

**SOCIOLOGICAL AND INFORMATIONAL ASSISTANCE  
FOR DEVELOPMENT OF OIL AND GAS RESOURCES  
IN RUSSIAN ARCTIC ZONE**

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**Abstract.** The article reveals social problems associated with the development of oil and gas in the Arctic region of Russia. It also justifies possibilities of their solution based on sociological studies conducted by the authors of representative samples in 2005, 2010 and 2015. Stressing the role and significance of sociological research in the general problem of the circumpolar regions' scientific study, the authors show the need for a sociological diagnosis of their results in the context of different social groups of respondents (old-timers, including representatives of indigenous ethnic groups, newcomers, shift personnel). They do so to identify the characteristics of social problems inherent to the arctic region and requirements for scientific support of possible technologies to solve them. The authors studied the northern specificity of the life quality of oil and gas in the Arctic region of Russia, the conditions of life of indigenous peoples, of shift workers who lead the mobile multi-local way of life, and other social groups of participants who develop this territory. They draw conclusions about the necessary strengthening of sociological and informational scientific support of planned Arctic projects and offer a methodological approach to the selection of the most relevant research topics.

**Keywords:** Arctic, social problems, sociological studies, indigenous peoples, shift method, northerners' health, informational and sociological range, image recognition technology

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## **1. Introduction**

The Arctic region, together with the adjacent ocean shelves covers more than a third of the Russian Federation territory. With the share of population at about 1%, the production here exceeds 60% of export earnings. Russian power structures have interest in the Arctic region, which, since the 18th century, periodically

arises, reaches its climax, and gradually fades. The kind of an indicator is the creation or elimination of special North mini-ministries in the government.

In 1960-1980, attention to the circumpolar region was caused by the necessity of forced formation of oil and gas cluster in the north of the Tyumen region. To this end, specific measures of mobilization of all the country's resources were used. So, a special department in the USSR State Planning Committee was created in addition to the normal management structures (Kuramin 2011). In the post-Soviet period (1990s-early 2000), it was recognized that the North was too expensive, funding to the region was dramatically reduced, and infrastructure, except for areas of oil and gas, was destroyed. The quantity of inhabited settlements was reduced by one third and, as a result of migration outflow, so was the population (North and the Arctic region 2010).

The process of decolonization of the circumpolar region stopped only in the last decade due to the rise of a new attention to the Arctic region, primarily due to geopolitical reasons. New investment projects have been started, of course, on the main base of the country's oil and gas territory – the Tyumen region. The largest of these are: the development of Gydansky and Yamal peninsulas' deposits, the Gulf of Ob, Taz Estuary, the Kara Sea and the Bazhenov strata aquatorium, Achimov deposits of the Urengoy region, the Uvat group, etc. The construction of liquefied natural gas manufacturing plant with the capacity of 16.5 million tons per year on the resource base of the South Tambeyk deposit, with subsequent competency expansion to 32 million tons per year was started on Gydansky peninsula. A sea port and an airport are being constructed in Sabetta town etc. (Veselin and Levinova 2012, Salvo et al. 2018).

Adopted sanction measures against Russia have slowed down several of these projects, but the need to implement them is obvious. The development of the Arctic region actualizes the need to address the large number of extremely difficult economic, social, political, engineering and other problems. They require serious scientific support. It is necessary to quickly start interdisciplinary fundamental and applied researches of Arctic problems. A significant place among them should be taken by sociological studies as well. On the one hand, it allows to identify and evaluate all the interrelations and consequences of known and still latent problems, on the other – the possible alternative routes and technologies of their solutions, their system assessment at different scenarios of the region development.

