The assessment of the socio-economic damage of the indigenous peoples due to industrial development of Russian Arctic

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Abstract
The paper discusses the problem of the damage assessing to indigenous peoples in modern Russia in the context of industrial development in Arctic. Today the important question is the correlation of the indigenous inhabitants' interests of the Arctic territories (the preservation of culture, traditional nature, *etc*.) with the objectives of companies-subsoil users. Therefore, the business' and the indigenous peoples' of the North cooperation mechanisms are currently researched and implemented in the industrial development of the territory, both at the primary stage of discussion, coordination of projects, and during investment project realization. The results of the social survey of the indigenous peoples made by the authors in Arctic areas are performed and analyzed in the paper. The research aims to improve the damage assessment methodology used in Russia.

Key words: Arctic, industrial development, indigenous peoples, damage assessment, Republic of Sakha (Yakutia)

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Introduction

Nowadays government policy aimed at the natural resources and socio-economic development in Arctic is actively implemented in Russia [1]. The territory of the Far North is considered as a strategic key-point of resource development. At the same time, the development of Arctic affects the territory inhabited by the indigenous peoples of the North keeping their traditional way of life. Currently, 22 regions of the Russian Federation are home to 40 ethnic groups, which belong to the indigenous peoples of the Russian Federation. They mostly live in the northern regions of Siberia and the Russian Far East.

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In Russia, there are governmental basic documents establishing the rules and principles for the development of the Arctic zone and the indigenous peoples, among them are:

1) The development strategy of the Arctic zone of the Russian Federation and national security for the period until 2020 (2008).

2) The basics of the state policy on the environmental development of the Russian Federation for the period up to 2030.

3) The concept of sustainable development of the indigenous peoples of the North, Siberia and the Far East (2009).

4) Federal Law of May 7, 2001 №49-FZ "On territories of traditional nature of Indigenous Peoples of the North, Siberia and the Russian Far East" *etc*.

In complex, these legal acts regulate the livelihoods of indigenous peoples, guarantee their rights to preserve and to develop their culture and to keep the essential elements of their identity, such as language, traditions and cultural heritage; to preserve and to promote traditional methods of land use and biological resources in accordance with the traditional cultural practices, *etc*. However, the legislation concerning the legal status of indigenous peoples in the present time is still a controversial subject and contains many gaps, thus preventing the possibility of its implementation. The same situation is seen in the sphere of mechanisms' and tools' use for the damage assessment of the indigenous peoples due to industrial development in Arctic.

Material and Methods

The rapid Arctic change makes researchers and policy-makers think more about issues what could be mechanisms and approach for sustainable development of the Arctic, protection rights and traditional way of life of the indigenous peoples of the North. Recent researches show increasing attention to such problems in the world.

Today most of the research centers address various aspects of sustainable development in the Arctic, including areas of environmental protection, economic growth, local community (Koivurova et al. 2016). The experience of the USA and Canada, where the positions of indigenous people are based on the activities of the Inter-American Commission on Human Rights, shows that there are tools and mechanisms that allow the realization of the rights of local communities to their traditional activities (Atapattu 2013). In the Arctic, there are disputes about ownership, utilization, management and conservation of traditional indigenous lands and resources – often caused by decisions or attempts to use traditional indigenous lands and resources for industrial purposes, including oil and gas exploration. This situation represents an enormous challenge, and in some cases threatens indigenous societies and their economies, cultures and ways of life (Fjellheim et Henriksen 2006).

In modern Russia, the need for attention to the rights of the indigenous peoples of the North is dictated by the relevant provisions of the Constitution and the historical experience of the state development (Baisheva 2012). Russian Constitution guarantees the rights of indigenous peoples in accordance with the generally recognized principles and norms of international law and international agreements (Article 69), including the protection of the original habitat and traditional way of life.

The future of the Russian Arctic zone is undoubtedly associated with the subsoil use development, which is a "locomotive" of economic modernization (Anderson et al. 2006). But in this context, the important

question is the correlation of the indigenous inhabitants' interests of the Arctic territories (the preservation of culture, traditional nature, *etc*.) with the objectives of companies-subsoil users. Therefore, the business' and the indigenous peoples' of the North cooperation mechanisms are currently researched and implemented in the industrial development of the territory, both at the primary stage of discussion, coordination of projects, and during investment project realization.

