

REGIONAL FEATURES OF THE SPATIAL DIFFERENTIATION AND SETTLEMENT LOADING ON LANDSCAPES OF THE NORTHERN CAUCASUS

©2014 Atayev Z.V.¹, Bratkov V.V.²

¹Dagestan State Pedagogical University

²Moscow State University of Geodesy and Cartography

Annotation. The article deals with geography and regional features of plane and mountainous landscapes of Ciscaucasia and the northern slope of the Greater Caucasus, characterizes plain and mountainous landscapes, reveals the most basic characteristics of their natural territorial complexes. As a result of applying the cartographical methods the spaces occupied by the main landscapes, are compared with the areas of settlements in their limits. The number of settlements within landscape contours, and also their average area is defined. It is revealed that foothill landscapes to Ciscaucasia and mountain-and-kettle landscapes in the territory of Greater Caucasus are subjected to the most settlement loading.

Keywords: the Northern Caucasus, Ciscaucasia, Greater Caucasus, natural landscape, plane landscape, mountainous landscape, natural-territorial complex, mountain moderate humid landscape, mountain moderate semihumid landscape, mountain moderate semiarid landscape, mountain cold humid landscape, alpine meadow landscape, anthropogenous landscape, settlement landscape, settlement, settlement loading.

Introduction

Many researchers have studied the landscapes and made schemes of physic-geographical zoning of separate parts of the Northern Caucasus. At the present time there are several variants of physic-geographical zoning for the whole territory of the Northern Caucasus. One of the first complex characterization of the territory was made up by S. V. Kalesnik[23]. The most famous works on physic-geographical zoning of the Caucasus belongs to N. A. Gvozdetskiy[19-21]. Later in 1986 N. A. Gvozdetskiy and T. A. Smagina made the more detailed scheme of physic-geographical zoning of the territory. The independent zoning scheme was offered by V. M. Chupakhin[27]. Jointly with T. A. Smagina he published the review landscape map of the Northern Caucasus and the Lower Don [28].

There are several landscape maps for the whole territory of the Northern Caucasus. Among the review maps there can be noted the Landscape map of the USSR (1: 4 000 000) edited by A. G. Isachenko [25]. The more detailed landscape map of the Northern Caucasus (1: 2 500 000) was made up by V. A. Shalnev [29]. N. A. Beruchashvili and others made up the landscape map of the Northern Caucasus 1: 1 000 000 scale [24]. Later, in 1996 he prepared electronic version of this map [26; 30]. This map as the most large-scale was used to characterize the landscapes of the Northern Caucasus and to identify the changes of climatic conditions within landscapes [11].

Results of researches

In the class of plain and hilly foothill landscapes that have spread in the Ciscaucasia there are 4 types and 5 subtypes of landscapes. Among them

hydromorphic and subhydromorphic are not zonal (Fig.1, Table 1). They are presented both in the western and eastern parts of the Northern Caucasus and are connected with the deltas of the rivers Terek and Kuban as well as the Kuma valley. They are also found in the mountains in the valleys of the largest rivers. In the class of mountain landscapes that are spread on the northern slope of the Greater Caucasus there can be distinguished 6 types and 12 subtypes of landscapes.

