

## THE PHILOSOPHY OF PERCEPTION REGARDING THE DEVELOPMENT PROBLEM OF A REGION'S KEY ECONOMIC SECTOR: A CASE STUDY OF THE PREBAIKALIA

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### ABSTRACT

The complexity of tackling a problem is often enhanced by a wrong determination of the reason for its origin. This is particularly true for the work of the administrative apparatus in countries with a Socialist and post-Socialist system where the economy is built upon the directive principle. In particular, this applies to the problems that emerged in agriculture as a result of the extensive development that was dominant in Russia during the Soviet era. Namely the extensification of the sector for stock-raising and universal development of collective farms, including in regions where the natural balance between pasturing and rehabilitation of grasslands had been historically observed, led to the degradation of pasture lands and hayfields. The study area lies on the Baikal's western shore where stock-raising traditions have their origins in remote times. The people residing there had historically tried not to disturb the natural balance when managing their economy and obtain only what was needed for subsistence. This historical factor was neglected during the Soviet era, as well as the fact that in regions with severe natural conditions, such as the Prebaikalia, the rehabilitation of the soil-vegetal cover was proceeding at a slow pace, and some areas were occupied by steppes, natural unique sites in the taiga zone. This led to soil erosion and to a substantial change in the species composition of the vegetation. This paper is concerned with some problems of estimating the various kinds of ecological risks that emerge with the establishment of a particular branch of the economy. A case history of the branch is examined with due consideration of the background experience and approaches in utilizing the natural resources by ethnic communities over the course of many centuries. An important aspect is the timely assessment of the possible natural environmental changes when acted upon by a particular factor, namely agriculture in the region in this case. The assessment of the cause and the process of such a risk perception is presented in this paper, as well as some suggestions regarding avoidance of the possible consequences on the shore area of the Baikal territory that was declared a UN World Heritage Site by UNESCO.

*Keywords: extensive development of agriculture, risk factors, traditions of ecological nature management.*

### 1 INTRODUCTION

On most occasions, the complexity of solving a problem is dramatized by improper identification of the reason behind it. This is especially true with regard to the operation of the administrative apparatus in countries with a Socialist and post-Socialist regime where the economy is built upon the directive principle. The key risk factors inherent in this system are:

1. the neglect of any scientifically grounded approach to solving the problem;
2. the lack of understanding of the reason behind the problem and, hence, the lack of a correct approach to solving it;
3. psychological imperception of the acuteness of the problems from below which have been established over the years of centralized management.

Specifically, this applies to the problems that emerged in agriculture as a result of the extensive development prevailing in Russia during the Soviet era. It is this extensification of the livestock breeding sector and the universal development of collective farms, including in areas where the natural balance between pasturing and reestablishment of grazing lands was historically maintained, which led to the degradation of pastoral and grasslands.

The aforementioned risk factors require system analysis to study the state of a particular branch of nature management as a whole, and its regional characteristics, as well as to provide a scientific rationale and determine the optimum pattern of its development. This is particularly true for the sustainable development of agriculture. A significant aspect of this analysis is the process by which man and society become aware of the risk. Psychological and ethnocultural features of risk perception are an important criterion in risk and damage assessment. As the existence experience of ethnic communities shows, the resolution of the nature management problem in the region is contingent on their approach to risk perception and assessment.

## 2 GENERAL CHARACTERISTICS OF THE REGION AND THE STUDY PROBLEM

The study territory, the western shore area of Lake Baikal, is characterized by a diversity of natural landscapes typical of water body shorelands. Its high altitude, from about 400 to 1000 m above sea level, and the proximity of the Primorsky range are responsible for the sharp dissection of the shore line: a combination of precipitous promontories with land-entrenched bays. Forest-clad and lichen-grown immediate shore areas are adjacent to steppe piedmonts. Large steppe masses amongst sparse tree stands can be found only here on Baikal's shores. They represent residues of tundra steppes dating back to the late Cainozoic: desert steppe plant and animal communities having no equal in the present natural conditions of the taiga zone of the Prebaikalia [1, 2]. Judging from the large number of archeological finds, it is these coastal valleys which were the starting point for the development of the severe Baikal region.

