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SPATIAL ANALYSIS OF DEPOPULATION IN GEORGIAN VILLAGES

ABSTRACT

The process of emptying the mountainous regions is a serious problem in the world today, which has become quite large scale. The mountainous regions have always been an important strategic objective, characterized by a healthy ecological environment, vast freshwater resources, biological and landscape diversity, endemic species of cultural and natural vegetation, unique and exciting forms of agriculture, architecture, ethnic culture, military-defense by purpose, by the development of cult-religious processes, etc.

The process of depopulation of the mountainous regions is a serious problem in the world today, which has become quite scalable. Population migration from mountainous areas is mainly due to harsh climates, scarce land resources, underdeveloped infrastructure, low incomes, poor access to health care and less prospects for development. With few exceptions, where a very attractive socio-economic environment is created, in mountainous areas, often even a more dramatic and very dramatic picture emerges, largely due to the fact that residents are leaving their homes and not only small settlements or villages, but also larger administrative districts. Units remain. Emigration from rural areas has a negative impact on agriculture, which is one of the main axes of the economy. Farming has not yet developed — it needs support.

According to the 2014 Census, Georgia has a total of 3633 villages, of which 223 are without permanent residents, and 1 in 10 of the 255 villages is a threat to rural protection, although tourism and other processes have slowed these processes down.

As an example, we took one of the abandoned villages of Botko and its surrounding area as a classic example of the depopulation of mountainous regions in Georgia.

KEYWORDS: cartography, sustainable development, depopulation

INTRODUCTION

Purpose of the article

The purpose of this article is to illustrate the problems of the deserted villages of Georgia with the example of one of the villages, the study of the environment and the spatial analysis.

Topic of the topic and science news

The process of emptying the mountainous regions is a serious problem in the world today, which has become quite large scale. In Georgia too, this process is a very pressing and problematic topic.

MATERIALS AND METHODS OF RESEARCHES

Materials used

The following cartographic and literary sources were used in the present article:

- Topographic maps of different scales;
- Orthophoto mosaics;
- Digital model of 5 m resolution of terrain;

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- Cartographic concepts;
- Internet sites.

Traditional Cartographic Method

Cartographic Form of Comparison One of the constituent parts of the cartographic method of research is the cartographic form of comparison, which is based on the properties of a logical form of reasoning. Comparison is a means of revealing similarities and differences in things and events. Without comparison, it is impossible to carry out such logical processes as generalization or its inverse action — boundary (Bakradze, 1955). Spatial to compare the time to show us the event of variation from place to place certain point in time, and the time to compare the space shows the event of fluctuation in the place to the ground at some point in the [Aslanikashvili, 1968, p. 115].

Cartographic forms of analysis and synthesis Knowledge of the multifaceted reality of objective reality is accomplished in a variety of ways, techniques and methods. In the study of the spatial-temporal features and regularities of the real world, a cartographic method of scientific research is quite effective, capable of representing (reflecting) certain aspects of cognitive reality as a whole. Since analysis and synthesis represent both logical forms of thinking and reflection, they will therefore be discussed interchangeably. The cartographic form of analysis comprises three main categories of objective reality: 1) space (specific space); 2) content and 3) objective reality mapping time [Gordeziani, 2012, p. 75].

Cartographic form of modeling. The summary of the cartographic method of the survey is a cartographic form of modeling. Modeling is a general understanding of the order in which objects and events of objective reality are interconnected, which is the subject of cartographic research. In cartography both spatial models and space-temporal models exist. In the first case the cartographic image depicts the spatial arrangement of spatially fixed objects and events in relation to each other and to the spatial system. In this case, space is given to us at a fixed point in time. In the second case, we are dealing with the space-temporal localization of a particular event, when the cartographic model provides information about the temporal variability of the event.

Geoinformation systems — latest methods of cartography

a) Data collection

- Field method — Data were collected using field inventory — using GPS technology (Comnav T300 GPS receiver, and southt17 controller) (fig. 1), and photographs were captured using a high-quality digital camera (Canon EOS R).
- The ArcMap digitalization methodology based on orthophoto-mosaic, satellite imagery and topographic mapping created baseline spatial data for various topics.