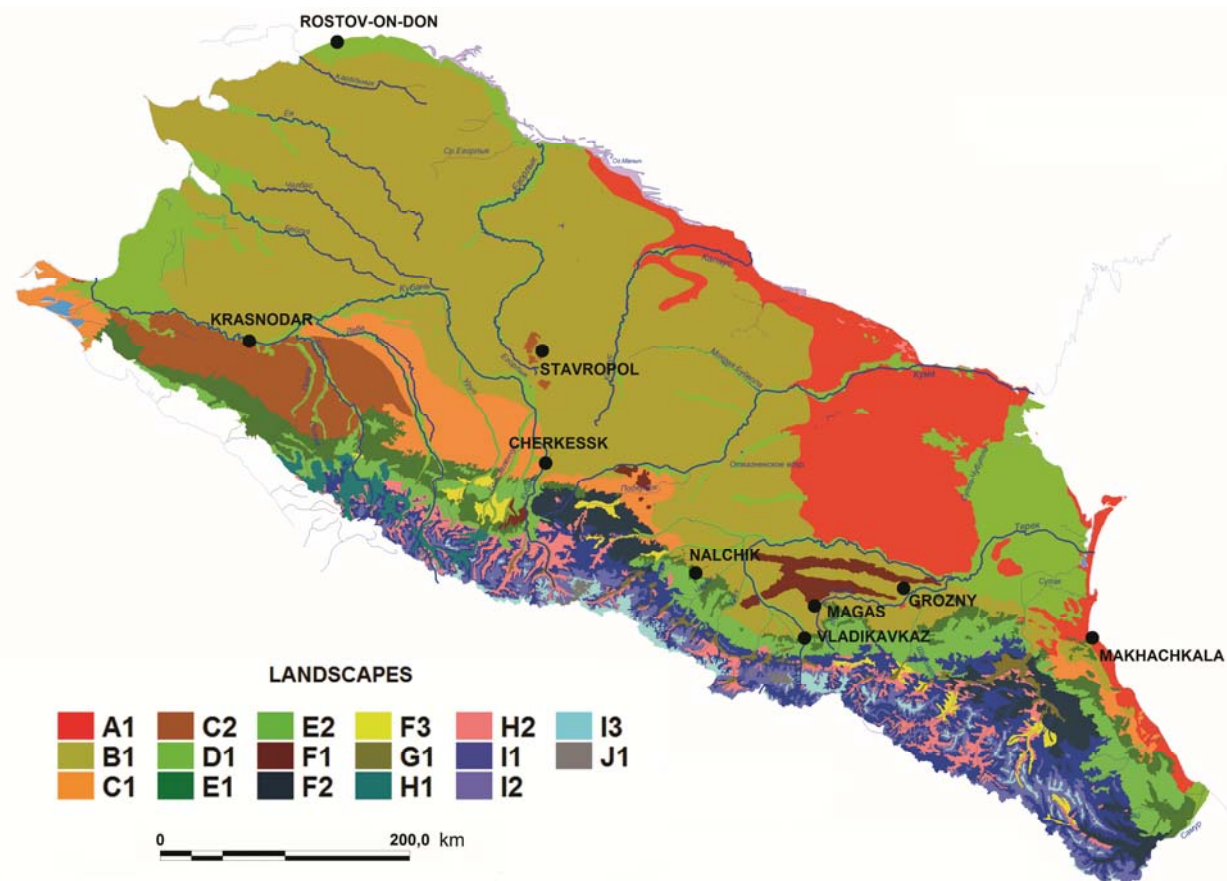


Fig. 1. Landscapes of the Northern Caucasus (designation see in Table 1)

Table 1

Systematics of landscapes of the Northern Caucasus

Classes	Types	Subtypes
I. Plain and foothill hilly (198654 km²)	A. Plain moderate arid (32246 km ²)	A1. Lowland and plain, semi-desert and desert (32246 km ²)
	B. Plain and hilly warm-moderate and moderate semiarid (109809 km ²)	B1. Plain and hilly steppe (109809 km ²)
	C. Foothill hilly warm-moderate and moderate semi-humid (23454 km ²)	C1. Foothill meadow-steppe, meadow, shrubby and steppe-forest (13054 km ²) C2. Foothill steppe-forest and forest (10400 km ²)
	D. Hydromorphic and subhydromorphic (33145 km ²)	D1. Lowland deltaic and alluvial (33145 km ²)
II. Mountainous (71998 km²)	E. Mountainous moderate humid (23425 km ²)	E1. Lower-mountainous-forest (10305 km ²) E2. Mid-mountainous-forest (13120 km ²)
	F. Mountainous moderate semi-humid (11798 km ²)	F1. Lower-mountainous forest-shrubby-meadow-steppe (2803 km ²)

		F2. Mid-mountainous meadow-steppe-steppeforest, shibljak and frigana (7000 km ²)
		F3. Mountainous-hollow, forest-shrubby-meadow-steppe (1995 km ²)
	G. Mountainous moderate semiarid (1551 km ²)	G1. Mountainous-hollow steppe and shibljak (1551 km ²)
	H. Mountainous cold moderate (8898 km ²)	H1. Mid-mountainous forest dark coniferous (2441 km ²)
		H2. Alpine forest pine and birch (6457 km ²)
	I. Alpine meadow (25958 km ²)	I1. Alpine subalpine shrubby-meadow (15691 km ²)
		I2. Alpine shrubby-meadow (7669 km ²)
		I3. Alpine subnival (2598 km ²)
	J. Glacial-nival (368 km ²)	J1. Glaciers (368 km ²)

I. Plain and foothill hilly landscapes.

Plain moderate arid landscapes (A) begin a series of zonal landscapes in the north and north-east. They are spread on 32,2 thousand km² (11,9% of the total area) and refer to the Terek-Kuma lowland and the coast of the Caspian sea, as well as to the Kuma-Manych depression (valley). These landscapes occupy a special place among the natural territorial complexes of the South of Russia, due to their transitional position between the steppes in the North and North-West and deserts in the South and South-East.

The lowland plain relief with a large set of accumulative and aeolian forms is typical here. The average annual air temperature is 9,5–11,5°C. January temperature varies from positive values on the coast of the Caspian sea to -3,5–5,0°C in the Kuma-Manych valley. In summer the temperature can reach +23,0–25,0°C. Annual rainfall ranges from 200 to 250 mm on the coast to 350-400 mm on the border with steppes. In accordance with such conditions the coefficient of moisture changes from less than 0,20 on the coast to 0,35–0,45 during the transition to the steppes.