The examples of the implementation of such a mechanism of target groups interests' coordination in the traditional nature can be found in the practice of industrial development of the Republic of Sakha (Yakutia). Currently, the region as well as other regions of the Russian Arctic implements major investment projects that affect the territory of traditional nature, *i.e.* the interests of the indigenous peoples and tribal communities. These are projects in the following areas:

- Extraction of rare earth metals;
- Development and production of alluvial diamonds;
- Prospecting and exploration of hydrocarbons in the Arctic Zone;
- Infrastructure projects' implementation of (roads, oil and gas pipelines, *etc*.).

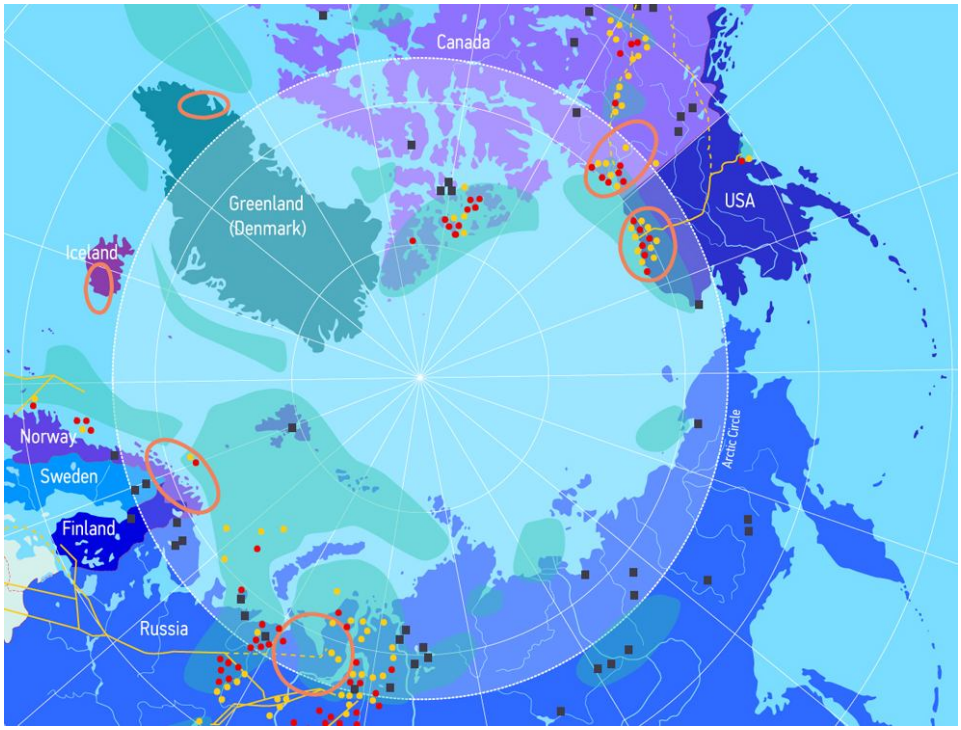

Fig. 1. Extraction of Natural resources in the Russian Arctic. *Symbol*: ● - oil, ● - gas, ■ - coal mining. *Source:* http://arctic.ru/resources/.

Currently, the economic interests protecting of the indigenous peoples is actual problem (Baisheva 2014). Their main organational forms defined by federal law are the nomadic tribal communities, agricultural cooperatives, municipal unitary enterprises *etc*. The objectives of such economic subjects are the native habitats protection, preserva-

tion and development of traditional ways of life, livelihoods, traditional economic activities and indigenous culture.

Active industrial development of Arctic and the North represents a particular problem for the preservation of the traditional Aboriginal way of life (Novikova 2016). At the same time the indigenous peoples cannot count from their point of view on the fair compensation for damages, as the prevailing legal system on its payment calculation ignores the specificity of the traditional forms of farming - reindeer herding, fishing, hunting, gathering *etc*.

The ecological and ethnological expertises have become a significant step in needs' and interests' harmonizing of the indigenous people of the North, which are the state policy instruments on subsoil use for the industrial projects implementation (Potravny et al. 2016b). It should be noted that the Republic of Sakha (Yakutia) - the largest region of Russia, is one of the first territory where the sphere of traditional nature has been legislatively regulated, inter alia, on the basis of the ethnological expertise law adopted in 2010 (Potravny et al. 2016a). The ethnological expertise is a kind of assessment of the potential changes in the native habitats of indigenous peoples of the North and the ethnic group as a whole due to industrial development. Such tools help not only to reduce social tension in the areas of compact residence of the indigenous peoples, but also to promote the search for the effective ways of the interaction with the authorities as well as with the companies-subsoil users.

