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Town-Planning Experience of Exploiting the North of Western Siberia

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ABSTRACT

The urgency of the study is caused by the special conditions of North of Western Siberia zoning: the climatic conditions for the permanent residence of population are extremely uneven in their comfortability. The purpose of the article is identifying possibilities on connectivity and integrated consideration of social development programs in the study region and urban zoning usage in this process. The distinctive feature of the study is that the authors present the unique experience for urban areas development not only in industrial centres but in previously unsuitable for living areas as well. The leading approach in investigation of this matter is the spatial analysis of urban planning model of oil and gas regions in Western Siberia, definition of stages in their development, consideration of urban experience of North development. The stages of oil and gas extracting regions in Western Siberia development are defined; town-planning experience of exploiting the North is considered; basic consequences of implementing department monoresource nature of exploration processes are distinguished, the need for establishing and developing social urban management, expanding fulfilled functions which can ensure an increase in effectiveness and stability of single-industry towns under conditions of modern market relations are proved. The materials can be useful in design of the world experience of cities and towns in depressive regions, single-industry towns and areas that need a new driver of growth and development.

KEYWORDS

North of Western Siberia, regions of new commercial exploitation, town-planning concept, town planning, monoresource model, department exploration

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Introduction

Fuel and extractive industries concentrated in the northlands of Western Siberia played a key role in the economy of the Russian state over a period of the second half of the 20th century – the beginning of the 21th century. Even today oil-and-gas industry of the region determines the country's economic development, covering both its domestic needs in raw hydrocarbons and the

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country's foreign economic activity due to export deliveries of energy resources, which are still the main source of currency proceeds.

An impetus, which raw hydrocarbon deposits discovered here had given to the northern territories, determined not only their economic but also social development, since intensive industrial development of oil and gas extracting areas was accompanied by equally intense social exploration of mostly uninhabited northern territories. According to V.V. Alekseev's (2009) vivid expression, inclusion of "Asian Russia into the world industrial civilization as yet a raw component" became the specific feature of Tyumen North development (Timoshenko, 2007).

The authors understand social exploitation as solution of a wide range of social problems starting with formation of labour force to creation of most important conditions for living activities (housing, service industry, organization of leisure activities). Creating social living environment became extremely important in the regions of new commercial exploitation (NCER) of the North of Western Siberia, because of tough natural and climatic conditions, remoteness from the "mainland" (this psychological factor also played an important part), as well as specific nature of work. The last-mentioned was associated with field conditions of work: geologic exploration, field facilities construction, road/gas/oil piping, building towns and industrial communities. The success of solving production tasks, stability of work collectives, migration processes in NCER directly depended on creating comfort conditions of work, life, rest. The interdependence of the factors of commercial and social exploitation was obvious (Barbakova et al., 2005; Belonozhko & Krysin, 2002; Belonozhko & Silin, 2014).

The scientific paper format does not allow considering all the aspects of social development of oil and gas extracting regions, therefore, the authors put an emphasis on the implementation of town-planning development model of oil and gas extracting regions exploitation, main issues in the development of northern towns.

Methods

The principle of historism taken as a basis of the research was the main methodological principle (Chubaryan, 2014). It's understood as a requirement to consider any historical event in its establishing and development, in interrelation and interaction with other events and phenomena, under which they took place in the context of particular experience.

When analyzing town-planning policy and its implementation in the regions of new commercial exploitation of the North of Western Siberia, the authors took the principles of omnitude and consistency as a basis, which involved using and critical reframing of all the totality of available data (Alekseev & Panin, 2003).

When processing empirical data such general scientific research methods as synthesis and analysis, historical and logical description, scientific generalization, as well as ad hoc methods: problem-chronological and comparative-historical were used (Rusina, 1997; Smolenskiy, 2008; Danilevskiy et al., 1998; Gorshkov & Sherega, 1985).

Results

Town-planning policy was a part of the social program for region development. It was based on the system of resettlement, i.e. selecting most

optimum options to build new towns and towns. Determination of principles and nature of building of the territory under development with regard to types of settlements, their number and purpose of use were components of town-planning.

The system of resettlement in NCER of the North of Western Siberia had been formed during the period of intense development of oil and gas resources. A high degree of urbanization mainly due to external migrants was its characteristic feature.