Fig. 1. GPS technology

b) Camera Processing and Visualization

The data collected through the field-inventory methodology through ArcGis program was integrated into a single geodatabase where we edited and harmonized the data, as well as the

compatibility and shaping of key features of spatial data and attribute data. Correction of existing spatial data in geometrical, attributive, logical and topological terms, data visualization and mapping, three-dimensional modeling, composition, printing and more.

RESULTS OF RESEARCHES AND THEIR DISCUSSION

The mountainous regions have always been an important strategic objective, characterized by a healthy ecological environment, vast freshwater resources, biological and landscape diversity, endemic species of cultural and natural vegetation, unique and exciting forms of agriculture, architecture, ethnic culture, military-defense by purpose, by the development of cult-religious processes, etc.

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Fig. 2. General geographical map of villages near Botko village

As an example, we took one of the abandoned villages of Botko (fig. 2), and its surrounding area as a classic example of the depopulation of mountainous regions in Georgia.

The village of Botko — in Kakheti region, particularly in Sagaredjo municipality, on the eastern end of Sabaduri Range, on the right bank of the river Iori, 1200 m above sea level.

This place has aroused interest because the area around it is developed and the permanent population is actively engaged in farming.

The nearest village is the Khinchebi (2.5 km northwest of it), which, along with the village of Botko, experienced displacement in the 1980s. During this period there were only 1–2 residents in both villages and no one lived here after their death. Kochbaani village is 3 km South-East of Botko village, with 132 permanent residents as of 2014.

The mountainous regions of Georgia have great agricultural potential, and the latter implies the ability of the landscape to produce a variety of plant products. To demonstrate such skills, complex analysis of relief, agroclimatic resources, water circulation and biogeocycle, soil fertility and structural features is required. The natural-resource, especially agricultural potential of the landscape is often equated with the productivity of the landscape, which implies its ability to reproduce matter and energy over a period of time. Moreover, maintaining or enhancing the potential of landscapes is equated with maintaining and increasing its productivity. Such a view is justified if the landscape and its potential are intended only to meet the ever-increasing needs of society. However, the lack of other features and potentials of the landscape can be seen as an impediment to economic and social development and the well-being of the population [Elizbarasvili *et al.*, 2000, p. 89].

Migration occupies a special place among the demographic processes. Unlike other demographic processes, such as birth rate, the rate of population migration in the country responds immediately to current socio-economic and political changes in society. In turn, migration processes directly affect the demographic development of the country, the structure of the population and the demographic behavior of society [Pirtskhalava, 1997, p. 58].

