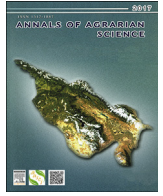




Contents lists available at ScienceDirect

Annals of Agrarian Science

journal homepage: <http://www.journals.elsevier.com/annals-of-agrarian-science>

Geographical features and development regularities of rural areas and settlements distribution in mountain countries

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ARTICLE INFO

Article history:

Received 15 November 2016

Accepted 27 January 2017

Available online xxx

Keywords:

Rural areas
 Geographical features
 Mountain countries
 River basin
 Lifestyle

ABSTRACT

River basins and valleys surrounded by dividing mountainous ranges are considered to be the basis for distribution of population and settlements in mountainous countries. In these areas physical-geographical factors are interrelated and interconnected, having a direct influence on distribution of population and settlements. Mountainous relief is preventing the consolidation of territory and development of fundamental processes of resettlement. For these areas basins and river valley-types of settlement systems are the most typical. As the economic activities of settlements are closely related to natural environment, the influence of natural environment on rural areas and settlements is bigger than on urban settlements: particularly, in mountainous areas with a great diversity of natural conditions. On the basis of analysis and generalization of the research outcomes of the author and different other researchers, some geographical features and development regularities of rural areas and settlements distribution in mountainous countries are worked out.

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In mountainous countries the base for population and settlements distribution are valleys and river basins, surrounded with dividing ranges. It is an area, where the physical-geographical processes are interacted and interconnected, differing significantly from the processes in other and neighboring physical-geographical regions.

In the upper parts of river basins the features of mountainous relief (dividing ranges, mountainous passes, etc) shape the specific lifestyle, language, dialect and other features of particular ethnic groups. Particularly, in each river basins and physical-geographical regions of Georgia are shaped Georgian ethnic groups, which differ from each other. In lower parts of river valleys the aforementioned geographical limitation is decreased, giving birth to wider distribution of homogenous Georgian ethnic group (Kartli, Kakheti, Meskhetia, etc). This should be typical for the population and settlements distribution of Armenian Highland as well, if there weren't be foreign invasions and devastations. These affected significantly on regularities of settlements distribution, shaping a new type of natural-historical (social) settlements distribution [1].

Mountain ranges are preventing the processes of settlements distribution and consolidation of the territory. For these areas the

settlements distribution systems of valley and basin types are more typical, when in a particular river basin a certain entity of settlements is formed, characterized with a common service system, transport and infrastructure network, inter-settlement socio-economic relations.

Transportation routes, service offices and relations are centralized in river valleys, forming the linear components of settlements basis. Meanwhile, the settlements with crossroad geographical position, located in lower parts of river basins are considered to be the nodal components of settlements system [2].

The regulations of population and settlements distribution according to the height from the sea level have been studied by different researchers [reference 3]: particularly, P. Polyanyan and K. Sergeyeva [3], V. Jaoshvili [5–7], T. Gugushvili [8], V. Gujabidze [9], G. Avagyan [10], H. Grgearyan [11], R. Margaryan [12], L. Ustinova [13], A. Kayumov, A. Bazarbaev [14] etc. However, many of above mentioned studies consider the absolute height as a separate factor and don't focus on geographical features of landscapes, especially the horizontal zoning. Analyzing the population distribution, development of settlements system and urbanization level in mountainous countries, along with historical and socio-economic factors, the regulations of landscape differentiation should be taken into consideration as well [4].

It is well known, that in both mountainous and lowland areas the level of productive forces development has a significant

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Peer review under responsibility of Journal Annals of Agrarian Science.

<http://dx.doi.org/10.1016/j.aasci.2017.02.012>

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influence on forming and further development of rural areas and settlements. However, as the economic activities of settlements are closely linked to natural environment, the influence of natural environment on rural areas and settlements in mountainous areas with a big variety of natural conditions is much bigger, than on urban settlements [15].

