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Geography and Regional Features of the Spatial Differentiation and Settlement Loading on Landscapes of the Russian Caucasus

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ABSTRACT.
The article considers the geography and the regional features of the landscapes of Ciscaucasia plains and the northern slope of the Greater Caucasus; it gives characteristics of the plain and mountainous landscapes, reveals their most typical elementary natural-territorial complexes. Due to application of cartographic methods, there is a comparison of the areas occupied by the core landscapes with the areas of settlements within their borders. There are evaluations of the number of settlements within the landscape outlines and their average area as well. It is revealed, the piedmont landscapes of Ciscaucasia or mountainous basin landscapes of the Greater Caucasus are a subject to the highest settlement loading.

Keywords: the Russian Caucasus, the Northern Caucasus, Ciscaucasia, the Greater Caucasus, natural landscape, plain landscape, mountainous landscape, natural-territorial complex, mountain moderate humid landscape, mountain moderate semi-humid landscape, mountain moderate semi-arid landscape, mountain cold humid landscape, alpine meadow landscape, anthropogenic landscape, settlement landscape, settlement, settlement loading.

INTRODUCTION

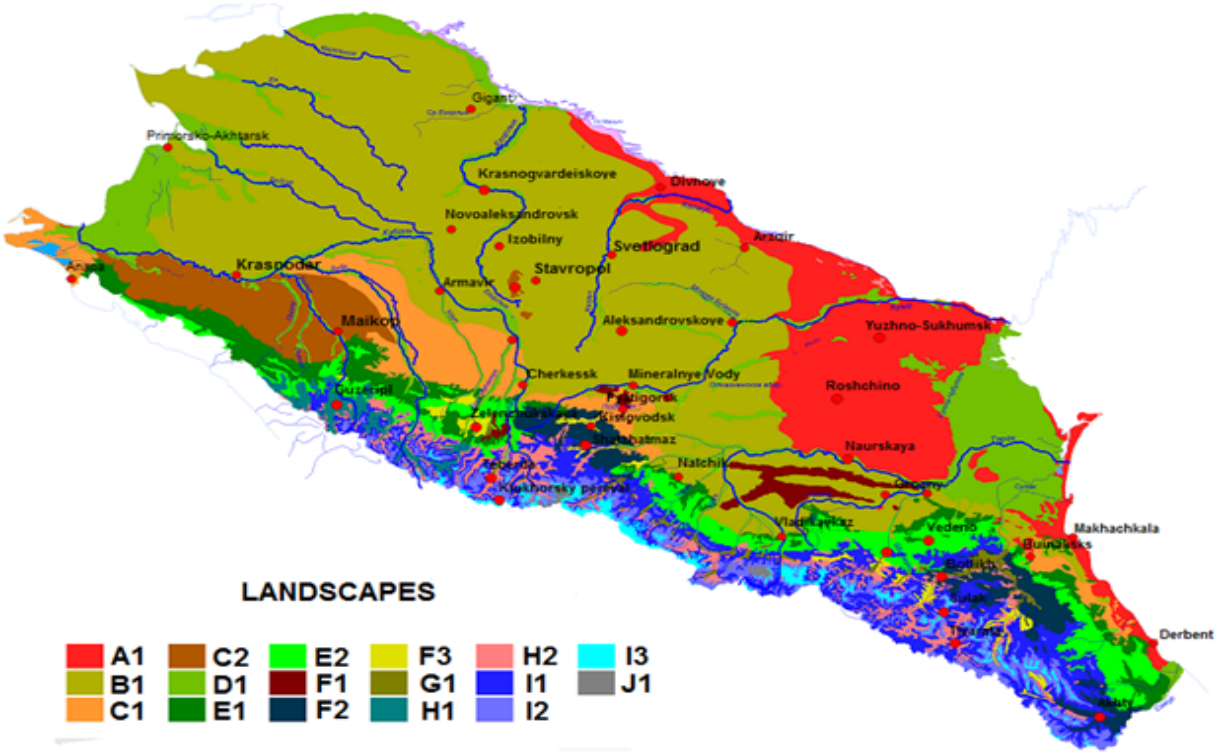
The study of the landscapes and the charting physiographic zoning of separate parts of the Russian Caucasus (the Northern Caucasus) engaged many investigators. Nowadays, for all the territory of the Russian Caucasus, there are several variants of physiographic zoning. S.V. Kalesnik [23] made one of the first complex characterizations of the territory. The most well-known works on the physiographic zoning of the Caucasus belong to N.A. Gvozdetsky [19-21]. Later, in 1986, he and T.A. Smagina created a more detailed map of the physiographic zones of the territory. V.M. Chupakhin suggested an independent zoning map [27]. In 1973, he (together with T.A. Smagina) published a chorographic landscape map of the Northern Caucasus and the Lower Don [28].