Land cover is characterized by complexity: here the fragments of adjacent landscapes – desert and steppe are combined; in particular the significant area within the given type of landscapes occupies the deserted steppes in combination with semi-desert groups. Zonal type of soil that traditionally diagnoses these landscapes is chestnut.

Within this type 1 subtype can be distinguished – lowland and plain, semi-desert and desert (A1). In general, this landscape is characterized by a rather monotonous morphological structure, within which the most widely represented typical natural-territorial complexes are the following:

- cereal-wormwood semi-deserts on the light-chestnut solonetzic soils with saline;
- wormwood-fescue-feather grass dry steppes on chestnut soils;
- wormwood-cereal and cereal-wormwood deserted steppes, combined with the breakers on the light chestnut soils;
- saltwort and wormwood semi-deserts on the light chestnut solonetzic-saline soils;

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

– cereal-wormwood and saltwort semi-deserts on the light chestnut soils.

Plain and hilly warm-moderate and moderate semiarid landscapes (B) are the most typical in the territory of the Northern Caucasus and occupy 109809 km² (40,6%). The most widely they are presented in the West and Central Ciscaucasia. In the East Ciscaucasia they are stretched in a narrow strip between the semi-desert landscapes on the coast of the Caspian Sea and low mountain ridges of the Greater Caucasus. They are characterized by plain relief with a combination of accumulative and denudation forms.

Annual temperature varies from 8,0–9,0°C in the foothills and the highest parts to 10,0–10,5°C on the coast of the Black Sea. In the coldest month temperature falls to -4,5–5,0°C, and in summer can reach +23,5 to 24,5°C. Annual rainfall varies from 350 to 500 mm. Coefficient of moisture with an average of 0,47 varies from 0,35 to 0,55 [17].

Steppe vegetation is represented by a number of groups, the spatial distribution of which is determined by the local conditions: from the richly-forb turf-cereal steppes in the West and Central to the turf-cereal and rhizome-cereal in the Eastern Ciscaucasia. During the transition to the foothills of the Greater Caucasus and in depressions forb-grass and grass-forb meadow steppes, in combination with steppe meadows are developed. Zonal type of soils is chernozems of different capacity.

Within this type of landscapes 1 subtype is presented: plain and hilly steppe (B1). Morphological structure of these landscapes, as well as semi-desert ones, is complex and diversified, as the dominant natural-territorial complexes occupy quite a large area. The most widely represented natural-territorial complexes are the following:

- richly-forb and turf-cereal steppes on the chernozems;
- forb-cereal meadow steppes and riparian forests on the leached chernozems;
- cereal and cereal-forb steppes on the chernozems;
- forb-cereal steppes on the ordinary low humus content and southern chernozems;
- forb-fescue-feather grass steppes on the southern chernozems;
- feather-grass-fescue-forb steppes on the southern chernozems;
- turf-cereal and turf-forb steppes on the southern chernozems;
- feather-grass-fescue dry steppes on dark chestnut soils;
- feather-grass-fescue-wormwood steppes on the chernozems;
- forb-fescue-feather-grass steppes on the chernozems;
- meadow and richly forb-turf-cereal steppes in combination with cereal-forb stepped meadows on the southern chernozems;
- forb-cereal steppes and meadow-steppes on the southern chernozems;
- forb-turf-cereal and turf-forb steppes on the southern and common chernozems.

Foothill-hilly warm-moderate and moderate semi-humid landscapes (C) occupy 23454 km² (8,7%) and are the most widely presented in the West Ciscaucasia. They are the transitional band between the mountain structure of the Greater Caucasus and Ciscaucasian plains. Within the Central Ciscaucasia they occupy the area of the Caucasian Mineral waters, and also they are fragmentarily presented in Dagestan. A distinctive feature of the relief of these landscapes is that gentle sloping plains as well as relict arrays are presented here (Sychev mountains with heights up to 850 m).

This situation affects the climate: due to the approach to the mountains, there is a slight decrease in air temperature and increase in rainfall here. Thus, the average annual air temperature within this type of landscapes is about +10°C, while in winter it can fall to -3,0 of 4,0°C, and in summer it can reach +17,5–20,0°C. The coefficient of moisture is >0,60, that corresponds to the forest-steppe conditions [8; 16].

Vegetation is represented by fragments of forests (oak and hornbeam), that previously were much more widespread, as well as forb-cereal and cereal-forb mesophytic and xero-mesophytic forb meadow steppe and stepped meadows. In the soil cover the most widely represented are typical and leached chernozems, fragmentarily there can be found grey forest and alluvial soils.

