the geo-questionnaires permitted the generation of a database that could be used for the characterisation of respondents and for eliciting opinions on the questionnaires.

Concerning the age structure of the respondents, the group of 20–39 years old was represented by the highest number of persons, while the group of persons over 50 years of age was the poorest represented (Fig. 3, 4). The disproportions are particularly pronounced taking into account the age structure of Łódź and Poznań Agglomerations, where the persons over 50 years of age make a large population group (47.4% in Łódź and 39.3% in Poznań Agglomeration). In Łódź the persons in the age interval of 20–39 represent the 30.6% of the population, while they made 78.8% of all respondents. In Poznań Agglomeration the age group of 20–39 years old represents 35.9% of the population, while they made 68.1% of all respondents. It should be noted that the age structure in the areas of particular implementations could be different as Rokietnica belongs to the communes of the youngest populations, while the populations of Łódź and Poznań are much older. The underrepresentation of certain age groups suggests the need to develop tools better suited for elderly persons or more attractive to the younger people.

With reference to the study by Kaczmarek & Wójcicki (2015), the age structure of geo-questionnaire respondents is the reverse to that of the respondents

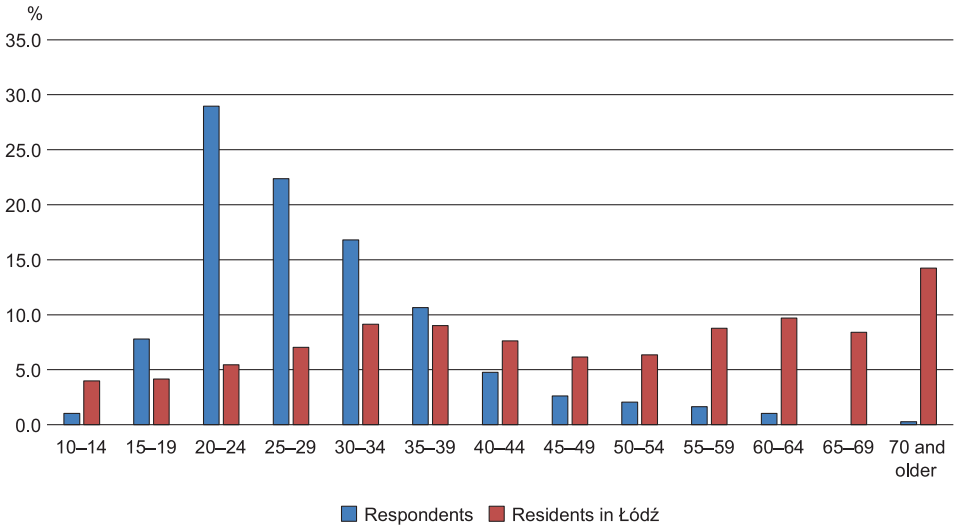

Fig. 3. Age structure of geo-questionnaires respondents taking part in the implementations in Łódź in comparison to the city age structure

Source: the authors' research based on the geo-questionnaire results and the Central Statistical Office of Poland data.

of public consultations performed by traditional methods, i.e. consultation meetings. The age structure of the total of 382 questionnaire respondents who participated in 26 consultation meetings revealed a significant domination of the

