Social and psychological aspects of individual adaptation in Arctic conditions

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Abstract. The article represents results of empirical socio-psychological research of factors of workers’ effective adaptation in the Arctic. In the elaborated questionnaire respondents were offered to evaluate a motivational meaning of such criteria as the transport and social infrastructure, the quality of the medical service, social facilities, labour conditions, career prospects, the climate and other indicators. The obtained data take into consideration the gender characteristic, the job form (the shift/ non-shift methods) and the work and living experience in the Arctic. The conducted research revealed the leading role of such infrastructure factors as a good railway and air connection and the availability of sport centres. It is also shown that the availability and the quality of the high-technology medical care also plays an important motivational role. That’s why serious chronic diseases are the reason for refusal of living in the Arctic for the majority of the respondents. The romanticization of the Arctic, so typical for young people, gave the way to the importance of a decent earning. In other words, most respondents pointed to the role of a financial factor. Among the factors that prevent adaption the respondents chose the severe climate and the uneasy psychological situation at a labour collective.

1. Introduction
Northern territories are known to play a key role in Russia’s national economy. They take 66.7% of the country’s area but their population is less than 10% of the total population of Russia. However 20% of Russian territory is represented by the lands lying to the north from the Polar Circle. Northern areas are home to almost 80% of all mineral reserves. Main mineral reserves are located on the continent and on the shelf. They are represented by large discovered fields or fields known to contain forecast resources [1]. Russia’s geopolitical interests in the North are attributable to the global value of its natural resources, the Northern Sea Route, transcontinental transport corridors, environmental safety factors, and humanitarian values. The significance of Russia in the global economy is mostly determined by its Northern territories. The ethnocultural and ethnodemographic dimensions of the North are of huge interest.

The Russian North is very diverse as regards its exploration degree and economic development. A powerful natural resources, geopolitical and strategic defense potential of the Russian North is an insurance reserve for sustainable development. However extremely uncomfortable living and business conditions, almost complete lack of contemporary transport and production infrastructure make all field development projects in coastal areas and in the basin of the Seas of the Arctic Ocean very difficult and expensive.
According to contemporary researchers, the geopolitical and other factors that impact Arctic development are distributed as follows: 30% geographical; 21% military; 18% economic; 10% ecological; 5% political; 5% demographic; 5% intellectual; 3% cultural and religious; 3% ethnic.

Apparently, each of these relatively independent factors must be taken into account when drafting a long-term policy for Arctic Region development. It is also evident that the North and the Arctic are legally considered sites of interdisciplinary discoveries with methods deeply related to the subject of sciences [2]. It should be noted that there is no single plan for the development of the Russian North. The Russian government has once again commented on the top priority of a new strategy for the development of the Russian northern regions.

The urgency of this issue is mainly due to colliding grounds. First, the value of natural resources potential of the North for the economic safety of Russia. Second, the need to preserve traditional use of natural resources as one of the main conditions for preserving northern ethnic groups. Third, there is a difficult situation in the northern economy with fewer opportunities to transfer to market relationships using a generally accepted model. It must be emphasized that the challenge of North development has long been considered solely from the economic viewpoint disregarding another and probably a more important aspect, that is the human aspect. The system of social guarantees and compensations for people who work and live in the North, including its regulatory support has long been targeted at maintaining a required workforce supply with government-guaranteed financial incentives. This approach was well justified with a centralized system of remuneration, prices, and workforce placement. Currently, system performance has significantly decreased.

Criteria for the evaluation of the economic situation become pointless if used in relation to the non-differentiated economic space of the country. For instance, as there is no scientifically based zoning of the Russian North, the northern context is underestimated when developing regulations and determining a consumer goods basket for key groups of the population attributable to the nature and climate in the region, especially when choosing food, commodities and services. There is still no differentiation in housing and utilities service standards. For example, a heat supply period in Vorkuta and the Komi Republic are significantly different from that in other regions.

