

Motivation potential of population in the system of public administration of the region

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Abstract — Provision of a sustainable development of the region significantly depends on the introduction into the practice of public and municipal management of the technologies of public administration. Together with governmental and municipal institutes the citizens themselves are active agents of public administration who in dependence on the goal set of the development of a region, methods, instruments and forms of its implementation can be both a managing agent and the subject under management. In the modern Russian society however the instruments of the citizens' participation in the adoption of political decisions are used in a limited way as it is determined by a low motivation potential of the population of Russian regions. In this context the analysis of factors, characterizing the creation of the motivation potential of population (resource, motivation, infrastructural ones) and its implementation (resulting factors) is a relevant scientific task the solution of which will allow intensifying the participation of citizens in the political process.

Keywords — *sustainable development of the region, public administration, motivation potential of population, modeling of motivation potential*

I. INTRODUCTION

The Resolution of the UN General Assembly which was adopted in September 2015, set the goals of sustainable development which determine the prospects of the world community until 2030. The basis for the achievement of the goals set in the Resolution is the global partnership, built on the principle of mutual respect, ethics of global citizenship and co responsibility. Besides the Resolution emphasizes that the construction of partnership relations should be implemented first of all at the regional levels as «regional and subregional mechanisms can contribute to an efficient implementation of strategies of a sustainable development into specific measures at the regional level» [1].

Consequently, for the ensurance of a sustainable development in the regions of the Russian Federation it is indispensable to create an efficient system of partnership relations constructed on the interaction between the citizens and the associations of citizens, the state and its institutes. The construction of a similar system is possible by means of development in the regions of public administration constructed on the principle of a net interaction between the citizens, public associations, entrepreneurial community and public authorities of all levels.

The category “public administration” was introduced into scientific community in the end of XIX by W. Wilson according to which the public administration is a detailed and systematic use of right [2].

In late 1950s of the XXth century the content of the category “public administration” was extended by means of inclusion in it the objects and results of the managing influence. As the objects the human and material resources were studied in the result of which the achievement of the desired goals was realized [3, p.3]. Within the given concept the role of the managing subject is contributed to the state and its institutions which functions included the organization of use of various resources by means of legal instruments. The citizens were given the passive function of the object of management.

As a result of the growth of the socialization of economic and political processes in the end of the XXth century the change of methodological approach to the study of problems of public management took place. First of all the goal of public administration was specified and it is normative and public service in the whole or its specific parts [4]. Second, the citizens and their association began to be considered as active managing subjects [5, p. 9].

The problems of the coordination of interests of citizens and the state were the object of the study of Russian scientists. A special interest in the context of creation of public administration in contemporary Russia has the ideas presented in the papers of the member of the Free Economic Society of Russia of the end of the XIXth or the beginning of the XXth century [6,7,8]. The quintessence of them is in the author's opinion and it is the statement of S.A. Korf "it is impossible to do without the population in the local matters in such a vast country as Russia. Consequently, the rational mind encourages us to preserve and cherish what we have and starve not to improve the ways of their use remembering that the mistrust of the people whose welfare you care about is a bad leader. To the contrary you should work in the way that these people do not stand as idle viewers and critics. For their best these citizens should be involved into a common work" [6, p. 8].

The similar ideas have also contemporary Russian scientists. According to A.V. Martynov the public administration is the "result of a social contract between the state and society when the power authorities have the corresponding bodies and officials. But at the same time the main power holder remains the people, population of the country" [9, p. 40]. R.M. Usmanova also emphasized the active role of the "society, collective of citizens and non government authorities" in the implementation of public administration which is realized by means of the participation of such actors in the process of the development of norms and regulations of the conduct in the society [10, p. 133]. A. I. Morozova emphasizes the necessity of creation of public administration on the basis of the principle of transparency [11, p. 21]. O. V. Glushakova and V.V. Mikhailov determine the public administration as the activity directed on the creation and development of public relations for a stable social and economic development of the state focused on the defense of rights and freedoms of citizens and satisfaction of their needs [12].