For the whole territory of the Russian Caucasus, there are several landscape maps. Among all chorographic maps, we can mention the Landscape Map of the USSR (1: 4 000 000) edited by A.G. Isachenko [25]. A more detailed landscape map of the Northern Caucasus (1: 2 500 000) was compiled by V.A. Shalnev [29]. N.L. Beruchashvili et al. compiled a landscape map of the Caucasus scaled

1: 1 000 000 [24]. Later, in 1996, he prepared an electronic variant of this map [26; 30]. The map, as most large-scaled, was used for the landscape characterization of the Russian Caucasus and for identification the changes in the climatic conditions within the landscape [11].

RESULTS OF THE STUDY

In the class of plain and piedmont undulating landscapes, which extend across the territory of Ciscaucasia, there are the landscapes of Sub-type 4 and 5, among which the hydromorphic and sub-hydromorphic ones are not zonal (Picture 1, Table 1). The latter are represented in both the western and eastern parts of the Russian Caucasus and joined with the estuaries of the Terek and the Kuban rivers and with the Kuma valley as well - they occur in the mountains along the valleys of largest rivers. In the class of mountainous landscapes, occurring on the northern slope of the Greater Caucasus, we can distinguish 6 types and 12 subtypes.



Picture 1. Landscapes of the Russian Caucasus (see Table 1 for interpretation of the symbols)

Table 1: Systematization of landscapes of the Russian Caucasus

Class	Type	Subtype
I. Plain and piedmont undulating (198654 km^2)	**A.** Plain moderate arid (32246 km^2)	**A1.** Lowland and plain semi-arid and arid (32246 km^2)
	B. Plain and undulating warm moderate and moderate semi-arid (109809 km^2)	**B1.** Plain and undulating steppe (109809 km^2)
	C. Piedmont-undulating warm moderate and moderate semi-humid (23454 km^2)	**C1.** Piedmont meadow-steppe, meadow, shrubby and forest-steppe (13054 km^2)
		C2. Piedmont forest-steppe and forest (10400 km^2)
	D. Hydromorphic and sub-hydromorphic (33145 km^2)	**D1.** Lowland deltaic and floodplain (33145 km^2)
II. Mountain (71998 km^2)	**E.** Mountain moderate humid (23425 km^2)	**E1.** Low mountain forest (10305 km^2)
		E2. Middle mountain forest (13120 km^2)
	F. Mountain moderate semi-humid (11798 km^2)	**F1.** Low mountain forest- shrubby - meadow -steppe (2803 km^2)
		F2. Middle mountain meadow, steppe, meadow- steppe, shibliak and phryganoid (7000 km^2)
		F3. Mountain basin forest- shrubby - meadow -steppe (1995

		km^2)
	G. Mountain moderate semi-arid (1551 km^2)	**G1.** Mountain basin steppe and shibliak (1551 km^2)
	H. Mountain cold humid (8898 km^2)	**H1.** Middle mountain forest dark-coniferous (2441 km^2)
		H2. Alpine forest pine and birch (6457 km^2)
	I. Alpine meadow (25958 km^2)	**I1.** High-mountain subalpine shrubby - meadow (15691 km^2)
		I2. High-mountain alpine shrubby - meadow (7669 km^2)
		I3. Alpine subnival (2598 km^2)
	J. Glacial nival (368 km^2)	**K1.** Glaciers (368 km^2)

I. Plain and piedmont-undulating landscapes.

Plain moderate arid landscapes (A) begin the series of the zonal landscapes in the north and northeast. They are spread by 32.2 thousand km^2 (11.9% of the total area) and belong to the Terek-Kuma lowland, the coast of the Caspian Sea, and to Kuma-Manych Depression (valley). Those landscapes have a special place in the natural-territorial complexes of the South of Russia; it is connected with their borderline position between the steppes in the north and northwest and the deserts in the south and southeast.

They are characterized by a lowland plain relief with a wide range of accumulative and eolian forms. The average annual atmospheric temperature is 9.5–11.5° Celsius. The temperature in January varies from positive values on the coast of the Caspian Sea to -3.5–5.0° in the Kuma-Manych Depression. Summer temperatures reach +23.0–25.0°. The annual precipitation ranges from 200–250 mm on the coast to 350–400 mm at the borderline with the steppe. The moisture index (MI) changes in accordance with the conditions – from less than 0.20 on the coast to 0.35–0.45 with moving to the steppes.

The soil and the vegetation cover are complex – their fragments are combined with the adjacent arid and steppe landscapes; in particular, a significant area of the landscapes of this type is occupied by desert steppes combined with semi-arid groups. The zonal type of the soil, traditionally typical for these landscapes, is the chestnut type.

