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**DEVELOPMENT OF A NEW ARCHITECTURE OF LOCAL  
SOCIO-ECONOMIC SYSTEMS OF MOUNTAIN REGIONS**

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### Abstract

The economic systems of regions in modern Russia are an institutional system characterized by the combination of market and administrative and shadow economy, which poses difficulties in analyzing and forecasting economic development, in particular, the investment process. This is especially evident in depressed regions, which include practically all the republics of the North Caucasus. The institutional framework expands under the impact of decisions made by individual market participants that leads to a high level of information asymmetry. In this regard, the conceptual substantiation of the ecological and economic vectors of sustainable development of local, including mountain socio-ecological and economic systems, acquires additional relevance. Various empirical methods of regulating economic activity, especially in terms of innovation processes, require an objective assessment methodology. It should be noted that mountain ecosystems are centers of special national, regional and international strategic interests and conflicts: economic, social, environmental and even geopolitical. Extreme natural and climatic features of mountain regions objectively hinder the possibilities of economic management and give rise to unique, social, ethnic, cultural and economic traditions, which are more affected by external shocks. Successful development of such regional systems is complicated by significant economic risks for agriculture. These problems are most obvious in the North Caucasus region. In conditions of globalization, integration of economic relations and increasing competition, the competitive advantages of the national economy in the Russian Federation can be developed only through implementation of an innovative scenario of sustainable development and global application of the advanced scientific and technological potential.

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*Keywords:* Mountain ecosystem, socio-ecologies, economic system, sustainable development



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## **1. Introduction**

Currently, the economy of the South of Russia is coming out of a systemic recession, which is accompanied by a significant decline in production, a decrease in economic, production and intellectual potential, an acceleration of migration flows of young people, and a decreased level of life of the population. The specific features of mountain regions caused a complete collapse of the industry and large enterprises of the agro-industrial complex. All this results in a deep socio-economic and demographic failure, and a negative balance of internal and external migration. Local authorities exhibit low efficiency due to corruption, limited financial and natural-biological resources, the most demanded of which are agricultural land, forestry and recreational resources.

The development of mountain regions cannot be studied and assessed without analysis of the current state of the intra-system environment of the multi-level socio-economic system of mountain regions. For this purpose, the information database on mountain regions of the KBR was created, the resource management system in the region was assessed, the work of local authorities was analyzed, and weak and strong sides in the development of the socio-economic system of municipalities were identified. This revealed the need to develop a new architecture of local socio-economic systems of mountain regions.

## **2. Problem Statement**

Formation of a database of local socio-economic systems of mountain regions of the KBR in terms of natural resource potential, specialization of the economy, population migration, social aspect and assessment of the work of municipal authorities. Analysis of the factors of the internal and external environment for the development of local mountain regions and municipalities. Investigation of the existing model of socio-economic systems of mountain regions of the KBR. Assessment of the effectiveness of management of limited resources with the allocation of economic and landscape zones. Development of a new architecture of local socio-economic systems of mountain regions.

## **3. Research Questions**

The object of the study is a complex of theoretical and methodological laws that affect the formation of a new architecture of local socio-economic systems of mountain regions.

## **4. Purpose of the Study**

The purpose of the study is to assess the efficiency of management of limited resources with the allocation of economic and landscape zones of a new archetype.

## 5. Research Methods

To achieve the purpose and substantiate the hypothesis, the study employed a general scientific method, which includes analysis of the literature on the studied problem, comparison, and systematization of theoretical and actual data.

## 6. Findings

Mountains are part of the planet's natural and climatic wealth, which provide various resources for the existence and development of mankind. According to the UN, mountain regions of the planet occupy twenty percent of the planet's surface, where more than 700 million people live. Mountain regions are the richest natural habitats of ethnic, cultural and biological diversity. Mountain regions are characterized by high hydropower and mineral resources potential. The concept *montology* indicates the physical and geographical features and the socio-economic and ecological problems of mountain ecosystems. The morphometric analysis (quantitative characteristics of the relief) of the Russian Federation revealed that out of 85 regions of the country, 44 have natural mountain objects. These regions with a population of almost 20 million people occupy 85.5 % of the country's territory, including mountains that account for 63 % of the total area.