Despite the presence of objective conditions, which complicated town-forming factors (swampiness, lack of transportation services, etc.), and focus on the use of non-traditional approaches to the formation of settlement system, traditional methods were taken as its basis at the initial stage of West Siberian oil and gas complex (WSOAGC) establishing – development of stationary towns with resident population. It was offered to carry out the development of the North using two types of settlements: mobile and traditional ones, which involve building towns within a radius of 40-50 km off deposits. The mobile type of settlements involved the use of rotational job organization. The creation of different categories of towns was considered necessary: large, average and small depending on particular conditions. However, the concept of settlement with regard to development prospects of exploration and production sector of the region wasn't reflected in the theory of town-planning (Gavrilova, 2002).

The territory of the Near North was initial base of exploiting oil deposits. The industrial communities of the Middle Ob – Uray, Surgut, Nefteyugansk, Nizhnevartovsk – was the center of exploiting. In 1964 the schematics of planning new towns with estimated population size was approved: Uray – 33, Nizhnevartovsk – 44, Nefteyugansk – 18 thous. According to many researchers, this apparently undervalued population size of future towns, was largely due to uncertainty in the estimation of oil recovery volume at the initial stage of the region exploitation (Alekseeva, 1987; Gavrilova, 1999; Belonozhko & Silin, 2013; Barbakov et al., 2016). That's why it is no coincidence that the general plan of town development of the Middle Ob had been being adjusted towards an increase in its population throughout the 1970s.

In the 1970s major changes were made into the content of the town-planning concept. They were caused by a new stage in the development of WSOAGC. A transition to the new stage was associated with promotion of exploiting processes to the territory of the Extreme North due to inclusion of gas fields into industrial development in the territory of Yamal. These were sparsely populated regions with more severe natural and climatic conditions. The level of costs for territory domestic preparation and civil engineering was determined 1,5 –2 times higher than in the regions of the Middle Ob (Pertsik, 1980). Moreover, according to specialists, the territory of the Extreme North taking into account their medicobiologic indicators was of little use for permanent residence. That's why it was suggested to carry out commercial exploitation in this zone "focusing on the periodical change of alien population" (Orlov & Kharitonova, 1983).

The new stage in the region development also came from inclusion of oil-fields small in area and deposits into development. The inefficiency of building permanent housings at each field (which property life could be limited to 10–15 years) became obvious.

These factors made town-planning tasks troublesome and predetermined a new approach to the further development of the region exploitation concept. It had been increasingly developing under the need for transition to the system of settlement with regard to a wider use of rotational job organization. In this case the main emphasis was put on the use of intra- and interregional watch, rather than inter-district (as was suggested earlier). However, the main reason for the transition to this form of job organization was a significant increase in oil and gas recovery since the mid 1970s. The steady increase in the volume of work in the oil and gas industry, which required a large influx of skilled workers, led to a serious contradiction associated with inability to ensure normal living conditions for that flow in the region. In such a manner the transition to a new social and town-planning model of the North development was marked.

According to A.N. Otradnov (2000), who was the chief architect of the Tyumen region, changes in the urban policy were caused by the fact that the adopted before settlement scheme "basic town – shift camp" didn't prove its value. There was a lack of housings in basic towns, and large settlements had been being spontaneously formed around basic towns, in spite of the hard line to keep down the growth of temporary, shift camps directly on the fields. So Fyodorovsky settlement, which was formally considered a shift camp, had been growing near Surgut; Poikovsky settlement near Nefteyugansk; Pangody settlement near Nadym. According to some sources to the mid 1980s there was 1480 shift camps, according to others – about 200 (Kutsev, 1987). Such a difference in calculations is not accidental and was largely due to the lack of a unified approach to the classification of settlements. According to I.P. Varshavsky (1987), the head of a major construction company in the Tyumen region – GlavZapSibzhilstroy, there was no common terminology and classification in determining the types of settlements until the mid 80s, so settlements of the same type were named in different ways: field camp, shift camp, rotational complex, etc.

This spontaneously developing situation necessitated the development of town-planning policy that would most fully meet the goals of efficient development of natural resources of the region. "Settlement of oil and gas industry workers, taking into account places of employment" became its basis (Otradnov, 2000).