Within the limits of this type there is one subtype – lowland and plain semi-arid and arid (A1). In general, this landscape is characterized by a rather monotonous morphological structure, represented mostly by the following regular natural-territorial complexes (NTC):

– gramineous- sagebrush semi-deserts on light-chestnut saline soils with salt pans;

– sagebrush - fescue - feathergrass arid steppes on chestnut soils;

– sagebrush -gramineous and gramineous-sagebrush desert steppes with ruts on light-chestnut soils;

– saltwort and sagebrush semi-deserts on light-chestnut saline-salt soils;

– saltwort, saltwort-sagebrush deserts and semi-deserts on light-chestnut soils;

– gramineous- sagebrush and saltwort semi-deserts on light-chestnut soils.

Plain and undulating warm moderate and moderate semi-arid landscapes (B) are most typical for the territory of the Russian Caucasus and occupy 109809 km^2 (40.6%). They are most widespread in the West and Central Ciscaucasia or stretch as a narrow strip between the semi-arid landscapes along the coast of the Caspian Sea and the low mountain ridges of the Greater Caucasus in the East Ciscaucasia. Their characteristic is a plain relief in combination with accumulative and denudation forms.

Here, the annual temperatures change from 8.0–9.0° at the foothills and higher locations to 10.0–10.5° at the coast of the Black Sea. The temperature of the coldest month is as low as -4.5–5.0°, in summer it can reach +23.5–24.5°. The annual precipitation varies from 350 to 500 mm. The MI values are 0.47 in average, 0.35 minimum and 0.55 maximum [17].

The steppe vegetation is represented by the groups, the spatial distribution of which is caused by the local conditions: from motley forb-sod-gramineous steppes in the West and Central Ciscaucasia to sod- and rhizome-gramineous in the East Ciscaucasia. Closer to the foothills of the Greater Caucasus and in the depressions, there are forb-gramineous and gramineous-forb meadow steppes in combination with steppe meadows. The zonal

soil type is black soil of varying thickness.

Here, this type of landscapes includes only one subtype: plain and undulating steppe (B1). The morphological structure of these landscapes, like in the case of semi-arid landscapes, has no great complexity and diversity, because the dominant NTCs occupy rather big areas. These are the most widely spread typical NTCs:

– motley forb and sod-gramineous steppes on black soils;

– motley forb - gramineous meadow steppes and floodplain forests on leached black soils;

– gramineous and gramineous - motley forb steppes on black soils;

– motley forb - gramineous steppes on common low-humus and southern black soils;

– motley forb - fescue - feathergrass steppes on southern black soils;

– fescue - feathergrass - motley forb steppes on southern black soils;

– sod- gramineous and sod- motley forb steppes on southern black soils;

– feathergrass - fescue dry steppes on dark-chestnut soils;

– feathergrass - fescue - sagebrush steppes on black soils;

– motley forb - fescue - feathergrass steppes on black soils;

– meadow and motley forb -sod- gramineous steppes in combination with gramineous - motley forb steppe meadows on southern black soils;

– motley forb - gramineous steppes and meadow-steppes on southern black soils;

– motley forb-sod- gramineous and sod- motley forb steppes on southern and common black soils.

Piedmont-undulating warm moderate and moderate semi-humid landscapes (C) occupy an area of 23454 km^2 (8,7%) and are widely represented in the West Ciscaucasia. They form transitional strip between the actual mountain structure of the Greater Caucasus and the Ciscaucasia plains. In the Central Ciscaucasia, they are represented on the territory of the Caucasian Mineral Waters and, in fragments, in Dagestan. The distinctive feature of the relief of these landscapes is presence of both mildly sloping plains and outlier ranges (e.g. the Sytchovy Mountains with altitudes up to 850 m).

This situation affects the climate: with the approach to the mountains, a slight decrease in temperature and an increase in precipitation are marked. Therefore, within the bounds of such landscapes, the average annual atmospheric temperature is around +10°; it can drop to -3.0–4.0° in winter or reach +17.5–20.0° in summer. The MI value is more than 0.60, which corresponds to forest-steppe conditions [8; 16].

The vegetation is represented by fragments of forests (oak and hornbeam), which were more widespread in the past, and by motley forb - gramineous and gramineous- motley forb mesophyte and xero-mesophyte motley forb meadow steppes or steppe meadows. The soil cover includes most widely available typical and leached black soils, fragments of grey forest soils and alluvial soils.

This type of landscapes has two subtypes: piedmont meadow-steppe, meadow, shrubby, forest-steppe (C1) or piedmont forest-steppe and forest (C2). In this type of landscapes, the setup of elementary NTCs is the most diverse among other zonal types of landscapes and mainly consists of:

– piedmont steppe meadows and meadow steppes on alluvial an meadow-black soils;

– meadow steppes in combination with gramineous-motley forb steppe meadows and shrubs on black soils;

– steppe meadows with oak- hornbeam forests on black soils and grey forest soils;

– steppe meadows with hornbeam –oak and oak forests on black soils and grey forest soils;

– sod- gramineous steppes in combinations of shibliaks and mixed forests on black soils and grey forest soils.