Mountain ecosystems located on all continents of the planet occupy vast territories and are centers of special national, regional and international strategic interests and conflicts: economic, social, ecological, and even geopolitical (Reilly, 2008). The extreme natural and climatic features of the mountains objectively hinder the possibilities of economic management and give rise to unique, social, ethnic, cultural and economic traditions, which are more affected by external shocks. The study of local socio-economic systems of mountain regions is necessary for the implementation of the regional development strategy. The conservation and socio-economic development of mountain ecosystems require global scientific research.

To date, the focus is on the study of development of local socio-economic systems of mountain regions since complex relief and peculiarities of indigenous ethnic communities (customs, culture, traditions, life, historical morphology, etc.) have a significant effect on the life of people. The mountainous terrain is characterized by a fragile ecosystem, limited natural resources and, as a result, a weak economy and low quality of life (Israilov, 2016; Ivanova 2019).

Global scientific research of mountain regions has been carried out since the middle of the 19th century, but in practice, scientists have always used a sectoral approach in the study of mountain regions. The study of mountain regions requires an integrated approach.

Literature sources present numerous definitions of the concept 'mountain region'. For example, according to Avakyan, 'mountain region is the space in which all quantitative and qualitative changes occur along vertical zones, where the profile, nature and conditions of agricultural production, and especially the productivity of aggregate social labor, sharply differ from those characteristic of flat lands and especially lowlands' (as cited in Khuzmiev, 2018).

The second article of the European Charter of Mountain Regions states that 'mountain regions are areas where the relief height and climatic features form special conditions that determine the life of the region's population (Klemperer, 1999).

The experience of France in defining the boundaries and state policy of socio-economic systems of mountain regions is of interest (Armstrong & Taylor, 2003). According to French law, mountain regions include communes, 80 percent or more of the area of which is more than 600 meters or the height difference of agricultural land at a level of 400 meters or more a.s.l.

The geographic modern illustrated encyclopedia provides the following definition: mountain country is a vast area of the earth's surface of great length (up to several thousand kilometers) and complex configuration with a folded and folded-block structure of the surface raised to an altitude of several thousand meters a.s.l., and the surrounding plains characterized by sharp fluctuations in altitude (Gorkin, 2006). In order to give a universal definition of 'mountain region', it is necessary to consider the combination of three components – man, nature and the national economic complex.

Mountain region is an area with rugged relief and relative elevations of 500 meters or more a.s.l., the natural and climatic conditions of which form unique local biological, ecological, social, economic and cultural systems (the authors' definition).

The development of socio-economic systems of mountain regions in the Russian Federation is complicated by the lack of modern laws and regulations. The federal law 'On the development and protection of mountain regions' has not been adopted until now. Similar situation can be observed in other regions; Dagestan (2010) and North Ossetia-Alania (1998) have a regional law 'On mountain regions'. In Kabardino-Balkaria and the Chechen Republic, 'Programs of mountain regions development' were elaborated, but they have already expired. Due to the lack of implementation and funding mechanisms, the targets were not achieved. Nowadays, within the framework of the CIS Interparliamentary Assembly, work is underway to adopt a draft model law 'On the development and protection of mountain regions'. 'The altitude of mountain regions, a special legal regime for doing business, including the conditions for attracting investments, the creation of special zones for conducting economic activities are established by each CIS member state,' said Khatsaev, Deputy Minister of the Russian Federation for North Caucasus Affairs (as cited in Khuzmiev, 2018). According to Khatsaev, the adoption of the draft law will contribute to the solution of a number of significant problems, including the low standard of living of the population of mountain regions, a decrease in the quality of education, medical and various types of social assistance, depletion of natural resources and environmental degradation, and a lack of communications of high quality and flat lands (as cited in Khuzmiev, 2018).