This type of landscapes is represented by two subtypes: foothill meadow steppe, meadow, shrubby and forest-steppe (C1) and foothill forest-steppe and forest (C2). According to the set of elementary natural-territorial complexes this type of landscapes is the most diversified among the other zonal types of landscapes. Among them the most widely represented are:

- foothill stepped meadows and meadow steppes on the alluvial and meadow-chernozem soil;
- meadow steppes in combination with cereal-forb stepped meadows and shrubs on the chernozems;
- meadow steppes with oak-hornbeam forests on the chernozems and grey forest soil;
- meadow steppes with hornbeam-oak and oak forests on the chernozems and grey forest soil;
- turf-cereal steppes in combination with shibljak and mixed-oak forests on the chernozems and grey forest soil.

Hydromorphic and subhydromorphic landscapes (D), as it has already been noted, are azonal, and their existence is connected with lower currents of the largest rivers in the Caucasus: the Kuban in the West and the Terek River in the East. This type of landscape occupies a quite vast area (33145 km², 12,2%), especially in the west part. It is composed of sediments of these rivers and its main difference from the contiguous zonal landscapes (steppe and semi-desert) is that groundwater comes close to the surface, and as a result the ranks of meadow vegetation are formed, and in the most depressed areas – wetlands and salt marshes are formed. In the floodplains forest vegetation is formed. Climatic conditions are

similar to adjacent landscapes. Here 1 subtype of landscapes can be distinguished – lowland deltaic and alluvial (D1).

II. Mountainous landscapes.

Mountainous moderate humid landscapes (E) are represented almost on the whole northern macroslope of the Greater Caucasus from the bottom to the height of 1500-1600 m and occupies 23425 km² (8,7%) on the slopes of the Rocky Ridge, the Pasture Ridge, the Wooded Ridge and their spurs [9; 18]. They are also found on the slopes of the ridges surrounding Inner Dagestan (Andean, Salatau, Gimrinskiy) [2]. They are characterized by karst, karst-denudation and erosion-denudation reliefs.

The area occupied by this type of landscape, is characterized by moderately warm and humid climate. Temperature is 1,5–5,0°C in winter and 17,0–22,0°C in summer; average annual temperature varies from 8–9°C at the lower limit up to 6–7°C on the top one. Annual rainfall ranges from 500–600 up to 800–900 mm, the main part of which falls in the warm season. From the west to the east there can be observed strengthening of the continental climate.

These conditions are most favourable for the development of deciduous forests, in the main canopy of which oaks (pedunculate and rock), beech, hornbeam, Linden, ash, elm and others are dominated. In Dagestan, in connection with drying of climate and deforestation, thickets of thorny shrubs and meadow natural-territorial complexes appear. Typical for such vegetation are the brown mountain-forest and humus-carbonate soils (on limestone).

Within this type of landscapes there are 2 subtypes: lower mountainous-forest (E1) and mid-forest (E2). Due to a set of typical natural-territorial complexes this type of landscape is not very diversified. In addition to serial, the most widely represented here are the following natural-territorial complexes:

- oak and hornbeam-oak forests with undergrowth on brown mountain-forest soils;
- beech-hornbeam and hornbeam-beech forests (herbal and with undergrowth) on brown mountain-forest soils.

Despite the rather limited distribution (4,4% and 0,6% of the area of the territory) mountainous moderate semi-humid and mountainous moderate semiarid landscapes are the most original in the mountainous part of the North Caucasus. Their existence as hydromorphic and subhydromorphic on the plain is connected with azonal factors, which complicate the altitudinal range of landscapes. As a result the differences between them consist in a set of elementary natural-territorial complexes – it is larger within semi-humid landscapes.

Mountainous moderate semi-humid landscapes (F) are unequally represented within the Greater Caucasus: in the Western Caucasus, they are confined to hollows between to the lowest ridges, in the Central – to hollows and slopes of mid-mountains, in the Eastern – to the advanced ranges, mid-mountains and the widest parts of the valleys of large rivers [15]. Despite the difference in the location, sets of forms and types of relief, these landscapes are united by common climatic conditions, in particular, hydration corresponds to steppe-forests (coefficient of moisture = 0,6–0,9) here. As a result natural complexes form rather

long series on the locations: from the forest on the most humid to the steppe in the most arid.

Within this mountainous type of landscapes 3 subtype can be distinguished: low-mountainous forest-shrubby-meadow-steppe (F1); mid-mountainous meadow, steppe, meadow-steppe, shibljak and frigana (F2); mountainous-hollow forest-shrubby-meadow-steppe (F3). Here the most widely represented indigenous natural-territorial complexes are the following:

- stepped mountainous meadows, areas of mountainous steppes and fragments of oak-hornbeam forests on chernozems;
- stepped meadows (meadow-steppes) in combination with beech and hornbeam-oak forests on chernozems.