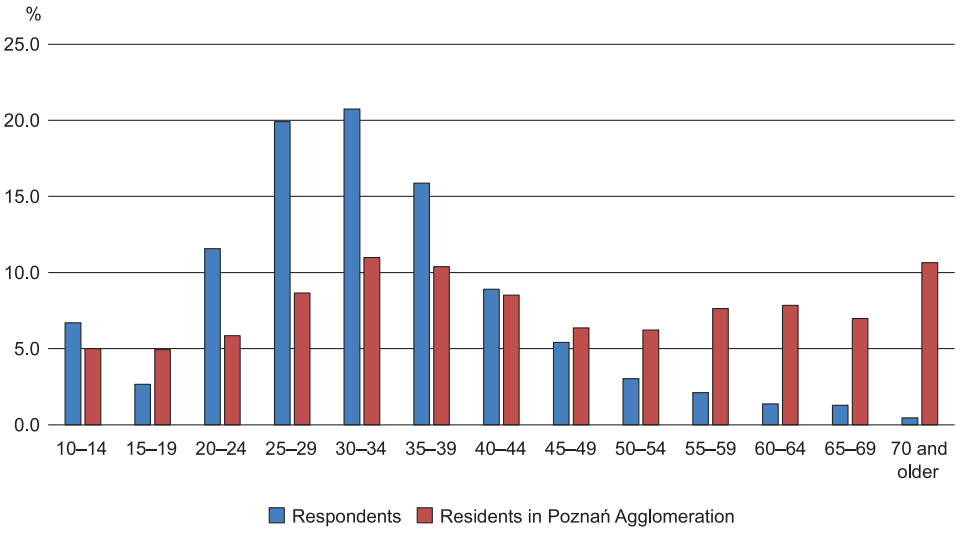

Fig. 4. Age structure of geo-questionnaires respondents taking part in the implementation in Poznań Agglomeration in comparison to the city age structure

Source: the authors' research based on the geo-questionnaire implementation results and the Central Statistical Office of Poland data.

Table 3. Education structure of geo-questionnaire respondents compared with the education structure of Polish society.

	Higher education	Secondary education	Vocational education	Lower secondary and primary education
Respondents of geo-questionnaire	59,9%	32,0%	3,3%	4,7%
Polish society	22,3%	33,4%	24,4%	19,9%

Source: Own elaboration based on the geo-questionnaire implementations results and Central Statistical Office of Poland data.

persons over 50 years of age. This result suggests that the geo-questionnaire study may complement the traditional consultations by involving the less active demographic groups.

The majority of respondents both in Łódź and Poznań Agglomerations were men. The feminization factor of the respondents in Łódź reached 67 and in Poznań Agglomeration 83. The factor levels in both areas indicate the significant under-representation of women, especially when compared to the feminization factor in both cities: 120 for Łódź and 111 for Poznań Agglomeration. The analysis of respondent educational attainment reveals that the most active group was that of persons with university level education, 59.9% (Table 3), then the persons with high school (32.0%), middle school (3.5%), vocational (3.3%) and elementary education (1.3%). The education structure of the geo-questionnaire respondents shows a significant over-representation of persons with higher education in comparison with the lower levels of education (vocational, lower secondary and primary).

Evaluation of geo-questionnaire by result recipients

Following the completion of the geo-questionnaire study and reporting its results, the implementation of the questionnaire was evaluated by the study team, result recipients, and respondents. Analysis of the comments and reservations toward the method and the tool permitted the introduction of certain modifications in subsequent implementations and in the software, which e.g. resulted in an increase in the number of respondents.

In evaluating the interviews conducted mostly with the representatives of authorities commissioning the study, apart from many positive comments also the improvement directions were pointed out. Based on the interview responses and comments, the geo-questionnaire implementation has resulted in increasing the number of inhabitants engaged in the urban planning process, however, the potential of geo-questionnaire has not been fully realized. In the case of the Map of Local Needs in Poznań, the implementation required additional stages relative to those in earlier years, which was mainly related to consultations with the representatives of housing estate (at the beginning of the process of map making) and due to the workshop held to sum up the results. In the opinion of the evaluating persons, the use of geo-questionnaire facilitated collecting opinions

on the matters related to the respondents' dwelling place but had no particular effect on their further engagement, which was illustrated by the poor turnout at the above-mentioned workshop. On the one hand, the low level of inhabitants engagement may follow from the low effectiveness of officials responsible for information in subsequent stages of consultations, while on the other hand, it suggests the need for new solutions in the geo-questionnaire application (internet, cell phones and tablet application formats) to permit keeping in touch with respondents (e.g. collection of contact data) and informing them about further stages of work or a continuation of the geo-questionnaire in the form of geo-discussion.

According to the recipient of results, the study with the use of geo-questionnaire provided new valuable information as the inhabitants knew a given area much better than the officials. This observation means that the geo-questionnaire satisfied one of the main objective of PPGIS, which is to derive new information on a given space from its actual users.

The results of the geo-questionnaire performed as the first stage of public consultations on the urban planning of the centre of Rokietnica were submitted to the responsible planners. Because of the limitations following from the Study of Conditions and Land Use Development in Rokietnica, not all postulates could be adopted. The most important result of the consultations was the reduction in the planned density of buildings. At the subsequent stage of planning process, the plan of urban development will be subjected to public discussion. The outcome of consultations on the Map of Local Needs of Poznań Centre was the determination of the investment priorities in the housing estates aimed at modernisation of public space, maintenance of cleanliness, and safety.

