Management of Local Community Social Capital when Solving the Problems of Urban Environment Pollution with Solid Municipal Waste

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Abstract. It is in the cities where the issues of environmental protection are of paramount importance. It is there where the problem of using the social capital of the local community for the purposes of urban environment development and improvement arises. The relevance of the research under consideration and the degree of its scientific development allow us to define a scientific problem: an apparent contradiction between the need to solve the problems of improving and developing urban environment using the resources of the local community and the insufficient scientific and practical consideration and development of the issues of management the local community social capital to solve this problem. The management of local community social capital relies on configuring relative network of the local community actors for the implementation of joint prosocial activities in urban environment. The authors developed a management technology based on the use of geographic information systems together with the technology of crowdsourcing; the proposed technology allows solving the problems of urban environment pollution with solid municipal waste.

1. Introduction
A characteristic feature of modern society is a process of urbanization which forms a special environment of living activities – urban environment. It is in the cities where the problem of environmental protection is of paramount importance. To a large extent, its solution is within the competence of urban communities (both the population and local authorities), and is associated with joint activities aimed at developing and improving the city environment. In these conditions, not only the task of organizing the population of the city to work on creating a comfortable living environment foregrounds, but the task of using the potential of the consolidated social ties of the representatives of urban community to achieve this goal. In the conditions of the social media domination, this task can be achieved by using crowdsourcing Internet websites that allow people to organize themselves for the purpose of developing and improving the places of their residence.
2. Relevance, scientific significance of the issue and a brief literature review

Social capital is in the focus of such researchers as P. Bourdieu [3], O. Demkiv [7], R. Putnam [18, 19]; its significance for the society as a whole is analyzed by N. K. Lebedeva, O. A. Lomovtseva [13], L. W. Pye [20], N. E. Tikhonova [22], M. Folley, B. Edwards [9], V. N. Yakimets [24]; its significance for regional and municipal communities is considered by S. N. Levin and E. A. Korchuganova [14]; the role of social capital in human living activities is discussed by E. M. Avramova and D. M. Loginov [1], J. Coleman [6], E. L. Glaester [10], N. M. Davydova, N. E. Tikhonova [23] analyze the approaches to social capital assessment and the formation.

Both foreign (D. Brabham [4], D. Baker [2], G. Rheingold [21], J. Howe [11]) and Russian researches (D. V. Maslanov, E. V. Maslanov, I. S. Podsevatkin [15], I. R. Nasyrov, I. L. Saveliev [16]) cover the issues of application of crowdsourcing technology in management, including in social management.

However, despite the increase in the number of publications on this issue, there are no researches, which mutually ‘dovetail’ management issues and the capitalization process, including in terms of social technologies for the implementation of this process.

3. Problem statement

The relevance of the research under consideration and the degree of its scientific development allow us to define a scientific problem: an apparent contradiction between the need to solve the problems of improving and developing urban environment using the resources of the local community and the insufficient scientific and practical consideration and development of the issues of management, the local community social capital to solve this problem.

4. Theoretical and methodological backgrounds of capitalization management

The term ‘urban environment’ refers to a set of conditions of population daily living activities in an urbanized area. Local authorities can influence the state of urban environment through its development and improvement, that is, the creation of comfortable and favourable conditions for population daily living activities within the boundaries of the municipality. Urban area development and improvement is a set of measures aimed at creating favourable socio-cultural conditions of population living, work and leisure within the boundaries of the municipality and is carried out by local governments, individuals and legal entities. Urban environment development and improvement involves urban planning; use of natural resources (land, water bodies, subsoil); public utilities and amenities (electricity, heat, gas, water supply, water disposal, fuel supply); road activities; landscaping, waste management, environmental protection. According to the Federal Law of the Russian Federation No. 7-FZ “On Environmental Protection” dated January 10, 2002, local governments are responsible for the ecological state of the entire jurisdictional area and shall assist citizens in the realization of their rights in the field of environmental protection. Among the problems of urban development and improvement, the sanitary and hygienic issue of urban environment pollution with solid municipal waste, especially in the form of unauthorized landfills, holds a key position.

In most cities, there are no necessary amount of material and financial resources for the complex solution of the problem outlined above, but there are huge social resources that can grow as local communities develop, forms of self-government improve, changes in people occur as part of the process of self-actualization of their essential forces, formation of civil self-consciousness [12]. Therefore, the problem of ‘unpacking’ these resources actualizes to reduce the severity of the problem of pollution with municipal waste.