The economic development of the Arctic region for the adoption of modern and effective management solutions requires knowledge of the actual social situation on the territory where the works are proposed or already underway. Unfortunately, the statistics cannot provide reliable information on most of the required parameters. Their measurements using sociological tools are needed. It is necessary to take into account that oil and gas companies to a greater extent than the state which is determining the development strategy of the Arctic region, are not only unfocused on the social and humanistic development of this sector of the territory, but also insufficiently show their social responsibility. In addition, the North has a special underdevelopment and weak influence of the civil society institutions in

comparison with other regions (Markin 2014). However, the interest of the highest echelons of Russian government in the Arctic region has significantly increased in recent years. The main purpose of Russian state policy in the sphere of scientific support of the Arctic region development today, was the decision to create the foundation of modern Arctic territory management. It includes addressing problems of defense and security, reliable operation of life support systems and production activities in the circumpolar region (Russian North 2012).

To successfully address the last problem, the Russian Academy of Sciences initiated the development of the Comprehensive Program of socioeconomic development of the region, taking into account characteristics of individual territories, settlements, industrial facilities and communications to improve the quality of life of people living here. It is assumed that the Arctic region should turn into a strategic innovative bridgehead in perspective, where new efficient technologies, including social, will be developed and broadcast to other regions (Karpov 2015, Pitsykevych 2015). The authors, who have been studying social situation on the Western-Siberian North for a few decades (Konev 1992, Silin 2015) would like to share some of the results and thoughts about the place of science in the development of the Arctic region (Barbakov et al. 2018).

## **2. Research methodology**

Power structures and various research foundations that are customers of scientific researches, receive numerous proposals based on applicants' scientific interest. But how to assess the significance of one or another research project to achieve the goal of effective socioeconomic development of the Arctic region? Obviously, first it is necessary to identify a set of problems that development participants encounter, evaluate them from the system positions, identify inter-relations, alternative solutions and possible consequences.

To carry out this work, we have implemented traditional sociological tools: Northerners' mass surveys, in-depth interviews with experts, media content analysis, including social networks, focus groups, etc. (Gorshkov and Sheregi 2012). Methodical toolkit was developed by the authors and saved with every small adjustment, allowing to analyze the dynamics of the ongoing changes. Sampling for mass survey was based on territorial and social criteria for selecting observation units and consisted of two stages. Initially, it was the selection of settlements based on their status in reclamation process and type of population. Next there was a respondents' selection in accordance with the social structure of the settlement. At the same time, selection criteria were both traditional, such as gender and age, and significant for our study, such as ethnicity, northern experience, and work experience in shift rotation.

Analysis of the survey results was recorded in four main social groups of northerners: the old-timers, representatives of indigenous ethnic groups; settlers (who have lived in the north for less than 5 years); shift workers. The survey was

conducted at workplaces – drilling units, training centers, shift personnel assembly points and helipads, as well as in national communities. In the latter case, the survey involved representatives of the northern ethnic minorities' intellectuals.

Collection of information was usually based on respondents filling questionnaires. The specifics of the North related to the mobility of production, the uncertainty of the situation due to climatic conditions, etc. made advance planning and respondents' selection difficult. Therefore, the assurance of the sample representativeness required its mandatory 'repairs'.

The results of conducted sociological studies were formalized. After this the set of criteria and indicators characterizing basic problems of oil and gas in the Arctic regional development, which were the basis of the so-called informational and sociological ranges, were formed. These ranges have become the basis of informational support of scientific researches of the Arctic regions. It is no secret that any decision-making supervisor deals primarily with the so-called semi-structured problems (Barbakov and Kiselyov 2012). In such cases, supervisor's actions can be unpredictable, basing on creative, heuristic, intuitive components of intellectual work, in the process of which, a person mentally plays out various solutions, analyzes provided information and sets timetables for the solution of the given problem. It is also possible to take indecisive approach.

There are specific solutions for semi-structured problems: a wide range of alternatives can be taken into account. The said solutions also depend on the current imperfections of technological decisions, the level of risk in decision-making area, required amount of resource investment and cost of the provided solution itself. Not to mention various combinations of the above-mentioned. In order to solve this type of problem using a computer, the machine's system required various creative and intelligent features such as distributed computing, parallel (simultaneous) memory usage, self-learning, multi-level decision-making, etc. This, however, can be avoided through usage of an image recognition technology and heuristic methods in epistemology.