Hydromorphic and sub-hydromorphic landscapes (D) are azonal. Their existence relates to the downstreams of the largest rivers of the Caucuses: the Kuban in the west and the Terek in the east. This type of landscapes has quite extensive areas (33145 km^2, or 12.2%), especially in the east. It is made by the sediments of these rivers. Its main difference from the adjacent zonal landscapes (steppe and semi-arid) is that the ground waters come close

to the surface and form a meadow vegetation (or salt marshes in the most depressed areas). The vegetation is forest in the floodplains. The conditions of the climate are similar to those of the adjacent landscapes. There is only one landscape subtype – Lowland deltaic and floodplain (D1).

II. Mountain landscapes.

Mountain moderate humid landscapes (E) are represented almost all over the macro slopes of the Greater Caucasus from its foot to the elevations 1500-1600 m and occupy 23425 km^2 (8,7%) of the slopes of the Skalistyi, the Pastbishchnyi, the Lesistyi ranges and their spurs [9; 18]. They are also present on the slopes of the ridges encircling Inner Dagestan (Andi Ridge, Salatau and Gimri Range) [2]. They are characterized by a karst, karst-denudation and erosion-denudation relief.

The areal of this landscape type has a moderately warm and rather humid climate. The winter temperatures are -1.5–5.0°, the summer temperatures are 17.0–22.0° Celsius; the average annual temperature varies from 8-9° at the lowest limit to 6-7° at the highest limit. The fluctuations of the annual precipitation are from 500–600 to 800–900 mm, the main part of which falls in the warm season. Moving from west to east, the climate continentality intensifies, with MI decreasing from 1.15 to less than 1.0.

These conditions favor the development of broad-leaved forests dominated by oaks (pedunculate and sessile), beech, hornbeam, linden, ash, elm, etc. In Dagestan, due to climate drying and deforestation, we observe appearing thickets of thorny shrubs and meadow NTCs. The typical soils for the vegetation are brown mountain-forest and humus-carbonate (on limestones).

This landscape type consists of two subtypes: low mountain forest (E1) and middle mountain forest (E2). The type does not feature a large variety of typical NTCs. Except serial complexes, we find the following widespread NTCs here:

– oak and hornbeam-oak forests with undergrowth on brown mountain-forest soils;

– beech-hornbeam and hornbeam-beech forests (grassy and with undergrowth) on brown mountain-forest soils.

The mountain moderate semi-humid and mountain moderate semi-arid landscapes, despite their quite limited occurrence (4.4% and 0.6% of the studied area), are the most peculiar in the mountainous parts of the Russian Caucasus. As plain hydromorphic and sub-hydromorphic, their existence is connected to azonal factors complicating the altitudinal variety of the landscape. As a result, their differentiation is reduced to a set of elementary NTCs; the variety of the semi-humid landscapes is more extensive.

Mountain moderate semi-humid landscapes (F) of the Greater Caucasus are quite unequal. In the Western Caucasus, they are bound to the basins between the lowest ridges, in the Central Caucasus - to the midland basins and slopes, in the Eastern Caucasus - to the front ranges, midlands, and the widest parts of the valleys of the major rivers [15]. Despite their difference in the location, forms and types of the relief, these landscapes are united by common climate conditions. In particular, the humidification here corresponds to the forest-steppe (MI=0.6-0.9). Therefore, the natural complexes form long series of locations, from the forest in the wettest parts to the steppe in the driest parts.

This mountain type can be divided into 3 subtypes: low mountain forest-shrubby-meadow-steppe (F1); middle mountain meadow, steppe, meadow-steppe, shibliak and phryganoid (F2), mountain basin forest- shrubby - meadow - steppe (E3). The following fundamental natural-territorial complexes share their wide representation:

– steppe mountain meadows, with parts of mountain steppes and fragments of oak-hornbeam forests on black soils;

– steppe meadows (grasslands) combined with beech- hornbeam –oak forests on black soils.

Mountain moderate semi-arid landscapes (G) are represented within the interval of elevations from 600-700 to 1100-1300 m, only in the basins. In the Western and Central Caucasus, they occur between the Lateral and Skalistyi ranges (North-Jurassic depression), in the east, in Inner Dagestan – in wide river valleys [6; 13;

14]. The relief is the erosion-accumulative. Compared with the zonal landscapes, the climate is characterized by higher temperatures and lesser precipitation. The temperature of the coldest month is -2-4 °, of the warmest month - + 18-20 °, and the average temperature is 8-10 °. The annual precipitation does not exceed 350-550 mm; the moisture index is 0.4–0.6. Therefore, the landscape is reach in phryganas and phryganoids, shibliaks, mountain steppes, although on the circulation slopes there are fragments of forest. The soils are mostly mountain-steppe and humus-carbonate.