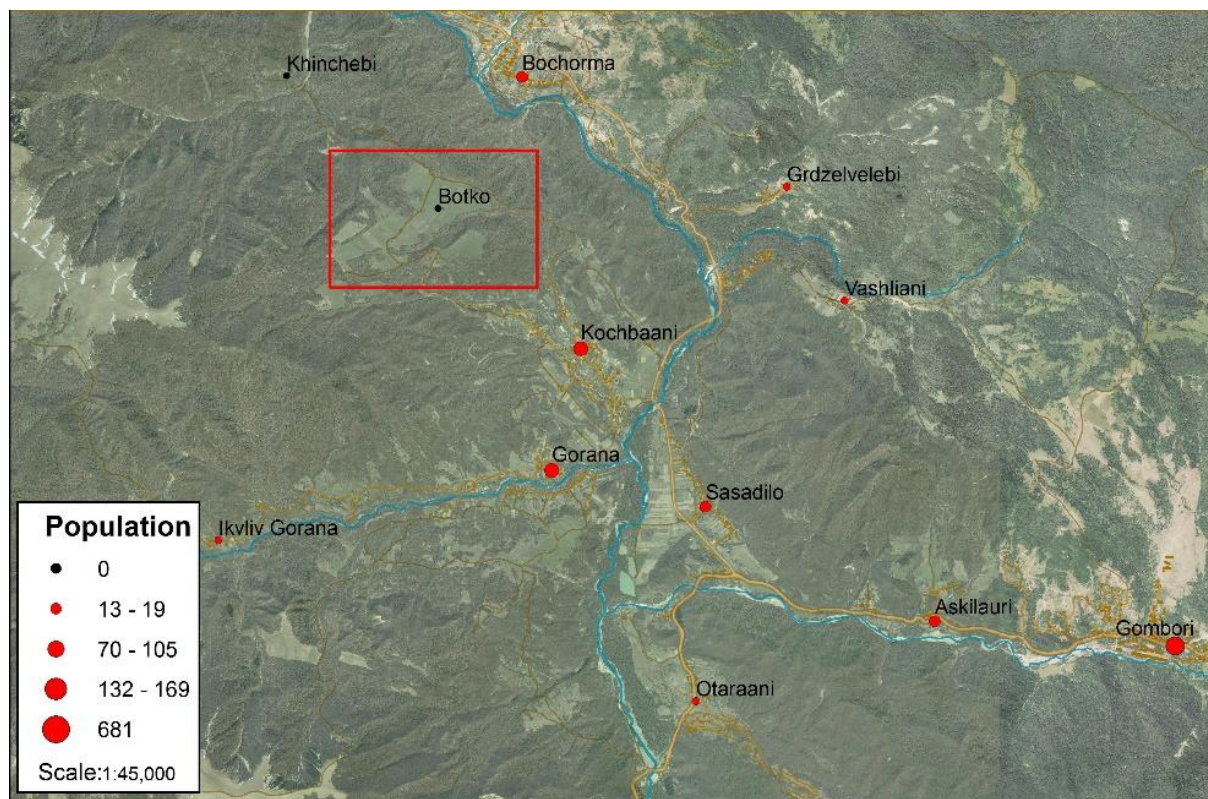


Fig. 3. Population of villages near Botko village

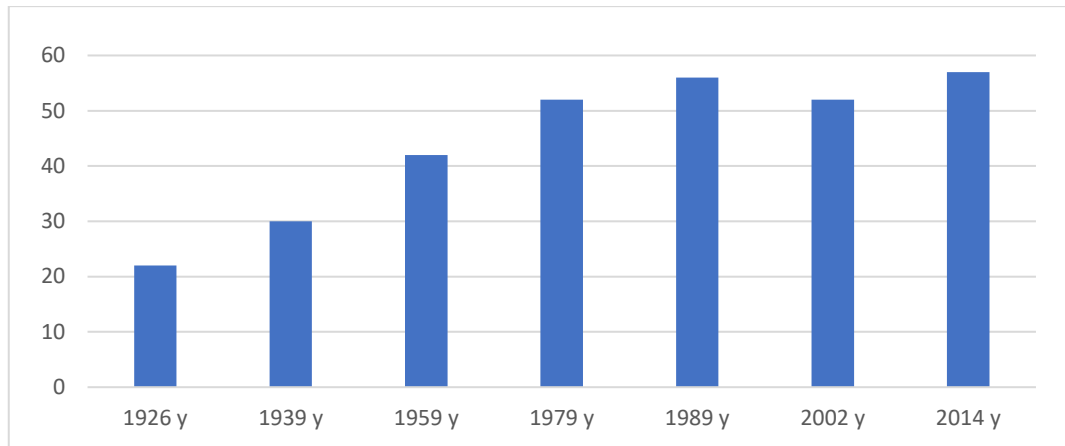


Fig. 4. The level of urbanization in Georgia (%)



Fig. 5. Infrastructure near the village Botko

The population of Georgia has moved from mountain to plain and from rural to urban areas due to lack of infrastructure and other vital livelihoods. Both of these villages have been the “victims” of these processes (fig. 3, 4).

In July 2015, the Georgian government adopted a law on the development of mountainous regions to stop the mass outflow of the mountain population. The law offers social and economic benefits to people living in the mountains. For example, under this law, every month 100 GEL will be transferred to a family where a child is born. Pensioners receive a 20 % higher pension and social assistance. Teachers and medics have more salaries. The state covers electricity bills. Pupils living here will study for free when enrolled in higher education. It’s cheaper to do business here too — companies here are exempt from tax for 10 years. Botko village is also included in the list

of villages in this program, but it is interesting how it will benefit if there is no electricity, school, medical station, road and more in the village (Law of Georgia on Development of Highland Regions. The parliament of Georgia, 2015).