The industrial development of the native habitat of the indigenous peoples currently defines their future socio-economic and ethno-cultural prospects. In our opinion, an important tool for the indigenous peoples in order to preserve their self-identity, protect their rights and ensure welfare is the compensation mechanism introduction (Potravny et al. 2016c). However in Russia at the present stage the damage mechanisms compensation to the indigenous peoples caused by industrial companies is not still developed. Although the methodology for damage assessment of land users and other natural resources in the places of traditional residence and traditional economic activities of indigenous peoples was adopted in 2009, many economic standards for its calculation to the characteristics of the traditional nature use territories are not approved.

One of the main activities of ethnological expertise is a comprehensive assessment of the damage of all kinds of traditional nature. As the analysis of Russian practice shows such results are often significantly underestimated (too low). In addition, the economic valuation of natural goods is complicated as there is no market price of some kins of natural resources and environmental services of natural capital (clean water, picking berries, mushrooms, herbs *etc*.) - the locals use them for personal consumption (Gassiy 2014).

Today the ethnological expertise is public and a mandatory. It is held in Russian regions before taking decisions on the implementation of the planned economic and other activities in places of traditional residence and traditional economic activities of indigenous peoples. The companies-subsoil users order the ethnological expertise.

For example, the objects of state ethnological expertise in the Republic of Sakha (Yakutia) are identified:

1) Normative legal acts, materials and other documentation for the planned economic implementation and other activities in places of traditional residence and traditional economic activities of indigenous peoples.

2) The living conditions of the indigenous peoples in the influence area of the planned economic activity.

3) Native habitats of indigenous peoples.

4) The socio-cultural situation in the influence zone of planned economic and other activities. In the Republic of Sakha (Yakutia) have already accumulated some ex-

perience in the ethnological expertise of such well-known investment projects as the Construction of Kankunskaya hydropower station, Power of Siberia gas pipeline, operation of The Vostochny Cosmodrome.

It is necessary to distinguish between the state ethnological expertise and impact assessment on the ethnological habitat of indigenous peoples. The first is a tool of governance resulting in legal decision-making to permit or to prohibit the investment project implementation. The second aims to expert evaluation of possible adverse effects, possible damage to the specific culture of the North, taking into account public opinion, the measures development of reducing and preventing negative impacts. The subsoil-user organizes its process and the resulting calculations and conclusions are attached to the materials of ethnological expertise (Klokov 2015).

The authors in the 2015-2016 carried out such work for subsidiaries of "Alrosa" OJSC - JSC Almazy Anabara (rough diamond production at the placer deposits) and JSC "Nizhne-Lenskoe" in the Republic of Sakha (Yakutia). In order to research 3 scientific expeditions to the Arctic regions of the Republic of Sakha were organized (Yakutia). Table 1 shows a research areas and in the Arctic in 2015-2016.

Years	Project for ethnological expertise (the impact assessment of the investment project)	Researched Arctic territories in Republic of Sakha (Yakutia)
2015	Technical project of alluvial diamond deposit development on promising areas riv. Bolshaya Kuonamka and riv. Talaktakh	Olenek evenki national region: Olenek, Kharialakh
	Technical project of alluvial diamond deposit development on promising areas riv. Malaya Kuonamka with confluent Maspaky	Olenek evenki national region: Dzhilinda
2016	Technical project of alluvial diamond deposit development on the riv. Molodo areas of bulun ulus (region)	Bulun ulus (region): Siktiakh, Kusur, Tiksi.

Table 1. Researched areas a plan of work of researchers during Arctic expeditions in 2015-2016.

This research work was carried out in several stages. On stage I the authors collected data related to the problem, official information, met with experts, representatives of relevant regional ministries and agencies (the Ministry of Nature Protection, State Arctic Committee, the Ministry of Agriculture and Food Policy, Ministry of Health, the Department of hunting.

The II stage of the research included a field work; the reserchers participated in the expeditions to the Arctic regions of Republic of Sakha (Yakutia). All internal relocations are on a motor boats and on foot, accompanied by representatives of indigenous tribal communities, local hunters and fishermen. At this stage, the experts collected the necessary information, interviewed people, organized local residents gathering. So, for example, at the meeting with the expert group the indigenous of Olenek Evenk National region including reindeer herders, hunters and representatives of tribal communities supported the industrial development of the territory but subject to respect for the native land ancestors.