A city is not just an area, a number of buildings and structures, institutions and enterprises, but also a local community as an association of people linked to the given area by common interests, living at distances within which daily communication with each other is possible [17]. The effectiveness of this interaction depends on the local community social capital. In this regard, at the level of urban community, the process of capitalization shifts to the focus of management.
Social capital is a local community resource, which is formed due to the presence of certain social qualities of its representatives and the relative social network, orienting them to each other and to solving a socially significant problem. The formation of social capital begins only when the level of individuals’ readiness and ability to use the opportunity for interaction within the community is sufficient to organize joint activities to make responsible and collective decisions on socially important problems of the local community. Social capital is capable of providing a synergistic effect by structuring social relations and links of a local society. It facilitates the achievement of the goal of urban environment development and improvement consolidating the efforts of individuals.

Social capital of a local community is characterized by a social initiative, participation and trust. A social initiative is readiness of the members of a local community to actively participate in solving socially significant problems. Social participation is a kind of activity aimed at meeting public interests. Social trust is the expectation that local community representatives when performing their social functions will behave predictably, in accordance with the rules adopted by the given society. A social initiative, participation and trust represent social capital at the institutional (interaction with local authorities, non-governmental organizations, and business structures) and personal (interaction with family, friends, colleagues, neighbours) levels.

Capitalization is considered as a transformation of individuals’ social resources into the social capital of a local community as a result of which social capital increases, which opens up the possibility of its self-reproduction. Capitalization process management is a kind of social management implemented by local authorities. It is treated as a two-contour process: 1) primary capitalization is a formation of the readiness of the members of a local society for communication, their ability to use contacts and relationships for the implementation of socially useful collective activities and responsibility to the local community for the results of collective activities; 2) secondary capitalization is a creation of conditions for social capital reproduction and its implementation in relation to solving socially significant problems (as it was mentioned above, in the conditions of urban environment they include problems of development and improvement, solving the problems of urban environment pollution with solid municipal waste is among them). The scope of the social capital management process involves configuring a relative network of stakeholders who are oriented to a common problem and to each other. Local governments are the driving forces of the process of local society self-organization for implementing joint activities for the development and improvement of urban environment.

5. Assessment of the possibility of using social capital for solving the problems of urban environment development and improvement

An expert survey of the 27 representatives of governmental authorities, public and commercial organizations, workers of scientific and educational institutions of Kursk region was conducted using the Delphi method with a 14-days interval between the polls in 2018. The survey showed that it is possible to involve population in solving socially significant problems mostly in the sphere of city development and improvement on a voluntary basis; it is in this sphere that the influence of the population activities on the living activities of the local community is great. Apparently, development and improvement is recognized as an activity that is in the joint area of responsibilities of the representatives of urban community and local authorities as well as the possibility of its implementation on a parity basis. Hence, the process of configuring the relative network of the local community actors is most effective if it is aimed at development and improvement of urban environment as a whole or at solving its separate problems.

In the city of Kursk, which occupies a median position in terms of social and environmental indicators, a diagnostic study was conducted (543 respondents over the age of 16 years, 2016-2017); its results are given below.

Firstly, ¾ of the respondents expressed their willingness to maintain the communication system necessary to achieve their life benchmarks. More than 70% of the respondents admit the capability for using the possibilities of the communication system of the urban community for implementation of socially active living activity (38% – fully and 39% – to a large extent). The survey showed that 79% of the
respondents have responsibility (48% – fully and 31% – to a large extent) for what is happening in the city. Individuals’ motivators to enter relative networks to improve urban environment are the desire to be helpful to people and implement their own ideas; communication with interesting people and establishing new contacts and acquaintances, which indicates the predominance of the motives of self-realization and involvement.

Secondly, the analysis of the level of demonstrating social initiatives, participation and trust, as components of a local community social capital was carried out at the personal and institutional levels. Social initiative is pronounced at the personal level more than at the institutional level, which is expressed in citizens’ readiness to build up constructive relationships with the close environment and the desire to participate in the environmental improvement activities organized by them and, on the contrary, in the unwillingness to build up constructive relationships with local NGOs, business, and governmental authorities and the reluctance of citizens to take part in the improvement of the city environment, organized by them. The main form of initiative is treated as immediate activity aimed at the city improvement (for 51% of the respondents such activities include unpaid subbotnics (Saturday cleaning days), volunteering). Social participation was analyzed based on the respondents’ answers to the question concerning the participation of citizens in public events aimed at creating a favourable urban environment. The most common social event is the work on collective improvement of areas (subbotnics). Half the population of Kursk was engaged in the activities. Social trust was treated as a tool of social self-regulation and maintaining the integrity of the local community. More than 90% in all groups of the respondents trust family members, relatives and friends; 63% and 79% trust immediate surroundings, that is colleagues and neighbours respectively; 41% of the citizens trust local NGOs; the respondents rather do not trust local business (39%), than trust (34%) it; 41% of the interviewees do not trust the local authorities, and only 1/3 of them trust the bodies. Thus, the capitalization process is carried out in the conditions of disproportions between the personal and institutional levels of social trust, initiative, and participation of the population, which leads to the preferential inclusion of the representatives of the immediate surrounding as actors in the process of development and improvement of the urban environment.