It is apparent that a new strategy for North development is necessary. Under the circumstances, it is vital to align interests at all management, corporation, and local community levels. We need an approach to achieve the following end results: conditions for stable social and economic development, increased gross domestic product, improved living conditions of people, elimination of disproportion between social and economic development of this constituent entity in the Russian North, and implementation of the unique geostrategic potential of regions. We need a common development strategy taking into account the context of each particular territory in order to achieve social and economic boost in northern regions and reinforce their sustainable development. A development strategy elaborated and implemented across the Russian North will help to use the principles which were not needed while generating development strategies for each particular area. These include: - synergy efficiency principle when individual economically inefficient regional projects of strategic value for Russian constituent entities must be configured to secure a significant growth of overall and therefore local economic viability; feasibility principle with precise time limits for the implementation of individual projects, calculation of available resources and involvement of all stakeholders; project co-evolution (synchronization) principle through the alignment of the rates and cycle of each project delivery against other projects and project ideas in view of short-term, medium-term, and long-term goals and complementarity; transboundariness principle stipulating that composite project boundaries must not be limited to actual administrative boundaries [3]. These provisions were naturally included in many documents and scientific articles but much is still to be done to implement them.

The fundamental principle during strategy development must be striving to achieve the maximum possible balance between economic development and the most sustainable use of natural resources. The main underlying idea must be as follows: the richest regional resources must promote community welfare, ensure safety and social guarantees. However, no plans or projects can be feasible without active mobilization of workforce to these regions.
What can we do to make work in the North appealing for skilled professionals once again and comfortable for people motivated to fulfill their potential in adverse climatic conditions? The target of this research is the analysis and study of these and other issues.

National and foreign scientists engaged to implement this challenge focus on the study of the appeal of the Arctic for human resources, this being one of key factors of its successful development. There are two areas of related research: study of the expectations of potential specialists (including young talents with "Arctic" professions) from Arctic jobs and study of satisfaction with working and living conditions among the specialists whose professional life is or was related to northern regions.

The statistical data in this article are from the social and psychological survey conducted as part of the second area of this research specified above. In our work we appealed to the results in such spheres of research as analysis of the quality of life of Arctic population [4, 5, 6], satisfaction with ethnic relationships [7, 8], social responsibility of the companies implementing their projects in the Arctic [9, 10], social and economic aspects of Arctic territories in the North America [11], infrastructure projects in Arctic countries [12] and ecological and climatic aspects of life in the Arctic [13].

There is a reasonably large experience in studying the factors that have both negative and positive effect on the ability to adapt to the Arctic conditions. Nevertheless, it is noteworthy to study in more detail the roles of the social and psychological factors behind willingness to work in the Arctic and factors of adaptation to Arctic working and living conditions.

1.1. Problem Statement
Research Objectives: to assess length of service and willingness to keep a job in the Arctic, identify attitude of people who have Arctic work experience to various aspects of their work in the region, expectations about working and living there and factors of successful adaptation to the working and living conditions in the Arctic.

1.2. Research Questions
Research Hypothesis
1) Transport and healthcare infrastructure is of vital importance.
2) Financial and career incentives as well as self-fulfillment and self-development prospects are important to attract workforce to the Arctic.
3) There are differences in implicit perceptions of the factors of adaptation to the Arctic and real factors promoting adaptation.
4) The key factor, which makes adaptation difficult, is an unfavorable climate in the Arctic.
5) Expectations about work in the Arctic are very often far from reality.

1.3. Purpose of the Study
The purpose of this study was to identify any social and psychological factors that impacted the motivation and adaptation of employees in the Arctic Region.