The Prebaikalia, as the whole of southern Siberia, was populated by people leading a nomadic life. In the Stone Age this area was inhabited by 'forest tribes' of hunters and fishermen. In the Bronze Age there emerged creators of the culture of 'plate graves', whose majestic stone fences and rock drawings have persisted to date and who were partly forced out by the legendary Huns. Their nomadic empire from 209 BC onward determined the main direction of the economy, animal husbandry. After the collapse of the state of Hunnu in the 1st century AD, the nomadic tribes were involved in the struggle for supremacy in the steppes [3]. At different times this region served as a junction of the cultures of the various reindeer-breeding communities (the Evenks, the Tofs, the Yakuts, the Kurykans, the nomadic Mongols and Buryats, and later the Russians also). They were all united by a common thing: leading a predominantly a nomadic and semi-nomadic husbandry.

Hunting, fishing, and traditions of cattle breeding constituted the principal occupation of the people inhabiting this region at different epochs (Table 1). A most remarkable vestige in the western shore area of Lake Baikal corresponds to the Evenk reindeer-breeders, the Kurykan builders, the Mongol conquerors, and the Buryat cattle-breeders whose population is predominant here.

### 2.1 Evolution of the problem

The people once living here tried not to disturb the natural balance in managing their economy, and to obtain just as much as was needed for their subsistence and for the turnover of commodities and money. However, in spite of the thrift in the use of money and goods, several thousands of years of human habitation in this region led to the degradation of the natural environment, which is particularly well pronounced in the occurrence of steppes in areas where forests had their origins from time immemorial.

This historical fact was also disregarded during the Soviet era, as well as the fact that the severe natural conditions of the Prebaikalia, let alone the economic activity, were unfavorable factors for natural reestablishment of the soil-vegetation cover. As a result, in the zone of the steppes in the Olkhon region and in the steppe areas of the western shore of Lake Baikal, huge areas have been

Table 1: History of the main ethnoses of the Prebaikalia.

Time	People	Occupation
The Stone Age	Forest tribes	Hunting, fishing
The Bronze Age, end of the 2nd millennium BC	Creators of the culture of work with stone and metal	Copper and bronze working, cattle breeding
The 3rd–1st centuries BC	The Hunnu people, who created the first state in Central Asia	Nomadic way of life, development of the art of war
The 1st century BC	Struggle for supremacy in the steppes waged by different tribes: the Hsien-bi, the Kurykans, the Ugurs, the Kidans, and the Khakas	Nomadic and semi-nomadic economy, cattle breeding, construction of fortifications
End of the 12th century to beginning of the 13th century	Unification of the Mongolian tribes into the Great Mongol State in the Transbaikalia, penetration of separate Mongolian tribes into the Prebaikalia	War-conquering culture of the Mongols
Till the end of the 17th century	The main groups took shape: the Bulagats, the Ekhirits, the Khogodors, the Khorinets, and also the disconnected tribes of the Mongols, the Turkis, and the Tungus	Cattle breeding, agriculture
The 17th century	Arrival of the Russians	Peasant type of economy
The 17th–18th centuries	Most of the native tribes of the Prebaikalia formed part of the established people, the Buryats	Hunters, cattle-breeders
The 19th–20th centuries	The Russians and the Buryats are the main people	Mixed type of economy: cattle breeding, agriculture, and utilization of natural resources

converted to forage and pastoral lands since the 1930s. Such an impact led to a drastic impoverishment of the soil, erosion, and to dramatic changes in floristic composition.

The description of the Prebaikalia's steppes involved, from the outset, a misleading comparison with the steppe area of the European Black-Earth Zone where fertile soil formation is favored by the wet climate and by the long duration of the warm season, and one or two years would suffice for this region to reestablish its natural structure, microflora and, hence, vegetation cover. The same cannot be said of the Prebaikalia's steppes where the bedrock was readily uncovered to expose the underlying thin soil horizons, and the overgrazing process led to the formation of stony surfaces with sparse vegetation (Fig. 1).

Consequently, the regime of agriculture management on the Prebaikalia territory required that, for the reestablishment of weak soil layers, the exploitation of land should be suspended for at least 2 or 3 years to the extent of prohibiting unorganized pasturing. Currently, the utilization of degraded areas should be excluded for 5–10 years in order to permit revegetation.