Evaluation of geo-questionnaire by respondents

From among all respondents, 240 persons or 5.9% of the total number of respondents, expressed their opinions on the geo-questionnaire (Fig. 5). The vast majority of them, 79.5%, were positive about this method of consultations, while only 3.35% gave negative evaluations, the other 17.15% of respondents did not take a particular pro or con position.

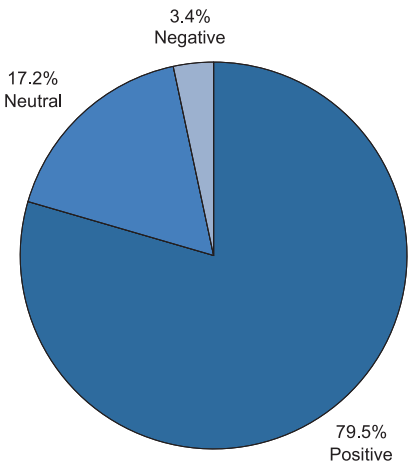

Fig. 5. Evaluation of geo-questionnaire by respondents
Source: the authors' analysis based on the geo-questionnaire implementations results.

Positive opinions were expressed about the form of consultation (77.0%) in particular on the possibility of indicating some problems or solutions on the map. Other positively evaluated aspects included the possibility of further use

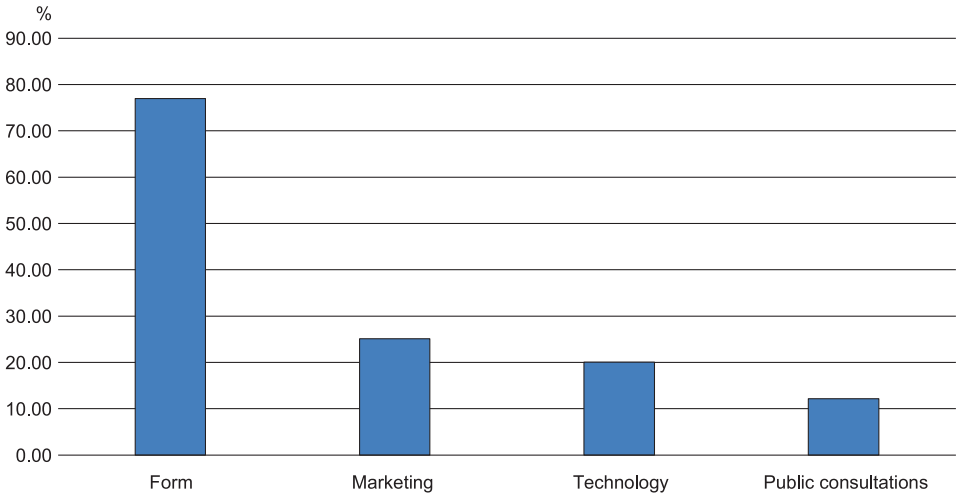

Fig. 6. Structure of respondents' opinions on some aspects of the geo-questionnaire [n=239]
Source: the authors' analysis based on the geo-questionnaire implementations results.

of geo-questionnaire for consultations of urban development in the cities and communes (Fig. 6), the possibility of taking part in the study via the internet, which ensures anonymity and gives more freedom of expression. The respondents indicated the need for consultations on all matters related to their dwelling place via the internet. Over 20.1% of the opinions concerned the technological aspects, construction of questions, possibility of their simplification or the lack of the ability to use map application (Fig. 6). The other opinions referred to the positive aspects of the consultation process and insufficient information on the geo-questionnaire study, the latter reservations appeared only in regard to the first implementation L1 on the act of law on advertisement presentation in Łódź. Some comments expressed the anxiety about the future use of the geo-questionnaire results.

Conclusions

The above described results of geo-questionnaire implementations in collecting public preferences on urban planning issues at 5 areas revealed the versatility of geo-questionnaire use. The implementations and their evaluation have indicated the possibility of further development of geo-questionnaire based on its information collection potential not only in urban land use planning (preparations of local spatial management plans), but also in advertisement policy, public transportation solutions, or monitoring the needs of inhabitants on the scale of city districts.