In mountainous countries like the Republic of Armenia (RA) the ratio of mountainous and lowland areas, as well as the relief break-up have essential role for rural areas and settlements system. In these areas horizontal and vertical relief break-up causes obstacles and difficulties in territory settling and usage [15]. Depending on geographical latitude, starting from a particular height climate also causes such kind of difficulties (starting from 2200 to 2300 m in RA). Higher areas are being used as seasonal pastures.

It should be taken into account, that in mountainous areas there are wide valleys, plateaus, canyons, where thousands of years ago rural settlements were formed, existing nowadays.

Comparing with low areas (with some exceptions) the network of rural settlements is sparse and the population number is small. Since ancient times mountainous villages were emerged at sub-river terraces greater villages in wider parts of river valleys, and smaller settlements in narrow and slope sections [15].

In mountainous areas there are wide valleys and plateaus in upper areas, which have favorable conditions for emerging and further development of rural areas, shaping wide areas of settlements distribution.

The ratio of mountainous and lowland areas shows, that besides of the ratio of absolute sizes of territories, the relative sizes of territories favorable of settling are important as well.

Besides, not all areas of mountainous and lowland territories are equivalent from the standpoint of usefulness for territory settling.

According to Georgian scientist Jaoshvili, during the assessment of usefulness of territories in the context settling in mountainous areas, the following factors should be taken into account:

- Ratio of surfaces of mountainous and lowland areas,
- Existence of lands in lower belt (including deserts, semi-deserts and swamps),
- Existence of useful lands in mountainous belt [5].

In mountainous areas the structure of agricultural lands, ratio of lands of different types, vertical distribution of agricultural lands, surface curvature, land sizes and other factors have an important role from the standpoint of development of rural areas and settlements. The land sizes are especially important, as big and small land areas are having different influence on rural settlements and their distribution.

The factors of hydrography and water resources, microclimate, inter-settlement relations, the distance between settlements and agricultural lands are also affecting the settlements distribution in mountainous areas.

In mountainous areas separated from each other by river basins, the historical features of territory usage and economic activities, national factors, lifestyle and traditions are having influence on rural territories. The level and features of influence of these natural and social factors on settlements distribution changes in time and space. As a result, a rural settlements network of a certain area is being shaped within a concrete time period [16].

Analyzing and summarizing the research results of aforementioned authors, as well as our own research outcomes, the following geographical features of rural territories and settlements distribution of mountainous areas can be marked out:

- Population and settlements are mostly accumulated in pre-mountainous lowlands, river valleys, lower parts of mountainous valleys and plateaus,
- Not equal spatial distribution of population and settlements,
- Big variation of population numbers of rural settlements,
- Uniqueness of demographical processes,
- Big differences in people's occupation and economic functions of settlements,
- A big diversity of morphology of villages,
- Low level of communication and connections between settlements,
- The absence of a regularity of changes in the settlements population, the settlements density and the average population numbers of settlements with increasing height,
- Significant differences of rural population and settlements distribution and density even within the same altitudinal zone,
- A big diversity of forms and types of rural settlements distribution on comparatively small areas.

The reasons of not-equal spatial distribution of rural settlements and population in mountainous areas are the spatial differences of settling conditions and factors. Here a more or less wide and dense settling is met in comparatively low, flat and pre-mountainous areas, river valleys, lower parts of mountainous valleys and plateaus.

As a result, higher the level above the sea, more sparse is the settlements network. In certain mountainous areas with extremely difficult relief conditions there are no settlements at all. In some cases the settlements density is high in comparatively higher plateaus and river valleys with small relief break-up (in RA: Shirak and Lori lowlands, Sevan sub-lake plateaus, Aparan, Goris and Erablur plateaus) [1]. Because of this, rural population density at 1801–2000 m altitudinal belt is higher than at 1401–1800 m and 1001–1400 m zones [t.1] (see Tables 1–4).

In both low and high mountainous areas are being formed so-called rural agglomerations, as a result of not equal spatial distribution of rural settlements. This is very typical for RA.

Almost in all mountainous areas the rural settlements are more or less equally distributes in low mountainous valleys and lowlands, then in mountainous plateaus and highlands, and then in high mountainous areas. Almost in the same order the mentioned areas are following each other in the context of the level of territories' settling.