Significant changes in the system of settlement followed this policy. While in the mid-1970s up to 85% of the population was concentrated in three basic towns of the North (Surgut, Nizhneva rtovsk, Nadym), the proportion of the population of these towns decreased to 70% by the beginning of 1980 (Orlov & Kharitonova, 1985). During this period, there was a rapid growth of urban settlements and formation of towns on the basis of permanent or shift camps. Thus, from the beginning of the 1980s 7 new towns appeared on the map of the Tyumen region: Langepas, Nyagan, Raduzhny, Megion – in the Middle Ob. In the Yamalo-Nenets Autonomous District Noyabrsk and Novy Urengoy were granted the status of towns.

A significant increase in oil and gas production volumes in the second half of the 1970s – the beginning of the 1980s necessitated adjustment of the general plan of northern towns once again. New projects included an increase in population for estimated period till 2000: Surgut – to 300 thousand, Nefteyugansk – to 100 thousand, Nizhnevartovsk – to 250 thousand, Nadym – to

50 thousand, Novy Urengoy – to 60 thousand people (Gavrilova, 2001). Of the 17 settlements planned by the settlement scheme of 1980, 15 were granted the status of towns: Megion, Novy Urengoy in 1980; Noyabrsk in 1982; Kogalym, Nyagan, Raduzhny, Langepas in 1985; Beloyarsk in 1988; Pyt-Yah, Muravlenko in 1990; Yugorsk, Pokachi, Lyantor in 1992; Gubkinsky, Sovetsky in 1996. In total 22 towns appeared during the period of development of oil and gas resources (since the mid 1960s) in the northern regions of the Tyumen region. Neither the world nor domestic practice of town-planning development has such experience of developing outback territory in harsh climatic conditions of the North in such a short period.

The intensive process of town formation was necessary, but not always feasible. Just as the mining industry was the town-forming basis of settlements, so oil and gas companies – departments were interested in maximum approximation of settlements to the place of employment. This sometimes led to the emergence of satellite towns. In the Middle Ob Nizhnevartovsk became a unique center with three satellite towns – Megion, Langepas, Rainbow, located in a radius of 50-60 km off the core town.

When evaluating such practice of urban development, Surgut researcher I.N. Stas (2016) says that it can be considered a "return to traditional departmental settlement when settlements of oil workers were placed next to the fields". This author's interpretation of the new phase in the implementation of the town-planning policy, which he defined as "performance of the system of group settlement", is reflected in the monograph title: "From settlements to towns and back ...".

Discussion

Thus, the urban model of development of the northern areas was being developed in parallel with the process of oil and gas complex formation. Therefore, errors in the calculation of the population size of northern towns, caused by continuous adjustment of forecast data in the areas of oil and gas recovery, which required, in turn, adjustment of master plans of urban settlements, were one of the most serious problems in the practice of town-planning.

Departmental problem solution was initially included in the concept of NCER settlement system, since departments' needs for determining production volumes and corresponding population size were town-forming base and town-forming factors. Monoresourse development of northern towns, given their raw material focus, was the consequence of the departmental policy. In addition, this policy resulted in priority building of industrial purpose facilities in new settlements, which often led to the archaic built-up area, violation of towns' architectural and planning space.

Within the settlement system established in NCER, a town or other locality appears some geometric point in the field of resource allocation of mining industry. A decrease in oil and gas production inevitably poses social problems associated with development prospects of northern towns and organization of their populations' living. Although the development of the territory of the Tyumen North is designed for a long term, which is largely due to development of gas fields in the Yamal Peninsula, the question about the future of new oil towns is still open.

The peculiarity of the current economic situation in the northern regions is due to the fact that over 55% of explored oil reserves in Western Siberia, according to experts, is characterized by declining production (Beshkiltsev, 2004). It is largely caused by the fact that the region's oil industry has exhausted the capacities of oil production at large fields (such as Samotrolskoe, Yuzhno-Surgutskoe) and is not prepared for large scale development (both from an economic and technical point of view) of medium- and low-profit deposits. That is why a sectoral specialization of new urban settlements determines the accumulation of social problems.

Secondly, according to architects, the urban development of the northern region had no "clear and coherent program of exploitation and complex development of new areas. This led to focal development of new areas of several large oil and gas deposits... without deep echelon training, resulting in appearance of a new large settlement nearby" (Beshkiltsev, 2004). As a result of this largely "spontaneous" town-planning policy, the emerging young towns were completely tied to the life cycle of a particular deposit. The weak interrelation between urban settlements with a closed economic system in the context of unformed district system of settlement resulted in labor shortage in emerging settlements, which weren't compensated with its excess in towns tied to depleting oil fields.