The picture of degradation of the Olkhon region's steppes would have been still more disastrous if it were not for a natural reduction in livestock, caused by shortage of forage, that started in



Figure 1: The degraded pasture with exposed bedrock.

the mid-1980s. However, in contrast to this there is a growing conviction that the reason for the reduction in livestock is attributable to the change of Russia's socioeconomic system and to the economic crisis in the 1990s. Therein lies the second cause of the risk, namely our lack of understanding of the root of the problem; this issue demands further investigation.

## 2.2 The ecological aspect of the problem

So far the decline in the region's agriculture has been perceived by local authorities as resulting from the country's economic crisis. Within this context, environmental degradation is not the cause for the decline. Moreover, it is believed that with collective farms and the Communist regime persisting to date, the productivity of lands would remain as before. However, contrary to these expectations, the territory of the Olkhon region's steppes currently shows a picture illustrating the degradation of the natural environment or, in other words, an increase in the degree of ecological risk.

The term ecological risk is used here in reference to any vector change of matter and energy of natural and natural-anthropogenic systems [4, 5]. In most cases, such processes have an intrinsically long-lasting character, and the role played in them by man is of little importance. Mixed types of risks, such as the evolutionary-dynamic and evolutionary-anthropogenic risks, occur most commonly. Currently, the term 'ecological risk' is almost always used on an anthropocentric basis, because a particular phenomenon is assessed from man's standpoint, whereas many of the natural catastrophic phenomena constitute a normal state of environmental evolution. This is particularly true of the regions of contact of different natural zones (forest-steppe, forest-tundra, semi-desert, etc.) and extreme conditions of landscape development: tundras, barrens, deserts, ranges of mountains, river valleys, shores of water bodies, etc. The study region, according to many indices, can be assigned to territories where ecological risks of a different origin emerge and develop. Furthermore, an active impact of anthropogenic factors in conditions of weak stability of landscapes adds greatly to the degree of ecological risk [6].

In the present case, the ecological risk arises owing to the impact of economic activity. In some areas the soil is beaten down as deep as the bedrock; in spite of the fact that no agricultural work other than occasional pasturing has been done in such areas for about a decade now, the earth still remains to be restored. This suggests that an active impact of the anthropogenic factors in circumstances where

the stability of the natural landscape is low increases the degree of ecological risk and, in extreme circumstances, determines its origination. Moreover, most of the agricultural impact corresponds to the 'weak links of natural systems' that most actively respond to any impact: the biota and the soil. The impact of anthropogenic factors increases the risk of formation of plant communities not typical of the region, having a low potential of stability to environmental factors [7]. This gives rise to communities with the natural–anthropogenic type of functioning, which leads to degradation of vegetation.

Irreversible changes of the natural system can also be exemplified by a change in the composition of the organomineral mass of soils in the ploughed field, a decrease in biological productivity of agricultural lands, and their reduction in size [8]. Based on using a scientific approach, the agro-ecological quality of lands should be regarded as an information system of all knowledge regarding the productivity level of agricultural lands and their spatial–temporal variability. This would permit assessment of the ecological–economic state of the territory in order to develop scientifically grounded management of efficient land use.

Besides, with a dramatic man-made stress, the study region has shown low initial stability of the geological environment, as it lies in the seismically active zone of Baikal's shores [9]. Thus it can be stated once again that the first case for the economic crisis in this sector of the economy should be attributed primarily to the increase of the degree of ecological risk (the risk of further degradation) for the territory under investigation.

The third risk factor, its psychological imperception combined with society's poor response towards avoiding it, is becoming an ambiguous issue and more philosophical. In our view, this factor could be influenced by the following aspects: first, awareness of the risk itself and of its role in the life of man and society, the national style of life and culture of the ethnoses inhabiting the territory under consideration, and the political–administrative and social system.

### 3 THE NOTION AND AWARENESS OF THE PERCEPTION OF RISK

First and foremost, only man can give a definition of the risk and its degree for natural and socio-economic processes. Were it not for human assessment, there would be no notion of risk. The natural environment alone cannot determine any risk for its existence. In nature all processes are perceived as one's due. Only man is able to assess the risk.