Mountainous moderate semiarid landscapes (G) are stretched in the interval of heights from 600–700 to 1100–1300 m and are found exclusively in hollows. Within the Western and Central Caucasus they occur between the Side and the Rocky Ridge (North Jurassic depression), and in the east, in the Inner Dagestan - also in the broad river valleys [6; 13; 14]. The erosion-accumulative relief is typical here. In comparison with zonal landscapes climate is characterized by higher temperatures but lower rainfall. Temperature of the coldest month is 2–4° C, of the warmest river +18–20°C, and the annual average temperature is 8–10° C. Annual amount of precipitations does not exceed 350–550 mm per year, and coefficient of moisture is 0,4–0,6. As a result, here are widely represented frigana, shibljak, mountainous steppes, although there are the fragments of forest on the circulating slopes. Mountain steppes and humus-carbonate soils are typical here.

Within this type of landscapes there is 1 subtype: mountainous-hollow-steppe, shibljak and frigana (G1). The typical natural-territorial complexes are the following:

- mountain steppes, shibljak in a complex with arid woodlands and frigana on the mountainous-steppe soils;
- thickets of thorny bushes (shibljak) in combination with mountainous steppes on the chestnut soils.

Mountainous cold moderate landscapes (H) are spread in the range of heights from 1000–1200 to 2200–2400 m and occupy 8898 km² (3,3%). Erosion-denudation, karst and partially paleo-glacial reliefs are typical here. Area of distribution of these landscapes is characterized by cold-temperate and rather humid climate. The average temperature of the coldest month descend to -3,5 – -6,5°C, of the warmest one can reach 14,0–16,0° C; the average annual temperature is +5–6°C. Annual amount of precipitation varies from 1000 mm in the West to 800 mm in the centre and 600 mm in the East. Humidification is sufficient and excessive (coefficient of moisture = 0,9–1,3). Forest vegetation is typical: in the West there are presented beech-dark coniferous forests, which go into coniferous and on the upper edge of the forest – to the small-leaved (birch and mixed-birch). Coniferous forests disappear on the territory of the Central Caucasus and re-appear in Dagestan. Within the continental sector coniferous forests are absent. Forests, located on the border of forest and meadow areas, have the appearance of crooked

and lower forests. Typical soils under forests are mountainous-forest, podzolic and often ashed.

This type of landscapes is divided into 2 subtypes: mid-mountainous dark coniferous forest (H1) and the upper-mountainous pine and birch forest (H2). This type of landscapes is not very diversified by indigenous natural-territorial complexes and the typical complexes are:

- pine and pine-birch forests on mountainous-forest soils;
- birch and beech-birch crooked and lower forests on mountainous-forest soils.

Alpine meadow landscapes (I) are located in the mountainous part, where they occupy 25,958 km² (9,6%) in the range of heights from 1800–2000 to 3200–3400 m. They are widespread on the slopes of the Main, and the Advanced, Side and Rocky ridges [5; 12]. This part is composed by the whole complex of rocks; as a result here is represented volcanic, denudation, erosion and karst relief. Powerful glaciation in the Western and Central Caucasus resulted in the presence of a large number of forms of the modern and ancient glacial relief. The climate is characterized by short, cool summer and long cold and snowy winter. Temperature of the coldest month drops to -8–12°C, of the warmest – +7–12°C, accordingly, the average annual temperature ranges from +2–2,5°C in the subalpine belt to -2,5°C and below – in the alpine. Rainfall varies from 600 to 1800 mm per year, and with increase of a height its proportion falling in a solid form increases. Vegetation is represented mainly by meadows (subalpine and alpine), which are combined with shrubby thickets of elfin type (Caucasian rhododendron and juniper). Under the meadows mountainous-meadow soils are developed; in relatively dry habitats, under meadow steppes, chernozemlike soils are formed.

This type of landscapes includes three subtypes: alpine, subalpine forest-shrubby-meadow (I1) alpine shrubby-meadow (I2) and alpine subnival (I3). Here are the grassy and shrubby types of natural-territorial complexes. The first group includes a variety of meadows, in the species composition of which the ratio of grains and herbs is the most changing, while the second includes shrubby elfins presented by thickets of either Caucasian rhododendron, or various kinds of junipers. Cereal-herb meadows on mountainous-meadow soils are the most widely spread here.

Glacial-nival landscapes (J1), or glaciers, are spread in the most elevated part of the mountain structure, starting from a height of 3400–3800 m. The total area of modern glaciation on the northern slope of the Greater Caucasus is estimated by various sources, from 368 to 800-900 km².

The landscapes of the North Caucasus are characterized by varying degrees of economic development. Within plain landscapes the most fully mastered are plain and hilly warm-moderate and moderate semi-arid landscapes, and foothill-hilly warm-moderate and moderate semi-humid landscapes. For example, in the Stavropol region almost 90% of the territory occupied by these landscapes is involved in agricultural turnover [29]. That is vegetation was the most strongly transformed. Within the Great Caucasus mountainous moderate semiarid and

mountainous moderate semi-humid landscapes are most fully mastered [3, 4, 10], and the loading on the rest of the mountainous landscapes is significantly lower, especially lately.