In the opinion of the authors of the article the public administration is the activity in the development and decision making in the system of state and municipal administration in terms of use of public resources realized on the basis of the interaction of citizens, public associations, entrepreneurial communities, power authorities and local government. The result of such interaction is the "setting of the balance of interests in terms of goals of social and economic development" [13].

Thus, the main essential characteristic of public administration is the participation of citizens in the process of decision making and the implementation of which is directed to the use of public resources for the provision of a sustainable social and economic development of both specific region and the country in the whole.

However according to the results of the research carried out by the authors [14, 15], the major part of the population of Russia has a passive role in the implementation of its functions as a subject of public administration at regional and municipal levels [14, p. 46-48]. It is possible to increase the activity of population in the decision making at regional and local levels by means of creation of conditions for the creation

and implementation of the motivation potential of the population in the system of public administration.

The problem of creation and realization of motivation potential is one of the priority issues in the theory of management of human resources. From this point of view the motivation potential is the "opportunity and readiness of the personnel and the organization itself to direct the efforts of the staff (expertise, knowledge, skills and competence) to the activities which give the organization the prospects of development and allow realizing its existing and forecasted advantages" [16, p. 13]. In the opinion of E.Yu. Starkova there exists a direct dependence between the level of motivation potential of the employees of an organization and their interest in the achievement of the goals of the organization. "At a low motivation potential an employee is characterized by the isolation and the indifference to the goals of the organization. In its turn an average motivation potential implies the beginning of involvedness into the organization at the level of paternalistic needs. Finally a high motivation potential is the involvedness and identification of an employee with the goals of the organization. When we speak about a high motivation potential we can count on the involvedness and active work of an employee" [17 p. 62]. Such a relationship is typical also of the public administration. In this respect the study of the motivation potential in the system of public administration is a relevant scientific goal the solution of which will allow identifying the conditions and factors of a more active participation of the population in the process of decision making directed on the provision of a sustainable development of both the region and the country in the whole.

II. MATERIALS AND METHODS (MODEL)

The public administration is the coordinated actions of citizens, public associations, entrepreneurial abilities, institutes of power authorities and local authorities directed on the achievement of common goals of social and economic development. The participation of every from the mentioned actors in the implementation of public administration depend on the level of maturity and degree of the implementation of their motivation potential, the basis of which is the involvedness of the actors into the achievement of the set goals.

When using the term "motivation potential" of the region implemented in the system of public administration we mean expertise, knowledge, skills and competences allowing the population to take part in the process of decision making directed to the solution of regional problems and they are created under the influence of internal factors (education level, attitudes, beliefs, interests, political culture and so on) and external factors (social and economic development of the region and the country, political situation, peculiarities of social and political sphere of the region, used political technologies and so on).

TABLE I. INDICES CHARACTERIZING THE VALUE OF RESOURCE FACTORS

Indicator	Use of the indicator
Knowledge and skills	
Share of population with secondary level education, %	The given group of indices characterizes the educational potential determining the opportunities of the population taking part in the process of administrative decision making
Share of population with higher education, %	
Share of population having scientific degrees, %	
Economic indicators	
Average income of population	They allow identifying the life standard of the population and degree of the satisfaction of the material and spiritual needs and also characterizing the consumer conduct of households
Real disposable income of population	
Purchasing ability of population	
Technological indicators	
Number of personal computers (per 100 persons)	The mentioned group of indices allows determining the technological foundations for the use of modern communication ways by the population
Use of the Internet by the population	

As both internal and external factors influencing the creation of motivation potential of the population in the system of public administration are subject to changes in the course of time and under the influence of a regulating impact as the motivation potential has a dynamic character and is subject to adjustments. Consequently the growth of the population's activity in the decision making at the regional level is only possible by means of the identification of factors which create its motivation potential and conditions determining the degree of its implementation.