The nearest shop and school are located 4 km from Botko village, and the nearest medical point is 11.5 km (fig. 5).

In Botko village, breeding fields were developed and livestock production was mainly followed by herding. The topographical maps of the 1950's clearly show the orchards and the village (fig. 6., 7).

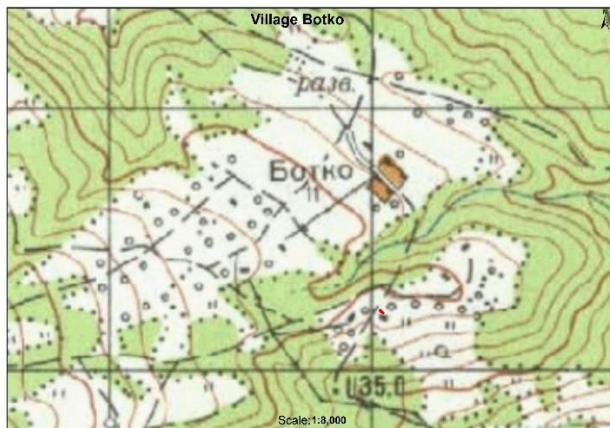


Fig. 6.

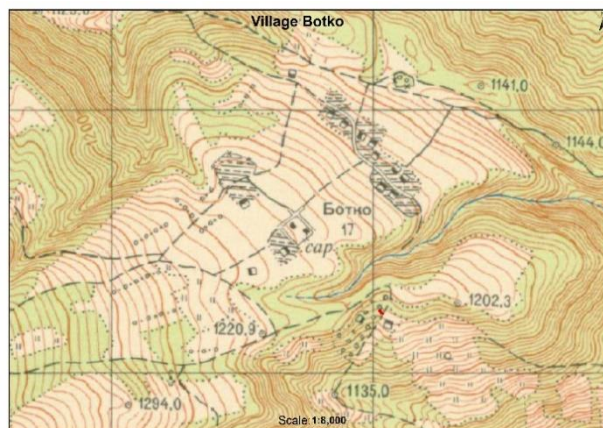


Fig. 7.