Within this type of landscapes, there is one subtype - mountain basin steppe, shibliak and phryganoid (G1). The typical NTCs are:

– mountain steppes, shibliaks in conjunction with the arid woodlands and phryganas on mountain-steppe soils;

– thickets of thorny shrubs (shibliak) with mountain steppes on brown soils.

Mountain cold humid landscapes (H) are located within the interval of elevations from 1000–1200 to 2200–2400 m and occupy 8898 km^2 (3.3%). The true to type relief is erosion-denudation, karst, and partly paleo glacial. The area of the distribution of these landscapes is characterized by moderately cold and rather humid climate. The average temperatures drop to -3.5 - -6.5 ° in the coldest month and reach 14.0–160° in the warmest month – with annual average +5–6°. The annual precipitation changes from 1000 mm in the west to 800 mm in the central part or 600 mm in the east. The moisturizing is sufficient and even excessive (MI=0.9–1.3). The forest vegetation is typical: in the west, there are beech dark-coniferous forests transforming into coniferous or into small-leaved (birch and mixed-birch) forests at their upper borders. The coniferous forests disappear in the Central Caucasus and reappear in Dagestan. Within the continental sector, coniferous forests are absent. The forests, located on the border of forest and meadow zones, are crooked or low. The typical soils under the forests are mountain-forest soils, often ashed and podsolic.

This type of landscapes is divided into two subtypes: middle mountain dark-coniferous forest (H1) and alpine pine and birch forest (H2). The main NTCs of these landscapes are not diversified. They are:

– pine and pine-birch forests on mountain-forest soils;

– birch and beech-birch crooked / low forests on mountain-forest soils.

Alpine meadow landscapes (I) are situated in the high mountain part, occupying 25958 km^2 (9,6%) within the range of elevations from 1800–2000 to 3200–3400 m. They are widespread on the slopes of the Main, the Front, the Lateral and the Skalistyi ranges [5; 12]. This part consists of a whole complex of land materials, causing volcanic, denudation, erosion and karst topography. A strong glaciation in the West and Central Caucasus led to a large number of forms of modern and ancient glacial relief. The climate is characterized by short cools summers and long cold snowy winters. The temperatures of the coldest month are -8–12°; the temperatures of the warmest month are +7–12°. The average annual temperature ranges from + 2-2,5 ° in the subalpine zone to -2,5 ° or lower - in the alpine zone. The annual precipitation varies from 600 to 1800 mm; the share of falling of solid forms grows with an increase in altitude. The vegetation consists mainly of meadows (subalpine and alpine), which are combined with shrub thickets of elfin type (Caucasian rhododendron and juniper). The soils under meadows are mountain-meadow; in the relatively dry locations, under the meadow steppes, there are soils of humus type.

This landscape includes three subtypes: high mountain subalpine forest-shrubby - meadow (I1), high mountain alpine shrubby - meadow (I2) and high mountain subnival (I3). The natural-territorial complexes here are of grass and shrubby type. The first group includes a variety of meadows, species composition of which is different in the ratio of motley forb and gramineous plants, and the second - shrub elfin plants represented by thickets of Rhododéndron caucásicum or various types of junipers. The most widespread are gramineous- grass forb meadows on mountain-meadow soils.

Glacial nival landscapes (J1), or glaciers, are situated in the most elevated part of the

mountain structure, starting from altitudes 3400-3800 m. The total estimated area of modern glaciation of the northern slope of the Greater Caucasus is, according to different sources, from 368 to 800-900 km^2.

The landscapes of the Russian Caucasus have different degrees of economic development. Within the plain landscapes, the most significant development is specific for the plain and undulating warm moderate и moderate semi-arid landscapes, the piedmont-undulating warm moderate and moderate semi-humid landscapes. For example, in the Stavropol region, up to 90% of the territory of these landscapes is involved in agricultural use [29]. That means the vegetation cover has the greatest degree of transformation. In the Greater Caucasus, the mountain moderate semi-arid landscapes and the mountain moderate semi-humid landscapes are developed most intensively [3; 4; 10], but the load on the other mountain landscapes is significantly less intensive, especially in recent times.

Nowadays, all the above-mentioned types and corresponding subtypes of the landscapes of the Russian Caucasus (excluding subnival and glacial-nival landscapes) are inhabited to varying degrees.

Like in the case of the Northeast Caucasus [1; 10; 22], the areas of the settlements are determined by topographic maps with the scale 1: 200 000. The calculations take into account the areas of the urban and rural settlements and the country house habitations. The data on the settlements (their size and number) are correlated with the area of the landscape subtypes. The average areas of the settlements within the landscapes are also calculated.

Table 2 illustrates the modern settlement load on the landscapes of the Russian Caucasus.