TABLE II. INDICES CHARACTERIZING INSTITUTIONAL FACTORS

Indicator	Use of the indicator
Competitiveness of choices	They allow assessing the presence and degree of maturity of necessary bases and conditions for the participation and control of citizens over the solution of questions affecting their interests
Inclusion of citizens into the election process	
Participation of citizens in the activity of public organizations	They determine the degree of conflictogeny of society and social well-being of population
Level of social and economic differentiation of population	
Private indices of people's expectations	They reflect the opinion of the population about specific aspects of social life
Indices of assessment of the total economic situation	They characterize the assessment by the population of its personal material situation and common economic conditions
Index of institutional trust	They characterize the degree of trust of the population to the institutes of public administration and local self government

The logic of the study of motivation potential of the population in the system of public administration is founded on the use of a model and a methodic complex of analysis and forecasting of the introduction of public administration into the regional practice [15, 18] and consists in the implementation of the following stages:

- Identification of determining factors (resource, institutional and infrastructural) (Table 1-3) influencing the resulting factors (Table 4).
- Creation of a database of primary data by means of the analysis of official statistical bulletins and statistical reports and the content analysis of the official sites of federal, regional and municipal authorities about the current condition of factors characterizing the creation of the motivation potential of the population (resource, institutional and infrastructural ones) and its implementation (resulting factors) in the region.

TABLE III. INDICATORS CHARACTERIZING THE INFRASTRUCTURAL FACTORS

Indicator	Use of the indicator
Access of the population to the Internet	These indicators allow identifying the coverage of population, business and government and municipal bodies with Internet connections
Access of power authorities to the Internet	
Accessibility of officials (yes/no, share of officials having blogs and accounts in the social net as the number from the total number of officials in the region)	They allow assessing the accessibility and transparency of power authorities for the population of the country
Accessibility of state services (including the reduction of waiting period)	
Availability of the infrastructure of the open data including the government expenditures	
Transparency of the election process	

- Reduction of the dimension of factor space of the model of motivation potential of population by means of the method of leading constituents.
- Use as a method of research the problem of multicollinearity of economic indices characterizing the value of resource, infrastructural and institutional factors, logistical regression, Linear regression, Lasso regression, Ridge regression and ARD regression.
- Verification of the model of the assessment of motivational potential of the population of the region in the system of public management. For the assessment of the quality of the model it is suggested to use the value of the coefficient of determination, means square error and number of correct answers at the sliding control in specific objects which are the standard methodology of testing and comparison of the algorithms of regression and forecasting.

TABLE IV. RESULTING FACTORS

Indicator	Use of the indicator
Willingness of citizens to consolidate for the solution of socially important issues	They allow assessing the degree of implementation of motivation potential of the country in the system of public administration
Participation in the legislative activity	
Implementation of functions of social control	

- Identification of a group of indices influencing mostly the creation of a motivation potential of the region in the system of public administration what will allow monitoring their value in the regions of Russia for the assessment of the citizen activity and also allows determining the instruments of the encouragement of citizens' participation in the political process.
- Creation of the system of operational evaluation of the dynamics of creation and implementation of motivation potential of the regional population on the basis of modern geo informational systems and technologies
- Identification of correcting measures of governmental policy directed to the provision of the efficiency of the interaction between governmental, regional and municipal authorities, non commercial associations and citizens in the regions of Russia by means of the encouragement of citizens' participation in the political process.

III. RESULTS AND DISCUSSION

For the solution of the goal of creation of motivation potential of the population in the system of public administration which allows identifying the tendencies in the development of citizen activism of the regional population it is suggested to use the model of implementation of public administration which has been developed earlier and which gives the opportunity of identifying the impact of resource, infrastructural and institutional factors on the resulting ones. It is suggested to calculate the dependence of target indices both from every set of explaining factors and from their combination.

If the essence of resulting factors y_i will allow constructing the linear econometric model with the explaining variables which create the matrix X , on the use of statistical data, so in the matrix and vector form it will be the following equation:

$$Y = X \cdot \theta + \varepsilon, \tag{1}$$

where Y – is the vector of resulting variables, θ – matrix of coefficients at the explaining variables, ε – matrix of observation errors for resulting factors. Herewith the linear dependence of the columns of matrix X , will be carried out and for the of matrix ε – the control of the fact that they are equally distributed and are uncorrelated [19]. One of the ways of assessment of unknown coefficients of the equations in regression is an old, verified method or the least squared errors method. It is worth mentioning that this method is too sensible for selective observations. The aspiration to reduce the residuals in these points can lead to a significant shift of assessment of parameters.