All supervisors possess their own goals, objectives, methods of description and measurement of objects and phenomena and patterns, the formalization of which allows to create a mathematical model of the control process. But there are also unknown regularities, which are nigh-impossible to formalize, which further complicates the creation process of a finished mathematical control model. Furthermore, solvable managerial tasks are not formulated clearly and without sufficient understanding. Experiments are carried out mainly based on the leader's intuition/experience and his point of view is defined via sets of instructions, rules, procedures and regulations developed on subjective, intuitive basis. All of these factors make it almost impossible to create a functional fully- or semi-automated control system for the purpose of decision-making due to the lack of a mathematical model of the control object.

The usage of image recognition technology in solving the world's problems makes it possible to carry out the formulation of administrative tasks on created economic and sociological grounds every time when resolving administrative

problems of such kind. The basis of such informational grounds is a database through which the identification of the problem will be carried out, followed by study and solution (Barbakov 2012).

The process of organizing informational and sociological grounds is carried out in several stages. First comes identification of the problem through data analysis from statistical, documentary, scientific sources, the results of conducted sociological researches. Next, objectives are defined within the framework of solutions of identified problems (whether overall global or partial specific ones) specifying the tasks to be solved in order to achieve goals. Then necessary background information is determined in the existing databank and additional information gathering takes place, which later is formalized and put into a database. In conclusion, we create informational and sociological training ground, where the process is carrying out management tasks.

Using the mathematical apparatus of pattern recognition technology (Belonozhko et al. 2016), the computer creates alternative options for the solution of the problem and, depending on conditions of a functioning process, selects the most efficient way to achieve the goal. Thus, each time addressing a problem first, staging of this problem occurs in the testing environment, and then the solution of this problem is implemented in the field of research. Administrative decision-making occurs automatically by selecting the most effective solution to resolve the problem from a set of alternatives, identified at the testing environment in the process of performing calculations on a computer, which creates a database – collection of alternative ways to solve management problems, taking into account various features of the research object and surrounding conditions in the operation of the testing and control processes.

A situation may arise where none of the solutions from the database meets the degree of accuracy required to achieve a specific goal. Then the expert becomes part of the problem solving process, which leads to goals becoming more specified, targets necessary to solve the problem becoming clearly defined, non-standard ways of solving problems are being found and all new data finds its way into the database of alternative solutions. The expert constantly monitors the processes within the base and defines goals which allow addressing arising problems.

### **3. Results of sociological research**

According to the Human Development Index, calculated annually by the UN Development Program, during the last two decades the Yamalo-Nenets autonomous district steadily occupies one of the first places in the Russian Federation (Human Development Report 2013) and is fairly safe.

Here we can observe the highest in the country indices of GDP and per capita income. However, this also leads to growth in property differentiation and unequal distribution of income. The level of socioeconomic inequality in the Arctic region

is much higher than the national average. At the same time more than 10% of the population has incomes below the subsistence minimum. These are people who are unable to meet even basic needs, read as absolutely poor. However, even poverty can be measured relatively: inability to support the adoption of a territorial community standard of living or to meet the typical needs of others. We define this figure as the percentage of the population with per capita income below 60% of median income (Bobkov and Chulyugina 2012). For the Yamalo-Nenets region it was 25.8 in 2014, in other words, every fourth resident of this rich region is poor.

Judging by the results of our mass surveys, this problem seems most relevant to northerners. Even though, according to the State Statistics, the standard of living in the Yamalo-Nenets region is much higher than in other regions of Russia, their inhabitants, as it turned out, are concerned about the same problems as the rest of Russians: poverty, unemployment, poor quality of health care etc. (Table 1). As everywhere else, in Russia people are concerned about the growth in prices, tariffs and other costs while the revenue side of their budgets is reducing. At the same time there is also a very specific feature of the Arctic region: northerners are making money in this region yet spend it mostly in the South, in the places of leisure, at home or in the cities, where their children study.