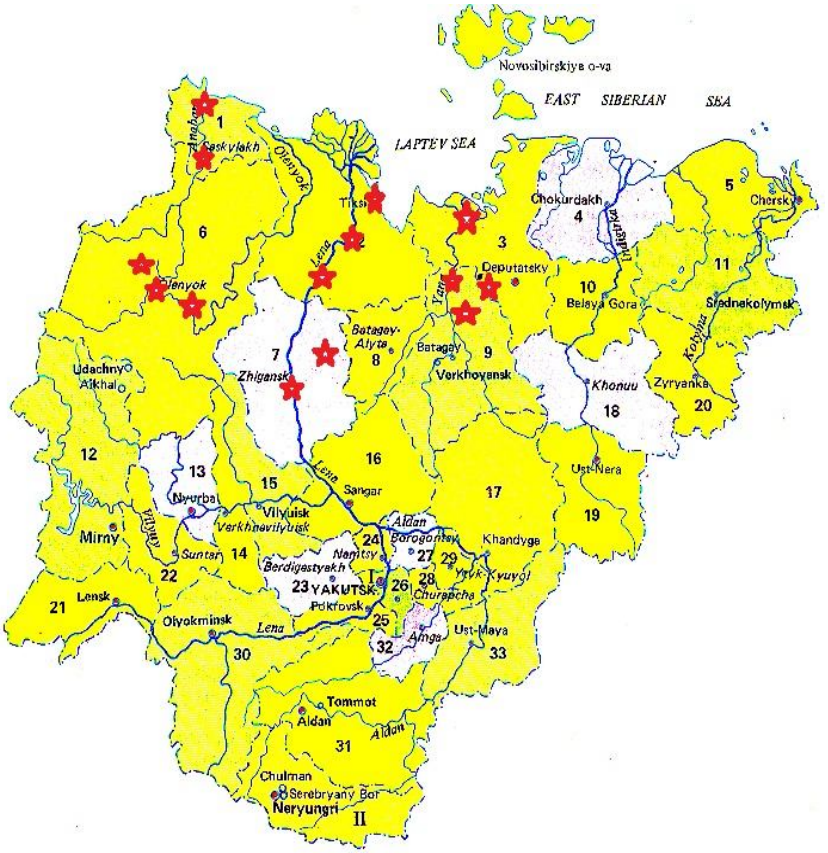

Fig. 2. The indigenous communities visited during Arctic expeditions in republic of Sakha (Yakutia) - indicated by an asterisk.

The research at the stage II aims to the data and other materials for further resource assessment of the territory. On its basis the potential damage caused by planned economic activity is determinated including the impact on the native habitat and socio-cultural development of indigenous peoples and their traditional nature. The ethnographic, demographic and socio-economic characteristics of the territories are also studied. As a result the poll revealed the existing problems as well as possible areas of the cooperation of all target groups (regional and municipal authorities, business, local and tribal communities). As our experience of the projects realization on the river Bol'shaya and Malaya Kuonamka (they flow into the Anabar River and then into the Laptev Sea) in Oleneksky region shows the use of sociological research methods and public opinion polls plays important role.

It allows to identify the preferences and interests of the indigenous peoples on the basis of a large and representative sample of respondents. In 2016, while working for the project of the impact assessment of „Molodo" mine (the extraction of alluvial diamonds) in Bulunsky region such surveys were also conducted.

Fig. 3. Area of project on the rivers Bol'shaya and Malaya Kuonamka.

At the stage III the the damage of land users and natural resources in places of traditional residence and traditional economic activities of indigenous peoples of the North was assessed. At this stage, the coordination mechanism of the interests and needs of target groups is developed as well as the compensation mechanisms and the approaches to the sustainable development of the area. According to respondents the industrial development of the territory may result not only in a significant land withdrawal traditionally occupied by indigenous peoples (hunting, herding, homes) but also the pollution of these areas. We have in mind not only the lands, including reindeer pastures, hunting grounds and ponds, which can lead to a deterioration of the indigenous population living conditions as well as the habitat of reindeer, wild animals, fish, berries, mushrooms, herbs *etc*. Analysis shows that the open method of subsoil development can have an impact on karst processes in permafrost conditions and have an impact on climate change (Clark et al. 2010). There may be also possible consequences of the projects impact in the deformation of the original economy and ethnic culture of the indigenous peoples of the North, gradual move away from their traditional way of life.