The decline in production, structural changes in the oil and gas industry in recent decades have created a new social problem of overcrowding of the northern resource areas. According to some estimates, the surplus population in remote areas is to 40%, and open and quasi unemployment – 30% (Beshkiltsev, 2004).

Domination of sectoral, departmental interests over decades was accompanied by not only monoresourse development of the northern territories but also led to significant disparities between their social and industrial development. The leftover principle of financing social sphere in NCER, attitude to the person as "a productive resource" resulted in a chronically low level of living. By the early 20th century, the housing shortage in the areas of the North was about 1,5 mln. m2; the share of temporary housing in the Polar zone made up 33%, and 20% in the Middle Ob. Provision of housing was 20% lower than in the central regions, schools – not above 60%, hospitals – 50% (Beshkiltsev, 2004). During 40 years since the initial period of industrial development of the North of Western Siberia we haven't managed to achieve even a relatively low level of living standards of the Russian population. Therefore, a contradiction between the importance of the region in the national economy and social security system population, which doesn't meet this importance is one of the most serious problems of oil and gas regions of Western Siberia.

The results of empirical studies of the authors of this paper have allowed identifying the most common problems and contradictions of single-industry development of the North of Western Siberia. The most important of them are the following:

- structural disparities in the economy, which causes and is increased by budget deficits, lack of investment;

- a low level of security and quality of production and social infrastructure;

- wages and incomes of the population, which does not ensure human development;

- weak mobility of population under intense "brain drain", attrition of highly qualified personnel and promising young people;

- a high level of alcohol abuse, spread of drug addiction and depression;

- deprived state of single-industry towns' residents, predetermining lack of community spirit and willingness to change the situation.

Until recently, researches of the problems of single-industry towns and monoresourse development of the northern territories were of primarily social and economic, town-planning, socio-demographic or administrative nature. Recognizing the importance of distinguished aspects, it is necessary to focus on such criteria for evaluating the effectiveness of its development as social management of single-industry towns, where citizens' social feeling plays an important part. It appears that improving the social feeling of the social community members, providing conditions for social, economic and cultural self-development by activating their own capabilities taken with the policy of state support for problem towns is essential in solving the problems of monoresource towns.

For example, in the author's sociological research for studying the social feeling of inhabitants of the Tyumen region, in particular, in the survey of respondents from the town of Kogalym, results were obtained that confirmed the close direct and feedback relation of a high level of social feeling of northern populations and possible solutions to the main problems of the northern one-resource towns.

Person's, his family's financial standing is one of the main indicators of the level of population's social satisfaction, which is considered one of the most important ones in determining the social wellbeing of the population and its relation to the further town development. Financial standing is largely determined by incomes, the central one of which is wages.

Comparing the average monthly wage of Kogalym residents to the average wage for the Khanty-Mansiysk Autonomous District – Yugra (the average monthly wage is 56682,4 roubles) shows that half of them have a sufficiently high level of wages, and one in four is a well-paid employee with wage over 70,000 roubles. Only 7.3% of respondents have wage (pension, scholarship) below 25,000 roubles, 17.5% earns to 35,000 roubles a month.

Thus, the wage level of Kogalym residents is high, however the cost of living in Kogalym is also above the average and for KMAD (12135 roubles), and for the Tyumen region (8470 roubles).

The conducted analysis of financial standing allows us to conclude that the level of citizens' income indicates a fairly high degree of social and economic satisfaction of citizens and their ability to maintain acceptable standards of living. For a reason more than a half of respondents believe that they can improve their financial situation. And in doing so, they get possible assistance of government agencies of Kogalym, besides, respondents rate the level of effectiveness of solution of problems of their life highly enough (see Figure 1 on a five-point scale).