With mass survey of the Yamalo-Nenets autonomous region residents which we conducted in 2015, the self-estimated life level of northerners has been revealed. Among the respondents 16.3% said that “they have enough for everyday costs, but buying new clothes is already difficult”, 12.1% – “virtually the entire salary is being spent on daily expenses”, 7% – “not enough money even for everyday costs”.

The second most important issue for the respondents is unemployment and the likelihood of work loss. At the same time indicators of both registered and actual unemployment in the northern settlements differ slightly from the average, in the structure of unemployment young people aged 18–29 years amount to 34–37%, women to 72–75%, people of pre-retirement age constitute 10–12%. It should be kept in mind that the official statistics did not adequately reflect the real situation in the employment for northerners. This is especially true of the indigenous population. Our studies have revealed that despite the statistical on aboriginal

**Table 1. The most important social problems of Yamal’s population, % of the number of respondents (up to 3 problems could be mentioned)**

| Problem   | Years of survey conduction |      |
|---|----------------------------|------|
|   | 2005                       | 2010 |
| Poverty, expenditure increase   | 55                         | 53   |
| Unemployment, possibility to lose a job   | 53                         | 49   |
| Low level of health care  | 33                         | 34   |
| Lack of accommodation, of possibility to improve living conditions, rent increase | 41                         | 42   |
| Criminality exposure, drug addiction, corruption                                  | 29                         | 30   |
| Environmental degradation   | 18                         | 19   |

unemployment value for about 6%, in fact it is over 60%. The fact is that most of them simply cannot be registered because of lack of the necessary documents. Such documents can only be received in the district center (Salekhard), but people simply cannot afford such a trip.

A considerable part of representatives of indigenous northern ethnic groups who have been reported as working, actually make incredibly little money; for example, one pay of a 'chum-worker' is usually divided between several people.

Third place in the list of the most socially significant problems for the people of Yamal belongs to their state of health and dissatisfaction with medical care.

The importance of this problem is confirmed by the data of medical statistics and the results of our mass surveys. Thus, the causes of mortality in the working age of the Yamalo-Nenets autonomous district's population are: diseases of the circulatory system (21.2 cases per 10 thousand people), accidents, poisonings and traumas (12.8 cases per 10 thousand people). Poisoning by low-quality alcohol, drug overdose, suicide and murders account for nearly half of the causes of death. Oddly, self-reported measurements of health are quite high, especially for men.

According to the latest data, the causes of ill health for the people who migrated to the North are: the geographical and climatic causes, social, psychological, environmental issues, also some human activities, as well as basic human interaction.

The combination of perturbations of the geomagnetic field with gravitational anomalies increases dramatically the number of exacerbation of cardiovascular diseases, mainly hypertensive crisis, myocardial infarction. (Dorshakova and Karapetyan 2004).

Northern natural conditions that affect the health of the people who migrated here from other regions are diverse and not yet completely understood (Table 2). It is not only low temperature, as many may think, but also lack of normal daylight hours (which leads to seasonal depression and insomnia), high wind speed, atmospheric pressure, specifics of water and food, etc.

At the same time, with the organization of work in shifts all these multiple effects on the human body are not permanent but fractional. Regular pendular movements with the multiple time zones passing, changing of climatic and social conditions do not allow to establish a stable relationship between man and the environment. So the mobile life of a shift worker in the 'I live in the South, work

**Table 2. Self-assessment of health by Yamal's population, % of respondents**

| Problem               | Years of survey conduction |      |
|-----------------------|----------------------------|------|
|                       | 2005                       | 2010 |
| Feeling good          | 38                         | 40   |
| Getting ill sometimes | 39                         | 38   |
| Getting ill often     | 9                          | 10   |
| Chronically ailing    | 8                          | 8    |
| Disabled              | 2                          | 3    |
| I do not know         | 4                          | 1    |
| Total amount          | 100                        | 100  |

in the North' mode is accompanied by chronic exertion of regulatory-adaptive body systems.

During surveys of northerners we have established both their level of satisfaction with medical services in general and with individual elements. These showings were worse than all-Russian, which were identified by sociological centers of the Russian Academy of Sciences (Trends and Problems... 2015).