2. Materials and methods
2.1. Materials
A questionnaire survey was used to achieve the goal and test the hypothesis. The questionnaire dealt with the following parameters: length of service in the Arctic; willingness to keep an Arctic job; satisfaction with an income level; importance of various social benefits; importance of various infrastructure; concern about unfavorable factors and a climate pattern; importance of a safe ecological situation; importance of available advanced local medical care; assessment of the probability of abandoning an Arctic job in case of an exacerbation of a chronic disease; implicit perceptions of the factors of successful adaptation to the Arctic conditions; real factors promoting and preventing adaptation to the Arctic conditions; reasons that could make candidates to reject an Arctic job; expectations of an Arctic job and to what extent they contract with reality; implicit perceptions of an
Arctic job; 12 personal traits that contribute to successful adaptation to the Arctic conditions (using the personality differential method with opposite personality traits placed on different sides of the scale when a respondent is offered to choose the side which characterizes him/her best by assessing the degree of manifestation of each trait on the scale from 0 to 3); and demographics, including gender, age, profession, place of residence and nature of work (permanent or rotation shifts).

2.2. Data analysis
The statistics processing methods applied to data included: analysis of primary statistics, analysis of cross-tables (for nominative data), comparative analysis, analysis of variance (for metric data), and discriminate function analysis. Statistics processing was done using Statistica 10.0 software.

2.3. Participants
The target of research was represented by 72 employees various professions with experience of work in the Arctic region. The average age of respondents was 44.4 years old, 39 respondents were female and 33 respondents were male.

3. Findings
Let us review the results of the empirical study. Most respondents were not satisfied with an income level in the Arctic as compared to their expectations (No – 36.49%, Rater no – 22.97%). Also most study subjects disagree to various degrees with the fact that employers offer necessary social guarantees (No – 28.38%, Rater no – 25.68%).

Importance of different social benefits is not the same. So preferential pension was most important and was chosen by almost all respondents (91.89%). Also respondents pointed resort healthcare paid by an employer (85.14%), reduced housing costs (83.78%), priority access to high-tech medical care (79.73%), reduced mortgage rates across Russia (71.62%). Access to extramural university education at any national university is the least important factor chosen by half of respondents only (52.7%).

Respondents perceive the importance of social benefits for their decision to work in the Arctic quite differently. While social benefits are very important for one third of respondents (33.78%), they are almost unimportant for another third of respondents (31.08%). And one third of respondents finds it hard to answer or marked the importance of such benefits as medium (12.16%).

It is interesting to compare importance of infrastructure. Sports and health centers (95.95%) and airport/railway station (95.95%) are of primary importance for the respondents. It is safe to say that these infrastructure sites play an important role in being satisfied with living conditions in the Arctic Region and their unavailability is one of demotivating factors. Also respondents pointed parks (87.84%), cinemas/theatres (86.49%), museums/exhibitions (82.43%), coffee shops/restaurants (78.38%), hypermarkets (64.86%). The rest of listed infrastructure sites are also important for the respondents with the only exception of entertainment parks, although 40.54% of the respondents find them important, too.

Table 1: Concern about the climate pattern and unfavorable factors

| Climate pattern and unfavorable factors                          | % of respondents |
|-----------------------------------------------------------------|------------------|
| Poor infrastructure in the community                            | 86.49            |
| Poor medical services                                           | 81.08            |
| Issues with recreation opportunities                            | 78.38            |
| Low availability of transport                                   | 74.32            |
| Unbalanced diet                                                 | 72.97            |
| Insufficiently warm climate and insufficient sun light          | 71.62            |
| Strong winds                                                    | 66.22            |
| Snowstorms                                                      | 66.22            |
Table 1: Climate and unfavorable factors in the descending order by a descending percentage of alarmed respondents. Poor infrastructure in the community, poor medical services and issues with recreation opportunities are at the top of the list. These results are in line with the data from the previous table providing a valuable update. Since we have analyzed the replies of people with experience of living in the Arctic, we can conclude that the items above are real concerns to be addressed. High humidity, heavy clothes and shoes, aggressive timetables (rotation shifts), and polar night are of least concern.

Most respondents comment on the importance of a safe ecological situation for long-term living in the Arctic, which is also supported by the data in Table 1 that details significant components of a safe ecological situation.