The main reason of variation of population number in rural settlements of mountainous areas is the difference of sizes of the spheres of economic activities. Usually, people prefer to live where they work. The size of rural settlements depends on the configuration of working areas or spheres. In agriculture the farming land size and area is particularly important.

Population of sub-city villages may be occupied in not-agricultural activities as well. However, agriculture has a priority importance. Therefore, in the areas of accumulation of big agricultural lands villages are greater than in the areas with smaller lands.

An important factor affecting the population number of villages in mountainous areas is the height of the territory. When the height increases, the share of agricultural lands decreases, the climate becomes colder, the sphere of agricultural activities becomes smaller. Therefore, the villages are small. This is typical for RA. Particularly, at 1801–2000 m there are comparatively wide and fertile lands and the villages are nigger than in lower zone (1001–1200 m), where the villages are smaller as a result of relief break-up and smaller agricultural lands [t.3]. Even within the same areal of settlements distribution the difference between population numbers of villages may be very big.

Table 1
The distribution of the RA area, population and settlements by sea level [17,18].

Altitudinal belts (meter)	Area occupied by a belt (km ²)	The same by %	The distribution of population by altitudinal belts						The distribution of settlements by altitudinal belts						The average population of cities	The average population of villages		
			Total		Urban		Rural		Total		Urban		Rural					
			a	b	a	b	a	b	a	b	a	b	a	b				
U _{high} , 800	607.3	2.1	83465	2.7	33886	1.8	49579	4.0	51	5.3	5	10.2	46	5.0	137.0	82	6777	1078
801–1000	2347.5	8.3	1717579	54.5	1286245	67.2	431334	34.9	208	21.6	11	22.5	197	21.6	732.0	184	116931	2190
1001–1400	4123.0	14.5	462537	14.7	249485	13.0	213052	17.3	165	17.2	13	26.5	152	16.7	112.0	52	19191	1402
1401–1800	5648.2	19.8	536737	17.0	261789	13.7	274948	22.3	288	30.0	12	24.5	276	30.3	95.0	49	21816	996
1801–2000	3653.2	12.8	275607	8.8	79160	4.1	196447	15.9	152	15.8	7	14.3	145	15.9	75.0	54	11309	1355
2001–2250	4149.0	14.6	72336	2.3	4490	0.2	67846	5.5	93	9.7	1	2.0	92	10.1	17.0	16.0	4490	737
2250–2500	3035.0	10.7	1710	0.0	—	—	1710	0.1	4	0.4	—	—	4	0.4	0.6	—	—	428
2500 and higher altogether	4901	17.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	28464.3 ^a	100.0	3149971	100.0	1915055	100.0	1234916	100.0	961	100.0	49	100.0	912 ²	100.0	111.0	43.0	39083	1354

^aWithout area of lake Sevan (1272.29 km², 43%).

^bThe quantity of rural settlements with permanent population. a) absolute number. b) by percentage.

Rural settlements of mountainous areas have specific migration and demographic processes as well. During the last 100 years the population of mountainous areas was moving mostly to lower areas. As a result, the settling area in mountains becomes narrow, while in lowlands it becomes wider. The small sizes of high-zone settlements, sparse distribution across territories, low density of transportation network and other factors make the social-economic service of population more difficult and cause migration. Meanwhile, the socio-economic problems of high mountainous villages become more sharp and actual.

The diversity of functional structure and types of production of villages in mountainous countries is linked to vertical zoning of crops and territorial differences of farming types. In different mountainous belts different crop productions and farming types may be combined. Therefore, the types of agricultural works and functional profile of rural settlements change.

The changes of functional structure of mountainous villages are caused by big territorial differences of population's working activities. If the lowland inhabitants have comparatively permanent working load during the year, the population of mountainous rural settlements is involved in farming activities with a shorter period of duration.

Due to diversity of historical, natural and socio-economic conditions, in mountainous areas the morphology of settlements changes from place to place. It is caused by the features of economic structures, inner planning of rural settlements, physical-geographical location, economic specialization, etc. These factors vary in space and time.

