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TÍTULO: Limitaciones y factores de desarrollo de la esfera de realización en la megalópolis.

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RESUMEN: Este documento hace un análisis de correlación para explorar la actividad de la Prefectura de Okrug Administrativa del Norte de Moscú con respecto a la mejora del área. Un análisis ha revelado una alta dependencia de las actividades de mejora del área de la situación económica y de los ingresos en el presupuesto de la capital. Para ayudar a superar esta dependencia, los autores proponen promover el autogobierno directo, con una parte de los deberes redistribuidos en la esfera del mejoramiento del área a favor de esta última. Los hallazgos del análisis de correlación de los autores y el estudio de la dinámica de ciertos indicadores indican una efectividad insuficiente en el gasto de fondos públicos en la mejora del área en el Okrug.

PALABRAS CLAVES: Mejoramiento del área, administración de gestión, control público, megalópolis.

TITLE: Limitations and development factors of the sphere of realization in the megalopolis.

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ABSTRACT: The document makes a correlation analysis to explore the activity of the Prefecture of Administrative Okrug of Northern Moscow with respect to the improvement of the area. An analysis has revealed a high dependence on improvement activities in the area of economic situation and income in the capital's budget. To help overcome this dependence, the authors propose to promote direct self-government, with part of the redistributed duties in the sphere of improving the area in favor of the latter. The findings of the correlation analysis of the authors and the study of the dynamics of certain indicators indicate an insufficient effectiveness in the expenditure of public funds in the improvement of the area in the Okrug.

KEY WORDS: area improvement, management, administration, public control, megalopolis.

INTRODUCTION.

Area improvement is a set of activities related to land use engineering and safety provision, landscaping, paving, lighting, and the siting of small architectural forms and items of monumental art. More specifically, area improvement incorporates the construction, remodeling, repair, and upkeep of a city’s street-road networks, bridges, tunnels, grade separations, upkeep and development

of lighting systems, upkeep of recreation areas, landscaping of city areas, upkeep and development of storm drain, organization of dog runs, and integrated development of intracourtyard areas.

Area improvement has been explored by scholars E.V. Ufimtseva (2014), M.M. Mitiugina (2011), M.D. Nedelin (2016), N.P. Kartashova (Kartashova, Khazova, 2016), L.Sh. Mukhazhinova (2012), O.G. Melnikova (2017), N.V. Medvedeva (2018), A.V. Zviagintseva (Zviagintseva & Konstantinov, 2017), V.Iu. Sergienko (2017), I.S. Rodionovskaia (Rodionovskaia, Dorozhkina, 2017), N. Balkenhol (Balkenhol, Cushman, Waits, Storfer, 2016), M. Brejcha (Brejcha, Staňková, Černota, 2016), J.A.G. Jaeger (Jaeger, Schwarz-von Raumer, Esswein, Müller, & Schmidt-Lüttmann, 2007), P. Angelstam (Angelstam et al.,2013), I. Zasada (Zasada et al., 2017), L. Zhou (Zhou, Yang, Wang, Xiong, 2017; Neustroev,., Nikolaeva,., Neustroeva, & Ivanova, 2016), and others.

The need for area improvement in a megalopolis like Moscow is obvious. A large city is a concentration of industry, cars, and energy-producing enterprises, which pollute the air, soil, surface and subterranean waters, destroy the ecosystem, and make living in such conditions quite hard for people. Accordingly, it is important to tighten public control over the environment, as well as over compliance with environmental standards on the part of particular enterprises and organizations (Kirillov, Lebedeva, 2017).

Area improvement can help smooth out most of the negative factors affecting a person's living in a megalopolis and create the conditions for a healthy and comfortable life in it. Activities carried out as part of improvement programs may significantly enhance a large city's environmental condition, its hygiene-and-sanitary conditions, and its aesthetics.

In particular, vegetation plantations may be instrumental in purifying the atmosphere, conditioning the air, reducing noise levels, thwarting the emergence of adverse wind patterns, and having a favorable psycho-emotional effect on people. Landscape areas in cities are of major cultural and social significance, play an important hygienic role as a means of influence on the megalopolis's

microclimate, and are an organic part of the large city's architecture, being one of the means of creating a natural-architectural ensemble.