A prevailing majority of the respondents (68.92%) find local hi-tech health care super important and this factor can be considered as concern about personal health. The importance of this factor is shown in Table 1. Therefore, improved medical services and health support must be among priorities for Arctic Region development. Otherwise the price of working in the Arctic will be too high involving irreversible health changes, reduced longevity and significant changes in life quality. Since most respondents were not satisfied with their salary level (and salary is one of key factors encouraging to choose an Arctic job), people working in the Arctic may be prone to interpersonal conflicts caused by a discrepancy between their expectations and reality as well as existential factors. Also a prevailing majority of the respondents (Absolutely agree – 35.14%, Rater agree – 27.03%) confirm that health is one of important factors behind the decision to keep or abandon an Arctic job.

A total of 12 answer categories were identified when analyzing the implicit perceptions of the factors that promoted adaptation to the Arctic working and living conditions. A total of 10 answer categories were identified as a result of the quality-based analysis of the real factors impacting the respondents' adaptation to the Arctic. The comparison of the implicit perceptions of the factors promoting adaptation in the Arctic and real contributing factors is shown in Table 2.
The results shown in Table 2 are of interest. Most often, respondents commented that adaptation in the Arctic could theoretically be promoted by health, social protection, young age, high salary, developed infrastructure and romantic appeal of living in the North. In reality, only a financial factor of all factors listed above happened to have an effect on the respondents' adaptation to the Arctic. Interpersonal relationships (with family, people around and at work) mentioned by almost one fourth of all respondents was of priority importance for their adaptation. A total of 16.22% of the study subjects did not have to adapt to the Arctic since those were their normal living conditions as they had been born in the Arctic Region. A total of 10.81% of the respondents commented that it was a fact of life with people being able to get used to anything. It can be assumed that they hardly have a positive view of life and work in the Arctic. A mere 9.46% commented that they could adapt through good and interesting work. Therefore, the possibility to create favorable interpersonal relationships and enjoy your work can contribute to successful adaptation to work and life in the Arctic.

As was shown in previous researches [7, 14], the main obstacle to adaptation in the Arctic is climate (28.38%). Health problems have a negative effect less often (6.76%). Hard work (4.05%), family problems (4.05%), issues within a team (2.7%), poor infrastructure (2.7%), initial lack of housing (1.35%) and low salary (1.35%) are even less common factors. A total of 10.81% of respondents did not find it difficult to adapt since almost the same percentage of the respondents were from the Arctic Region.

It is impossible to influence the climate but its significance for potential employees must be taken into account as work in the Arctic can hardly be a positive experience for a person who cannot be satisfied with his/her work and life due to climate. Furthermore, the underestimation of climatic conditions on successful adaptation to the Arctic and the overestimation of physical abilities can entail negative consequences by making adaptation more difficult and impairing life quality and professional performance.

The main reason to turn down an Arctic job offer is low salary (22.97%). Own housing in other Russian regions (17.57%) and health problems (16.22%) are also popular reasons for leaving the Arctic Region. It is interesting to compare the factors that made adaptation difficult and reasons to turn down an Arctic job. Difficulties with getting used to the climate do not encourage to leave the Arctic (just 4.05%), while health problems finally force to move to other southerner regions of Russia. Low salary is critical for the decision to leave the Arctic. It does not complicate adaptation but makes further working and living in the Arctic pointless. The importance of available housing in other Russian regions confirms that living in the Arctic is the last choice for most respondents.

The analysis of expectations from an Arctic job resulted in six answer categories. High salary is at the top of the list (50% of respondents) followed by an interesting job (9.46%) and availability of housing (6.76%) and benefits (5.41%) as well as understanding of strenuous work ahead (4.05%) and harsh climate (4.05%).