Next, we examine the third risk factor, namely psychological imperception of the acuteness of the problem and the poor manifestation of activity and initiative from below; in doing so, we shall try to identify the reasons behind it. First and foremost, mention should be made of the need to determine the risk. The risk is most often determined for a particular process, for equilibration of forces acting on a particular object, and for attaining equilibrium in the system involved. Hence, it follows that only man can assess the risk; in nature, however, all processes are naturally occurring ones.

The attitude of man to the risk indicates a certain disposition to foresee hazards and act in such a way as to reduce the risk to some acceptable level [10]. According to Myagkov, the psychological mechanism of underestimating the risk implies subconscious exaggeration of the desired in comparison with the undesired; this is particularly true of the nearest (in time) goals with more remote consequences. This issue was thoroughly studied with regard to settlement of the country's northern territories, as well as Siberia and the Far East. Man's adaptation when acted upon by extreme conditions close to the state of risk is discussed by Medvedkova [11]. In the present case, it is necessary to consider the social–group and ethnocultural peculiarities of behavior motivation that determine man's response to a natural risk.

Under natural conditions, the attitude to the risk is characterized by the following features. For a group of people there exist only natural and external social (threat from alien groups) hazards.

The group response to a risk is perfected empirically and imprints itself in nature management methods of choice. The natural risk increases dramatically where previous experience of managing it fails: there is an abrupt change in nature management technology and the natural organization of the group gives way to an artificial one. This resulted from the overall sophistication of economic activity and of the society's structure in Russia. With the advent of the Socialist regime, the policy focused on the extensification of nature management. In Russia, namely in Siberia, while the industrial economy encountered the highest 'resistance of the natural environment' [10], the natural risk was increasing at a slower pace compared with the other industrially developed countries. On the other hand, the increase of the technogenic risk turned out to be faster. For the 60-year period of expanding the areas for ploughed lands in the former USSR, about 70 and 30% of the areas were eroded and strongly eroded, respectively. Every year the area of eroded soils and gullies increased by 2 million hectares and 150 000 hectares, respectively [10]. And this occurred with the simultaneous influence of hazardous agrometeorological phenomena, with the losses incurred for agricultural products in the former USSR amounting to several billion rubles per year. For comparison, in the 1980s the value of agricultural products in the USSR was about 200 billion rubles per year, the losses for the above-mentioned reason made up 5–10%, and one-third of it corresponded to Russia. Opinion polls showed that most (85%) citizens were afraid of technogenic disasters, and 75% of the citizens feared natural disasters. Thus the ecological problem was assessed or, more precisely, realized as the second most important challenge in this country. Making a choice of the socioeconomic direction for the further development of the country seemed possible in principle. But something different than expected happened, namely a turn from the planned for market alternative of economics.

### 3.1 Influence of the culture of the ethnoses

We have already examined the influence of the culture of economic management for the various ethnoses inhabiting the Prebaikalia territory at different epochs. It is appropriate at this point to consider only the most spectacular periods that affected the state of the natural environment. Thus, the characteristics of the people dealt with in Section 1 include information about the prohibition of land use in the Mongol state. In 1212, on the 'Soil of the Forebears' (the territory of the present Buryatia) prohibitions were imposed on the cultivation of land, on the construction of towns, and on battue hunting. The land was declared a sacred reserve 'Ikh-Khorig'. Over the course of several centuries the land remained free of any economic effect. Were it not for these measures, which, more likely, were taken from religious motives but manifested themselves in the self-consciousness of the ethnoses, the steppe areas would currently appear as the more degraded territory.

Such behavior can also be found in other ethnoses. And the traditions of ecological nature management are deeply rooted in the consciousness and experiences of ancestors. Even the massive arrival of the Russians, and with it the new type of economic management, agriculture [12], did not affect nature management to the extent to which it showed up with development of Siberia in the late 19th century and with the advent of Soviet power in the 20th century.