DEVELOPMENT.

Methodology.

Normally, area improvement is attended with a certain number of difficulties. The authorities get to undertake these activities under conditions of substantial spatial restrictions in the megalopolis. More specifically, there is the need to take account of the placement of items of city infrastructure, industrial enterprises, educational, research, and cultural institutions, etc.

In addition, the growing population density in large cities and strains on their territory may tangibly complicate the fostering of decent levels of area improvement and creation of adequate conditions for the life and activity of people. This can be illustrated using the following data. Since 2012, Moscow's Northern Administrative Okrug has been seeing an increase in the total number of its courtyard areas, more specifically from 1,825 to 2,033 (an increase of over 11%). That being said, the share of courtyard areas which are in need of improvement is around 16% (Northern Administrative Okrug Prefecture, n.d.).

Virtually, all rules on area improvement in municipal units provide for the obligation of business entities to perform the upkeep (e.g., clean-ups and waste disposal) of the surrounding grounds. The integrated implementation of relevant systematic activities is a formula for achieving significant boosts to the region's environmental condition and its exterior, creating a comfortable socio-economic atmosphere, and boosting investment attractiveness (Sergienko, 2017).

The above factors have complicated the government's management of area improvement activities and increased the strains on the city budget, with the issue of effective use of available funds taking on much relevance lately.

It is the above difficulties in the sphere of area improvement in Moscow's Northern Administrative Okrug that have warranted the need to conduct this study.

To explore the current issues in area improvement in Moscow's Northern Administrative Okrug, the authors employed correlation analysis. Correlation analysis involves establishing the relationship between a set of observation outcomes and a set of factors under examination and assessing on that basis the degree to which the impact of those factors on the observation outcomes is significant. As is commonly known, a measure of the statistical relationship between chance variables is the coefficient of correlation, assessing which helps reveal the actual strength of that relationship (Bainova et. al., 2016).

Findings.

If the relationship is linear (which is the case most of the time when it comes to the social sphere), the correlation ratio can be calculated using the linear coefficient of correlation, as follows:

$$r_{xy} = \frac{\sum xy - \frac{\sum x \sum y}{n}}{\sqrt{\left(\sum x^2 - \frac{(\sum x)^2}{n}\right)\left(\sum y^2 - \frac{(\sum y)^2}{n}\right)}}$$

This coefficient takes values ranging from −1 to +1. It is assumed that, if the coefficient of correlation is not greater than |0.3|, the relation is weak; between |0.3| and |0.7| – medium; greater than |0.7| – strong, or close. When the coefficient is equal to ±1, the relation is functional, while, if it is equal to 0, there is said to be no linear relation between the factor and the indicator.

To conduct the correlation analysis, it was first necessary to determine a set of indicators that characterized area improvement activities in Moscow's Northern Administrative Okrug. For the purposes of this work, it was the amount of funding allocated annually to government programs on courtyard area improvement. In addition, the authors had to establish a set of indicators that would characterize the factors influencing the prefecture's activity with regard to area improvement. The

overall roster of indicators, including those mentioned above, was as follows:

1) the amount of funding allocated annually as part of government programs on courtyard area improvement in Moscow's Northern Administrative Okrug;

2) the amount of funding allocated annually to the landscaping and upkeep of landscape areas;

3) the amount of funding allocated annually to the improvement of the areas around cemeteries;

4) the amount of funding allocated annually to the overhaul of landscape areas;

5) the amount of funding allocated annually to the upkeep of landscape areas;

6) the amount of housing planned to be pulled down;

7) per capita population income;

8) the number of courtyards in need of improvement;

9) the number of citizen appeals filed;

10) Gross Regional Product.