Table 2: Modern settlement loading of the landscapes of the Russian Caucasus

Landscape	Landscape area, km^2	Settlement area, km^2	Number of settlements	Average settlement area, km^2	Share of settlement in landscape, %
I. Plain					
A1. Lowland and plain semi-arid and arid	32247	401	314	1.3	1.24
B1. Plain and undulating steppe	108602	4408	2374	1.9	4.06
C1. Piedmont meadow-steppe, meadow, shrubby and forest-steppe	14261	920	427	2.1	6.45
C2. Piedmont forest-steppe and forest	10401	709	401	1.8	6.81
D1. Lowland deltaic and floodplain	33145	2125	1323	1.6	6.41
Subtotal	**198656**	**8563**	**4839**	**1.74**	**4.31**
II. Mountain					
E1. Low mountain forest	10543	318	284	1.1	3.02
E2. Middle mountain forest	13121	192	475	0.4	1.46
F1. Low mountain forest- shrubby - meadow -steppe	2815	83	72	1.1	2.95
F2. Middle mountain meadow, steppe, meadow- steppe, shibliak and phryganoid	6762	148	392	0.4	2.19
F3. Mountain basin forest- shrubby - meadow -steppe	1985	102	129	0.8	5.14
G1. Mountain basin steppe and shibliak	1552	52	114	0.5	3.35
H1. Middle mountain forest dark-coniferous	2441	11	18	0.6	0.45
H2. Alpine forest pine and birch	6457	33	182	0.2	0.51
I1. High-mountain subalpine shrubby - meadow	15690	44	255	0.2	0.28
I2. High-mountain alpine shrubby - meadow	7689	1	9	0.1	0.01
Subtotal	**69055**	**984**	**1930**	**0.54**	**1.42**
TOTAL for the landscapes of the Russian Caucasus	**267708**	**9546**	**6769**	**0.93**	**3.57**

The data show, the total number of the mapped settlements of the Russian Caucasus (cities, towns, urban villages, rural villages and country house habitations) is 6769, and the area

occupied by them is 9546 km^2. Of course, their allocation cannot fail to differ considerably in the mountain and plain parts. Therefore, the plain part accommodates 4839 settlements with the overall area 8563 km^2, and the mountain part includes 1930 settlements with the area 984 km^2. In other words, within the bounds of the plain landscapes, occupying 74% of the Russian Caucuses area, there are 90% of the settlements, and the mountain landscape, which is 26% from the total, places only 10% of all the settlements. The average areas of the settlements differ as well - 0.93 km^2 in total, 1.74 km^2 for the plains and 0.54 km^2 for the mountains.

The plain landscapes vary significantly in the degree of development, despite the relief is quite monotonous. The lowland and plain semi-arid and arid landscapes of the Caspian depression and Kuma-Manych depression are poorly developed. They include only 314 settlements with the area of 401 km^2; and their share is small (1.24%). In general, this is due to relatively unfavorable natural conditions – the long dry season and the scarcity of the vegetation cover, allowing the population to be engaged mainly in cattle breeding with the appropriate settlement system. The deltaic and floodplain landscapes occupying the lower reaches of the Kuban, Terek and Sulak can be compared in size to the lowland landscapes. They are characterized by a much greater development, obviously, due to more favorable conditions of soil moisture, and, respectively, due to possibility of farming. There are 1323 settlements with the total area 2125 km^2, i.e. 6.41% share from total. Despite all the differences, the average area of the settlements of these landscape subtypes is the smallest in the plain landscape type – 1.3-1.6 km^2.

The biggest area in the group of plain landscapes belongs to steppes – 108602 km^2, with the maximal number of settlements (2374) and the maximal area (2374 km^2). Because these landscapes are most favorable for grain agriculture, their average area of the settlements is quite small (1.9 км^2) and in general their share is only slightly more than 4% of the total area of the landscape subtype.

The piedmont landscapes of the Russian Caucasus are most favorable for living, which is evident from the presented data. Without regard to their small territories, they have the biggest share of settlements not only in the plain but also in the overall total of the Russian Caucasus: 6.45% in the piedmont meadow-steppe, meadow, shrubby and forest-steppe landscapes and 6.81% in the piedmont forest-steppe and forest landscapes. They have the maximal average value of settlements – up to 2.1 km^2. It is explained by the fact that we observe a great diversity of internal landscape conditions in the foothills – from the steppes of a relatively plain relief to forest-steppes and even separate forestlands (e.g. Strizhament on the Stavropol upland). All this creates auspicious conditions not only for habitation but also for farming.

Mountain landscapes of the northern macro slope of the Greater Caucasus are characterized by great variety of complexes – from forest in the low-hills and low-mountains to glacial-nival in the highest parts of the mountain system. As for the settlement loading, it differs rather substantially from a landscape to a landscape. In general, the area of the settlements reduces in line with increase of the absolute altitude but this process is uneven. The maximum absolute settlement area is registered within the low- and middle-mountain forest landscapes (200-300 km^2). Another peculiar «maximum of development» is marked in the basins where the area of the settlements can reach 100-150 km^2. Further, with increasing altitude, deterioration of conditions for permanent habitation is reducing human presence - to a minimum in the alpine landscapes.