Based on foreign experience and practice, we propose to form a database of local socio-economic systems of mountain regions of the KBR in terms of natural resource potential, specialization of the economy, population migration, social aspect and assessment of the work of municipal authorities. In addition, the factors of the internal and external environment for the development of local mountain regions and municipalities should be analyzed (Table 01, Table 02, Table 03).

Consider the main socio-economic indicators of the Kabardino-Balkarian Republic in the context of the mountain zones under study.

**Table 1.** Average per capita income, rub

#	Regions	2005	2010	2015	2016	2017	2018	2019
1.	RF	8088	18958	30254	30865	31897	33178	35340
2.	KBR, incl.	4190	11290	18976	19767	20439	20782	20980
	zone I	3142	8128	14611	14620	16351	15580	15320
	zone II	3352	9370	15370	16011	16600	16150	16010
	zone III	4940	13400	24560	27320	28550	28480	28320
	zone IV	3090	8370	14150	14790	15940	15420	15180

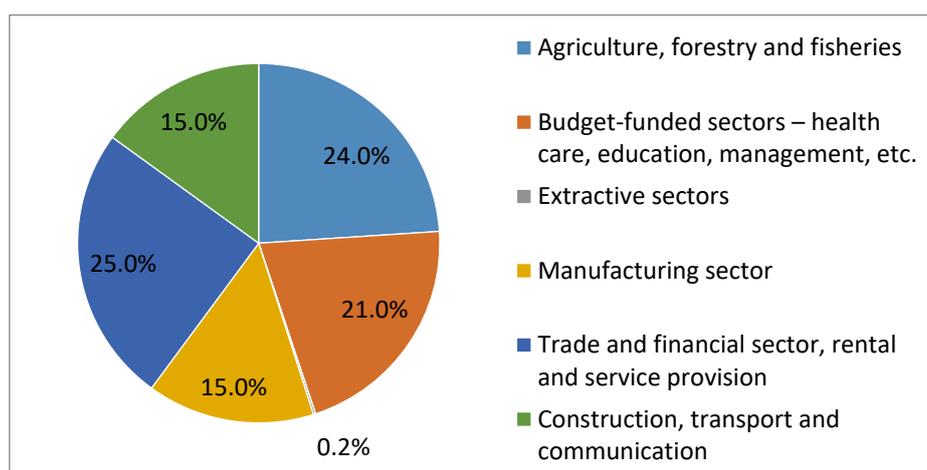
**Table 2.** Share of the population with incomes below the minimum subsistence level (%)

#	Regions	2005	2010	2015	2016	2017	2018	2019
1	KBR, incl.	23.8	15.7	21.1	25.8	24.7	24.2	24.01
2	zone I	29.3	26.1	28.4	33.4	32	31.7	31.5
3	zone II	26.5	16.2	24.5	26.9	26.6	26.4	26.45
4	zone III	14.2	9.3	10.7	12.9	12.6	12.1	11.95
5	zone IV	31.9	27.4	31.9	36.5	34.2	33.9	34

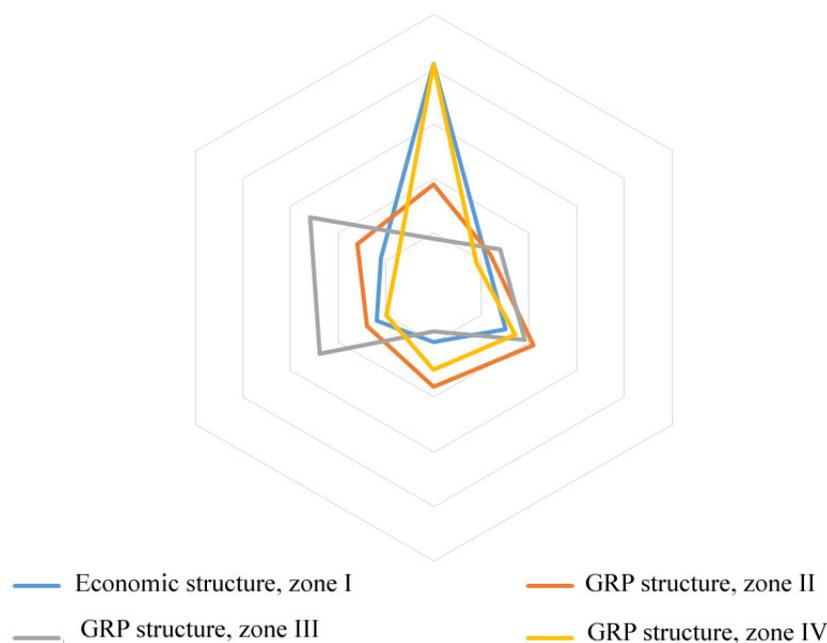
**Table 3.** Per capita consumption, rub