Table 3 has the responses to our questionnaire: "What you do not like in the system of health care in your settlement?" in dynamics. However, there were no obvious trends of the situation change over the years.

At sufficiently low levels of satisfaction with the existing health care system there is a reduction of government expenditure on it and, as a consequence, a decrease of medical organizations. So, over the past 15 years, their number in the Yamalo-Nenets autonomous district was reduced by half (48 hospitals and 78 ambulatory organizations in 2000 and, respectively, 23 and 36 in 2015.).

The accommodation problem, is, of course, associated with previous one – human health. It had the highest priority of all social problems for many of Yamal respondents. The residents of Salekhard, Labytnangi and Muravlenko, Gubkin, Purovsky and Taz regions, who have been living in shacks for many years, considered it to be the most important problem.

This problem was also closely associated with the problem of corruption: a growing number of respondents noted that you had to pay bribes to get an accommodation or register rights, to have repair services and maintenance of housing.

One in four employed in the economy and social sphere is a shift worker, and in the future this percentage will increase further. One of the housing problem solutions is the creation of new mechanisms of regional and municipal structures' interaction (southern and central regions of Russia), and work places (circumpolar territories). The specific problem is the creation of adequate living conditions in workers' settlements, located near the deposits. The specifics is that along with the restriction of the number of social infrastructure's main objects, some functions of life necessities should be expanded. For example, in the field of nutrition and consumer services, typically carried out by the family.

**Table 3. Disadvantages of health care system in settlements of Yamalo-Nenets autonomous district, % of respondents (few reasons for discontent were allowed)**

| Problem   | Years of survey conduction |      |
|---|----------------------------|------|
|   | 2005                       | 2010 |
| Big lines to the appointment with doctor                            | 57                         | 50   |
| The suggested treatment is ineffective                              | 27                         | 26   |
| Prescribed medicine is missing from apothecary or is very expensive | 25                         | 24   |
| Ambulance comes too late  | 6                          | 7    |
| I am satisfied with health care                                     | 27                         | 23   |
| I do not know   | 10                         | 12   |



Another problem is criminality and corruption exposure. At the same time, according to statistics, the criminal situation in the region has steadily deteriorated in recent years. It has especially worsened due to the economic crisis. The largest crime rate increase in the Yamalo-Nenets autonomous district occurred in the sphere of drug trafficking and bribery. In a survey, 24% of respondents answered that they were well aware of the drug sale place, 11% answered that they know people who distribute drugs. 19% of respondents reported that they had repeatedly faced bribery. According to our research, social concerns of northerners are closely related. Management decisions addressed to solve some of them have a significant impact on others (Volosnikova 2010). This also applies to the last on the list of social problems – environmental degradation in the Arctic region.

It is known that in the circumpolar region, which is the most fragile ecosystem of the planet, special methods of the environment preservation are needed, other than the ones that are used in the South and the midland. It is necessary to take into account all the interactions of the oil and gas cluster with the environment, changes in the hydrosphere as a result of surface and groundwater pollution with oil products, lithospheres associated with the soil pollution, thawing of ground ice and terrain subsidence. Atmosphere pollution due to emissions of toxic substances, products of gas combustion and condensate in torches, etc. (Kupershtokh 2012).

At the same time the environmental situation, in addition to the impact on health of people living here and the quality of their life, largely determines the conditions of traditional management of the aboriginal population (Smorchkova and Mazharov 2007). Our surveys suggest that more than one third of respondents believe the predatory attitude of visitors to the nature of the North to be the main reason of tensions between the northern ethnic groups and migrant population. That includes: seizure and contamination of land used for reindeer breeding, inability to fish from many northern fishing ponds and rivers contaminated by petroleum products and chemicals.

#### **4. Modeling of life activities in the Arctic region**

Conducted social researches and the obtained results in arrays of different criteria and indicators have formed the basis for the creation of informational and sociological ranges, for modeling of various processes and phenomena of social life in the Arctic in order to increase the efficiency of development of oil and gas resources of the Arctic zone, which is possible only with achieving the social well-being of its population.