The number of settlements is maximal in the low-mountain forest and high-mountain subalpine landscapes. It is explained by relatively favorable conditions for living in the first case and by maximal area of the distribution of the landscape in the second case.

SUMMARY AND CONCLUSIONS

The share of the settlements within the landscapes is a very informative index, testifying to the level of favorable conditions and comfort for habitation. The index allows dividing the mountain landscapes into three

groups. The first group includes the high-mountain alpine, subalpine landscapes and the middle mountain forest dark-coniferous landscapes, where the share of settlements is close to 0.5%. The limiting factors for habitation are inclement conditions of the high-mountain climate, as well as complications in farming and housekeeping within the coniferous forest territories, characterized by a rather large amount of precipitation. The second group consists of the lower-tier forest landscapes (low- and middle-mountain-forest), the middle-mountain, meadow, steppe, meadow-steppe, shibliak and phryganoid, low-mountain forest, forest shrubby, meadow and steppe landscapes, where the share of the settlements is 3% of the area of the landscape. Finally, the third group is most suitable for living and farming. It includes mountain-basin steppe shibliak and mountain-basin forest-shrubby-meadow-steppe landscapes, where the share of the settlements is maximal – more than 5.1%. At the same time, the area of these landscapes is the smallest not only among the mountain landscapes but also among all other landscapes of the Russian Caucasus.

The study revealed that the areas with the highest diversity of landscape forms are the most attractive for settlement and farming. On the plains of Ciscaucasia, such areas are piedmont landscapes; in the Greater Caucasus, those are mountain basins [7], which actually perform as «settlement landscapes» for the ethnic group inhabited this territory historically. It is possible this contradiction is cardinal in the evolution of ecological relations "human - natural environment". Therefore, the study of its genesis, adaptation and disdaptation mechanisms are of crucial importance for the geographical science.

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NOTES

1. Abdulaev K.A. Otsenka stepeni selitebnoi nagruzki na landshafty gornogo Dagestana // Izvestiya Dagestanskogo gosudarstvennogo pedagogicheskogo universiteta. Estestvennye i tochnye nauki. 2009. № 1. S. 84-86.
2. Abdulaev K.A., Ataev Z.V., Bratkov V.V. Sovremennye landshafty Gornogo Dagestana. Makhachkala: DGPU, 2011. 116 s.
3. Ataev Z.V. Landshafty Vysokogornogo Dagestana i ikh sovremennoe sostoyanie // Izvestiya Dagestanskogo gosudarstvennogo pedagogicheskogo universiteta. Estestvennye i tochnye nauki. 2007. № 1. S. 90-99.
4. Ataev Z.V. Kotlovinnye landshafty Vnutrigornogo Dagestana // Estestvennye i tekhnicheskie nauki. 2008. № 4. S. 176-178.
5. Ataev Z.V. Landshaftno-ekologicheskie osobennosti Vysokogornogo Dagestana // Problemy razvitiya APK regiona. 2011. T. 7. № 3. S. 9-16.
6. Ataev Z.V., Bratkov V.V. Gorno-kotlovinnye landshafty Severo-Vostochnogo Kavkaza: sovremennye klimaticheskie izmeneniya i sezonnaya dinamika. Makhachkala: DGPU, 2011. 123 s.
7. Ataev Z.V., Bratkov V.V. Sovremennoe sostoyanie selitebnoi osvoennosti landshaftov Severnogo Kavkaza // Trudy Geograficheskogo obshchestva Respubliki Dagestan. 2011. № 39. S. 25-31.
8. Ataev Z.V., Bratkov V.V., Gadzhimuradova Z.M., Zaurbekov Sh.Sh. Klimaticheskie osobennosti i vremennaya struktura predgornykh landshaftov Severo-Vostochnogo Kavkaza // Izvestiya Dagestanskogo gosudarstvennogo pedagogicheskogo universiteta. Estestvennye i tochnye nauki. 2011. № 1. S. 92-96.
9. Ataev Z.V., Bratkov V.V., Khalidova N.A. Sezonnaya dinamika gornykh umerennykh gumidnykh landshaftov Severnogo Kavkaza // Izvestiya Dagestanskogo gosudarstvennogo pedagogicheskogo universiteta. Estestvennye i tochnye nauki. 2011. № 2. S. 81-86.