Table 1. Area Improvement Indicators.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Courtyard improvement program, thousand rubles	4.5	8.6	13	22.9	46.3	61	79.2	87	106.8	129	181.1	208.6	223.4	220.5	218.3	215
Landscaping and upkeep of landscape areas, million rubles	13.5	16.7	21.1	37.3	59.9	71.8	80	92	104.6	134.6	169	192	206.2	201.3	195.1	193.4
Improvement of the areas around cemeteries, thousand rubles	750	650	900	1,100	1,200	1,250	1,300	1,400	1,500	1,600	1,650	1,700	1,800	1,750	1,700	1,700
Overhaul of landscape areas, million rubles	5.6	6.7	7.9	9.2	10.4	11.8	13.3	16.2	19.8	26.4	32.6	40	43	42.3	39.4	42.7
Upkeep of landscape areas, million rubles	7.9	9.9	11	17.6	21.7	28.2	30	43	67	75	82.7	88.1	94.5	97.3	102.4	103.2
Housing planned to be pulled down, thousand square meters	99.3	119.3	108.7	150.6	79.8	120.8	88.4	163	118.8	116.5	106.9	94.4	83.3	74.1	73.7	73.2
Per capita population income, rubles	7,998	10,282	12,461	16,827	20,899	24,958	29,803	35,490	34,207	43,099	44,051	47,319	48,935	54,869	54,504	59,850
Courtyards in need of improvement, items	616	780	818	440	450	251	298	230	191	196	211	230	245	293	304	320
Citizen appeals, items	330	368	439	512	542	639	588	708	1,380	1,958	2,441	4,852	4,320	5,611	6,621	7,977
GRP, million rubles	1,159,034	1,551,178.9	1,999,995.3	2,441,425.8	2,853,272.4	4,135,154.6	5,260,232.8	6,696,259.1	8,248,652	7,157,536.8	8,375,863.8	9,948,772.8	10,666,870.5	11,814,897.4	12,779,525.7	13,532,598

Table 2. Indicators and Coefficients of Correlation.

	Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line 8	Line 9	Line 10
Line 1	1.00									
Line 2	1.00	1.00								
Line 3	0.94	0.95	1.00							
Line 4	0.99	0.99	0.91	1.00						
Line 5	0.98	0.98	0.94	0.98	1.00					
Line 6	-0.54	-0.52	-0.38	-0.55	-0.49	1.00				
Line 7	0.97	0.98	0.96	0.95	0.98	-0.46	1.00			
Line 8	-0.67	-0.70	-0.85	-0.60	-0.68	0.05	-0.73	1.00		
Line 9	0.89	0.88	0.75	0.92	0.89	-0.64	0.88	-0.39	1.00	

Subsequent to a structuring procedure based on the size of the coefficient of correlation between the amount of money allocated annually to government programs on courtyard area improvement and the rest of the indicators, the following groups were identified:

1) a group with a medium relation:

- Housing planned to be pulled down (thousand square meters) - rxy = -0.54;
- Number of courtyards in need of improvement (items) - rxy = -0.67.

2) a group with a close relation:

- funding allocated annually to landscaping and the upkeep of landscape areas (million rubles) - rxy = 1;
- funding allocated annually to the improvement of the areas around cemeteries (thousand rubles) - rxy = 0.94;
- funding allocated annually to the overhaul of landscape areas (million rubles) - rxy = 0.99;
- funding allocated annually to the upkeep of landscape areas (million rubles) - rxy = 0.98;
- per capita population income (thousand rubles) - rxy = 0.97;

- number of citizen appeals (items) - rxy = 0.89;
- Gross Regional Product (across Moscow) - rxy = 0.97.

The high and positive coefficients of correlation between the amount of funding allocated annually as part of government programs on courtyard area improvement in Moscow's Northern Administrative Okrug and the amount of funding allocated annually to the landscaping and upkeep of landscape areas (rxy=1), the amount of funding allocated annually to the improvement of the areas around cemeteries (rxy=0.94), the amount of funding allocated annually to the overhaul of landscape areas (rxy=0.99), and the amount of funding allocated annually to the upkeep of landscape areas (rxy=0.98) may be indicative of the existence of a "third" factor which is influencing those five indicators. It is most likely that this factor is the present-day condition of the capital's economy and the city budget's relevant revenue part, which is substantiated by the high and positive coefficient of correlation between Gross Regional Product and the above indicators (rxy=0.97, rxy=0.96, rxy=0.92, rxy=0.96, and rxy=0.98, respectively).