In this case we will use another method providing the numeral sustainability, i.e. ridge regression [19]. For the removal of the free member in the equation of regression, let us analyze the problem of regression with a weight variable \tilde{w} and a vector and column of variables \tilde{x} . Then the function of regression will have the following view:

$$f(\tilde{x}) = (\tilde{w} \cdot \tilde{x}). \tag{2}$$

When minimizing the regret function

$$L(\tilde{w}) = \lambda(\tilde{w} \cdot \tilde{w}) + \sum_{i=1}^n (y_i - (\tilde{w} \cdot \tilde{x}_i))^2, \tag{3}$$

We will get the solution of the problem \tilde{w} in matrix form.

Besides as the instruments of the calculation of regression dependence, the Lasso and ARD regressions can be used.

The experience of construction of a previous mathematical model connected with public administration showed that the resulting factor can be also a binary variable, that's why the approach showed above cannot be used for the construction of the relation of this resulting variable from the observed values of explaining variables. And as before for the assessment of the models of binary choice we will use the logical regression and the method of maximum likelihood. For the implementation of the given approach let us use the hidden variable y_i^* , for which the logit model will be constructed:

$$y_i = \begin{cases} 1, & y_i^* \geq 0 \\ 0, & y_i^* < 0. \end{cases} \tag{4}$$

$$y_i^* = \beta_1 + \beta_2 x + \varepsilon, \tag{5}$$

where ε has a logistic distribution with the density

$$f(t) = \frac{e^{-t}}{(1 + e^{-t})^2}. \tag{6}$$

We will assess the ratio of the chances of adoption by the binary variable of values 1 and 0, i. e. the value

$$\ln \frac{P(y_i = 1)}{P(y_i = 0)}. \quad (7)$$

It is known that with the growth of x per unit at β_2 the inclination of binary variable of taking the value 1 is growing and consequently the logarithm of ratio will also grow at the value β_2 . In other words the ratio from the chances will grow by $\beta_2 \cdot 100\%$.

For the assessment of coefficients β_1 and β_2 it is suggested to use the method of maximal likelihood. Having made the forecast for the hidden variable and using the logical function of distribution let us construct the forecast of probability $\tilde{P}(y_i = 1)$, using L_2 – or regularity, we can improve the quality of forecast.

At the construction of the model the modern technologies will be used and they are founded on the use of programming languages R and Python and their libraries what will allow automating the calculations [20].

The visualization of results of research is carried out with the help of ArcGIS system that contains the analytical instruments and operations allowing on the basis of the analysis of spatial information taking more reasonable managerial decisions.

IV. CONCLUSION

The use of mathematical statistics methods for the study of social and economic problems of regional development allows constructing the models reflecting the dependences between determining and resulting factors.

In the process of the solution of the model of the assessment of motivation potential of regional population in the system of public administration constructed by the authors the following results will be obtained:

- The set of key indices determining the condition of resource, infrastructural and institutional factors which create a motivation potential of regional population in the system of public administration is determined;
- The target indicators characterizing the value of resulting factors which determine the implementation of motivation potential of the region in the system of public administration are identified;
- The degree of influence of resource, infrastructural and institutional factors on resulting factors is determined;
- The verification of the model of assessment of motivation potential of regional population in the system of public administration is carried out;
- The electronic atlas on the platform GIS Arc GIS is created which integrates the data on creation and implementation of motivation potential of population in the system of public administration in cities and

municipalities of the Volgograd region and which allows carrying out the operational assessment of dynamics of regional population participation in the political decision making;

- The practical recommendations upon the development of measures of governmental policy directed to the encouragement of citizens' participation in the political process are given.

The scientific relevance of the suggested model consists in the theoretical and methodological substantiation of issues of creation of the system of monitoring and corrections of the degree of the activity of the population of Russian regions in the adoption of political decisions.

The practical relevance of the results of research consists in the opportunity of the justification of the system of basic statistical coefficients and indicators necessary for the implementation of a verified assessment of creation and realization of motivation potential of regional population in the system of public administration. The visualization of the obtained results in the geoinformational system ArcGIS will allow not only assessing the current condition of motivation potential of regional population but also identifying the instruments of the government policy realization directed on the growth of civil activity in the regions of Russia.

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