At the present time all of these types and their corresponding subtypes of landscapes of the Northern Caucasus are populated in varying degrees except subnival and glacial-nival landscapes.

As for the North-East Caucasus [1, 10, 22], the area of human settlements were determined from topographic maps of scale 1: 200 000. This figure includes the area of urban and rural development, as well as the villages of country type. Then the obtained data on human settlements (HS) – their size and number, were correlated with an area of subtypes of landscapes, in addition, there was calculated the average area of the human settlement within the landscape.

Modern settlement loading on the landscapes of the North Caucasus illustrated in Table 2.

Table 2

Modern settlement loading on landscapes of the North Caucasus

Landscapes	Landscape area, km²	Area of human settlements, km²	Number of human settlements	Average area of human settlements, km²	Percentage (share) of localities in the landscape, %
I. Plain					
A1. Lowland and plain, semi-desert and desert	32247	401	314	1,3	1,24
B1. Plain and hilly steppe	108602	4408	2374	1,9	4,06
C1. Foothill meadow-steppe, meadow, shrubby and forest	14261	920	427	2,1	6,45
C2. Foothill forest-steppe and forest	10401	709	401	1,8	6,81
D1. Low-land deltaic and alluvial	33145	2125	1323	1,6	6,41
Total	198656	8563	4839	1,74	4,31
II. Mountainous					
E1. Low mountainous forest	10543	318	284	1,1	3,02
E2. Mid mountainous forest	13121	192	475	0,4	1,46
F1. Lowland forest, shrubby- forest, meadow and steppe	2815	83	72	1,1	2,95
F2. Mid-mountainous meadow, steppe, meadow-steppe, shiblyak and frigana	6762	148	392	0,4	2,19

F3. Mountainous hollow forest-shrubby-meadow-steppe	1985	102	129	0,8	5,14
G1. Mountainous-hollow-steppe and shiblyak	1552	52	114	0,5	3,35
H1. Mid-mountainous forest dark coniferous	2441	11	18	0,6	0,45
H2. Upper-mountainous forest pine and birch	6457	33	182	0,2	0,51
I1. Alpine, subalpine forest-shrubby-meadow	15690	44	255	0,2	0,28
I2. Alpine shrubby-meadow	7689	1	9	0,1	0,01
Total	69055	984	1930	0,54	1,42
TOTAL on the landscapes of the North Caucasus	267708	9546	6769	0,93	3,57

As seen from the data in the North Caucasus total number of settlements (cities, towns, villages and rural suburban types) which are reflected on the maps is 6769 and they occupy 9546 km². Naturally, their distribution cannot significantly differ in the mountainous and plain parts. So, in the plain part there are 4839 settlements with a total area of 8563 km², and in the mountainous – 1930 settlements which occupy 984 km², respectively. That is, within the plain landscapes, occupying 74% of the territory of the North Caucasus, 90% of settlements is located; and in the mountainous region, which occupies 26%, only 10% of settlements is located. With an average area of the settlements of 0,93 km², it takes on the plain – 1,74 km², and in the mountainous area – 0,54 km².

Despite some monotony of relief plain landscapes rather significantly differ by the level of development. Relatively poorly developed are low-lying plains and semi-desert and desert landscapes, occupying the Caspian depression and Kuma-Manych cavity. Only 314 settlements are located here with a total area of 401 km², and their share is only 1,24%. In general, it can be explained by quite unfavourable natural conditions – long dry season and the lack of vegetation cover, which allows the population to be involved mainly in cattle with the corresponding system of settlement. Comparable in size with these landscapes lowland deltaic and alluvial ones occupying the lower reaches of the Kuban, Terek and Sulak, characterized by a much greater development. Apparently it is connected with more favorable soil moisture, and thus the possibility of farming. Here are 1323 settlements with total area of 2125 km², i.e. they occupy 6,41%. Despite these differences, the average area of the settlements within these subtypes of landscapes is minimal among all classes of plain landscape – 1,3–1,6 km².

The largest area among the plain landscapes is occupied by steppe – 108602 km², here is marked the maximum number of settlements – 2374, as well as area occupied by them – 2374 km². Due to the fact that these landscapes are the most favorable for agriculture of grain type, here can be noted a relatively small average size of settlements – 1.9 km², and, in general, their share is slightly more than 4% of the total area of this subtype of landscapes.

As it can be seen from the data, the most favorable for settlement and residence within the North Caucasus are foothill landscapes. Despite the fact that they occupy the smallest area, they are characterized by maximum share of human settlements among not only plain, but all the landscapes of the Northern Caucasus: 6,45% within the foothill meadow-steppe, meadow, shrubby and steppe-forest landscapes and 6,81% – within the foothill steppe-forest and forest landscapes. Besides it can be noted the maximum average value of the settlement here – up to 2,1 km². This is explained by the fact that in the foothills there is observed the maximum diversity of conditions inside the landscapes: from steppe in the relatively plain relief to the steppe-forest and even isolated areas of forest (e.g., Strizhament on the Stavropol Upland). All this creates the favorable conditions not only for living, but also for farming.