The high and positive coefficients of correlation between per capita population income and the amount of funding allocated annually as part of government programs on courtyard area improvement in Moscow's Northern Administrative Okrug (rxy=0.97), the amount of funding allocated annually to the landscaping and upkeep of landscape areas (rxy=0.98), the amount of funding allocated annually to the improvement of the areas around cemeteries (rxy=0.96), the amount of funding allocated annually to the overhaul of landscape areas (rxy=0.95), and the amount of funding allocated annually to the upkeep of landscape areas (rxy=0.98) cannot be viewed as an indication that expenditure on area improvement is one of the items of expenditure with the okrug's residents. These indicators are, rather, dependent on the economic situation, which is substantiated by a close and positive relation between per capita population income and Gross Regional Product (rxy=0.98).

The negative and medium (close to weak) relation between the number of courtyards in need of improvement and the number of citizen appeals (rxy=-0.39) may indicate that the prefecture *does* receive citizen appeals on area improvement (including through websites and Internet portals) and

funding *is* provided to deal with the issues – but the poor relation with area improvement is testimony that the amount of work performed in this respect is insufficient.

Also, it may be worth noting an increase in the number of citizen appeals – from 330 to nearly 8,000. This may be associated with the following two reasons:

- Boosts in citizens' sense of justice;
- Ineffective use of funding and, as a consequence, the unsatisfactory quality of some of the improvement work carried out.

The findings from the authors' analysis indicate the following:

1. Area improvement activities are highly dependent on the economic situation and revenue in the capital's budget. A decline in the latter may cause declines in the quantity and quality of area improvement activity. A way to mitigate this dependence to a certain degree is to foster direct self-governance in the sphere of area improvement. However, this may require a major redistribution of duties between the okrug's prefecture, municipal councils, and territorial public self-government bodies, including in terms of the allocation of public funds. These changes ought to be of a systematic nature, which will help to continually update and enhance various prescribed indicators and procedures, especially in the event there is a need to overhaul some of the more significant ones (Matraeva & Vasiutina, 2018).

2. Funds allocated to area improvement in the Northern Administrative Okrug are not being expended effectively enough. This assumption is substantiated by an insufficiently close relation between the amount of funding allocated annually as part of government programs on courtyard area improvement in Moscow's Northern Administrative Okrug and the number of courtyards in need of improvement, on the one hand, and a negative and medium (close to weak) relation between the number of courtyards in need of improvement and the number of citizen appeals, on the other hand. Unfortunately, while government financial control is supposed to be of a systematic, conceptual, and practical nature, in Russia it currently exists strictly on a scientific-statutory foundation (Fedorov, 2017).

As was already stated above, the issue could be resolved through fostering direct self-governance in the sphere of area improvement.

In addition, it may help to tighten public control over spending, which should help maximize the efficiency of funding initiatives.

This could be achieved through boosts in the openness of activity by the Northern Administrative Okrug Prefecture. To this end, a set of special activities may need to be carried out, some of which are outlined below.

It may help for the prefecture to publish information on the number of courtyards that will be improved in a current year; on the amount of funding allocated to the improvement of those areas, with relevant work volumes, types and lead times listed; on work requestors and contracting organizations.

CONCLUSIONS.

All of the above information must be published and made available open-access on the websites of the okrug's prefecture and municipal councils, so that each citizen could get an idea of the objectives for and volumes of funding available. This may also help enhance citizens' sense of justice.

As a side note, for the above proposals to be put into effect, there may need to be changes made to the legislation of the city of Moscow.

Additionally, it may be worth exploring the possibility of bestowing cash awards on citizens who have spotted a flaw in the work of an authority; for instance, in the event of a violation of established work practices (poorly laid asphalt or poorly sited vegetation plantations), the organization which was in charge of the activities may face administrative penalties (a fine). These funds will go into the city's budget, and from there a certain percentage will be paid to the citizen who called the supervisory authority's attention to the issue.

Doubtless, a proposal of this kind requires conducting an additional painstaking study of the issue's both legal and economic aspects, which suggests it may need to be viewed as an area for the further enhancement of state regulation of public control in the sphere of area improvement.

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