An important feature of rural areas of mountainous countries is weak connectivity between settlements. The reason is that the settlements are spread in an area with inaccessible mountainous ranges. Throughout thousands of years this is typical for Armenia.

During the last decades the inter-settlement relations are improved due to scientific-technical advancement. However, the factor of isolation still remains a serious challenge for settlements with vulnerable relief conditions.

Actually, there isn't a strong correlation between the height of the territory and rural population number, population of settlements and settlements density. It is caused by relief break-up, slope gradient and position, microclimatic features, differences of infrastructure, urbanization level, etc. Even within the same altitudinal belt of the same region there are significant differences of distribution of rural population and settlements. This is typical for RA. The average population number differences between distinct places at 1801–2000 m zone vary more than five times [t.4].

The accomplished research [1] shows that mountainous countries have a big variety of rural areas, settlements distribution, local or complex settlements types, etc. The reason is the big diversity of natural-geographical patterns and economic activities. In mountainous countries the natural-geographical and economic patterns of rural areas change not only from one natural-landscape zone to another and within the same zone as well. As a result, so-called intra-zonal types of distribution of rural settlements emerge.

Conclusion

The results of analysis done above allow us to conclude, albeit economic factors are determined in formation and development of rural areas and settlements, but in mountainous countries are mainly influenced by natural conditions. Hence, uneven distribution of population and settlements, differences in population numbers, specific demographic and migration processes and settlements connection, particular appearance and morphological features of settlements are typical for mountain regions. Due to these, the indexes characterizing rural areas and settlements in

Table 2
The RA rural settlements grouping by population numbers [18].

Groups of settlements by population numbers (people)	The number of settlements	The share of a group in number of settlements (%)	The distribution of population by settlement groups (%)	The average population number in a group
Until 50	26	2.8	0.0	25
51–100	48	5.1	0.3	76
101–200	77	8.2	0.9	148
201–500	166	17.6	4.4	324
501–1000	177	18.7	10.1	708
1001–3000	312	33.0	45.0	1780
3001–5000	72	7.6	21.6	3697
5000 and more	34	3.6	17.7	6430
Villages without permanent population	32	3.4	–	–
Altogether	944	100.0	100.0	1354

Table 3
The average population number of the RA rural settlements by altitudinal belts (1.01.2015) [17,18].

Altitudinal belts	The share of area occupied by an altitudinal belt (%) ¹	The entire quantity of villages ²		The share in entire population, %	Average population number of villages
		Total Villages without population			
Until 800	2.1	46	–	4.0	1079
801–1000	8.3	197	1	35.0	2190
Until 1000	10.4	243	1	39.0	1979
1001–1200	6.2	75	1	7.8	1279
1201–1400	8.3	77	4	9.5	1521
1000–1400	14.5	152	5	17.3	1402
1401–1600	9.4	142	6	11.5	1003
1601–1800	10.4	134	9	10.7	989
1401–1800	19.8	275	14	22.2	1000
1801–2000	12.8	145	9	15.9	1355
2001–2250	14.6	92	2	5.5	737
2250 and higher	27.9	4	2	0.1	427
Altogether	100.0	912	32	100.0	1354

Table 4
Rural settlements population number in 1800–2000 m altitudinal belt.

The areas involved in an altitudinal belt	The number of rural settlements in mentioned areas	Average population number of settlements
1. Aparan plateau	18	948
2. Sevan sub-lake plateaus	42	2876
3. Ashotsk highland	19	540
4. Volcanic plateaus of Artik, Karmrashen and Maralik	19	1289

*In the table are presented the areas of 1800–2000 m zone that have relatively large surface and are distinguished by large number of settlements.

mountainous countries do not change regularly with increasing height and the diversity of forms and local types of settlement is specific to rural areas.

The study of geographical features and development regularities of rural areas and settlements distribution in mountainous countries has a big scientific and applied importance: particularly, in the context of accomplishing efficient regional policy in mountainous areas and assuring sustainable human development.

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