### 3.2 The peculiarities of formation of society's Soviet self-consciousness

Compared with the whole of Russia's history, the Soviet period was marked by a violent development of productive forces and, hence, the greatest damage to the natural environment. The key thesis in the formation of the Soviet social–political regime was declared the role of man and his need for production: 'The main source of acceleration is the human factor, and the increase of his role in production. Our society cannot be effectively functioning without finding new ways of development

of the creative activity of the masses in all spheres of social life, increasing civil responsibility of every worker, tightening up discipline, and cultivating thrift" [13]. It was declared that a dynamic and well-proportionate development of production, the acceleration of scientific and technical progress, and an increase in labor productivity were the tasks of further development of the Socialist society [14].

More than 65 billion rubles of capital investments were assigned for the development of agriculture in the non-Black-Earth Zone of the RSFSR for the entire package of measures to be taken within 1976–1984. During this period the main production capacities of collective farms and state farms increased by a factor of two, and the power generating capacities increased by a factor of 1.7. More than 2.5 million hectares of drained ameliorated and irrigated lands were put into service, and 3.3 million hectares underwent technical amelioration [13]. The pursuance of such a policy of extensification in the sphere of agriculture resulted in the ecological crisis. It was most conspicuous in the early 1980s when soil depletion became a challenging tendency.

It should be noted that already at that time caution began to be exercised with regard to the development of Siberia in order to avoid previous serious errors in managing the national economy and waste of billions of rubles of investments in the development of some of the Siberian regions—as with project planning of the Baikal–Amur railway intended for development of the country's north-eastern territories where the expenditures connected with its construction never saw any recoupment whatever even after the year 2000. Many of these projects were frozen in Siberian soil, i.e. they were either abandoned or have not yielded any good return on investment to date. By the year 1900, however, it was planned to carry out technical amelioration over the area of 2.15 million hectares, to put into service 1.2 million hectares of drained ameliorated lands and 220 000 thousand hectares of irrigated lands, to lime 20.7 million hectares of acidic soils, remove 440 million tons of peat, and to apply 250 million tons of mineral fertilizers [13].

The advent of Perestroika in the mid-1980s prevented the USSR's immediate plans for the development of the country's national economy from being accomplished. Otherwise, it would be hard to imagine the extent of the consequences from such an impact on the state of the natural environment. Our region was somewhat fortunate in that the Prebaikalia's territory forms part of Lake Baikal's basin. This was instrumental in assigning it the status of a Specially Protected Territory of the Pribaikalsky National Park (PNP). This area provides a large number of species of high-priority protection significance, is notable for a high level of relict forms and endemism as regards the flora and fauna of the park, as well as for a high proportion of species on the boundaries of their habitats and altitude limits of occurrence [2]. Although 110 000 hectares of relict steppes are included in the conservation territory of the PNP, without any withdrawal from economic utilization, the powers of the nature conservation organization still remain highly limited. Nevertheless, this measure shows promise that the region would receive adequate attention from scientists and the public at large in order to conserve its uniqueness.

Hopefully, the ethnoses inhabiting Baikal's shores will cope with all kinds of risk and transition over to sustainable development. Endowed with an unprecedented wealth of experience, their approach to land use may well be called for, as is the case with the scientific approach. Going through and overcoming the crises in this case constitutes regular and necessary stages in the process of realizing the allowable degree of ecological crisis in land use. The manifestation of risk over time is a reliable indicator of the state of the environment, as it is a reflection of the conditions and methods of nature management in a given territory.

One way of avoiding the ecological risk in whatever form would be to create a global–regional monitoring system and forecast the most appropriate forms and types of land use [15]. The system must take into account the unbalanced development of social and ecological (living) systems, the divergence in their functioning, and the emergence and manifestation of risks. Taken together, this is

required to identify the reasons behind the development and appearance of risks in order to eliminate them. In this context it is necessary to devise a system of assessment parameters for a particular factor (a set of factors) of impact over time and in space.

Avoidance of the ecological risks in whatever manifestation will be based on the administrative authorities' revising the philosophy of understanding the cause–effect relations of the emergence of ecological risks in land use, where environmental conservation will be the top priority in the activity of every human being.

#### ACKNOWLEDGEMENT

The author is indebted to Dr V.G. Mikhalkovsky for his assistance in preparing the English version of the manuscript.

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