#	Regions	2005	2010	2015	2016	2017	2018	2019
1	NCFD	3409	9314	18388	18286	19056	19321	19770
2	KBR, incl.	2912	7764	14636	15411	16253	16688	16870
3	zone I	2790	7150	14100	14160	15240	14930	14900
4	zone II	2810	7300	14280	14750	15600	15500	15500
5	zone III	3600	9100	16900	18500	21040	22000	22600
6	zone IV	2710	6900	13700	13700	13950	13830	13800

The study of the existing model of socio-economic systems of mountain regions of the KBR (Figure 01, Figure 02) allows assessment of the efficient use of limited resources with the allocation of economic and landscape zones..



**Figure 1.** GRP structure of the KBR in 2019



**Figure 2.** GRP structure of four mountain zones of the KBR

We have developed a methodology for assessing the state policy of the Russian Federation in the field of sustainable development of socio-economic systems of mountain regions. We propose to divide it into three quality blocks (Gurtuev et al., 2020).

1. Definition and classification of problems, difficulties and opportunities for development of socio-economic systems of mountain regions, including those in the current laws and regulations. This requires a practical definition of problems with the use of state institutions as mechanisms of technical expertise of the components of local socio-economic systems and consultation with the local population.

2. Analysis and assessment of the legal system. First of all, determination of the necessary amendments to the current legislation regarding mountain regions.

- A clear and adequate definition of mountain regions;
- Provisions of the Constitution of the Russian Federation on land, climatic and labor resources, social and demographic programs related to the development of socio-economic systems of mountain regions;
- Land management, including planning, and agricultural land use system;
- Reform and development of legislation by the central and local authorities, rural areas;
- Regulations in the field of environmental protection and monitoring;
- Legislation in the field of taxis, credits and financing.
- Mechanisms to ensure participation of the mountain population in decision-making.

3. Analysis and assessment of the architecture of local socio-economic systems of mountain regions in terms of:

- social relations – ideological, political, legal, moral, religious, cultural, national and other relations.

- social infrastructure – education, healthcare, housing and communal services, settlement, demography, employment, trade and transport services, communications, income and consumption, etc.
  - production and economic structure – natural and climatic factors, natural resource potential, specialization of production, opportunities for diversification, labor resources, transport, etc.
- assessment of the development of rural areas and municipal authorities.

## 7. Conclusion

A new model of socio-economic systems of mountain areas will change the approach to the formation of socio-economic policy and enable implementation of the system of effective management of limited resources in mountain areas with a high proportion of the rural population, which will lead to the increased direct economic results and the advanced development of mountain areas.

The development of mountain areas cannot be studied and assessed without analysis of the current state of the intra-system environment of the multi-level socio-economic system of mountain areas. For this purpose, the information database on the mountain areas of the KBR was created, the resource management system in the region was assessed, the work of local authorities was analyzed, and weak and strong sides in the development of the socio-economic system of municipalities were identified. This revealed the need to develop a new architecture of local socio-economic systems of mountain areas.

A new model of socio-economic systems of mountain areas will change the approach to the formation of socio-economic policy and enable implementation of the system of effective management of limited resources in mountain areas with a high proportion of the rural population, which will lead to the increased direct economic results and the advanced development of mountain areas.

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