The formation of informational and sociological range represents collecting and analyzing information on this issue. That is, the collection of information on objects with a different level of social development of the Arctic zone territories, the index of which is formed by summing up social indices: 'health', 'wellbeing', 'education and culture', 'social security', 'social activity' – with usage of standard

values, synthesized according to the data of different sub-projects of the Russian Federation for a certain period of time (Gurman 2003).

A range with the whole diapason of objects with different levels of social development of Arctic territories is needed for the statement and decision-making.

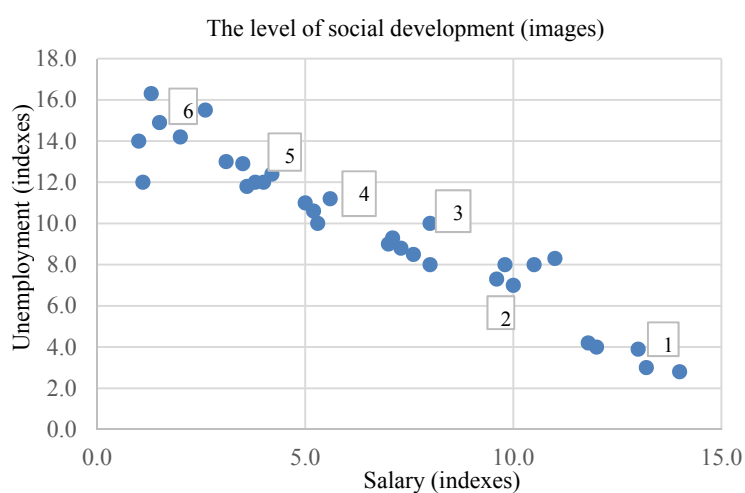
There are indicators that quantitatively or qualitatively characterize the level of social development of the object. We will call such indicators indirect properties. They are chosen by experts at the stage of administrative task statement during the formation of the training site. To this end interviews with experts were conducted: specialists – theoreticians and experts – practitioners in the field of economics, sociology in order to identify a set of indicators that characterize the object of research. It is quite optimal to reflect different sides of the object, and to obtain more knowledge about the object to help formulate the hypothesis of research further. About 30 experts on these issues took part in this interview. After the research and choice of experts, their set was optimized by using image recognition technology (Barbakov and Kiselyov 2012).

Direct property – the level of social development of Arctic territories – can be characterized by the following indirect properties:

1. Public health
  - life expectancy
  - mortality
  - birth rate
  - disease rate
  - number of health care facilities
  - number of sports facilities
2. Welfare
  - personal income:
    - a) average wage;
    - b) minimum wage;
    - c) minimum pension;
    - d) sales of private farming products;
    - e) children's scholarship;
    - f) payment in kind;
    - g) side income;
  - Expenses:
    - a) food expenditures;
    - b) clothing and household goods expenditure;
    - c) housing expenditures;
    - d) health care expenditures;
    - e) vacation expenditures;
    - f) education expenditures;
    - g) service payment;
    - h) taxes;
    - i) equity investment and bank deposits.

- property (housing, personal property);
- durables.
- 3. Education
  - number of people with higher and secondary professional education;
  - number of higher and secondary professional educational institutions.
- 4. Culture
  - number of cultural institutions;
  - number of visits to cultural institutions.
- 5. Social security
  - corruption
  - number of reported crimes;
  - unemployment level
- 6. Family and marital relations
  - number of two-parent families;
  - number of single-parent families;
  - number of divorces.

It is very convenient to use these indicators also because there are records, and statistics and information about them is available in print. In addition, sociological research on these issues was conducted in the Tyumen region recently. Thus, we assume that different ratio indicators (indirect properties), characterizing it (for the problem's easy solution we can emphasize six objects with different levels of social development) correspond to the different values of the direct properties – level of social development of Arctic territories. Figure 1 shows a diagram of a few indicators interdependence, as in subspaces of indirect properties images generate on the straight property.