The Surveys of Arctic communities residents have given researchers some interesting results. The purpose of such sociological studies is to evaluate the relationship of local residents to the companies-subsoil users' activities, to the environment and the changes taking place in the Arctic; what socio-economic and environmental problems of the territory they are most concerned about; what are their expectations of the industrial development of their ancestral territories; possible from their point of view, size and forms of compensation for the damage caused by subsoil users.

Consider the generalized results of the surveys. The questionnaire included 22 questions, 11 questions of them were related to socio-demographic analysis including specific questions related to the self-identification local residents with indigenous groups, traditional communities, additional income *etc*. Such questions were included

for the determination of the groups researched during survey (on the areas there are several nationalities which may or may not be attributed to indigenous peoples. This fact impacts the attitudes to the industrial development and subsoil-user activity). Other questions were stated in accordance with the set research tasks. The questionnaire also comprised one open question, where respondents could provide additional information in their discretion. Each question offered an optional reply "other", providing the respondents the opportunity to give a reply in the free form.

Qualitative analysis of the survey results has revealed a number of socio-economic problems, including a threat to the family institute. Thus, respondents highlighted the following issues: "lack of brides", "parenting issues", *etc*. Table 2 shows distribution of the surveyed by the type of employment.

Type of Employment	**2015** Olenek evenki national region: Dzhilinda, %	**2015** Olenek evenki national region: Olenek, Kharialakh, %	**2016** Bulun ulus (region): Siktiakh, Kusur, Tiksi, %
Employed	45.5	49.7	64.4
Unemployed	18.2	16.3	5.0
Temporarily unemployed	12.7	11.6	7.0
Retired	15.8	14.7	18.0
House wives	3.6	2.9	1.0
Students	1.8	2.4	2.0
Other	2.4	2.4	2.6

Table 2. Distribution of respondents by the type of employment.
Source: authors' calculations based on questionnaire results.

46% of respondents noted the traditional activities development is a priority form of the indigenous peoples support. 24% of respondents indicated that they are engaged in traditional economic activities. The most developed industries view is fishing; it has been 10.6% of the population. Traditional economic activities are popular in men aged 40 to 50 years. However, the attitude and evaluation of traditional economic activities of the local population is very different and contradictory.

The research has revealed a downward trend in the proportion of the population engaged in traditional economic activities. These data may also indicate willingness to other types of employment. Summarized results of population survey about the socio-economic problems of the indigenous peoples are performed in Table 3.

The proportion of respondents	The respondents' altitude to the traditional economic activities (hunting, fishing, reindeer, picking up wild herbs)
12.1%	engaged in traditional economic activities, they consider themselves to be employed
6%	engaged in traditional economic activities in addition to the basic work
6.6 %	engaged in traditional economic activities, consider themselves unemployed and therefore are ready for other activities and wishing to employment
5.1%	perceive traditional economic activities as an additional source of income

Table 3. The respondents' attitude to the traditional economic activities.

As we can see the most important problems for the indigenous peoples are connected with the low income and unemployment (Table 4). According to the results, 68.3% of the respondents point at the lack of transport and social infrastructure, the Internet. At the same time, the majority of the population is concerned about the lack of employment (86.8%), which, according to surveys of that very population, cannot be solved through development of traditional livelihood activities. Traditional livelihood activities are considered by respondents as secondary activities for individual consumption purposes (25.2%), which is caused by the reduction in the number of reindeers, fur animals and wild growing herbs (specified in the list of environmental problems).

The environmental problems of the compact residence areas of the indigenous people were also included in the questionnaire. The respondents were asked to select from a list or to add their own answer in «other» column (Table 5).

Problem	Proportion of the surveyed, %
Poor work opportunities	86.8
Low income	76.0
High food prices	77.8
Lack of transport and social infrastructure, Internet	68.3
Lack of development opportunities for young people	63.5
Low level of healthcare	47.9
Lack of access to education	38.9
Alcohol abuse	32.9
Increased morbidity and mortality	25.1
Crime	11.4
Other problems	1.8

Table 4. Main socio-economic problems identified by indigenous in habitants during the sociological survey.