Mountainous landscapes, widely spread on the northern macroslope of Greater Caucasus, are characterized by a great variety, from the forest in low-and lower mountainous to glacial-nival in the highest parts of the mountain structure. As for the settlement loading, it is quite different on the various landscapes. Overall with the increase of absolute altitude the area of human settlements decreases, but this process occurs abruptly. So, the greatest absolute area of human settlements occurs within the Lower and Mid-mountainous forest landscapes (200-300 km²). The second kind of "maximum development" is noted in the hollows, where the area of human settlements can reach 100-150 km², and then, with the increase of height, due to the deterioration of conditions for human habitation and permanent living, its presence is reduced to a minimum in the high alpine landscapes.

The number of settlements is maximum in the Low-mountainous forest and high subalpine landscapes. This is explained in the first case by a relatively favorable habitat conditions, and in the second – by the fact that these landscapes have a maximum distribution area in the mountains.

Summary and Conclusions

Informative indicator, reflecting the ease and comfort for living, is the proportion of area within the landscapes that is occupied by human settlements. According to this indicator, mountainous landscapes can be divided into three groups. The first group includes Alpine, sub-Alpine landscapes, as well as the mid-mountainous dark coniferous forest, where the share of human settlements is closed to 0.5%. Limiting factor for settlement, as it was mentioned, is the severe climatic conditions in the highlands, as well as the complexity of farming in areas of coniferous forests, which are characterized by a fairly large amount of precipitation. The second group includes forest landscapes of lower forest level (low - and mid-mountainous forest), mid-mountainous meadow, steppe meadow-steppe, shibljak

and frigana, low-mountainous forest, shrubby-forest, meadow and steppe, where the share of human settlements is 3% of the area of the landscape. Finally, the most favorable for living and farming are the mountainous-hollow steppe and shibljak, as well as mountainous-hollow forest-shrubby-meadow-steppe landscapes, where the share of human settlements is maximum – more than 5,1%. These landscapes are characterized by the minimum area not only among the mountainous but also among all other landscapes of the Northern Caucasus.

The research revealed that the most attractive for settlement and farming are the areas with the highest diversity in landscapes. On the plains of Ciscaucasia, they can be foothill landscapes, and in the Greater Caucasus – mountainous hollows [7], which actually perform "the settlement landscapes" for the peoples which historically inhabited this territory. It is possible that this contradiction is overriding in the evolution of environmental relations "people – the natural environment," and therefore the study of its genesis and adaptation and disadaptation mechanisms is fundamentally important for geographical science.

Notes

1. Abdullaev K.A. Assessment of the burden on the residential landscape of mountainous Dagestan // Proceedings of the Dagestan State Pedagogical University. Natural and Exact Sciences. 2009. Number 1. Pp. 84-86. 2. Abdullaev K.A., Atayev Z.V., Bratkov V.V. Modern landscapes of the Mountain Dagestan. Makhachkala: Dagestan State Pedagogical University, 2011. 116 p. 3. Atayev Z.V. The landscapes of the High-Dagestan and their current status // Proceedings of the Dagestan State Pedagogical University. Natural and Exact Sciences. 2007. Number 1. Pp. 90-99. 4. Atayev Z.V. Landscapes of the intermountain hollows of Dagestan // Natural and Technical Sciences. 2008. Number 4. Pp. 176-178. 5. Atayev Z.V. Landscape and ecological features of high Dagestan // Problems of agricultural development in the regions, 2011. V. 7. Number 3. Pp. 9-16. 6. Atayev Z.V., Bratkov V.V. Mountain-hollows of landscapes of the North-Eastern Caucasus: Current climate change and seasonal dynamics. Makhachkala: Dagestan State Pedagogical University, 2011. 123 p. 7. Atayev Z.V., Bratkov V.V. The current state of the residential development of landscapes of the Northern Caucasus // Proceedings of the Geographic Society of the Republic of Dagestan, 2011. Number 39. Pp. 25-31. 8. Atayev Z.V., Bratkov V.V., Gadzhimuradova Z.M., Zaurbekov Sh.Sh. Climatic features and the temporal structure of the landscapes of the foothills of the North-East Caucasus // Proceedings of the Dagestan State Pedagogical University. Natural and Exact Sciences, 2011. Number 1. Pp. 92-96. 9. Atayev Z.V., Bratkov V.V., Khalidova N.A. Seasonal dynamics of mountain temperate humid landscapes of the Northern Caucasus // Proceedings of the Dagestan State Pedagogical University. Natural and Exact Sciences, 2011. Number 2. Pp. 81-86. 10. Atayev Z.V., Zaurbekov Sh.Sh., Bratkov V.V. Modern residential development of landscapes of the North-Eastern Caucasus // Proceedings of the Dagestan State Pedagogical University. Natural and Exact Sciences. 2010. Number 1. Pp. 71-74. 11. Beruchashvili N.L. Caucasus: landscapes, models, experiments. Tbilisi: Publishing House of the Tbilisi State University, 1995. 315 p. 12. Bratkov V.V., Atayev Z.V. High mountain meadow landscapes of the