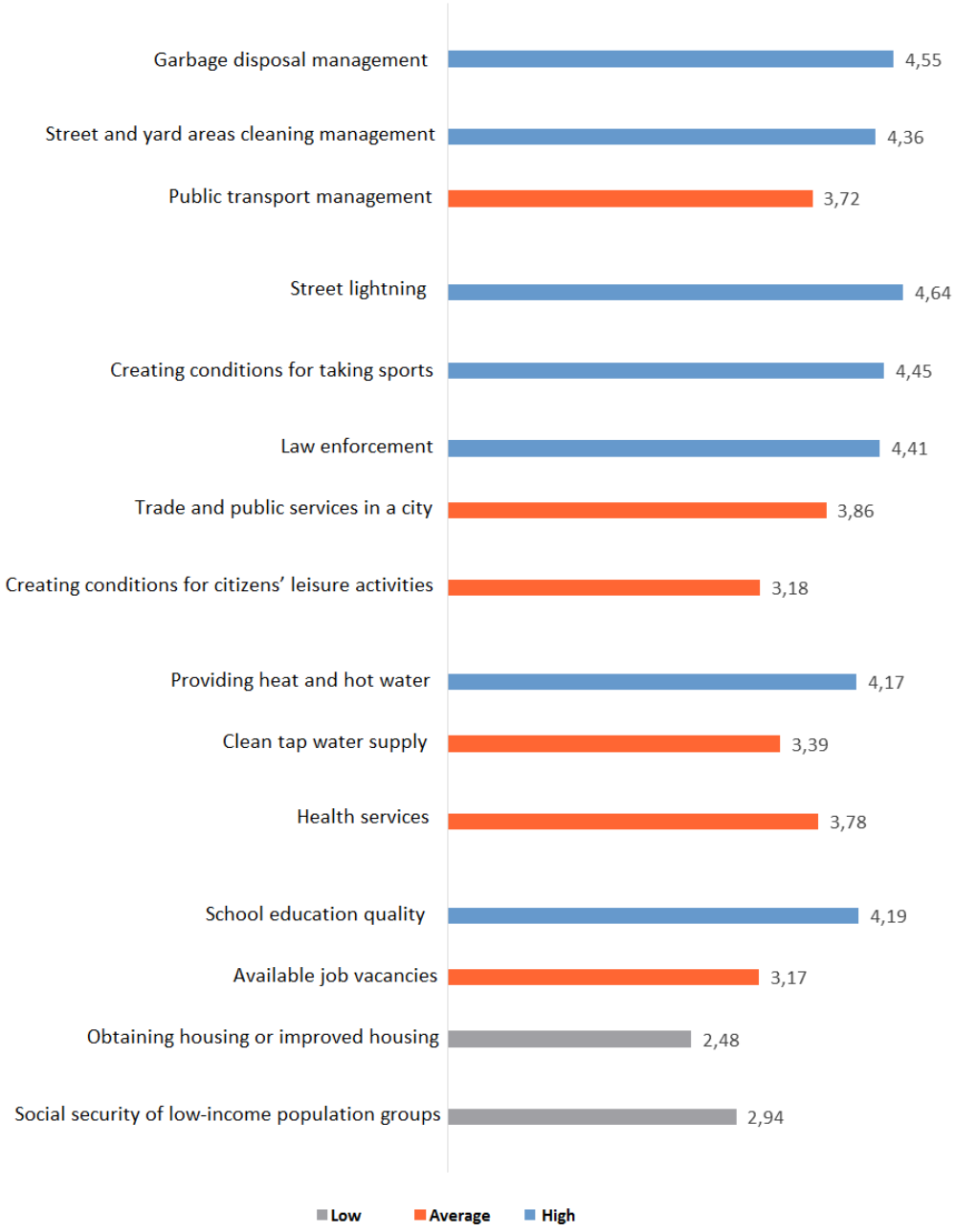

Figure 1. The level of effectiveness of solution of issues related to citizens' activities

On average, Kogalym residents evaluated the effectiveness of the town authorities to 3.82 points out of possible 5, which indicates a high level of confidence in them.

Thus, the higher the effectiveness of solution of social problems of northern Russia one-industry towns, the higher the social well-being of their residents, and vice versa: people with a high level of social feeling, and due to that fact, socially active, help town authorities to solve issues of person's and society's life activities, which, in general, increases the efficiency of social management

system, the network nature of which requires continuous enhancement due to constant changes of not only internal but also external environment under conditions of society transformation. New management approaches make it possible to recover the ability of single-industry towns for independent development and improvement of population's life quality. It's of particular importance for northern single-industry towns of Western Siberia, which play a key role in the economic development of Russia and have potentials for social development.