Thirdly, the capitalization process can be carried out with the help of social media, which, in the opinion of half of the respondents, contribute to attracting the population to participate in the events aimed at development and improvement of the city, primarily to the fight against pollution of the urban environment with solid municipal waste.

6. Development of crowdsourcing technology for social resources capitalization for solving the problems of urban environment pollution with solid municipal waste

Based on the theoretical backgrounds and the conducted empirical research, the authors carried out a comprehensive development of the corresponding technology at three levels: 1) scientific and organizational level, 2) formalized-descriptive level, 3) procedural, activity-centred level.

It is determined that at the scientific and organizational level the theory of the network society structures (M. Castells [5]), the theory of social capital (P. Bourdieu [3]), semi-sociopsychological approach to communications (T. M. Dridze [8]), the theory of crowdsourcing (J. Howe [11], D. Brabham [4], D. Baker [2]) form the framework of the technology. Application of these theories and approaches allows us to address social capital to the solution of the problem of urban environment pollution with solid municipal waste.

At a formalized-descriptive level, the goal, the subject, the object and the tool for implementing the technology were determined. The purpose of the latter is to consolidate the efforts of the representatives of the local community for solving the problems of urban environment pollution with solid municipal waste. The object is a relative network of actors involved in the activities aimed at solving the identified problem. Social capital management is carried out by a communal subject, which includes representatives of local governments and local society as well as a social and technical support service. The staff of this service should include a specialist qualified in the field of IT-technologies and a project moderator to provide its proper work. The responsibilities of the programmer-technician include the monitoring of the implementation, operation and updating of software, periodic diagnostics of crowdsourcing site, assistance
in the application of modern technologies. The project moderator responsibilities are to organize the process of performing collective work, ensuring the communicative component of the group, directing the course of negotiations in the required area, focusing the team’s attention on the objectives and characteristics of the problem under discussion. It should be noted that the community subject is organized as an off-site project team which is formed with a specific purpose and uses information technologies for effective joint activities. The tasks of the representatives of the local community include identification of solid municipal waste (SMW) landfills which should be primarily eliminated. The representatives of the scientific (expert) community determine the hazard class and the possibility of elimination without special equipment, and the delegated representatives of the authorities act as organizers of the implementation of the decision. The project team is responsible for organizing such processes as planning and interaction management among participants. The team function communicating virtually; its members activate the execution of the processes at current stages by the stakeholders, determine practical limitations and the necessary results at each stage. The mission of the project team is to achieve consensus and create an effective exchange of views and experience among all the members.

The tool for the capitalization process is crowdsourcing which allows implementing projects on specialized websites – electronic interactive Internet sites based on social networks. The implementation of the technology is possible by means of a special application through geographic information systems, opening up the possibility of geovisualization of problem areas (SMW landfills) and the results of joint activities.

At the procedural, activity-centred level, the technology of socialized capitalization is an algorithm for the actions of a communal subject in configuring the relative network of the local community actors for carrying out joint prosocial activities in the field of the city development and improvement. The technology of capitalization is implemented using a basic algorithm (an algorithm for organizing crowdsourcing activities) which includes the following processes: 1) plotting the places which need development and improvement on the electronic map by citizens; 2) creation of a single database containing complete information about such places; 3) automated calculation and visualization of the degree of ‘disadvantage’ based on the data provided by users; 4) informing about an upcoming event on development and improvement of the area. An example of the implementation of these operations is the project of the Southwest State University (Kursk, Russia) on conducting an assessment of the risk of unauthorized landfills of the city and informational support for the management decision-making process based on this assessment (GIS application “Unauthorized landfills of the settlement” - URL: http://dev.im46.ru).

Crowdsourcing activities per se are effective at the initial stages of introducing geographic information systems when the latter are perceived as something new by the local community. For the reproduction of social capital on a regular basis, it is necessary to expand the basic capitalization algorithm through the following processes: 1) involvement of social population groups in the decision-making concerning the problems of the pollution of urban environment with solid municipal waste; 2) involvement of the citizens in joint activities aimed at their solution; 3) the formation of participants’ loyalty to a crowdsourcing platform based on geo-information systems; and 4) the creation of a self-reproducing relative network of stakeholders representatives.

7. Conclusion
The management of the local community social capital relies on configuring the relative network of the local community actors for the implementation of joint prosocial activities in the urban environment. It is most effective if the process is focused on the development and improvement of urban environment. The authors developed a management technology based on the use of geographic information systems together with the crowdsourcing technology, which allows solving the problems of urban environment pollution with solid municipal waste.
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