North-Western and North-Eastern Caucasus // Proceedings of the Dagestan State Pedagogical University. Natural and Exact Sciences. 2009. Number 2. Pp. 93-103.

13. Bratkov V.V., Atayev Z.V. Integrated assessment of the impact of climatic conditions on the mountain hollows of landscapes of the northern slope of the Greater Caucasus // Proceedings of the Dagestan State Pedagogical University. Natural and Exact Sciences. 2009. Number 3. Pp. 99-101.

14. Bratkov V.V., Atayev Z.V. Geographical features of the influence of climatic conditions on the mountain hollows of landscapes of the northern slope of the Greater Caucasus // The South of Russia: the environment, the development. 2009. Number 4. Pp. 192-195.

15. Bratkov V.V., Atayev Z.V., Bairamkulova B.O. Geographic features of the temperate mountain semi-humid and semi-arid landscapes of the northern slope of the Greater Caucasus // Proceedings of the Dagestan State Pedagogical University. Natural and Exact Sciences. 2009. Number 1. Pp. 92-96.

16. Bratkov V.V., Atayev Z.V., Baysieva L.K., Gadzhimuradova Z.M. The influence of climatic changes on longtime structure of foothill landscapes of the North-Eastern Caucasus // Proceedings of the Dagestan State Pedagogical University. Natural and Exact Sciences. 2013. Number 1. Pp. 76-80.

17. Bratkov V.V., Gadzhibekov M.I., Atayev Z.V. Climatic variability and dynamics of semi-arid landscapes of the North-Western Caspian // Proceedings of the Dagestan State Pedagogical University. Natural and Exact Sciences. 2008. Number 4. Pp. 90-99.

18. Bratkov V.V., Salpagarov D.S. Landscapes of the North-Western and North-Eastern Caucasus. M. : Ileksa, 2001. 256 p.

19. Gvozdetskii N.A. Caucasus. Sketches of nature. M.: Geografiz, 1963. 264 p.

20. Gvozdetskii N.A. Physical geography of the Caucasus. The general part. Greater Caucasus. Issue 1. Moscow: Moscow University Press, 1954. 208 p.

21. Gvozdetskii N.A., Smagina T.A. Physical and geographical regionalization // Environment and Natural Resources. Rostov-on-Don: Publishing house of Rostov University Press, 1986. Pp. 300-338.

22. Idrissova R.A. Landscapes of the Chechen Republic: the spatial structure and features of the residential load: Thesis abstract of dissertation for the degree of candidate of geographical sciences. Nalchik, 2009. 24 p.

23. Kalesnik S.V. The North Caucasus and the Lower Don. Moscow-Leningrad, 1946.

24. Physical map of the Caucasus. Scale 1: 1,000,000 / Comp. N.L. Beruchashvili, S.R. Arutyunov, A.G. Tediashvili. Tbilisi, 1979.

25. Physical map of the USSR (for higher education) of 1: 4,000,000 / Science Editor is A.G. Isachenko. Moscow, 1986.

26. Environment Outlook Caucasian / Ed. N.L. Beruchashvili etc. UNEP GRID. Tbilisi, 2002. 98 p.

27. Chupahin V.M. Physical geography of the Northern Caucasus. Rostov-on-Don: Publishing house of Rostov University Press, 1974. 200 p.

28. Chupahin V.M., Smagina T.A. Landscape Survey map of the Northern Caucasus and Lower Don // Geographical research in the Northern Caucasus and the Lower Don. Rostov-on-Don: Publishing house of Rostov University Press, 1973. Pp. 84-92.

29. Shal'nev V.A. Landscapes of the Northern Caucasus: evolution and modernity. Stavropol: Publishing House of the SSU, 2004. 265 p.

30. Radvanyi J., Beroutchachvili N. Atlas géopolitique du Caucase. Paris, 2009.

Information about the authors:

Zagir V. Atayev – Russia, Makhachkala, Dagestan State Pedagogical University, Vice-Rector on Scientific Work, Candidate of Geography, Professor of the Department of Physical Geography and Geoecology. E-mail: zagir05@mail.ru

Vitaly V. Bratkov – Russia, Moscow, Moscow State University of Geodesy and Cartography, Head of the Department of Geography, Doctor of Geography, Professor. E-mail: vbratkov@mail.ru