The carried out author's researches made it possible to demonstrate the need for using new mechanisms for implementing town-planning policy within the framework of the territorial structures of the North of Western Siberia, which predetermines not only restructuring of their economy, optimization of northern regions population density but also the development and introduction of activities of social dimension taken with measures for enhancing investment and social attractiveness, which ensure changing the situation in northern one-industry towns based on not only state, regional and municipal supportive measures but also active involvement of territorial community members, what can be achieved using the social mechanism for implementing social management of northern one-industry towns' development as a stable system of interacting subjects of different types and levels. That system promotes the development of a one-industry town and can be implemented at any number of repetitions with maximum predictable result based on most acceptable methods and technologies in one or another situation (Figure 2).

The main function of the social mechanism is to define purposes, formation of needs and motives, securing "right" actions, which meet situational conditions and peculiarities of northern one-industry towns development, reflect the specific nature of not only social and cultural environment but also spaces represented in the social management model – natural and environmental, political, economic, and social ones.

Organization order is considered in the context of mechanisms for implementation of social management as a system of relatively stable goals, relationships and standards that regulate the relations between the authorities at federal, regional (district) and municipal levels, businesses and territorial communities over the fulfilment of functions for the development of a one-industry town, which provides a framework for ensuring favourable conditions for the formation of positive social feeling of citizens and stimulate their social activity as a conscious activity of territorial community members, the result of which is transformation of the conditions of one-industry town operation aimed at its development.

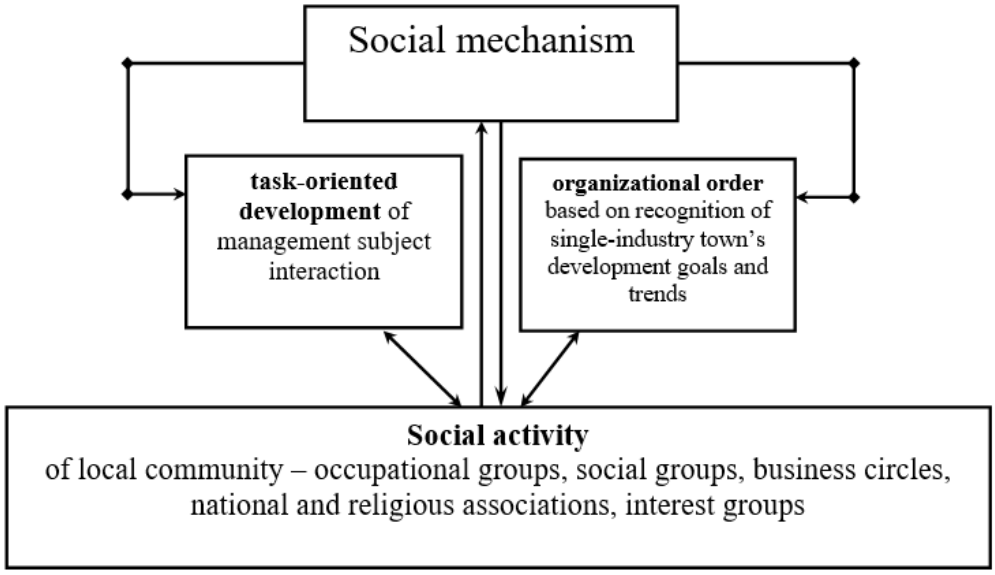

Figure 2. Social mechanism for managing Tyumen North single-industry town development

Acceptance by citizens of their responsibility for living in their town is the most important task of social management and the most efficient social mechanism.

Conclusion

Thus, the level of population's social activity is largely dependent on the quality of interaction with town authorities, which is one of the distinctive features of one-industry town social management. Through the social interaction mechanism one-industry town social management stimulates and orients the development, displaying and operation of the social activity of individuals and social groups. It is interaction of local authorities, administration of town-forming enterprise, and members of the territorial community in the North stands the most important factor of development of single-industry towns. The specific nature of the northern one-industry towns allows overcoming citizens' social inertia and passivity. It is reflected in the social management model and social mechanism of its implementation. It includes, first of all, unification of the efforts of federal, district and municipal authorities in the field of development of single-industry towns of circumpolar zone; secondly, a significant socio-economic potential and stability of town-planning enterprises; thirdly, maintaining a significant role in establishing and developing single-industry towns of local communities, above all, professional, national ones, business circles.

By ensuring a balanced division of social responsibility between government, businesses and residents of a town, social management will improve the social feeling of territorial community members, which will be crucial not only in the creation of institutional, resource and organizational conditions for the implementation of development strategies but also to the citizens preparedness to take part in the development of their town.

Disclosure statement

No potential conflict of interest was reported by the authors.

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