**Figure 1.** Diagram of images formation (direct property) on the set (bidimensional) of indirect properties.

The first image is characterized by a low value of indirect property – unemployment and high one – wage, the sixth – on the contrary: a high unemployment value and a low wage rate. It is clear that the first image is an image of a higher level of social development of Arctic territories than the second, third, etc.

Naturally, while in the subspace of the two indicators it becomes difficult to select objects via direct properties. For example, points of two-dimensional space in the fifth and sixth social development image are virtually fused into a single image. It could be done much easier in the space consisting of three, four and so on (in this case, six) indirect properties. Although it appears difficult, since the areas, formed from a variety of points in the space of indications, intersect. But six images – levels of social development of the Arctic territories – have been identified in this exact multidimensional space.

Modifying some values of the indirect properties, it is possible to achieve transition of some points in a multidimensional space from one image to another, with a higher level of social development. By changing some of the indices on different areas of the Arctic region such as health measurements, social security, culture, welfare and others, it becomes possible to improve the level of social development of specific areas, which may increase the efficiency of oil and gas development of the Arctic zone of Russia.

## **5. Discussion**

The resulting of our and others researchers' (e.g. Tkachev 2010, Belonozhko and Krysin 2002, Dregalo 2012, Kolesnikov 2015, Kibenko 2014, Saxinger 2014, Buscherm 2009, Storey 2010, Weichhart 2009) empirical information and its analysis require, in our opinion, a significant focus on focusing on scientific support of the development process in the Arctic region as well as improvement of human life conditions in the North. First of all, there is a need for fundamental interdisciplinary research concerning developmental participants' quality of life in addition to the northern ethnic groups living here, as well as health and repercussion for the offspring of those who come here in order to permanently reside in the area or work in the shift mode. Not to mention general safety of life and preservation of the fragile ecosystems of the North.

We believe that priority attention should be paid to physiological, biomedical, and environmental aspects of health maintenance for people who came to the Arctic from other regions. This research unit should also include the groundings for the most acceptable work and rest regimens ('WRR') for the personnel. The optimal WRR choice for specific conditions requires both study and consideration in addition to medical, biological, economic, legal, psychological and social factors, which represents a rather complicated methodological problem, and calls for the development of appropriate mathematical tools (Andreev et al. 2009).

Another equally important subject of interdisciplinary scientific research is the social situation connected with the life of ethnic minorities of the North. This

problem is given inadequate attention in relation to its importance. So far there are only a few ethnological studies (Tsymbolistenko and Parshukov 2015).

There is an obvious need for major fundamental research of the quality of life of the Arctic aboriginal, which should be conducted by sociologists, lawyers, economists, anthropologists, biologists etc.

Scientific support for sustainable development of the Arctic territories requires the timely identification and decomposition of arising problems and search for possible technological solutions under different scenarios of environmental change (Levashov 2001, Agranat 2004). We consider it necessary to draw attention to these issues, not only of the scientific community but also of civil society, government agencies and businesses interested in the development of the Arctic region.

These indicators aggregated into indices will form the basis for the formation of informational and sociological grounds where in the virtual reality social experiments can be carried out in order to increase the level of social development of the Arctic zone, which produces oil and gas.

## **6. Conclusions**

The presented results of years of sociological research on the Russian territory of the Arctic oil and gas region have identified the most significant social problems for people living here. In fact, they are the same as for the population of other regions: poverty, unemployment, dissatisfaction with housing and medical care, lack of protection from crime and the deteriorating environmental situation. However, the specific content and the possibility of problem solving in the north possess a set of significant features which need to be taken into account in the preparation and adoption of both strategic and current management decisions, including those that happen on informational and sociological ranges in the virtual space.

A massive development of Yamal resources, northern seas' shelf and other circumpolar areas require serious informational and scientific support, interdisciplinary research of already identified and still latent social problems, based on the methodology of the system. The authors call out for greater attention towards scientific and informational training basis as well as social impact identification of decisions related to the Arctic region, which are now taken over by the authorities and the oil and gas companies' management who lack sufficient knowledge in the area.

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