Table 3 shows the alignment between expectations and reality. Most of respondents had a salary level below their expectations, although a financial incentive is a leading factor for accepting an Arctic job. Therefore, 64.52% of employees in the Arctic Region had frustrated material needs dependent on their salary which was a serious demotivating factor. One third of respondents also encountered housing issues and the rest of them did not receive expected benefits. Strenuous work was confirmed for two thirds of the respondents and harsh climate became a reality for 100% of them. The current
situation looks optimistic because the prevailing majority of respondents expecting interesting work got it. Therefore, in order to forecast satisfaction with Arctic work, it is necessary to identify internal motivation since the external one will most likely be suppressed by a discrepancy between an expected and actual income level.

Table 3: Alignment between expectations and reality

| Expectations         | Yes, % | Rather yes, % | Rather no, % | No, % | Hard to answer, % |
|----------------------|--------|---------------|--------------|-------|-------------------|
| Salary               | 9.68   | 19.35         | 22.58        | 41.94 | 6.45              |
| Housing              | 33.33  | 0.00          | 0.00         | 66.67 | 0.00              |
| Benefits             | 0.00   | 0.00          | 0.00         | 75.00 | 25.00             |
| Strenuous work       | 33.33  | 33.33         | 0.00         | 33.33 | 0.00              |
| Interesting work     | 57.14  | 28.57         | 14.29        | 0.00  | 0.00              |
| Harsh climate        | 100.00 | 0.00          | 0.00         | 0.00  | 0.00              |

The quality research of the incomplete sentence "For me, work in the Arctic is…" resulted in 14 answer categories (Table 4).

Table 4: Implicit perceptions of an Arctic job

| Implicit perceptions                                           | % of respondents |
|----------------------------------------------------------------|------------------|
| Familiar conditions (a respondent is from the Arctic Region)    | 17.57            |
| New experience, sounds fun                                      | 12.16            |
| Money                                                           | 9.46             |
| Self-test                                                       | 8.11             |
| Horror                                                          | 8.11             |
| Way to survival                                                 | 8.11             |
| Opportunity (self-fulfillment or development)                   | 6.76             |
| People                                                          | 5.41             |
| Romantic appeal                                                | 4.05             |
| Last resource                                                   | 1.35             |
| Career                                                          | 1.35             |
| Cold, hardships                                                | 1.35             |
| Benefits                                                        | 1.35             |
| Illness                                                         | 1.35             |

As the table shows, the most popular answer is "Familiar conditions" followed by a totally different reply of new experience and fun and with money in the third place. In total, we have 20.27% of negative perceptions versus 23.41% positive and 43.25% neutral perceptions. A total of 13.07% respondents did not answer.

4. Conclusion

Therefore, the following conclusions can be made from the empirical study of the social and psychological factors behind willingness to work in the Arctic and factors of adaptation to Arctic working and living conditions.

1. The essential infrastructure includes an airport and a railway station, sports and health centers with parks, museums, theatres and cinemas being slightly less important. This poor infrastructure, low availability of transport and especially poor medical services cause or caused concern among people with experience of work in the Arctic. Availability of local hi-tech health care is a priority for most respondents, and most of them would abandon an Arctic job in case of the exacerbation of their chronic diseases.
2. Most often, respondents commented that adaptation in the Arctic could theoretically be promoted by health, social protection, young age, high salary, developed infrastructure and romantic appeal of living in the North. In reality, only a financial factor of all factors listed above happened to have an effect on the respondents' adaptation to the Arctic. Interpersonal relationships (with family, people around and at work) were of priority importance for the adaptation of the respondents. A good and interesting work contributes to successful adaptation. Therefore, the possibility to create favorable interpersonal relationships and enjoy your work can contribute to successful adaptation to work and life in the Arctic.

3. The key factor, which makes adaptation difficult, is an unfavorable climate in the Arctic Region. Nevertheless, difficulties with getting used to the climate do not encourage to leave the Arctic, while health problems finally force to move to other southern regions of Russia. Low salary is critical for the decision to leave the Arctic. It does not complicate adaptation but makes further working and living in the Arctic pointless.

4. Respondents expected a high salary, social benefits, and interesting work in the Arctic Region. But only expectations about interesting work proved true.

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