10. Ataev Z.V., Zaurbekov Sh.Sh., Bratkov V.V. Sovremennaya selitebnaya osvoennost' landshaftov Severo-Vostochnogo Kavkaza // Izvestiya Dagestanskogo gosudarstvennogo pedagogicheskogo universiteta. Estestvennye i tochnye nauki. 2010. № 1. S. 71-74.
11. Beruchashvili N.L. Kavkaz: landshafty, modeli, eksperimenty. Tbilisi: Izd-vo TGU, 1995. 315 s.
12. Bratkov V.V., Ataev Z.V. Vysokogornye lugovye landshafty Severo-Zapadnogo i Severo-Vostochnogo Kavkaza // Izvestiya Dagestanskogo gosudarstvennogo pedagogicheskogo universiteta. Estestvennye i tochnye nauki. 2009. № 2. S. 93-103.
13. Bratkov V.V., Ataev Z.V. Integral'naya otsenka vliyaniya klimaticheskikh uslovii na gorno-kotlovinnye landshafty severnogo sklona Bol'shogo Kavkaza // Izvestiya Dagestanskogo gosudarstvennogo pedagogicheskogo universiteta. Estestvennye i tochnye nauki. 2009. № 3. S. 99-101.
14. Bratkov V.V., Ataev Z.V. Geograficheskie osobennosti vliyaniya klimaticheskikh uslovii na gorno-kotlovinnye landshafty severnogo sklona Bol'shogo Kavkaza // Yug Rossii: ekologiya, razvitie. 2009. № 4. S. 192-195.
15. Bratkov V.V., Ataev Z.V., Bairamkulova B.O. Geograficheskie osobennosti gornykh ume-rennykh semigumidnykh i semiaridnykh landshaftov severnogo makrosklona Bol'shogo Kavkaza // Izvestiya Dagestanskogo gosudarstvennogo pedagogicheskogo universiteta. Estestvennye i tochnye nauki. 2009. № 1. S. 92-96.
16. Bratkov V.V., Ataev Z.V., Baisieva L.K., Gadzhimuradova Z.M. Vliyanie dlitel'novremennykh klimaticheskikh izmenenii na strukturu predgornykh landshaftov Severo-Vostochnogo Kavkaza // Izvestiya Dagestanskogo gosudarstvennogo pedagogicheskogo universiteta. Estestvennye i tochnye nauki. 2013. № 1. S. 76-80.
17. Bratkov V.V., Gadzhibekov M.I., Ataev Z.V. Izmenchivost' klimata i dinamika polupustynnykh landshaftov Severo-Zapadnogo Prikaspiya // Izvestiya Dagestanskogo gosudarstvennogo pedagogicheskogo universiteta. Estestvennye i tochnye nauki. 2008. № 4. S. 90-99.
18. Bratkov V.V., Salpagarov D.S. Landshafty Severo-Zapadnogo i Severo-Vostochnogo Kavkaza. M. : Ileksa, 2001. 256 s.
19. Gvozdetskii N.A. Kavkaz. Ocherki prirody. M.: Geografgiz, 1963. 264 s.
20. Gvozdetskii N.A. Fizicheskaya geografiya Kavkaza. Obshchaya chast'. Bol'shoi Kavkaz. Vyp. 1. M.: Izd-vo Mosk. un-ta, 1954. 208 s. 21. Gvozdetskii N.A., Smagina T.A. Fiziko-geograficheskoe raionirovanie // Prirodnye usloviya i estestvennye resursy. Rostov-na-Donu: Izd-vo Rostovsk. un-ta, 1986. S. 300-338. 22. Idrisova R.A. Landshafty Chechenskoi Respubliki: prostranstvennaya struktura i osobennosti selitebnoi nagruzki: Avtoref. dis. … kand. geogr. nauk. Nal'chik, 2009. 24 s.
23. Kalesnik S.V. Severnyi Kavkaz i Nizhnii Don. M.-L., 1946.
24. Landshaftnaya karta Kavkaza. Masshtab 1: 1 000 000 / Sost. N.L. Beruchashvili, S.R. Arutyunov, A.G. Tediashvili. Tbilisi, 1979.
25. Landshaftnaya karta SSSR (dlya vysshikh uchebnykh zavedenii) masshtaba 1: 4 000 000. / Nauchnyi redaktor A.G. Isachenko. M., 1986. 26. Perspektiva okruzhayushchei sredy Kavkaza / Pod red. N.L. Beruchashvili i dr. YuNEP, GRID. Tbilisi, 2002. 98 s.
27. Chupakhin V.M. Fizicheskaya geografiya Severnogo Kavkaza. Rostov-na-Donu: Izd-vo Rostovsk. un-ta, 1974. 200 s.
28. Chupakhin V.M., Smagina T.A. Obzornaya landshaftnaya karta Severnogo Kavkaza i Nizhnego Dona // Geograficheskie issledovaniya na Severnom Kavkaze i Nizhnem Donu. Rostov-na-Donu: Izd-vo Rostovsk. un-ta, 1973. S. 84-92.

29. Shal'nev V.A. Landshafty Severnogo Kavkaza: evolyutsiya i sovremennost'. Stavropol': Izd-vo SGU, 2004. 265 s.
30. Radvanyi J., Beroutchachvili N. Atlas géopolitique du Caucase. Paris, 2009.

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