The topographical maps of the 1950's

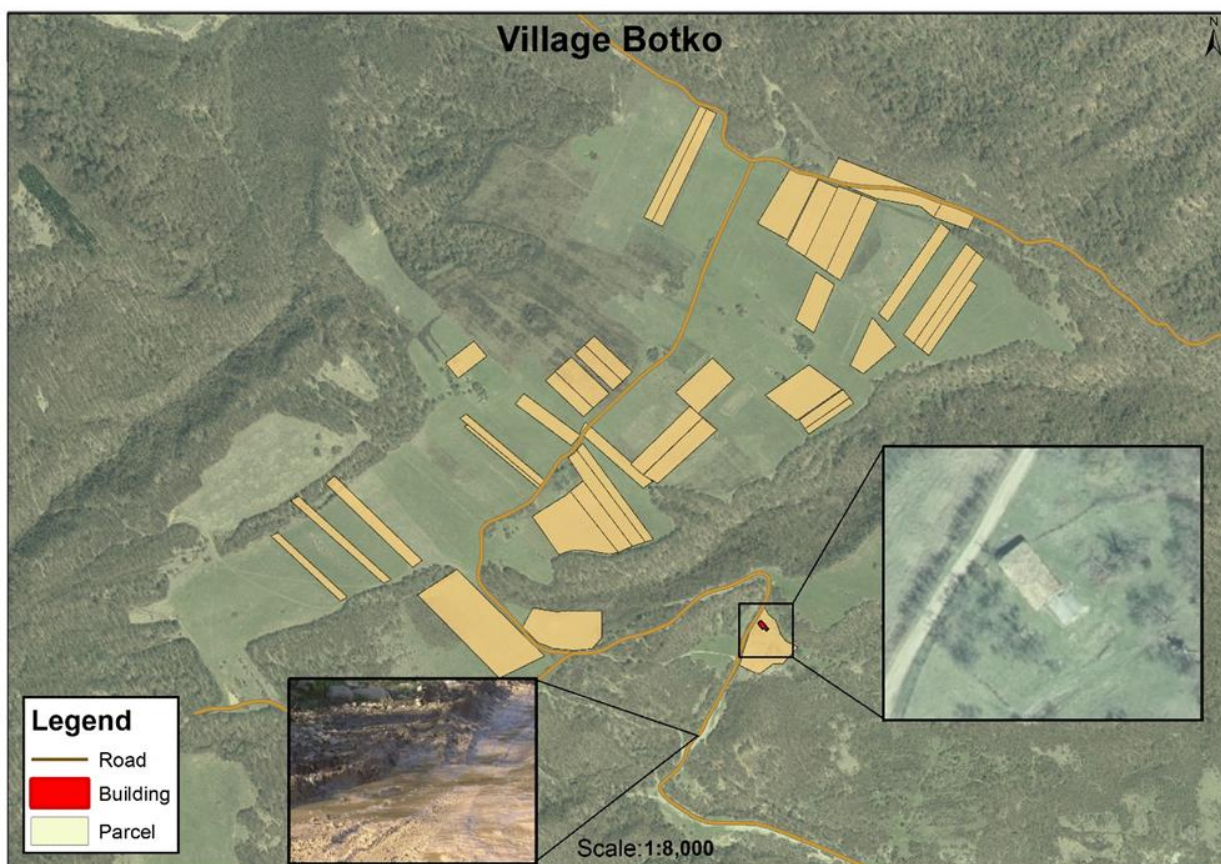


Fig. 8. Dwelling house and land plots in the village Botko

Currently there are 1 dwelling house and 40 land plots in the village (fig. 8). These plots were mainly registered in 2014–2019, the owners of which represent a significant population of the Sagarejo municipality, indicating that the interest in the village of Botko is not too low, and in theory the prospect of “revitalization” and redevelopment of the village may be promising.

CONCLUSIONS

In the modern world, the urgent need for sustainable development of mountainous areas has been put on the agenda, ensuring the creation of a favorable social, economic and ecological environment for future generations. Achieving such development is only the prerogative of an educated, healthy and motivated society, whose interdisciplinary and systematic sciences play an essential role. This is the modern geography that, in the face of the challenges of sustainable development, seeks to establish its place in the civilized world and to demonstrate its importance.

Mountains have played a major role in the history and development of mankind. They represent an essential source of water, forest and many mineral resources, an area characterized by biological and ethnic diversity, an area of high potential for recreational farming. Therefore, it is important to return the population to the mountains and villages, and this requires a great deal of support.

Only the display of recreational values and the development of tourism, is not considered a real way to stimulate the population and stop depopulation. That’s the way it is it is possible to maintain the mountain population having a decent life the means and incentives will be given. It is usually widespread in mountainous regions a common subsidy approach or different types of benefits. Such the vision undermines the initiatives of the local population, the rationalization of resources and effective use of opportunities, principles of sustainable development to realize. The mountainous regions of Europe, at the expense of optimal planning, already for decades it has been considered an area of interest for the population and business. This particularly relevant to ecological agriculture, energy alternative development of sources, local handicrafts, cultivation of medicinal plants, recreation, etc. Sustainable development of mountainous areas for both the local population and comprehensive understanding and satisfaction of public and private business interests requires. Implementing state policy requires both strategic and global as well as regional and local issues and development to show trends. In this case, the global role is given to global and regional.

It is important to develop the migration processes in Georgia in time History too. Long formation and development of the state of Georgia Throughout history, in different forms and intensities, it has always been characterized Migration processes. Nevertheless, Georgians have historically had less they belonged to the migrating nations, which was facilitated by farming and Historical traditions of culture [Tukhashvili, 1996, p. 38]

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