Demographic structure of respondents revealed significant differences with respect to that of the whole country, which suggests the need for the tool devel-

opment to better address the diversity of abilities, needs, education levels, and expectations of users of a given space (Kahila & Kyttä 2009). The modifications of the method should be preceded by studies evaluating technological skills of respondents and their visual perception abilities taking into account the under-representation of some age groups among the respondents. An important challenge is to reduce the disproportion in the representation of respondents with different levels of education. In this context of key importance is increasing the awareness of society about the need and the possibilities of participation in local decision making processes. Another important point is to develop methods of participant recruitment that ensure the representation of different social groups.

Undoubtedly the proposed method of collecting public preferences has been appreciated by the respondents, however, they expressed the anxiety about the actual impact of geo-questionnaire results on urban planning decisions. This aspect however, is independent of the tool and is mainly the responsibility of local authorities and planners. The geo-questionnaire can only be supplemented with some elements that could facilitate contact with respondents and improve the clarity of the consultation process. In this respect a particular role of urban planners has to be emphasised; for some time already their responsibilities have included not only urban planning but also communication with inhabitants and mediation in conflicts between different groups of interests (Taylor 1999).

To sum up, the above described and discussed results of geo-questionnaire studies indicate that further development of this application should concentrate on extending its availability and increasing its attractiveness to persons of different age and different educational backgrounds. The actual work with geo-questionnaires should be more intuitive and simple, and the methods of recruitment of specific groups of respondents should be improved. In order to increase the awareness of the significance of participation in public consultations with the use of PPGIS, the efforts should be made to develop a possibility of tracing the decision making pathways and to ensure the direct contact with representatives of the institutions commissioning the consultations. In view of the above, the geo-questionnaire should be transformed from a tool for collecting information through a tool for contact with authorities to becoming an interactive platform for communication and monitoring the decisions and their realisations. Such a platform should eventually permit the presentation of simulated effects of decisions made and postulates proposed by the respondents.

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Geoankieta w planowaniu przestrzennym – wstępne wyniki eksperymentalnych wdrożeń w Polsce

Streszczenie: Zmiany w podejściu władz lokalnych do udziału społeczeństwa w procesach decyzyjnych wpływają na rozwój nowych metod partycypacji społecznej. W obszarze planowania przestrzennego szczególny potencjał znajduje się w tzw. partycypacyjnych systemach informacji geograficznej (ang. *Public Participation GIS*, PPGIS). Jednym z tego typu narzędzi jest geoankieta, łącząca w sobie zalety tradycyjnej ankiety i mapy, dającej możliwość udzielania informacji w odniesieniu do istniejących miejsc w przestrzeni oraz wskazywania przez respondenta lokalizacji nowych obiektów i funkcji. W oparciu o pilotażowe wdrożenia realizowane w wybranych miejscowościach w Polsce przedstawione zostały wstępne wyniki implementacji geoankiety w kontekście różnorodnych opracowań o charakterze przestrzennym.

Słowa kluczowe: geoankieta, PPGIS, partycypacja społeczna, planowanie przestrzenne

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Collaboration in planning: The Geodesign approach

Abstract: This paper proposes a critical review of Geodesign methods and techniques which can be used to carry out collaborative design in participatory processes. The case study of a Geodesign workshop held in 2016 Cagliari (Italy) shows how it is possible to involve teams of members of the community in what is perhaps the most critical phase of a spatial planning process that is putting knowledge into action through the collaborative design of future change alternatives, and their choice based on negotiation. In addition, a discussion of further potential of the Geodesign approach in public participation is discussed with reference to both knowledge creation and community value and preferences accounting.

Keywords: Collaboration, Geodesign, Planning Support Systems, Planning Process

Introduction

Planning literature proposes different paradigms (Khakee 1998) for interpreting the concept of public participation in spatial planning, ranging from early advocacy planning approaches (Davidoff 1965) to more recent communicative ones (Innes, Booher 2010). Different approaches highlight different perspectives on participation, including expression of pluralist community views, preferences, and values, creation of better knowledge, better transparency, and more consensus in decision making.

While the Arnstein's Ladder (1969) can be still considered a reliable model to describe different degree of participation, ranging from none to full citizen control, most recent studies propose its revised application to the realm of current digital practices in spatial planning (Kingston 1998, Carver 2001). As shown in Figure 1, Kingston (1998) and Carver (2001) argue that the highest levels of participation are achieved when citizens are actively involved in designing possible