Problem	Olenek evenki national region, %	Bulun ulus (region), %
Reduction in the number of traditional livelihood specimens (reduction of the number of reindeers, fur animals, picking up wild herbs, *etc*.)	76.6	32.2
Supply of high quality drinking water	40.7	10.0
Lack of waste collection and re-cycling system	33.5	23.7
Climate change	29.3	12.9
Pollution of river and its confluents	35.6	26.9
Other problems	1.2	0.9

Table 5. Main environmental problems identified by indigenous inhabitants during the sociological survey. *Source*: authors' calculations based on questionnaire results.

It is noteworthy that many of the respondents associate the problem of the reduction in the number of traditional livelihood specimens (reduction of the number of reindeers, fur animals, picking up wild herbs, *etc*.) with climate change which results in milder winters and transformation of all Arctic eco-systems.

The study about indigenous peoples' damage has been distinguished in a separate block. The results showed that local people have a positive attitude to the activities of "Alrosa" subsidiaries in the territories of traditional nature. 82% of residents under certain terms agreed to support the company's activities in the license area. On average, in each village the number of negatively-minded citizens does not exceed 16%. The possible compensation distribution is shown in Fig. 4.

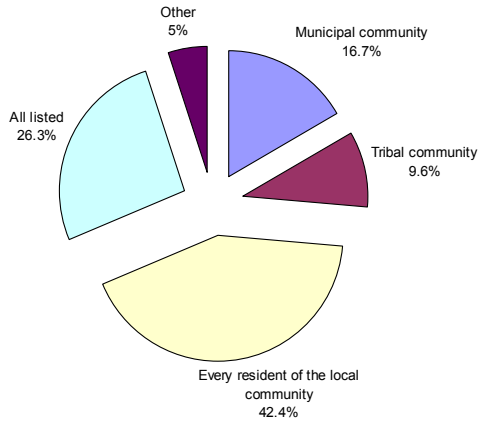

Fig. 4. The Recipients of the compensation.*
*The respondents could choose more than 1 option from the list of possible compensation recipients.

With a great desire the local residents expressed on the subject of what compensation they see from the company. Moreover, the majority of respondents want the possibility of obtaining compensation for damage caused by subsoil-users and this must be officially guaranteed. We included in the list of the possible warranties following options: the tripartite partnership (local government – subsoil-user – indigenous peoples' association); the compensation fund of possible damage; the ecological insurance.

The results of the survey are:

- the tripartite partnership (local government – subsoil-user – indigenous peoples' association) – 33.4%;
- the compensation fund of possible damage – 30.7%;
- the ecological insurance - 16.5%.

The variants of the compensation types are demonstrated at the Fig. 5 (the respondents could chose more than 1 possible option).

It should be emphasized that the mechanism of compensation for damage, which could take the form of various payments directly to the public or local communities in Russia does not exist, in contrast, for example with Canada, where in Quebec there is the Makivik Corporation - the significant economic force of ethnic corporation. Its investment interests are represented in different fields such as oil and gas production, transportation, environmental management and so on [2].

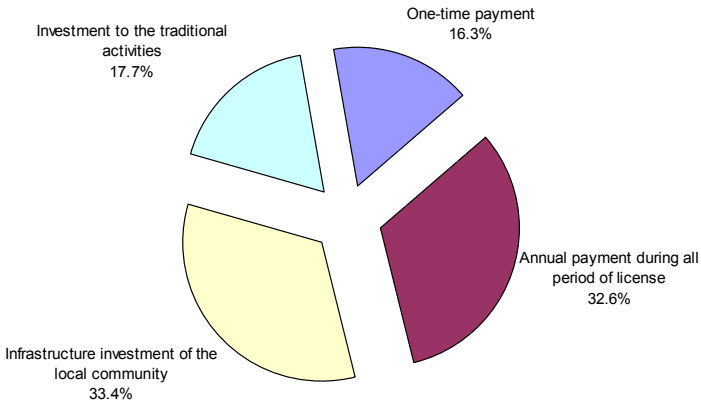

Fig. 5. The results of the survey on possible options for type of the compensation due to industrial development of the area.

Currently in Russia many of compensation are solved individually with the subsoil users and local authorities so the indigenous communities are dependent on these negotiations with an unknown outcome for themselves (Novoselov et al. 2016). Thus our case studies have shown the urgent need for a better approach to the damages assessment of the indigenous peoples of the North as well as its mechanism of compensation.

Discussion

The material presented in the previous section indicates that the environment of the indigenous peoples is changing; the attitude of people to their traditional activities, priorities is changing. This makes scientists expand the discussion on the prospects for the development of territories of traditional nature use.

In Russia, the damage assessment to the indigenous peoples of the North, Siberia and the Far East, their associations and organizations of all ownership forms is based on the methodology approved by the Ministry of Regional development in 2009. The structure of losses includes:

- Real property damage;
- Other documented expenses;
- The lost profit.

The lost profit is a lost income of holder. The annual gross income derived from the conduct of traditional economic activities is estimated for the calculating of lost profit. This method takes into account the cost of doing traditional economic activities, which are deducted from the gross income.

In our opinion, you need to perform calculations on the standard indicators that allow determining the possible loss of production as a result of the impact of anthropogenic factors. This technique is not without drawbacks. According the Order N 565 [3] of Ministry of Regional Development, the methodology on lost profit suppose to sue 101 (!) indicators. Moreover, the 24 indicators from this list are various kinds of correction factors (*Order of the Ministry of Regional Development of the Russian Federation of 9.12.2009 "Methodology for calculating the damage to indigenous peoples"*). This confirms the need to use in the calculation of normative land productivity indicators that reflect the real value of the territories.

Thus nowadays the technical approaches improvement of the indigenous peoples' damage assessment due to industrial projects implementation is the important challenge for ecological economics. Currently the research group consisting of scientists from the North-Eastern Federal University (Yakutsk), Plekhanov Russian University of Economics (Moscow) and Kuban State University (Krasnodar) realizes a project aiming to the improvement of the damage assessing methodology. The project is implemented with the support of Russian Foundation for Humanities. Today it is obvious that there is a strong need to establish simplified, affordable tools that could benefit and be used by all stakeholders (public and municipal authorities, business, indigenous groups and associations).

It should be noted that the issue of a fair damage assessment to the indigenous peoples of Siberia and the Russian Far East is associated with the lands' quality assessment, which are their native habitat. According to the Government recommendations on the land quality assessment which are native habitat of Indigenous Peoples such assessed researches were realized in Khanty-Mansi and Yamalo-Nenets autonomous regions, partially in Chukotka, Taimyr, Nenets Autonomous regions and Komi Republic. In the Republic of Sakha (Yakutia), such work was carried out on reindeer pastures only in 1970-1980. This information should be updated for the modern stage management. For other types of traditional nature such work is not carried out (gathering) or it was done in fragments (hunting and fishing). For an objective assessment of the indigenous peoples' damage it is needed, first of all:

- To research on the identification of traditional nature resources' reserves;
- To calculate the damage on the basis of the production and economic indicators of tribal communities (market prices of products of traditional industries, and other costs).

Concluding Remarks

The inadequacy of elaboration at the federal and regional levels of standards and norms, indicators for calculating the impact on biological resources, material and technical costs in calculating the amount of losses caused to the indigenous peoples due to economic and other activities of subsoil-user; lack of data on stocks of biological resources. The productivity of forest lands for berries, fruits, fungi, cedar seeds, *etc*. has not been studied or determined. There are no data on the distribution and density of growth of medicinal plants, plants that can be used as technical raw materials, *etc*., do not allow an objective assessment of the damage caused to associations of indigenous peoples and thereby infringe on the rights and guarantees of these peoples.

Thus, the urgency of the scientific problem consists in the need to formulate a methodology and develop a scientific tool for economic assessment of damage to indigenous peoples of the North due to investment projects implementation in the Arctic zone on the territories of the traditional nature use.

The other important issue is the partnership dialog between indigenous communities and business, from which the vital activity of indigenous peoples is depended. The recognition of this reality determinates the establishing of civilized relations between the actors of the traditional economics and industrial management, often having differently oriented interests. We cannot ignore the problems associated with the projects' impact assessing of the industrial activity on the traditional way of life of the indigenous peoples of North, the methods of the calculation of loss, damage, harm, and the mechanisms of the compensation. One of the problem-solving may be the damage evaluation and compensation to the indigenous peoples of the North, if the investment projects implementation affect the traditional places of residence. Thus such studies allow creating a scientific basis for the formation of methodology and tools for the economic damage assessment for the indigenous peoples of the North in the process of investment projects realization in the Arctic zone especially in the territories of traditional nature.

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